RECORD OF DECISION

Sherwin-Williams/Hilliards Creek Superfund Site

Operable Unit 2
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Gibbsboro, New Jersey

U.S. Environmental Protection Agency
Region II
August 2020

DECLARATION STATEMENT

SITE NAME AND LOCATION

Sherwin-Williams/Hilliards Creek Superfund Site (NJD980417976),
Borough of Gibbsboro, Camden County, New Jersey.
Operable Unit 2 – Soil, Sediment and Light Non-Aqueous Phase Liquid

STATEMENT OF BASIS AND PURPOSE

This Record of Decision ("ROD") presents the selected remedy to address contaminated soil, sediment and light non-aqueous phase liquid ("LNAPL") at portions of the Sherwin-Williams/Hilliards Creek Superfund Site ("Site"), located in the Borough of Gibbsboro, Camden County, New Jersey. The Site is comprised of the former manufacturing plant ("FMP") area, Hilliards Creek, portions of Silver Lake (Gibbsboro, New Jersey), and Kirkwood Lake (Voorhees, New Jersey). Operable Unit 2 ("OU2") of the Site will address soil contamination present within the FMP area, LNAPL within and adjoining the FMP area, and contaminated soil and sediments within the upper quarter-mile of Hilliards Creek ("Upper Hilliards Creek"). The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, ("CERCLA") and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"). This decision is based on the Administrative Record established for this Site.

The State of New Jersey Department of Environmental Protection ("NJDEP") concurs, in part, with the selected remedy. NJDEP concurs with the selected alternative of soil removal including off-site soil disposal. However, the State of New Jersey does not concur with the capping and institutional control component of the selected soil alternative unless property owners provide their consent to the placement of a deed notice.

ASSESSMENT OF THE SITE

The remedial action selected in the ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The remedial action described in this document addresses the soil, sediment and LNAPL contamination at the Site. Lead and arsenic are the primary soil contaminants within the FMP area and within the floodplain soils and sediments of Upper Hilliards Creek. Co-located with lead and arsenic, but detected at a lesser frequency, are other metals as well as polycyclic aromatic hydrocarbons ("PAHs"), such as benzo(a)pyrene, and low levels of polychlorinated biphenyls ("PCBs"). Separate from the areas of contamination just described, are areas within the FMP area impacted with LNAPL. The LNAPL has also migrated, east of the FMP area, beneath several residential properties along United States Avenue, Gibbsboro, New Jersey. The LNAPL also exists beneath Foster Avenue and United States Avenue.

The major components of the Soil Remedy include: a combination of excavation and capping of soils above cleanup goals; excavation of saturated soils which act as sources to shallow groundwater contamination; and excavation of shallow LNAPL, passive and active recovery, in-situ bioremediation (nutrient injections) and vapor recovery of deep LNAPL.

The details of the excavation and capping component of the remedy are as follows:

- Excluding PCB and arsenic sources, excavation, transportation, and off-site disposal of contaminated soil which exceeds cleanup goals to depths of up to four feet in Subareas 1 and 2.
- Excavation to a depth of approximately six feet of soil containing PCBs concentrations greater than 50 mg/kg in Subarea 1.
- Excavation of soil containing LNAPL from Subarea 4 to an approximate depth of five to seven feet.
- Excavation of pentachlorophenol (“PCP”) to the water table in Subarea 5.
- Excavation of all soil and sediment contaminants greater than their cleanup goals in Subarea 6.
- Maintaining existing areas that serve as caps and expanding or installing caps where necessary in Subareas 1, 2, 4, and 5 where contamination remains above cleanup goals at depth.
- Removal of any underground structures that may be a source of contamination from all six subareas.
- Restoration and revegetation of remediated areas.
- Institutional controls (“ICs”), such as a deed notice, to inform the user of potential exposure to residual soils which exceed levels that allow for unrestricted use. ICs would be established for areas where soil contamination exceeds residential cleanup goals, including existing roadways.

This selected remedy will also remove contaminated saturated soil, which acts as a source to shallow groundwater contamination. By removing these saturated soils, the concentrations of contaminants in groundwater that exceed ground water quality standards are anticipated to be reduced. The specific actions to address sources of shallow groundwater contamination include:

- Within Subarea 1, excavation of saturated soils exceeding 50 mg/kg of arsenic to approximately 15 feet in depth.
- Within Subarea 5, excavation of saturated soils exceeding 15 mg/kg of PCP to approximately eight feet in depth.

This selected remedy will also address LNAPL contamination in Subareas 2 and 3 by utilizing bioremediation technology (in the form of nutrient injections), as well as passive and active LNAPL recovery systems. The specific actions to address LNAPL include:

- Implementation of a Pilot Study to determine nutrient quantities and injection spacing to conduct bioremediation of LNAPL contamination.
- Development and implementation of a large-scale network of nutrient injection wells, as part of bioremediation activities, throughout portions of the FMP area and off-property areas.
- Installation of a LNAPL recovery well system in Subarea 2.
- Installation of an LNAPL recovery trench in Subarea 4, to collect any mobile LNAPL and transport it off-site for proper treatment and disposal.
- Installation of soil gas recovery systems throughout portions of the FMP area and in off-property areas where LNAPL contamination exists and soil gas generated by LNAPL bioremediation could become a concern.
- ICs to indicate potential vapor intrusion issues in existing buildings should they be reoccupied before subsurface contamination is remediated to appropriate levels. Additionally, ICs that require that future buildings constructed over volatile contamination be subject to a vapor intrusion evaluation or be built with vapor intrusion mitigation systems until subsurface contamination is remediated to appropriate levels would be included.

The major components of the Sediment Remedy include:

- Construction of a stream diversion system to allow access to sediment.
- Excavation of contaminants to depths ranging from 2 to 7 feet below sediment surface.
- Removal of contaminated sediment from the culvert that connects Silver Lake to Hilliards Creek.
- Dewatering and processing of excavated sediment.
- Transportation and off-site disposal of dewatered sediment.
- Stream bank revegetation and restoration.

EPA expects that removal of contaminated floodplain soils and sediments will result in a decrease of surface water contaminants. Surface water monitoring in Upper Hilliards Creek will be included as part of the remedial action to assess any changes in contaminant conditions over time. If monitoring indicates that contamination levels have not decreased to below standards, EPA may require an action in the future. Future operable units will address site-related groundwater contamination (“OU3”), and the remaining portions of Hilliards Creek, Kirkwood Lake, and Silver Lake (“OU4”).

DECLARATION OF STATUTORY DETERMINATIONS

Part 1: Statutory Requirements

The selected remedy is protective of human health and the environment, complies with federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost effective and utilizes permanent solutions and treatment technologies to the maximum extent practicable.

Part 2: Statutory Preference for Treatment

The LNAPL contamination is considered by EPA to be principal threat waste. Bioremediation of the LNAPL satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Part 3: Five-Year Review Requirements

Because the remedy will result in contaminants remaining in the soil on-site above levels that allow for unlimited use and unrestricted exposure, a statutory five-year review will be required.

RECORD OF DECISION DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for this Site.

- Contaminants of concern and their respective concentrations may be found in the "Site Characteristics" section.

- Baseline risk represented by the contaminants of concern may be found in the "Summary of Site Risks" section.

- Cleanup levels established for contaminants of concern and the basis for these levels can be found in the "Remedial Action Objectives" section.

- Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and decision document can be found in the "Current and Potential Future Site and Resource Uses" section.

- Estimated capital, annual operation and maintenance (“O&M”), and total present worth costs, discount rate, and the number of years over which the remedial cost estimates are projected can be found in the "Description of Alternatives" section.

- Key factors that led to selecting the remedy may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

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Pat Evangelista, Director
Superfund and Emergency Response Division
EPA-Region II

Date

DECISION SUMMARY

Sherwin-Williams/Hilliards Creek Superfund Site
Gibbsboro and Voorhees
New Jersey

U.S. Environmental Protection Agency
Region II
New York, New York
August 2020

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SITE NAME, LOCATION AND DESCRIPTION

The Sherwin-Williams/Hilliards Creek Superfund Site (“Site”), EPA ID # NJD980417976, is one of three sites which collectively make up what is commonly referred to as the “Sherwin-Williams Sites” (“Sites”). Located in areas of Gibbsboro and Voorhees, New Jersey, the Sherwin-Williams Sites are the: *Sherwin-Williams/Hilliard’s Creek Superfund Site* located in both Gibbsboro and Voorhees; the *Route 561 Dump Site* in Gibbsboro; and the *United States Avenue Burn Superfund Site* in Gibbsboro (Figure 1). The Sites represent source areas of contamination from which contaminated soil and sediment have migrated to downgradient areas within Gibbsboro and Voorhees.

Sherwin-Williams/Hilliards Creek Superfund Site: The Sherwin-Williams/Hilliards Creek (“SW/HC”) Site includes the Former Manufacturing Plant area (“FMP area”), Hilliards Creek, Kirkwood Lake, and Silver Lake. The FMP area is approximately 20 acres in size and is comprised of commercial structures, paved surfaces, and undeveloped land. The FMP area extends from the south shore of Silver Lake to the shoreline of Bridgewood Lake, Gibbsboro, New Jersey. Hilliards Creek is formed by the outflow from Silver Lake. The outflow enters a culvert and flows beneath Foster Avenue, where it resurfaces. From this point, Hilliards Creek flows in a southerly direction through the FMP area and continues downstream through residential and undeveloped areas. At approximately one mile from its origin, Hilliards Creek empties into Kirkwood Lake. Kirkwood Lake, located in Voorhees, New Jersey, is approximately 25 acres in size and has residential properties lining its northern shore.

Route 561 Dump Site: The Route 561 Dump (“Dump”) Site is located approximately 700 feet to the northeast of the FMP area and is approximately 19 acres. It includes retail businesses, a portion of a residential area, wooded vacant lots and a small creek. A 2.9 acre fenced portion of the Dump Site is located at the base of an earthen dam that forms Clement Lake. The Dump Site includes portions of White Sand Branch, a small creek which originates at the Clement Lake dam and flows in a southwest direction for approximately 1,650 feet where it enters the fenced portion of the Burn Site.

United States Avenue Burn Site: The fenced portion of the U. S. Avenue Burn Superfund (“Burn”) Site and its associated contamination is approximately 13 acres in size and encloses the remaining 400 feet of White Sand Branch downstream of the Dump Site. A 500-foot portion of a small creek, Honey Run, enters the Burn Site where it joins White Sand Branch before it passes beneath United States Avenue and enters Bridgewood Lake in Gibbsboro. The six-acre Bridgewood Lake empties through a culvert beneath Clementon Road and forms a 400-foot long tributary that joins Hilliards Creek at a point approximately 1,000 feet downstream from the FMP area.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The former paint and varnish manufacturing plant property in Gibbsboro, New Jersey, was originally developed in the early 1800s as a sawmill, and later a grain mill. In 1851, John Lucas & Co., Inc. ("Lucas"), purchased the property and converted the grain mill into a paint and varnish manufacturing facility that produced oil-based paints, varnishes, and lacquers. Sherwin-Williams purchased Lucas in the early 1930s and expanded operations at the facility. Historic features at the former manufacturing plant, referred to as the FMP area, included wastewater lagoons, above-ground storage tanks, a railroad line and spur, drum storage areas, and numerous production and warehouse buildings (Figure 2). Various products were manufactured at the former facility, including dry colorants, varnishes, lacquers, resins, and oil-based and water-based (emulsion) paints.

After the Sherwin-Williams Company ("Sherwin-Williams") ceased operations at the plant in 1977, NJDEP issued Sherwin-Williams an Administrative Order on August 17, 1978. The NJDEP Administrative Order required Sherwin-Williams to remove the residual sludge from wastewater lagoons. Sherwin-Williams complied with NJDEP's Administrative Order, the sludge was removed and disposed of off-site. The property was sold to Robert Scarborough, a private developer, in early 1981. On May 19, 1981, NJDEP directed Sherwin-Williams to characterize and address groundwater contamination.

In 1983, NJDEP received a report that a petroleum-like seep, detected at the former Sherwin-Williams facility, was discharging into Upper Hilliards Creek. On March 3, 1987, NJDEP issued Sherwin-Williams a "Telegram Order", ordering Sherwin-Williams to immediately begin containment of the petroleum seeps and to submit a plan proposing additional actions to contain the contamination. Sherwin-Williams did not comply with the Telegram Order.

In 1990, Sherwin-Williams entered into an Administrative Consent Order ("ACO") with NJDEP to investigate the extent of groundwater contamination, and to characterize a petroleum-like seep in the vicinity of the 1 and 5 Foster Avenue buildings. A Seep Area[1] (Figure 3) was identified and investigated. From 1991 until 2000, five phases of remedial investigation ("RI") activities were performed by Sherwin-Williams, under NJDEP oversight. In 1997, the private developer sold the property to Brandywine Realty Trust ("Brandywine"). Brandywine retains ownership and operates the property as commercial and office space.

In 2001, the NJDEP terminated its ACO with Sherwin-Williams. In 2002, a new release of petroleum-like product was observed in the Seep Area and reported to state and federal agencies. In response to the observed seep, EPA issued Sherwin-Williams an "Expedia Notice" ("Notice").

[1] Seep Area – LNAPL, best characterized as a petroleum-like waste with long-chain hydrocarbons, has historically seeped to the ground surface within the parking lot adjacent to the 1 Foster Avenue building and behind the 5 Foster Avenue building. This area has been the subject of historic and present investigations and interim measures and is referred to as the "Seep Area."

The 2002 Notice required Sherwin-Williams to perform interim actions to prevent seep-related discharges from reaching Hilliards Creek, as well as additional geophysical and soil investigations. Sherwin-Williams' activities under the EPA 2002 Notice were completed, and the Notice was closed out by EPA in 2007. In 2008, the SW/HC Site was placed on the National Priorities List. Under EPA oversight, Remedial Investigation/Feasibility ("RI/FS") activities began at the Site, pursuant to the 1999 Administrative Order on Consent ("AOC[2]") and those activities continue at present for portions of the Site for which EPA has not yet selected a remedy. EPA has been designated as the lead agency for cleanup of the Site, with the NJDEP functioning in a support role.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA released the Proposed Plan for this remedial action at the Site to the public for comment on November 25, 2019. EPA made the Proposed Plan and other site-related documents available to the public in the Administrative Record file maintained at the Gibbsboro Borough Hall/Library in Gibbsboro, NJ; the M. Allan Vogelson Regional Branch Library-Voorhees in Voorhees, NJ; the EPA Region II Records Center located at 290 Broadway, New York, NY; and online at https://www.epa.gov/superfund/sherwin-williams. The notice of availability for these documents was published in the Courier-Post on November 25, 2019. A request to extend EPA's public comment period was received during the 30-day period; therefore, the public comment period lasted for 60 days and extended from November 25, 2019, through January 29, 2020.

In addition, on December 5, 2019, EPA held a public meeting at the Gibbsboro Senior Center, 250 Haddonfield-Berlin Road, Gibbsboro, New Jersey, to discuss the findings of the RI/FS and to present EPA's Proposed Plan to the community. At this meeting, EPA representatives answered questions about the remedial alternatives developed as part of the FS.

EPA addresses comments it received at the public meeting and during the public comment period in the Responsiveness Summary, which can be found in Appendix V.

SCOPE AND ROLE OF OPERABLE UNIT

Due to the size and complexity of the Site and varying land uses, EPA is addressing the cleanup of the Site in several parts, dividing work into phases called operable units. Operable Unit 1 ("OU1") for all three of the Sherwin-Williams Sites consists of remediating contaminated soils on residential properties in accordance with the September 2015 Record of Decision ("ROD") for OU1. The OU2 selected remedy will address contaminated soils, including LNAPL-impacted saturated and unsaturated soils, and sediments. Future OUs (OU3 and OU4) will address contaminated groundwater and sediments (respectively) present at the Site.

[2] 1999 AOC – 1999 AOC Index No. II CERCLA-02-99-2035 covers RI/FS activities for all three Sites: the Dump Site, Burn Site and the Sherwin-Williams/Hilliards Creek Site.

SITE CHARACTERISTICS

Physical Setting

The northern portion of the FMP area is a commercial property that is situated at the base of Silver Lake. There are a number of large unoccupied warehouse buildings in the northern portion of the FMP area as well as smaller occupied office buildings including the Gibbsboro Police Station. The southern portion of the FMP area is wooded and is the former location of waste lagoons. Residential developments adjoin the FMP area to the east and west.

This OU2 ROD evaluates alternatives that address soil contamination present throughout the FMP area, LNAPL contamination located at the FMP and on adjoining areas, and contaminated soil and sediments within Upper Hilliards Creek. Due to the large size of the FMP area and scope of work, EPA has designated "subareas" of the FMP area to aid in review of the plan. Six subareas of OU2 are described below. Figure 4 shows the extent of each subarea.

Subarea 1: This subarea is referred to as the former main plant area. This subarea encompasses property north of Foster Avenue: the 10 Foster Avenue building and the 6 East Clementon building slab, and south of Foster Avenue: the 7 Foster Avenue building. Historic features of this subarea included paint production buildings, a lacquer manufacturing building, and Tank Farm B, where above-ground storage tanks contained raw materials for paint manufacture.

Subarea 2: This subarea includes the 2 and 4 Foster Avenue buildings, a grassy lot and paved parking lot east of the buildings, and portions of Foster Avenue. Historic features of this subarea include a former resin manufacturing facility and Former Tank Farm A that contained large above and below-ground storage tanks. This subarea is primarily impacted by LNAPL in saturated soil.

Subarea 3: This subarea is on the eastern side of United States Avenue and adjoins the eastern side of the FMP area. This subarea consists of several residential properties, as well as a vacant lot that once was a gas station. This subarea is also primarily impacted by LNAPL in saturated soil.

Subarea 4: This subarea, known as the Seep Area, is downgradient of Former Tank Farm A. This subarea includes paved and unpaved areas adjoining the 1 and 5 Foster Avenue buildings. LNAPL historically seeped from the ground surface in this subarea and discharged into Hilliards Creek.

Subarea 5: Former Lagoon Area. This subarea located south of Subarea 4 is undeveloped and contains terrestrial habitat. This subarea was the location of lagoons and holding basins that contained paint manufacturing wastes.

Subarea 6: Upper Hilliards Creek. This subarea includes floodplain soils and sediments of an 800 foot section of Hilliards Creek, located between Foster Avenue and West Clementon Road. Wastes entered this section of the creek by direct discharge from paint manufacturing operations, and uncontrolled releases from the waste lagoons.

Summary of Pre-Remedial Investigation Activities

The 2018 OU2 RI Report provides a detailed description of the RI activities used to define the nature and extent of contamination. The 2018 RI Report also contains a comprehensive description of all "pre-RI" investigation activities performed by Sherwin-Williams under the ACO with NJDEP, and under the 2002 Notice with EPA. The 2018 OU2 RI Report also contains information from investigations performed by Mr. Scarborough, the property owner of the FMP area after the Sherwin-Williams Company and prior to Brandywine. This historic data aided EPA in directing Sherwin-Williams to perform more focused RI sampling activities (2009 – 2016), pursuant to the 1999 AOC. The 2018 OU2 RI Report, containing pre-RI data, is available in the EPA Administrative Record file.

Summary of Remedial Investigation Activities

The following is a summary of the investigations and findings for the FMP area (Subareas 1, 2, 4, and 5); Upper Hilliards Creek (Subarea 6); and properties adjoining FMP area (Subarea 3) that are the focus of this ROD.

FMP Area Soil RI Sampling Approach

Sherwin-Williams collected over 3,000 soil samples from over 400 sample locations. Soil samples were collected from surface (0.0 – 2.0 feet below the surface) and subsurface (greater than 2.0 feet below the surface) intervals and were sent to laboratories for analyses. Many soil samples were collected in shallow groundwater to determine the approximate extent of LNAPL impacts. Soil samples were collected beneath the slab of the 6 East Clementon building after demolition of the building. No soil samples were collected beneath the remaining buildings in Subareas 1, 2, and 4.

FMP Soil Sample Findings

Soil data in the 2018 OU2 RI Report were compared to the NJDEP Residential Direct Contact Soil Remediation Standards ("RDCSRS"), often referred to as "residential soil standards". Review of the soil data collected from Subarea 1 indicates that there are broad areas of lead and arsenic soil contamination, above residential soil standards, predominately beneath paved surfaces. The residential soil standards for lead and arsenic are 400 milligrams per kilogram (mg/kg) and 19 mg/kg, respectively. The highest concentration of lead is detected at 15,300 mg/kg, and the highest concentration of arsenic is detected at 863 mg/kg. These concentrations are in separate sample locations beneath the 6 East Clementon slab. The remaining detections of lead and arsenic in soil samples are found immediately east of the 6 East Clementon slab and are well below these concentrations. In a localized area, beneath the 6 East Clementon slab, arsenic contamination is present in soil both above and below the water table. Based on shallow groundwater sampling, it is likely that the arsenic in the soil below the water table is the source of arsenic groundwater contamination.

Soil sample locations containing PAHs above the residential soil standards are co-located with approximately seventy-five percent of the sample locations containing lead and arsenic above residential soil standards. The highest concentration of PAHs is benzo(a)pyrene at 69 mg/kg, with the majority of the remaining exceedances being well below this value. The residential soil standard for benzo(a)pyrene is 0.5 mg/kg.

A localized area of PCBs was detected near the northern portion of the 10 Foster Avenue building. Lead, arsenic, and PAHs are also present above residential soil standards at this location. The highest concentration of the PCB Aroclor 1260 was detected at a concentration of 1,200 mg/kg. The remaining PCB concentrations are generally below 3.0 mg/kg. The PCB residential soil standard is 0.2 mg/kg. The source of PCB contamination appears to be the location of a historic electrical transformer substation.

Lead and arsenic contamination is present in shallow soils, predominantly less than 4 feet deep in the southern portion of Subarea 1, south of Foster Avenue, beneath the paved surfaces that surround the 7 Foster Avenue building. The highest concentration of lead detected throughout this area is present at a concentration of 3,050 mg/kg, while the highest concentration of arsenic is 138 mg/kg. PAHs exceed residential soil standards; however, they are not co-located with lead and arsenic exceedances with the same frequency as PAH exceedances in the northern portion of Subarea 1 (north of Foster Avenue). The PAH exceedances of soil standards are generally present at depths of less than two feet, but one location extended to ten feet below the paved surface. The highest concentration of benzo(a)pyrene is present at a concentration of 22 mg/kg.

Within the southern portion of Subarea 1, PCP is also found above the residential soil standard (0.9 mg/kg) but at a lower frequency of detection than other contaminants. The highest concentration of PCP is 2.7 mg/kg. PCP was detected in very few soil sample locations, generally less than two feet deep, however, the deepest detection of PCP was found at eight feet in depth.

Within Subarea 5 (the former lagoon area), located to the east of Hilliards Creek and south of Subarea 4, the RI sampling results indicated the presence of PCP and PAHs. The highest concentration of PCP is 650 mg/kg, whereas the highest concentration of benzo(a)pyrene is 1.1 mg/kg. The PCP concentrations are largely detected in the subsurface soils below the water table. The PCP-contaminated soils are residual lagoon wastes that were not addressed during the removal actions performed by Sherwin-Williams under the 1978 NJDEP Directive.

The remaining Subareas of the Site include Subareas 2, 3, and 4, and Upper Hilliards Creek (Subarea 6), and are discussed below. Subareas 2 through 4 are impacted with LNAPL. Arsenic, lead, and PAHs, frequently detected at Subarea 1, were found on a very limited basis in Subareas 2 and 4. Contamination within Subareas 2 through 4 is almost exclusively limited to LNAPL-impacted soils.

LNAPL and Residual LNAPL-Impacted Soils

LNAPL at the Site is comprised of degraded mineral spirits, residual petroleum hydrocarbons, with some aromatic and aliphatic compounds, including volatile organic compounds ("VOCs"), semi-volatile organic compound ("SVOCs") such as benzene and naphthalene (respectively), and associated tentatively identified compounds ("TICs"). A TIC is a compound that can be detected by the analytical testing method, but its identity and concentration cannot be confirmed without further analytical investigation. The source of the LNAPL release is primarily located in Former Tank Farm A. The presence of LNAPL can be attributed to the chemicals historically stored in Former Tank Farm A. Spills and releases of chemicals from Former Tank Farm A migrated downward through the soil column and entered the shallow groundwater.

RI sampling activities conducted to determine the extent of LNAPL-impacted soils included the collection of soil samples, groundwater samples from fixed monitoring wells, aqueous grab samples, and vapor intrusion studies. Environmental screening techniques included: a photo-ionizing detector ("PID"), membrane interface probe ("MIP"), laser-induced fluorescence ("LIF"), and visual observations. The use of these different methodologies provided multiple lines of evidence which were used to approximate the vertical and horizontal extent of LNAPL-impacted soils. Figure 5 presents the approximate horizontal extent of LNAPL-impacted soils.

The LNAPL at the Site is lighter than water and is generally found near the groundwater table. LNAPL contamination is the source of dissolved-phase VOCs and SVOCs in shallow groundwater.

Within Subarea 2, the water table was often encountered eight to ten feet below ground surface. Soil samples indicated VOC and SVOC TICs (components of LNAPL contamination) often extended 10 – 15 feet below the water table. Within the Seep Area (Subarea 4), where the water table was often encountered one to three feet below ground surface, LNAPL-impacted soils were recorded up to seven feet in thickness. The water table beneath Subarea 3 (off-property area) was often not encountered until nearly 15 feet below ground surface. The LNAPL-impacted soils were less than four feet thick at the water table in this area.

Vapor Intrusion Studies

EPA initiated vapor intrusion studies in May 2008. Vapor intrusion activities included the collection of sub-slab soil gas samples beneath the basements of a number of residential properties along U.S. Avenue and Berlin Road in Gibbsboro. Analysis of sub-slab soil gas indicated no detections of VOC compounds beneath the slabs of the residential properties, as a result, there was no need to collect indoor air samples.

In December 2008, EPA collected sub-slab soil gas samples from beneath all commercial buildings (Subareas 1, 2, and 4) within the FMP area. The sub-slab soil gas samples detected high concentrations of several VOC compounds, such as: benzene, toluene, ethylbenzene, and xylene ("BTEX") beneath the slabs of the 2 and 4 Foster Avenue buildings (Subarea 2). Former Tank Farm A, located adjacent to these buildings, contained chemical compounds used for paint, lacquer, and varnish manufacturing, including mineral spirits, benzene, toluene, and xylene.

Based on the 2008 sub-slab soil gas results from beneath the 2 and 4 Foster Avenue slabs, EPA has periodically performed indoor air sampling activities and resampling of the sub-slab ports.

Methane Monitoring

In 2015, as part of the periodic vapor intrusion monitoring activities, methane vapors were detected beneath the 2 and 4 Foster Avenue slabs. Methane concentrations are due to the natural breakdown processes (biodegradation) of the LNAPL. Methane concentrations have been periodically monitored to ensure that they did not exceed unacceptable levels within the 2 and 4 Foster Avenue buildings. Additionally, methane concentrations have been used as a means to approximate the extent of LNAPL-impacted soils throughout portions of the FMP area.

Upper Hilliards Creek RI Sampling Activities

A majority of the sampling activities within Upper Hilliards Creek (Subarea 6) were completed in 2008. However, Sherwin-Williams returned to Upper Hilliards Creek in 2016 to collect soil and sediment samples for hexavalent chromium and extractable petroleum hydrocarbons ("EPHs"). Sherwin-Williams again returned in 2017 to collect additional soil, sediment, and a variety of biota, to complete an analysis of a site-specific Baseline Ecological Risk Assessment ("BERA") which is discussed below.

Upper Hilliards Creek Soil Sample Findings

Lead, arsenic, and PAHs were found above residential soil standards within Upper Hilliards Creek floodplain soils. PCB Aroclor 1260 was also detected above residential soil standards within Upper Hilliards Creek soils. PCBs and PAHs are frequently co-located with lead and arsenic. Concentrations of lead and arsenic remain relatively the same throughout Upper Hilliards Creek floodplain soils. Lead and arsenic concentrations are generally similar in either the 0.0 – 0.5-foot to 1.5 – 2.0-foot soil sample intervals. The highest concentrations of lead and arsenic detected were 7,580 mg/kg and 191 mg/kg, respectively. Exceedances of residential soil standards for lead and arsenic are present in shallow soil but not consistently present in soils deeper than two feet. Antimony and cyanide were infrequently detected above the residential soil standards, 31 mg/kg and 47 mg/kg, respectively. When detected above the residential soil standards, they are co-located with lead and arsenic.

Concentrations of PAHs were generally highest in the most upstream portions of Upper Hilliards Creek floodplain soils near Foster Avenue, adjacent to the 1 Foster Avenue building. Concentrations of PAHs in soils are also much higher in the surface soils (0.0 – 0.5 feet in depth) than in subsurface (1.5 – 2.0 feet in depth). The highest reported concentration of benzo(a)pyrene detected in a surface soil sample was 37 mg/kg, whereas, at the same sample location, the subsurface soil concentration was 2.6 mg/kg. Concentrations of PAHs in Upper Hilliards Creek floodplain soils decline downstream, to where the highest reported concentration of benzo(a)pyrene was detected at 8.4 mg/kg.

PCB Aroclor 1260 was also detected in floodplain soils above residential soil standards. Similar to PAHs, the highest concentrations of PCB Aroclor 1260 were found at upstream points, declining downstream, and also present at higher concentrations in surface soils than in subsurface soils.

The soil sampling activities outside of the Hilliards Creek floodplain, upland and behind residential properties, also found lead, arsenic, and PAHs, but at relatively low concentrations, and in soils less than two feet in depth. The highest reported concentrations of lead, arsenic, and benzo(a)pyrene were: 626 mg/kg, 25 mg/kg, and 0.87 mg/kg, respectively.

Upper Hilliards Creek Sediment Findings

Sediment samples were collected from approximately fifteen locations in Upper Hilliards Creek. In addition, sediment samples were collected from within the Silver Lake conveyance system, the underground culvert which connects the Silver Lake outflow to the confluence of Hilliards Creek. Sediment sample results were compared to the NJDEP lowest effect levels ("LEL") for ecological receptors, which are often lower than residential soil standards.

Lead and arsenic were found most frequently and at the greatest concentrations above the NJDEP LEL of 31 mg/kg for lead and 6 mg/kg for arsenic for ecological receptors. Contaminants in sediment that exceed the LEL criteria generally require further evaluation. Other contaminants found above this criterion were cadmium, chromium, copper, cyanide, mercury, zinc, PAHs, pesticides, and PCBs. These other contaminants were found less frequently and are co-located with lead and arsenic.

Lead and arsenic LEL exceedances were found in sediment throughout Upper Hilliards Creek. The concentration of lead varies from below the LEL for ecological receptors to 10,900 mg/kg. The arsenic levels varied from below the LEL for ecological receptors to over 1,720 mg/kg. For both metals, the highest values were found within creek sediments in the vicinity of the former lagoon area, where several releases were reported to have occurred from the lagoons.

Upper Hilliards Creek Surface Water Findings

Surface water samples were collected from five locations within Upper Hilliards Creek on two occasions. One sampling event was performed after a significant rain event, and another sampling event was performed during a dry period. Surface water results were compared to the NJDEP New Jersey Surface Water Quality Standards ("NJSWQS").

Analyses of the surface water showed exceedances of the NJSWQS for aluminum, iron, zinc, cyanide, and lead. As with the other media, lead is detected most frequently. Arsenic was not detected at concentrations above the NJSWQS. The concentration of lead in surface water was compared to the NJSWQS of 5.4 micrograms/Liter ("µg/L"). The total lead value varied from below the NJSWQS to over 16 µg/L for total lead.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Site consists of developed and undeveloped land, currently zoned office/technical park (approximately 20 acres in size) and mixed commercial/residential properties (approximately 8 acres in size). Although the Site is primarily zoned for commercial use, the Borough of

Gibbsboro has indicated to EPA the potential for future residential use. Therefore, EPA has considered remedial alternatives and cleanup levels that would allow the Site to be used for residential purposes. Wetland areas, comprised of floodplain soils and sediments, within Upper Hilliards Creek will be remediated to ecological cleanup goals and restored. Additionally, LNAPL contamination has impacted the soils and shallow groundwater beneath areas of the Site, a series of residential properties along U.S. Avenue, and beneath portions of Foster Avenue, Berlin Road, and U.S. Avenue roadways. The LNAPL contamination will be addressed by the selected remedy.

SUMMARY OF SITE RISKS

As part of the RI/FS, 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 in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment includes a human health risk assessment ("HHRA") and an ecological risk assessment. It provides the basis for taking an action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessment for OU2 of 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 at a site for each environmental medium (e.g., soil, sediment, etc.), with consideration of several 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., vapor intrusion concerns due to inhalation of soil gas) 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).
>
> *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the National Contingency Plan ("NCP") as an excess lifetime cancer risk greater than 1×10^{-6} to 1×10^{-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 contaminants of concern ("COCs") and are typically those

that will require remediation at a site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, the chemicals of potential concern ("COPCs") in each environmental 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 2017 OU2 HHRA ("2017 HHRA") characterized potential risks to human health from exposure to soil, sediment, surface water, and vapor intrusion at the Site. COPCs were determined for each exposure area and medium by comparing the available analytical data to appropriate risked-based screening criteria. An exposure area is a geographical designation created for the risk assessment in order to define areas of a site with similar anticipated use or similar levels of contamination. Analytical data collected during the RI activities at the Site indicated the presence of VOCs, metals, PAHs, PCBs, and pesticides in various media above screening criteria.

Only the COCs, or the chemicals requiring a response, are listed in Appendix II-C, Table 1. Lead was also identified as a COC; the relevant subset of information for lead is summarized in Table 7 of Appendix II-C. However, a full list of all COPCs identified in the 2017 HHRA is available in the Administrative Record for the Site.

Exposure Assessment

Consistent with Superfund policy and guidance, the HHRA is a baseline human health risk assessment and therefore assumes no remediation has been performed or institutional controls established to mitigate or remove hazardous substance releases. 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 conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a Site.

The Site was divided into the following four exposure areas within the 2017 HHRA: North of Foster Avenue ("NFA"), South of Foster Avenue ("SFA"), Undeveloped Area ("UNDV"), and East of United States Avenue ("EUSA"). Exposures to sediments and surface water for Upper Hilliards Creek ("UHC") were evaluated as part of the UNDV. The NFA is comprised of the northern portion of Subarea 1 as well as Subarea 2 (Figure 4). The SFA encompasses the southern portion of Subarea 1 and Subarea 4. The EUSA is comprised of the off-property parking and roadway area adjacent to Subareas 2 and 4. Soil above the water table on the residential properties included in Subarea 3 were evaluated under a separate OU. The UNDV is made up of Subareas 5 and 6. For the purposes of this ROD, these six subareas will be used to summarize the 2017 HHRA findings.

The varying exposure areas within the Site are currently zoned for commercial or mixed commercial/residential purposes. Subareas 5 and 6 are undeveloped and can only be accessed by recreational users. Considering zoning as well as current and potential future land use in each exposure area, the following exposure populations and pathways were evaluated under the future land use scenario in the 2017 HHRA for Subareas 1 through 5:

- Utility Worker (adult): incidental ingestion, dermal contact and inhalation of particulates and volatiles released from surface (0-2 feet) and subsurface soils (2-10 feet).
- Construction Worker (adult): incidental ingestion, dermal contact and inhalation of particulates and volatiles released from surface (0-2 feet) and subsurface soils (2-10 feet).
- Outdoor Worker (adult): incidental ingestion, dermal contact and inhalation of particulates and volatiles released from surface soils.
- Resident (child [0-6 years] and adult): incidental ingestion, dermal contact and inhalation of particulates and volatiles released from surface soils.

Current/future exposure pathways specific to Subareas 5 and 6 (due to them being either a creek habitat or vacant/wooded land) included the following:

- Recreator (adult, adolescent [6-16 years], and child): incidental ingestion, dermal contact and inhalation of particulates and volatiles released from surface soils; incidental ingestion and dermal contact of sediments along with dermal contact with surface water while wading in UHC.

Buildings within Subareas 1, 2 and 4 have also been evaluated for potential vapor intrusion through the collection of sub-slab soil gas and indoor air data. The 2017 HHRA evaluated the potential for risks associated with this pathway to future commercial workers resulting from the inhalation of contaminants in indoor air. The vapor intrusion pathway for the residential properties included in Subarea 3 was evaluated in the 2014 OU1 HHRA. No concerns were identified for the residential units, as no exceedances were detected in the sub-slab soil gas samples; and therefore, no indoor air sampling activities were required. The potential for vapor intrusion in subareas 5 and 6 was not evaluated, as these locations are undeveloped.

A summary of all the exposure pathways considered in the 2017 HHRA can be found in Table 2 of Appendix II-C. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration ("EPC"), which is usually an upper-bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. For lead exposures, the arithmetic mean of all samples collected from the appropriate soil interval was used as the EPC. In addition, total and hexavalent chromium samples were collected from Site soils; however, sediment data collected from UHC was only analyzed for total chromium. For soils, the average ratio for hexavalent chromium to total chromium was 5%. In the absence of speciated data for sediment, two EPCs were used to evaluate risk for current/future recreators exposed to this media in Subarea 6. The first conservatively assumed that 100% of the chromium identified exists in the more toxic hexavalent form to represent the "worst-case" scenario. The second applied the hexavalent chromium soil ratio to the EPC for total chromium in sediment, thus adjusting it to 5%, as the hexavalent chromium content in sediment is not likely to be higher than that in soil. The results of applying this EPC range to recreational receptors in Subarea 6 are discussed further under

Risk Characterization. A summary of the exposure point concentrations for COCs other than lead in each medium can be found in Appendix II-C, Table 1; lead EPCs are summarized in Table 7. A comprehensive list of exposure point concentrations for all COPCs can be found in Appendix C (table 3 series) of the 2017 HHRA.

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. Consistent with current EPA policy, it was assumed that the toxic effects of the 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. This information is presented in Appendix II-C, Table 3 (Noncancer Toxicity Data Summary) and Table 4 (Cancer Toxicity Data Summary). Additional toxicity information for all COPCs is presented in the 2017 HHRA.

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. Exposure from lead was evaluated using blood lead modeling and is discussed in more detail later in this section.

Noncarcinogenic Risks

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 to chemicals 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. A 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. These discrete HI values are then compared to the acceptable limit of 1 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. A summary of the noncarcinogenic risks associated with these chemicals for each exposure pathway is contained in Table 5 of Appendix II-C.

It can be seen in Table 5 of Appendix II-C that the noncancer hazard estimates exceeded EPA's threshold value of 1 for the future resident in Subareas 1, 2, 4 and 5 with HIs ranging from 4 to 10. The majority of the noncarcinogenic hazard for these populations (future resident) were primarily attributable to metals (arsenic, antimony and/or cyanide) and PCBs (Aroclor 1260) in surface soils. The construction worker HI of 6 in Subareas 1 and 2 was driven by Aroclor 1260 in soil as well.

In the 2017 HHRA, soils from Subareas 1 and 2 were combined into one exposure area. The results for this exposure area, however, indicate that arsenic and Aroclor 1260 comprised the majority of risk and hazard within Subarea 1 only, particularly the area north of Foster Avenue. Aroclor 1260 is localized to an area beneath the paved parking lot near the 10 Foster Avenue building. Similarly, elevated risks due to antimony were attributable to elevated concentrations in the southern portion of Subarea 1, south of Foster Avenue. A child recreator in Subareas 5 and 6 had a HI of 12 driven by arsenic and cyanide in floodplain surface soil adjacent to Hilliards Creek and sediment within the creek. The adolescent recreator HI of 3 was predominantly based on exposure to arsenic in sediment.

Carcinogenic Risks

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

Risk = LADD x SF

Where: Risk = a unitless 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 EPA Superfund guidance identifies the range for determining whether a remedial action is necessary as an individual lifetime excess cancer risk of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk), with 10^{-6} being the point of departure.

As summarized in Table 6 of Appendix II-C, the estimated cancer risks for the future resident in Subareas 1, 2, 4 and 5 slightly exceed EPA's target risk range of 1×10^{-6} to 1×10^{-4}. Cancer risks ranged from 2×10^{-4} to 3×10^{-4} primarily as a result of exposure to arsenic and benzo(a)pyrene in surface soil. Although exposure to no individual chemical resulted in elevated risk within Subareas 1 and 2, the total risk estimated for the future resident exposed to surface soil (2×10^{-4}) was slightly above the target risk range. This estimate was primarily driven by arsenic (6×10^{-5}) in surface soil. For a child recreator in Subarea 6, exposure to arsenic and chromium in sediment was associated with a risk of 4×10^{-3}. This estimate was based on the conservative assumption that 100% of the chromium identified exists in the hexavalent form. Risks reflecting the previously mentioned 5% hexavalent chromium ratio were 2×10^{-4} for this metal specifically, and still resulted in a total receptor risk of 1×10^{-3}. Therefore, chromium and arsenic are both considered COCs within UHC sediment. Chromium also contributed to slightly elevated risk for the adolescent recreator exposed to sediment, although assuming 5% hexavalent chromium reduced the total risk to an estimate equal to that of the upper bound end of the target range (1×10^{-4}). The cancer risk estimate for the adult recreator was predominantly due to arsenic in sediment as well, resulting in a total receptor risk of 2×10^{-4}.

Risks Associated with Lead

Lead was detected in soil and sediment at elevated concentrations. Because there are no published quantitative toxicity values for lead it is not possible to evaluate risks from lead exposure using the same methodology as for the other COCs. However, since the toxicokinetics (the absorption, distribution, metabolism, and excretion of toxins in the body) of lead are well understood, lead risks are regulated based on blood lead concentrations ("PbB"). In lieu of evaluating risk using typical intake calculations and toxicity criteria, EPA developed models which are used to predict PbB and the probability of a child's blood lead level exceeding 5 micrograms per deciliter (µg/dL) based on a given multimedia exposure scenario. EPA's risk reduction goal for lead-contaminated sites is to limit the probability of a typical child's (or that of a group of similarly exposed individual's) PbB exceeding 5 µg/dL to 5% or less. In the HHRA, lead risks for child residents and recreators were evaluated using EPA's Integrated Exposure Uptake Biokinetic ("IEUBK") model; the Adult Lead Methodology ("ALM") model was used for all other adolescent and adult receptors.

As summarized in Table 7 of Appendix II-C, the predicted probabilities of a child's PbB exceeding 5 µg/dL surpassed EPA's risk reduction goal of 5% for a future child residing in Subareas 1, 2, 4 and 5 as well as a current/future child recreator in Subareas 5 and 6. Based on the IEUBK results, the predicted probabilities at these exposure areas ranged from 14% to 99.8%. Additionally, results of the ALM indicated that an outdoor worker in Subareas 1, 2, and 4 exceeded the risk reduction goal with predicted fetal PbB probabilities ranging from 19% to 64%. For the construction worker at Subareas 1, 4 and 5, blood lead modeling indicated that the probability of fetal PbB exceeding 5 ug/dL ranged between 9% and 18% as well. The predicted fetal PbB probabilities for the outdoor and utility worker in Subarea 5 were each below the risk reduction goal of 5%.

Vapor Intrusion

Vapor intrusion investigations, which initially consisted of sub-slab soil gas sampling activities at both residential properties (Subarea 3) and commercial properties within the FMP area, were performed to determine the potential presence for sub-slab VOC vapors. The sub-slab sampling activities at the residential properties confirmed no presence of sub-slab VOC vapors. Due to the presence of VOC vapors beneath several commercial buildings within the FMP area, indoor air sampling activities were performed at seven commercial buildings within the FMP area. The buildings investigated included 1, 2, 4, 5, 7 and 10 Foster Avenue and 6 East Clementon Road (all present in Subareas 1, 2, and 4). The indoor air and sub-slab vapor results were compared to EPA's commercial vapor intrusion screening levels ("VISLs") based on a cancer risk of $1x10^{-6}$ and hazard quotient of 1.

Results of the data collected indicated that elevated sub-slab vapor and indoor air concentrations were present at 2 Foster Avenue and 4 Foster Avenue only (Subarea 2). Each of these buildings are currently vacant. A total of 12 VOCs were detected above sub-slab VISLs beneath these buildings, including: 1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene, benzene, cyclohexane, ethylbenzene, m,p-xylenes, n-hexane, n-nonane, o-xylene, tetrachloroethene, trichloroethene, and vinyl chloride. Within indoor air, 10 VOCs were identified above VISLs, which included acrolein, benzene, benzyl chloride, bromodichloromethane, chloroform, 1,2-dichloroethane, ethylbenzene, naphthalene, 1,1,2,2-tetrachloroethane, and trichloroethene.

Since the 2 and 4 Foster Avenue buildings are currently unoccupied, the vapor intrusion pathway remains incomplete, however, the exceedances of both sub-slab and indoor air VISLs indicate the potential for the vapor intrusion pathway to be complete if these buildings were to be used in the future. Additional discussion of the sub-slab vapor and indoor air results can be found in the 2017 HHRA.

Human Health Risk Summary

Exposure to contaminants in surface soils, subsurface soils, and sediments was found to exceed EPA's threshold criteria at the FMP area (Subareas 1, 2, 4, 5 and 6). Based on these results, arsenic and lead were identified as the primary COCs; however, exposure to other metals (antimony, chromium and cyanide), PCBs (Aroclor 1260), and SVOCs (benzo(a)pyrene) was also identified in soils and/or sediment exceeding cancer risk and noncancer hazard thresholds at some of the Subareas evaluated. There were no contaminants found in the surface soils at Subarea 3; therefore, there are no risks associated with exposure to surface soils on Subarea 3.

The LNAPL present in the saturated soils at portions of Subarea 2, 3, and 4 and present within portions of the roadways (Foster Avenue, U.S. Avenue, and Berlin Road) is considered to be principal threat waste and will be addressed as part of the response action selected in the ROD.

Overall, the exceedances of sub-slab and indoor air VISLs indicate a potential risk to commercial workers at the 2 and 4 Foster Avenue buildings. Since these buildings are currently unoccupied, the vapor intrusion pathway remains incomplete; however, the exceedances of both sub-slab and indoor air VISLs indicate potential risks if these buildings were to be used in the future.

Based on these results, the response action selected in the ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of contaminants into the environment.

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 COCs (exposure frequency), the period of time over which such exposure would occur (exposure duration), and in the statistical methods used to estimate the concentrations of the COCs 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 unlikely to underestimate actual risks related to the Site.

A noteworthy source of uncertainty in the 2017 HHRA deals with the large number of TICs detected at the Site. Toxicity factors are needed to quantify risks and hazards from exposure to chemicals. Since toxicity values were not available for the majority of the detected TICs, risks and hazards could not be quantified for these compounds. The omission of these chemicals from the quantitative risk evaluation tends to lead to an underestimate of total noncancer and cancer risks.

Risks to commercial workers exposed to VOCs in indoor air may be biased low due to elevated detection limits. High concentrations of aliphatic and aromatic compounds, benzene, ethylbenzene, xylene, toluene, and 1,2,4-trimethylbenzene resulted in elevated detection limits at levels above screening criteria for other compounds in several sub-slab soil gas samples. Four of these chemicals were detected in indoor air above their screening criterion (1,1,2,2-tetrachloroethane, acrolein, benzyl chloride and bromodichloromethane). Therefore, it is not known whether these compounds could have been present in sub-slab soil gas at levels below the detection limit, and thus whether the presence of these compounds in indoor air could be related to vapor intrusion. Several compounds, such as petroleum hydrocarbons, that were detected at high concentrations in both sub-slab and indoor air do not have screening criteria as well. The TICs reported in indoor air also did not have screening criteria. Risks from these compounds were not assessed due to the absence of screening criteria; therefore, VI risks based on sub-slab soil gas and/or indoor air data may be underestimated.

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

Ecological Risk Assessment

A baseline ecological risk assessment was conducted to evaluate the potential for ecological risks from the presence of contaminants in the following media: sediment, surface water, pore water, and soil. The aquatic habitat is the stream, while the terrestrial habitat includes the Upper Hilliards Creek floodplain and adjacent forested areas (Subarea 6), and the Former Lagoon Area (Subarea 5), which is vacant and undeveloped. See Figure 6. Media concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors by habitat type.

Exposure of terrestrial wildlife through ingestion of contaminated soil and biota, and exposure of aquatic wildlife to contaminants in Upper Hilliards Creek (Subarea 6) through ingestion of contaminated sediment, surface water, and biota were evaluated. Biological data were collected (benthic invertebrates, fish, and soil invertebrates) to assist in understanding site-specific bioaccumulation rates and subsequent exposure to upper trophic level receptors. In addition, COC concentrations and biological responses (sediment toxicity) were evaluated to understand potential community level impacts associated with sediment COCs.

A complete summary of all exposure scenarios and ecological receptor groups may be found in the 2018 OU2 BERA ("BERA") which is part of the EPA Administrative Record file.

Summary of the Baseline Ecological Risk Assessment

Ecological risks identified in the BERA for key inorganic COCs are primarily associated with localized elevated concentrations in soil and sediment within and near Upper Hilliards Creek (Subarea 6), whereas concentrations are much lower in Subarea 5 and are expected to pose minimal risks to wildlife.

The BERA provided evidence that COCs, primarily arsenic, lead, and cyanide are present in both aquatic and terrestrial environments and pose unacceptable risk to wildlife receptors. The greatest potential for exposure and unacceptable risk in Subarea 6 (Upper Hilliards Creek) is to aquatic invertivorous receptors (spotted sandpiper) from the ingestion of contaminated sediments and food items. There is low potential for toxicity to benthic organisms; no sediment toxicity was observed in any of the sample locations. Inorganic contaminants (arsenic, lead, and manganese) may pose unacceptable risk to the aquatic community (fish) based upon the exceedance of risk-based benchmarks in pore water, surface water, and fish tissue. Overall, terrestrial wildlife risks are driven primarily by arsenic and lead. Insectivorous wildlife (the American Robin and Short-Tailed Shrew) were identified as the wildlife receptors with the highest predicted exposures and hazard quotients in the terrestrial area of OU2. Similarly, the Spotted Sandpiper was identified as the receptor with the highest exposure and hazard quotient associated with the aquatic community in Upper Hilliards Creek.

The response action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives ("RAOs") are specific goals to protect human health and the environment. RAOs provide a general description of what the cleanup will accomplish. RAOs are based on available information and federal or state standards, such as applicable or relevant and appropriate requirements ("ARARs"), advisories, criteria for guidance to-be-considered ("TBCs"[3]), and Site-specific risk-based levels (such as, ecologically derived cleanup goals).

The RAOs identified for OU2 soil contamination are:

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[3] TBCs are non-promulgated advisories, criteria, or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies.

- Prevent potential current and future unacceptable risks to human and ecological receptors resulting from exposure to contaminants in soil.
- Minimize migration of Site-related contaminants in the soil to sediment, surface water, and groundwater.

The RAOs identified for OU2 LNAPL contamination and Soil Vapor Intrusion concerns are:

- Prevent potential current and future unacceptable risks to human and ecological receptors resulting from direct contact with LNAPL.
- Prevent potential current and future risks to human health resulting from the presence of methane in soil gas.
- Minimize migration of LNAPL-related compounds.
- Prevent potential current and future unacceptable risks to human receptors resulting from inhalation of VOCs and SVOCs.

The RAOs identified for OU2 sediment contamination are:

- Prevent potential current and future unacceptable risks to human and ecological receptors resulting from exposure to contaminants in sediment.
- Minimize migration of Site-related contaminants in the sediment to floodplain soils and surface water.

RAOs were not identified for the Site groundwater, as they will be selected in a future ROD for OU3. No remedial action is proposed for surface water, therefore there are no remedial action objectives for surface water. Instead, surface water monitoring is included as part of each sediment remedial alternative, except no action, to ensure that the RAO is met.

Achieving RAOs relies on the remedial alternative's ability to meet cleanup levels derived from Preliminary Remediation Goals ("PRGs"), which are based on ARARs, calculated human health and ecological risks, background concentrations, and reasonably anticipated future land use. PRGs, presented in the OU2 Proposed Plan, are the desired endpoint concentrations or risk levels, for each exposure route believed to provide adequate protection of human health and the environment. PRGs become final remediation ("cleanup") goals when EPA selects a remedy after taking into consideration all public comments. EPA's final cleanup goals for the Site can be found in Appendix II-A, Tables 1 and 2.

The following is a summary of selected cleanup goals applicable to OU2. The FMP area is currently zoned commercial/light industrial or mixed commercial/residential, however, for shallow soil contamination, the NJDEP RDCSRS are applicable as the Borough has indicated an anticipated residential future use for the FMP. Additionally, many adjacent parcels are zoned residential. The NJDEP Non-Residential Direct Contact Soil Remediation Standards ("NRDCSRS") are applicable to soil contaminants which may exist under roadways (Foster and

United States Avenue). Within areas of OU2 where soil contamination exists above the water table (i.e., unsaturated soils), EPA selected the application of the more stringent of the RDCSRS or the default NJDEP Impact to Groundwater Soil Screening Levels ("IGWSSL").

PCP, arsenic, benzene, and naphthalene have been detected in groundwater above the New Jersey Groundwater Quality Standards ("NJGWQS") and have been detected in soils above their IGWSSL in soil, therefore these compounds have been identified as COCs and their cleanup values are listed in Table 1. For areas of soil contamination that exist primarily below the water table (i.e., saturated soils), which act as a source to groundwater contamination, site-specific soil cleanup goals were developed to address sources of known shallow groundwater contamination in Subareas 1 and 5. These site-specific cleanup goals, to address sources of shallow groundwater contamination, were developed for arsenic and PCP in saturated soils in Subarea 1 and Subarea 5, respectively (Appendix II-A, Table 1).

In Subarea 6, site-specific ecological cleanup goals were developed for sediment contamination in Hilliards Creek and the top 1 foot of floodplain soil. These site-specific ecological cleanup goals were developed from site-wide data that was collected as part of the 2018 BERA. Site-specific ecological cleanup goals are not applied to other subareas within the FMP area, as the other subareas do not contain significant ecological habitat. The lists of ecological cleanup goals for soil and sediment can be found in Appendix II-A, Table 1.

Due to the site-specific nature of the LNAPL at the Site (i.e., high concentration of VOC and SVOC TICs, and for its presence in saturated soil), the LNAPL cleanup goals are based on NJDEP's Interim GWQS for TICs in groundwater. Because groundwater is not the focus of this ROD, the effectiveness of the selected remedy to address LNAPL contamination and its impacts on shallow groundwater will be further assessed as part of the future groundwater OU.

The presence of LNAPL contamination in shallow groundwater is also the source of indoor-air VOCs, SVOCs, and sub-slab methane concerns. Appendix II-A, Table 2 presents the LNAPL cleanup goals for TICs in shallow groundwater. Indoor-air and sub-slab VOC and SVOC cleanup goals are based on the chemical-specific VISLs. Methane cleanup goals are based on the lower explosive limit.

DESCRIPTION OF ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1) requires that a remedial action be protective of human health and the environment, be cost effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practical. In addition, Section 121(b)(1) of the statue includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances. CERCLA Section 121(d), 42 U.S.C. §9621(d), specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. §9621(d)(4).

Potential technologies applicable to soil, LNAPL, and sediment remediation were identified and screened using effectiveness, implementability, and cost criteria, with emphasis on effectiveness. Those technologies that passed the initial screening were assembled into alternatives for soil and sediment.

For alternatives that incorporate removal of contaminated soil, LNAPL, or sediment, the proposed depths of excavation are based on the soil boring data collected during the RI. These depths were used to estimate the quantity of soil to be removed and the associated costs. The actual depths and quantity of soil to be removed will be finalized during design and implementation of the selected remedy.

The time frames below for construction do not include the time it will take to negotiate with the potentially responsible party, design the selected remedy or procure necessary contracts. Except for the No Action alternative, five-year reviews will be conducted as a component of the alternatives that would leave contamination in place above levels that allow for unlimited use and unrestricted exposure. For all soil alternatives requiring five-year reviews, the Present Worth Cost includes the periodic present worth cost of five-year reviews.

Common Element for Soil and Sediment Alternatives: Surface Water Monitoring

The Feasibility Study included two surface water alternatives: a no action alternative; and a surface water monitoring alternative. EPA decided not to carry these forward as separate surface water alternatives. EPA expects that removal of sediment, combined with soil removal and/or capping, will result in a decrease of surface water contaminants in Upper Hilliards Creek to levels below NJSWQS. Monitoring will be conducted on a quarterly basis to assess any changes in contaminant conditions over time. If monitoring indicates that contamination levels have not decreased to below the NJSWQS, EPA may require an action in the future. The cost of surface water monitoring is included in all sediment alternatives.

SOIL ALTERNATIVES:

Alternative 1 - No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Construction Timeframe:	*0 years*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated soil at the Site.

Soil Alternative 2 - Capping and Institutional Controls

Capital Cost:	*$4,953,000*

Annual O&M Cost: *$55,000*
Present Worth Cost: *$5,919,885*
Construction Timeframe: *10 months*

This alternative would use engineering controls consisting of impermeable caps and soil covers as the primary method to prevent exposure to the contaminants in Site soils and control migration in Subareas 1, 2, 4, 5, and 6. Subarea 3 consists of residential properties and one vacant, commercially owned property. No capping in Subarea 3 would be required, as there are no unacceptable risks associated with unsaturated soils in Subarea 3.

Approximately 8,000 CY of soil would be removed and disposed of off-site to accommodate caps under Soil Alternative 2. The estimated limits of Soil Alternative 2 are shown in Figure 7.

Within Subareas 1, 2, and 4, existing impermeable caps, consisting of existing buildings, concrete building slabs, asphalted parking areas, and roadways would serve as the engineering controls under this alternative. Vegetated areas without existing impermeable caps would be evaluated to determine if installation of a cap is needed. ICs for any areas where soil contamination exceeds the RDCSRS in the form of a deed notice would be required to ensure that future use of the Site recognizes and maintains these controls.

Up to two feet of soil would be removed from Subareas 5 and 6 for the purpose of installing a cap. Following the shallow soil removal, if the RDCSRS are achieved, the area would be backfilled and revegetated. Subsurface locations, where contaminants remain at concentrations greater than the RDCSRS, would receive a cap. The cap would consist of a demarcation layer, one and a half feet of common fill, and six inches of topsoil. The area would be revegetated according to regulatory requirements. A deed notice would be established for those areas where contaminants remain at concentrations greater than the RDCSRS below the cap.

Soil Alternative 3 – Deep Soil Removal, LNAPL Removal/Bioremediation and Soil Gas Removal, Capping and Institutional Controls

Capital Cost: *$23,512,000*
Annual O&M Cost: *$629,500*
Present Worth Cost: *$27,620,000*
Construction Time Frame: *1 year*

Alternative 3 would include excavation and offsite disposal of soil that acts as a source to shallow groundwater contamination within portions of Subareas 1 and 5. These excavations would be deep, up to 15 feet, and would be below the water table. Site-specific saturated soil values, see Table 1, would be used to determine the exact depths of soil excavation. Within Subarea 4, LNAPL that exists immediately below the paved surfaces would be excavated and disposed of offsite. Finally, all contaminated floodplain soils within Subarea 6 would be excavated and disposed of offsite. In total, approximately 40,000 CY of soil would be removed and disposed of off-site. The estimated limits of excavation activities are shown in Figure 8.

Alternative 3 also includes the maintenance of existing caps or installation of caps for soils that exceed RDCSRS or IGWSSL and ICs throughout portions of Subareas 1, 2 and 5. Similar to Alternative 2, ICs, in the form of deed notices, would be applied to any areas where soil contamination exceeds the RDCSRS and are required to ensure that future use of the Site recognizes and maintains these controls. The estimated limits of capping activities are shown in Figure 8.

Additionally, Alternative 3 also addresses LNAPL where present at depth in Subareas 2 and 3. Activities to address LNAPL at depth include: bioremediation (nutrient injections), installation of LNAPL recovery wells, the installation of a LNAPL-recovery trench, and installation of vapor recovery systems. The estimated limits of LNAPL remediation activities are shown in Figure 9. Finally, ICs such as deed notices to inform future building owners/occupants of potential vapor intrusion issues in existing buildings should they be reoccupied before subsurface contamination is remediated to appropriate levels are included in this alternative, as well as ICs that require that future buildings over volatile contamination be subject to a vapor intrusion evaluation or be built with vapor intrusion mitigation systems until subsurface contamination is remediated to appropriate levels.

Additional details of Soil Alternative 3 would consist of the following:

Subarea 1:

- Maintain the existing impermeable caps consisting of asphalted parking lots, roadways, concrete building slabs, and buildings. Expand caps where needed, to address exceedances of RDCSRS. In addition, locations not covered by the impermeable caps would be evaluated to determine if unsaturated soil containing contaminants at concentrations greater than the IGWSSLs would be removed or if impermeable capping would be expanded onto those areas.

- Remove arsenic-contaminated soil at concentrations above 50 mg/kg, below the water table, to an approximate depth of 15 feet, north of Foster Avenue.

- Remove PCB-contaminated soil at concentrations greater than 50 mg/kg (the concentration at which the PCBs become defined as a PCB remediation waste under Toxic Substances Control Act ("TSCA")), to a depth of approximately six feet at locations adjacent to the Silver Lake conveyance north of Foster Avenue.

- Remove any underground structures that may be a potential source of contamination.

Subarea 2:

- Maintain the existing impermeable asphalt cap or expand the cap to address exceedances of RDCSRS.

- Cap or remove contaminants exceeding IGWSSL in areas that are not currently paved.

- Install a LNAPL recovery system at the 2 and 4 Foster Avenue buildings.

- Install a system to deliver nutrients to the LNAPL across the Former Resin Plant/Tank Farm A area to stimulate existing LNAPL biodegradation.

- Install a system to remove methane and other soil gas from the subsurface.

- Remove any underground structures that may be a potential source of contamination.

Subarea 3:

- Install injection wells and soil gas extraction wells on the former tavern/service station property, and on the west side of U.S. Avenue to address LNAPL contamination.

- Install pressurized nutrient injection wells along the U.S. Avenue right-of-way east of U.S. Avenue and south of the former tavern/service station.

- Install soil gas extraction and treatment, and nutrient mixing and injection systems in the eastern parking area of the 2 and 4 Foster Avenue buildings.

- Install piping beneath U.S. Avenue from the former tavern/service station to the 2 and 4 Foster Avenue parking area.

- Conduct direct push nutrient injections in those areas beneath impacted properties along U.S. Avenue where LNAPL is present.

- Operate the nutrient injection and soil gas recovery systems.

Subarea 4:

- Remove soil containing LNAPL from the Seep Area to an approximate depth of five to seven feet.

- Restore the excavation area and reinstall the parking area.

- Install a collection trench south of Foster Avenue to prevent LNAPL transport under Foster Avenue from the parking area east of 2 and 4 Foster Avenue (source of LNAPL) to the Seep Area and Upper Hilliards Creek. Captured LNAPL would be transported off site for treatment and disposal.

Subarea 5:

- Remove any additional unsaturated soil where PCP is present at concentrations greater than the IGWSSL.

- Remove PCP-contaminated soil at concentrations above 15 mg/kg below the water table, to a depth of approximately eight feet in the western portion of the Former Lagoon Area.

- Restore the excavation areas and maintain the existing soil cap that is present across the remainder of the former Lagoon Area where PCP is greater than the RDCSRS.

Subarea 6:

- Remove all soil containing contaminants greater than the ecological soil cleanup goals in the top one foot of the Upper Hilliards Creek flood plain.

- Remove all soil at depths greater than one foot where contaminants are present at concentrations greater than the lower of the RDCSRS or IGWSSL throughout the Upper Hilliards Creek floodplain.

Soil Alternative 4 – Deep and Intermediate Soil Removal, LNAPL Removal/Bioremediation, Soil Gas Removal, Capping and Institutional Controls

Capital Cost:	*$30,151,000*
Annual O&M Cost:	*$692,500*
Present Worth Cost:	*$34,259,000*
Construction Time Frame:	*2.5 years*

Under Alternative 4, the scope of the remediation in Subarea 1 differs from Alternative 3 as specifically described below. All of the other elements in Alternative 4 are the same as those presented in Alternative 3. Approximately 67,000 CY of soil would be removed and disposed of off-site under Alternative 4. Figures 9 and 10 show the limits of LNAPL and soil cleanup actions, respectively, for this alternative.

Subarea 1:

- Excavate all soil contamination exceeding the RDCSRS or IGWSSL (whichever value is lower) at the FMP north of Foster Avenue to an intermediate depth of four feet below the soil surface. The excavation to remove exceedances of RDCSRS or IGWSSL to an intermediate depth of four feet would apply to all areas (except existing building footprints), as the majority of the contamination is located in the top four feet of soil. Except for the arsenic and PCB areas mentioned in Alternative 3, areas of contamination deeper than four feet within the footprint of the excavation that exceed RDCSRS or IGWSSL would receive either a soil or impermeable cap. An impermeable cap would be required for areas where contaminant levels exceeding the IGWSSL remain between the excavation bottom and the water table. A soil cap may be used for soil remaining below the excavated areas that do not exceed IGWSSL values or where IGWSSL do not apply (below the water table) but RDCSRS exceedances remain.

- Excavate soil contamination exceeding the RDCSRS or IGWSSL (whichever value is lower) on the 7 Foster Avenue commercial lot to a depth of four feet below the soil surface in all areas except for the 7 Foster Avenue building footprint. Areas below four feet within the excavation footprint where contamination exceeds RDCSRS or IGWSSL would receive either a soil or impermeable cap. An impermeable cap would be required for areas where contaminant levels exceeding the IGWSSL remain between excavation bottom and the water table. A soil cap may be used for soil remaining below the excavated areas that do not exceed IGWSSL values or where IGWSSL do not apply (below the water table) but RDCSRS exceedances remain.

Soil Alternative 5 –Excavation to Depth and Institutional Controls

Capital Cost:	*$104,893,000*
Annual O&M Cost:	*$1,000*
Present Worth Cost:	*$105,574,000*
Construction Time Frame:	*8 years*

This alternative would remove and dispose off-site all soil exceeding cleanup goals (RDCSRS or IGWSSL, whichever value is lower) and all soil containing LNAPL, regardless of depth. A total volume of approximately 300,000 CY of soil would be removed and disposed of off-site under Alternative 5; the estimated limits of the excavation are shown in Figure 11. Similar to Alternative 2, ICs for any areas, including existing roadways, where soil contamination exceeds the RDCSRS in the form of a deed notice would be required to ensure that future use of the Site recognizes and maintains these controls.

The scope of Alternative 5 would include:

Subarea 1:

- Remove the parking areas on the property adjacent to the 7 Foster Avenue building, and the parking areas and a portion of the 6 East Clementon Road building slab on the property adjacent to the 10 Foster Avenue building.
- Remove soil to a depth of one to ten feet adjacent to the 7 Foster Avenue building.
- Remove soil to depths of five to fifteen feet on the property currently occupied by the 6 East Clementon Road building slab and adjacent to the 10 Foster Avenue building.
- Remove any underground structures that may represent a source of contamination.
- Backfill all areas to existing grade.
- Existing roadways, where contamination would remain, would serve as caps. ICs would be applied.

Subarea 2:

- Remove the 2 and 4 Foster Avenue buildings and building slabs.
- Remove the parking area and former red barn building slab.
- Remove soil containing LNAPL to a depth of 25 feet below ground surface.
- Remove any underground structures that may represent potential sources of contamination.
- Remove soil containing LNAPL to seven to ten feet on the slopes towards Foster Avenue and U.S. Avenue, and backfilling all areas to existing grade.

Subarea 3:

- Demolish and replace several residential foundations and replace housing structures, garages and storage sheds.
- Temporary relocation of residents from five residential properties and workers from one commercial property, for as long as one year each.
- Manage several million gallons of groundwater containing LNAPL.
- Install approximately 3,200 linear feet (100,000 ft^2) of shoring.
- Excavate approximately 80,000 CY of soil.
- Disposal of approximately 20,000 CY of the excavated soil containing LNAPL, importing 20,000 CY of replacement soil, and reuse of 60,000 CY of soil.
- Restore properties to current conditions.

Subarea 4:

- Remove soil containing LNAPL from the Seep Area to an approximate depth of five to seven feet.
- Restore the excavation area and reinstall the parking area.
- Install a collection trench south of Foster Avenue to prevent LNAPL transport under Foster Avenue from the parking area east of 2 and 4 Foster Avenue (source of LNAPL) to the Seep Area and Upper Hilliards Creek.

Subarea 5:

- Remove soil to a depth of approximately 20 feet throughout the northwest portion of the Former Lagoon Area.

- Backfill to original grade and restore.

Subarea 6:

- Remove all soil containing contaminants greater than the ecological soil cleanup goals in the top one foot of the Upper Hilliards Creek flood plain.

- Remove all soil at depths greater than one foot where contaminants are present at concentrations greater than the RDCSRS or IGWSSL (whichever is lower) throughout the Upper Hilliards Creek floodplain.

SEDIMENT ALTERNATIVES:

Sediment Alternative 1 – No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Timeframe:	*0 years*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated sediment within Upper Hilliards Creek (Subarea 6).

Sediment Alternative 2 - Targeted Removal of Surface Sediment with Contaminants Greater than the Cleanup Goals, Capping and Natural Recovery

Capital Cost:	*$1,377,000*
Annual O&M Cost:	*$16,500*
Present Worth Cost:	*$1,610,000*
Construction Time Frame:	*2 months*

One foot of sediment containing contaminants at concentrations greater than the ecological sediment cleanup goals would be removed from Upper Hilliards Creek. Approximately 310 CY of sediment would be removed under this alternative. The extent of excavation is shown in Figure 12. A cap would then be installed, consisting of 6 inches of sand, covered by 3 inches of stone, that would act as an armoring layer. Natural sedimentation would then be allowed to fill in above the armoring layer and reestablish the current elevation of the stream. As part of this alternative, the sediment that has accumulated in the Silver Lake conveyance system, located beneath the parking area between the 2 and 4 Foster Avenue buildings and the 10 Foster Avenue building, and the sediment that is in the concrete culvert south of Foster Avenue, would be removed and disposed of off-site.

Sediment Alternative 3 – Removal of All Sediment with Contaminants Greater than Ecological Sediment Cleanup Goals

Capital Cost:	*$1,730,000*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$1,759,000*
Construction Time Frame:	*3 months*

This alternative would consist of excavation of all sediment in Upper Hilliards Creek, the Silver Lake conveyance system, and concrete culvert containing contaminants at concentrations greater than the ecological sediment cleanup goals. Approximately 1,400 CY of sediment would be removed under this Alternative. The extent of excavation is shown in Figure 12. The areas where sediment would be removed would be backfilled with clean material that would both remain stable and provide habitat for the benthic community. Because all contaminants present at concentrations greater than the ecological sediment cleanup goals would be removed and disposed of off-site, there would be no need for a cap.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA Section 121, 42 U.S.C. § 9621, by conducting a detailed analysis of the viable remedial response measures pursuant to the NCP, 40 CFR § 300.430(e)(9) and OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of the individual response measure against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each response measure against the criteria. The first part discusses the nine evaluation criteria for the soil and the second part discusses the nine evaluation criteria for the sediment.

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.

Evaluation of Soil Alternatives

1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks *posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.*

Alternative 1, No Action, would not be protective of human health or the environment since it does not include measures to prevent exposure to contaminated soil.

Alternative 2 would provide limited protection to human health and to ecological receptors. All exposure pathways would be eliminated by soil removal (in the ecological habitat areas), existing and new capping (in other areas of OU2), and ICs (deed notices). The soil removal and capping in the ecological habitat areas would prevent transport of soil containing contaminants into surface water bodies. However, under this alternative, sources of groundwater contamination would remain, no actions to remove or contain the LNAPL would be performed, and no actions would be conducted to mitigate the soil gas vapors beneath the 2 and 4 Foster Avenue buildings. Therefore, there would remain the possibility that, without ongoing manual recovery activities, discharges of LNAPL to Upper Hilliards Creek and potential indoor exposure to vapors originating in the subsurface would continue.

Alternatives 3 and 4 would protect human health and the environment by eliminating all exposure pathways through a combination of soil excavation, LNAPL treatment, and use of existing structures for capping. The soil removal and capping in the ecological habitat areas would prevent transport of soil containing contaminants into surface water bodies. In contrast to Alternative 2, under Alternatives 3 and 4, sources of groundwater contamination would be removed, LNAPL would be addressed by a combination of removal and bioremediation, and a subsurface soil ventilation system would remove vapors beneath the 2 and 4 Foster Avenue buildings. Alternative 5 would achieve protectiveness by excavating all impacted soils as well as LNAPL contamination, except for a limited amount of contaminated soils under existing roadways. Alternatives 2, 3, 4, and 5 would require deed notices where contaminants remain in soil at concentrations greater than the NJDEP RDCSRS.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121(d) of CERCLA and NCP § 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 CERCLA section 121(d)(4).

<u>Applicable requirements</u> are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

<u>Relevant and appropriate requirements</u> are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental

or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

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 potential ARARs and TBCs can be found in Appendix II-B, Tables 1 – 3 and Table 4, respectively.

Alternative 1 would not meet ARARs.

Alternatives 2 through 5 would address chemical-specific ARARs (Appendix II-B, Table 3), such as NJDEP RDCSRS, by removing contaminated soil, both in the shallow and/or deep zones, and capping and placing deed notices to eliminate direct contact. Action-specific ARARs (Appendix II-B, Table 2) would be met by Alternatives 2 through 5 during the construction phase by proper design and implementation of the action, including disposal of excavated soil at the appropriate disposal facility. The capping elements of these alternatives would meet action-specific ARARs. These alternatives would also be required to meet location-specific ARARs (Appendix II-B, Table 1), such as NJDEP Wetlands Protection Act Rules.

Primary Balancing Criteria - The next five criteria, criteria 3 through 7, are known as "primary balancing criteria". These criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions.

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3. Long-Term Effectiveness and Permanence

A similar degree of long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain on-site following remediation and the adequacy and reliability of controls.

Alternative 1 would not provide long-term effectiveness or permanent protection to ecological receptors, groundwater, or surface water because the soil contaminants would remain uncontrolled.

Alternative 2, capping, would provide long-term effectiveness and permanence for control of direct contact exposure to soil contaminants as long as the cap is maintained, and the provisions of the deed notices are followed.

Alternative 3 would provide a greater degree of long-term effectiveness and permanence compared to Alternative 2 by a combination of capping, removal of metals, PCBs, and PCP from soil, as well as a combination of LNAPL removal and bioremediation.

Alternative 4 has many of the same components of Alternative 3. In addition, Alternative 4 would also include excavation of soil contaminants to a depth of four feet beneath Subarea 1 commercial properties (except under existing building footprints). The four-foot excavation of Alternative 4 provides for greater long-term protectiveness than Alternative 3 because it does not solely rely on ICs and existing shallow surficial caps to protect against potential releases and exposures from any future shallow utility installations, maintenance, repair, or improvements which may take place at the property.

Alternative 5 provides the greatest degree of long-term effectiveness and permanence. Under Alternative 5, all subsurface soil containing contaminants at concentrations greater than the cleanup goals would be removed from the Site except for areas beneath roadways and remaining buildings.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternative 1 would not reduce the toxicity, mobility, or volume of soil contaminants since no material would be treated, removed, or capped.

Alternative 2, capping, would reduce mobility of contaminants but it involves no treatment of the contaminants, and therefore, no reduction in toxicity or volume. The principal threat waste LNAPL would not be treated under this alternative.

Alternatives 3 and 4 would provide the highest degree of reduction of toxicity, mobility, or volume through treatment. The principal threat waste LNAPL, would be captured and treated through the construction of a recovery system in Subarea 2, which would reduce the LNAPL mobility, while LNAPL bioremediation would reduce its toxicity, mobility, and volume in Subareas 2 and 3.

Alternative 5 does not provide for reduction of toxicity, mobility, or volume through treatment because soil, sediment and LNAPL removal, not treatment, would be used for this alternative.

5. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternative 1 does not present any short-term risks to site workers or the environment because it does not include active remediation work.

Under Alternatives 2 through 5, potential adverse short-term effects to the community increase with each successive alternative.

Risks to site workers, the community, and the environment include potential short-term exposure to contaminants during soil excavation. Potential exposures and environmental impacts associated with dust and runoff would be minimized with proper installation and implementation of dust and erosion control measures and monitoring. Subareas 5 and 6 of the Site consist of wooded areas and wetlands. Under Alternatives 2 through 5, it would be necessary to remove trees and vegetation, as well as disrupt the small streams and associated wildlife in Subareas 5 and 6. Alternatives in which the largest quantity of soil is removed would have the greatest area of impact, would require the longest period of time to complete, and would have the highest potential for short–term adverse effects. Among Alternatives 2 through 5, Alternative 2 would take the shortest time to achieve protection of human health and the environment and would, therefore, have the lowest potential for short-term adverse effects. Alternative 5 would involve the most invasive method of soil remediation and would take the longest time to implement and, therefore, would have the highest potential for short-term adverse effects.

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.

Because Alternative 1 would not entail any construction, it would be most easily implemented.

Alternative 2, capping, is readily implementable since much of the area in need of capping would rely on the existing buildings, concrete building slabs, and asphalted parking areas and roadways, with the exception of Subareas 3, 5, and 6.

Alternatives 3 through 5 have common implementability issues related to the removal of contaminated soil and installation of the caps. These include short-term traffic disruption on West Clementon Road, Foster Avenue and United States Avenue. The amount of disruption depends on the location of the contaminated soil, the amount of soil removed and the amount of time it takes for removal.

The increased volume of soil removal associated with Alternatives 3, 4, and 5 increases the implementation difficulties compared to Alternative 2.

In Alternatives 3 through 5, deep excavations to remove groundwater source areas in Subareas 1 and 5 present implementability challenges. Alternative 4 presents greater implementability challenges than Alternative 3, and Alternative 5 presents greater implementability challenges than Alternative 4, due to the additional volume of soil to be removed. The implementation issues related to road disruptions, capping, and off-site disposal can be managed through common engineering controls.

7. Cost

Includes estimated capital and O&M costs, and net present worth value of capital and O&M costs.

The total estimated present worth costs of the Soil Alternatives, calculated using the 7% discount rate, are:

- Alternative 1 - $0
- Alternative 2 - $5,919,885
- Alternative 3 - $27,620,000
- Alternative 4 - $34,259,000
- Alternative 5 - $105,574,000

8. State Acceptance

Indicates whether based on its review of the RI/FS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected remedial measure.

The State of New Jersey concurs with the selected alternative of soil removal including off-site soil disposal. However, the State of New Jersey does not concur with the capping and institutional control component of the selected soil alternative unless property owners provide their consent to the placement of a deed notice.

9. Community Acceptance

Summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

EPA solicited input from the community on the remedial alternatives for soils and sediment that were proposed for the site. Oral comments were recorded from attendees at the December 5, 2019 public meeting. The attached Responsiveness Summary addresses the comments received during the public comment period. The community (local residents, business owners, elected officials) had varied positions, from support to reservations about EPA's Proposed Plan. EPA received written and oral comments from residents and elected officials. The issues raised by the commenters are discussed in EPA's comprehensive response to comments received during the public comment period in the Responsiveness Summary, Appendix V.

Evaluation of Sediment Alternatives

1. Overall Protection of Human Health and the Environment

Alternative 1 is not protective of human health or the environment because no action would be taken to address sediment contamination.

Alternative 2 would provide protection of human health and the environment by removing the sediment containing the highest concentrations of contaminants and providing a cap to prevent human and ecological exposure to the remaining sediment that contains contaminants at concentrations greater than the cleanup goals.

Alternative 3 would provide human health and ecological receptor protection by removing the sediment containing contaminants at concentrations greater than the cleanup goals and placing clean material in the stream bed as part of the restoration.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Sediment cleanup goals are site specific and risk-based. There are no chemical-specific federal or State of New Jersey standards for the contaminants of concern in sediment.

Location-specific ARARs (Appendix II-B, Table 1) for the sediment are applicable because Upper Hilliards Creek contains wildlife areas. Location-specific ARARs include the federal Fish and Wildlife Coordination Act and the New Jersey Freshwater Wetlands Protection Act and Clean Water Act.

Action-specific ARARs (Appendix II-B, Table 2) are determined by the specific technology of each alternative. In this case, Alternatives 2 and 3 include excavation and off-site disposal. Action-specific ARARs include the federal Resource Conservation and Recovery Act.

Alternative 1, No Further Action, will not comply with location- or action-specific ARARs.

Alternatives 2 and 3, which require remedial action, would comply with location- and action-specific ARARs that apply to remediation and filling in floodplains, work in wetland areas, waste management, and storm water management.

3. Long-Term Effectiveness and Permanence

Alternative 1 would allow existing contamination, and ecological exposures and risks to remain. No routine monitoring of contaminants or site conditions would be conducted to determine if natural processes are reducing the surface concentrations of contaminants in sediment.

The cap associated with Alternative 2 would be installed in Upper Hilliards Creek sediment. This alternative would be effective in maintaining protection of human health and the environment in the capped section of the water body. Such protectiveness would remain only as long as the cap remains in place. This alternative would require continued maintenance to ensure long-term effectiveness.

Alternative 3 would remove all sediment contamination from Upper Hilliards Creek. Alternative 3 would be more effective and have a higher degree of permanence than Alternative 2 since all contaminated sediment exceeding cleanup goals would be removed under Alternative 3.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

The major contamination in the OU2 sediment is metals. The sediment alternatives, except No Action, involve removal and/or capping of the sediment. Although removal of the contaminated sediment would decrease the volume, and capping would decrease the mobility of contamination in the OU2 sediment, no sediment alternative reduces the toxicity, mobility, or volume through treatment. The volume of contaminants at OU2 of the Site would be reduced to a greater extent in Alternative 3 versus Alternative 2, as more contamination is removed; however, volume would not be reduced through treatment. Contaminants in excavated sediment would be transferred to a landfill without treatment.

5. Short-Term Effectiveness

Alternative 1 does not present any short-term risks to the community, site workers, or the environment because this alternative does not include remediation work.

Alternatives 2 and 3 involve excavation and thus have potential for short-term adverse effects. Potential risks posed to site workers, the community, and the environment during implementation of each of the sediment alternatives could be due to wind-blown or surface water transport of contaminants. Any potential impacts associated with dust and runoff would be minimized through proper installation and implementation of dust and erosion control measures. The areas would be monitored throughout the construction.

The potential risk of sediment release could increase with Alternatives 2 and 3, due to removal of existing vegetation. However, this could be managed with proper engineering controls. There is little difference in the implementation time from the shortest (two months) to the longest (three months). Therefore, Alternatives 2 and 3 are equal in terms of short-term effectiveness.

6. Implementability

Alternative 1 would not include any construction, and therefore would be easily implemented.

Alternatives 2 and 3 require sediment removal and face similar implementability challenges. Such challenges include access to low lying saturated areas, control of surface water flow, controlling groundwater intrusion into excavation areas, streambed stabilization, and wetland restoration.

The implementability challenges increase with the volume of sediment to be removed. Alternative 2 calls for the least amount of sediment removal and therefore presents the least amount of implementability challenges among the active alternatives. In contrast, Alternative 3 poses slightly higher implementability challenges since it requires the largest remediation area and involves deeper removal of sediment, however, standard engineering practices can be employed to address these issues.

7. Cost

The total estimated present worth costs of the Sediment Alternatives, calculated using the 7% discount rate, are:

- Alternative 1 - $0
- Alternative 2 - $1,610,000
- Alternative 3 - $1,759,000

8. State Acceptance

Indicates whether based on its review of the RI/FS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected response measure.

The State of New Jersey concurs with the selected sediment alternative for OU2.

9. Community Acceptance

Summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

EPA solicited input from the community on the remedial response measures proposed for the sediment. Oral comments were recorded from attendees of the December 5, 2019 public meeting and written comments were also received during the public comment period. The community was supportive of EPA's Proposed Plan for sediment. Appendix V, the Responsiveness Summary, addresses comments received during the public comment period.

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 C.F.R. § 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 the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner 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 alternatives, using the remedy selection criteria described above. The manner in which principal threat wastes are addressed provides a basis for making a statutory finding as to whether the remedy must employ treatment as a principal element.

The concept of principal threat and low-level threat waste is applied on a site-specific basis when characterizing source material. Although lead and arsenic in soil and sediment act as sources to surface water contamination and contribute to groundwater contamination, these sources are not highly mobile and are not considered principal threat wastes at OU2. LNAPL, a source material present in saturated soils (largely below the water table), is considered a principal threat waste.

<u>SELECTED REMEDY</u>

Based upon consideration of the results of the Site investigations, the requirements of CERCLA, the detailed analysis of the remedial alternatives and State and public comments, EPA has determined that Soil Alternative 4: deep and intermediate soil removal, LNAPL removal/bioremediation, soil gas removal, capping and institutional controls, combined with Sediment Alternative 3: removal of all sediment with contaminants greater than ecological sediment cleanup goals, is the appropriate remedy for OU2. As discussed above, the surface water in Upper Hilliards Creek will be monitored to determine the effectiveness of the implemented soil and sediment remedies. Together, these elements comprise EPA's selected remedy. The remedy best satisfies the requirements of CERCLA Section 121 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR § 300.430(e)(9). This remedy includes the following components for the soil and sediment.

Soil:

The major components of the Soil Remedy include: a combination of excavation and capping of soils above cleanup goals; excavation of saturated soils which act as sources to shallow groundwater contamination; and excavation of shallow LNAPL, passive and active recovery, in-situ bioremediation (nutrient injections) and vapor recovery of deep LNAPL.

The details of the excavation and capping component of the remedy are as follows:

- Excluding PCB and arsenic sources, excavation, transportation, and off-site disposal of contaminated soil which exceeds cleanup goals to depths of up to four feet in Subareas 1 and 2.
- Excavation to a depth of approximately six feet of soil containing PCBs concentrations greater than 50 mg/kg in Subarea 1.
- Excavation of soil containing LNAPL from Subarea 4 to an approximate depth of five to seven feet.
- Excavation of PCP to the water table in Subarea 5.
- Excavation of all soil and sediment contaminants greater than their cleanup goals in Subarea 6.

- Maintaining existing areas that serve as caps and expanding or installing caps where necessary in Subareas 1, 2, 4, and 5 where contamination remains above cleanup goals at depth.
- Removal of any underground structures that may be a source of contamination from all six subareas.
- Restoration and revegetation of remediated areas.
- ICs, such as a deed notice, to inform the user of potential exposure to residual soils which exceed levels that allow for unrestricted use. ICs would be established for areas where soil contamination exceeds residential cleanup goals, including existing roadways.

This selected remedy will also remove contaminated saturated soil, which acts as a source to shallow groundwater contamination. By removing these saturated soils, the concentrations of contaminants in groundwater that exceed ground water quality standards are anticipated to be reduced. The specific actions to address sources of shallow groundwater contamination include:

- Within Subarea 1, excavation of saturated soils exceeding 50 mg/kg of arsenic to approximately 15 feet in depth.
- Within Subarea 5, excavation of saturated soils exceeding 15 mg/kg of pentachlorophenol (PCP) to approximately eight feet in depth.

This selected remedy will also address LNAPL contamination in Subareas 2 and 3 by utilizing bioremediation technology (in the form of nutrient injections), as well as passive and active LNAPL recovery systems. The specific actions to address LNAPL include:

- Implementation of a Pilot Study to determine nutrient quantities and injection spacing to conduct bioremediation of LNAPL contamination.
- Development and implementation of a large-scale network of nutrient injection wells, as part of bioremediation activities, throughout portions of the FMP area and off-property areas.
- Installation of a LNAPL recovery well system in Subarea 2.
- Installation of an LNAPL recovery trench in Subarea 4, to collect any mobile LNAPL and transport it off-site for proper treatment and disposal.
- Installation of soil gas recovery systems throughout portions of the FMP area and in off-property areas where LNAPL contamination exits and soil gas generated by LNAPL bioremediation could become a concern.
- ICs to indicate potential vapor intrusion issues in existing buildings should they be reoccupied before subsurface contamination is remediated to appropriate levels. Additionally, ICs that require that future buildings constructed over volatile contamination be subject to a vapor intrusion evaluation or be built with vapor intrusion mitigation systems until subsurface contamination is remediated to appropriate levels would be included.

Soil Alternative 4 was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through a combination of bioremediation of LNAPL, excavation and off-site disposal of soil contaminants, and the use of engineering and institutional controls, and is expected to allow the upland areas of OU2 to be used for the reasonably anticipated future land use, which is commercial/residential. The selected Soil Alternative reduces the risk within a reasonable time frame, at a cost comparable to other alternatives, and provides for long-term reliability of the remedy.

The selected Soil Alternative will achieve cleanup goals that are protective for residential use in most of the OU2 areas. However, since contamination would be left at depth in some areas, ICs, such as deed notices, will be required for those areas. Five-year reviews will be conducted since contamination will remain above levels that allow for unlimited use and unrestricted exposure.

Sediment:

The selected Sediment Remedy is Alternative 3 (Figure 12) which includes excavation of all sediment within Upper Hilliards Creek (Subarea 6), where contaminant levels are greater than the ecological sediment cleanup goals (Table 1).

The major components of the selected Sediment Remedy include:

- Construction of a stream diversion system to allow access to sediment.
- Excavation of contaminants to depths ranging from 2 to 7 feet below sediment surface.
- Removal of contaminated sediment from culvert that connects Silver Lake to Hilliards Creek.
- Dewatering and processing of excavated sediment.
- Transportation and off-site disposal of dewatered sediment.
- Stream bank revegetation and restoration.

EPA expects that removal of contaminated floodplain soils and sediments will result in a decrease of surface water contaminants. Surface water monitoring in Upper Hilliards Creek will be included as part of the remedial action to assess any changes in contaminant conditions over time. If monitoring indicates that contamination levels have not decreased to below standards, EPA may require an action in the future. Future operable units will address site-related groundwater contamination (OU3), and the remaining portions of Hilliards Creek, Kirkwood Lake, and Silver Lake (OU4).

The Selected Sediment Alternative was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through off-site disposal of sediment by reducing contaminant levels in Upper Hilliards Creek. The Selected Sediment Alternative 3 reduces risk within a reasonable timeframe, at a cost comparable to the other alternatives, and provides for long-term reliability of the remedy.

After remediation of sediment, the restored stream banks, riparian zone, and wetlands will be monitored for a period of five years to assure successful restoration of these areas.

Summary of Estimated Costs

The total estimated present worth cost for the selected remedy is $36,020,000 utilizing a seven percent discount rate. Details of the cost estimates are presented in the FS Report. This is an engineering cost estimate that is expected to be within the range of plus 50 percent to minus 30 percent of the actual project cost. Changes to the cost estimates are likely to occur as a result of new information and data collected during the engineering design of the remedy.

Expected Outcomes of Selected Remedy

The components of the selected remedy will actively address contaminants in Site soil and sediment, as well as the LNAPL-impacted soils that create VI concerns. The results of the risk assessment indicate excess cancer risk from incidental ingestion of contaminated soil and sediments as well as inhalation exposure concerns in select areas of LNAPL contamination. An ecological risk assessment also found unacceptable risks to terrestrial and aquatic wildlife. The response actions selected in this ROD will address on-site soil and sediments at the Site, as well as LNAPL that is considered principal threat waste, which also act as a source to shallow groundwater. The response actions will thereby eliminate the risks associated with the exposure pathways, while allowing the commercial and/or residential use of the FMP area, and reduce contamination in the shallow groundwater. Additionally, ecological risks posed by sediment will be eliminated, as will downstream transport of contaminants.

Green Remediation

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

STATUTORY DETERMINATIONS

As was previously noted, CERCLA §121(b)(1) mandates that a remedial action must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA §121(d) further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4).

Protection of Human Health and the Environment

The selected soil remedy will be protective of human health and the environment by utilizing a combination of removal and in-situ treatment of LNAPL, and by removing contaminated surface soil that poses a direct contact threat and subsurface soil that poses a threat to the groundwater. The combination of soil removal and capping will prevent human and wildlife receptor exposure to contaminants. Where the soil is capped, institutional controls such as deed notices will be put in place to ensure that impacts to human health and the environment are minimized.

The selected sediment alternative will be protective by removing the contaminated sediment within Upper Hilliards Creek to below cleanup goals.

In addition, removal of the contaminated soil and sediment is expected to result in contamination levels in the surface water decreasing to below the surface water cleanup goals. Surface water will be monitored to ensure protectiveness.

Implementation of the selected remedy will not present unacceptable short-term risks or adverse cross-media impacts and will therefore be protective of human health and the environment.

Compliance with ARARs

EPA expects that the selected remedy for soil and sediment will comply with federal and New Jersey ARARs. A complete list of potential ARARs and TBCs can be found in Appendix II-B, Tables 1 – 3 and Table 4, respectively.

Chemical-specific ARARs (Appendix II-B, Table 3) are only available for the soil because there are no chemical-specific federal or State of New Jersey standards for the contaminants of concern in sediment. Sediment cleanup goals are site-specific and risk-based. The chemical-specific ARARs for lead and arsenic in the soil include the New Jersey Residential Direct Contact Soil Remediation Standards. The New Jersey Surface Water Quality Standards are ARARs for surface water.

Location-specific ARARs (Appendix II-B, Table 1) affect some portions of the soil and sediment at the Site, such as the flood plain of Upper Hilliards Creek which contains wildlife areas. Location-specific ARARs include the federal Fish and Wildlife Coordination Act and the New Jersey Freshwater Wetlands Protection Act and Clean Water Act.

The action-specific ARARs (Appendix II-B Table 2) are the same for the soil and sediment because the selected remedy for soil and sediment includes excavation and off-site disposal. For the soil and sediment, action-specific ARARs include the federal Resource Conservation and Recovery Act.

Cost Effectiveness

EPA has determined that the selected remedy is cost effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP §300.430 (f)(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 the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost effectiveness. The relationship of the overall effectiveness of the selected remedy was determined to be proportional to costs and hence, the selected remedy represents a reasonable value for the money to be spent. The selected remedy is cost-effective as it has been determined to provide the greatest overall protectiveness for its present worth costs.

Utilization of Permanent Solutions and Alternative Treatment Technologies

The selected remedy complies with the statutory mandate to utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. The LNAPL, which has been identified as the principal threat waste at OU2, will be actively addressed through extraction and in-situ biodegredation. The selected remedy satisfies the criteria for long-term effectiveness and permanence by permanently reducing the mass of contaminants in the OU2 soils, sediments, and LNAPL, thereby reducing the toxicity, mobility and volume of contamination.

Preference for Treatment as a Principal Element

The LNAPL contamination is considered by EPA to be principal threat waste. Bioremediation of the LNAPL satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment). Treatment is not an element for soils with contamination other than LNAPL; however, soils that are excavated and transported off-site may be treated prior to disposal.

Five-Year Review Requirements

The selected remedy for the soil involves capping where the remediation goals are not attained at depth. Therefore, contamination will be left in place at levels above those that allow for unlimited use and unrestricted exposure. A statutory five-year review will be conducted within five years of initiation of the remedial action for the Site to ensure that the remedy is, or will be, protective of human health and the environment.

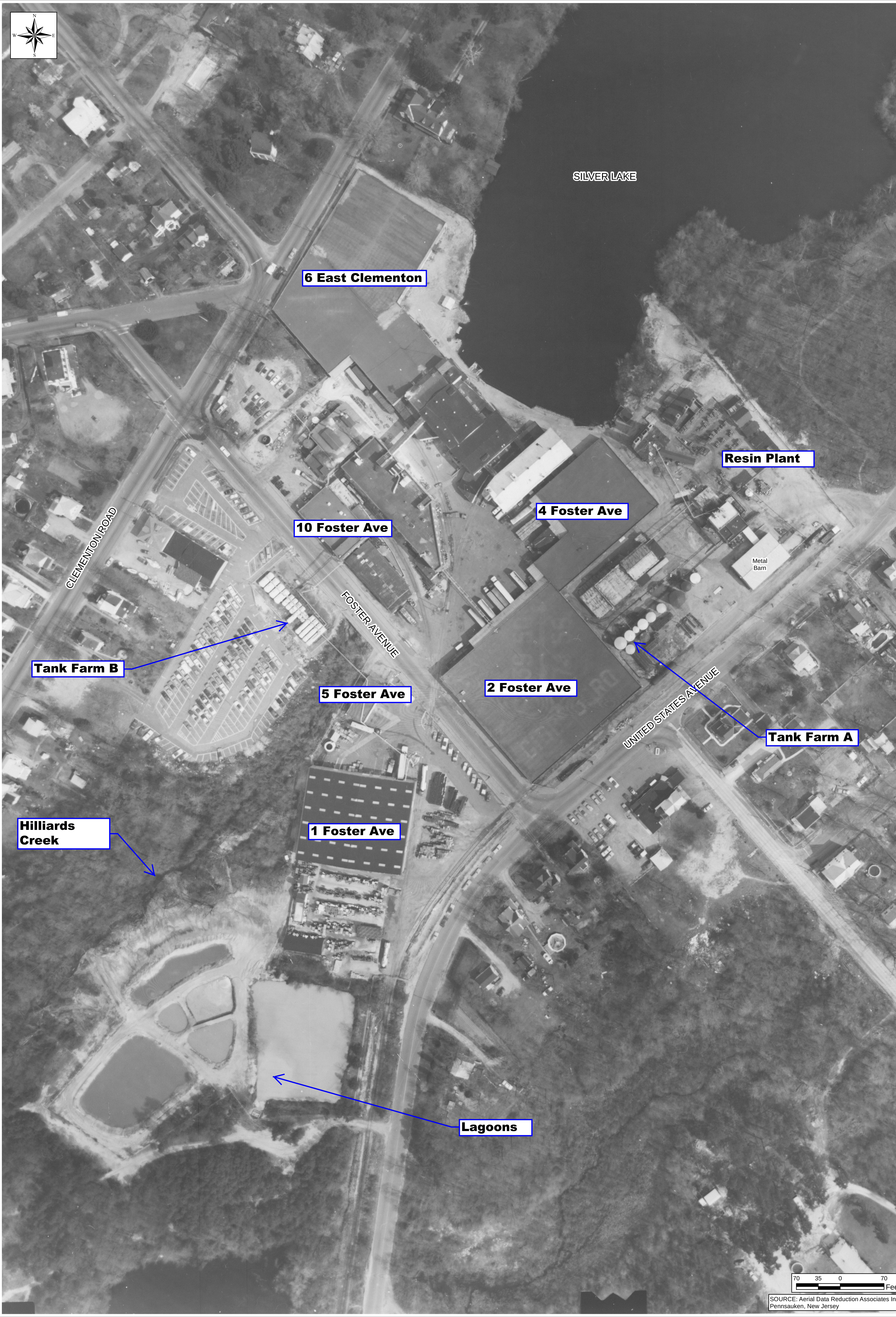
DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU2 of the Site was released for public comment on December 5, 2019. The Borough of Gibbsboro requested a 30-day extension of the 30-day comment period. EPA granted the Borough’s request, and the comment period closed on January 29, 2020. The Proposed Plan identified Soil Alternative 4 as the preferred alternative to address soil contamination and Sediment Alternative 3 to address sediment contamination, and monitoring of surface water. Upon review of all comments submitted, EPA determined that no significant changes to the selected remedy, as it was presented in the Proposed Plan, are warranted.

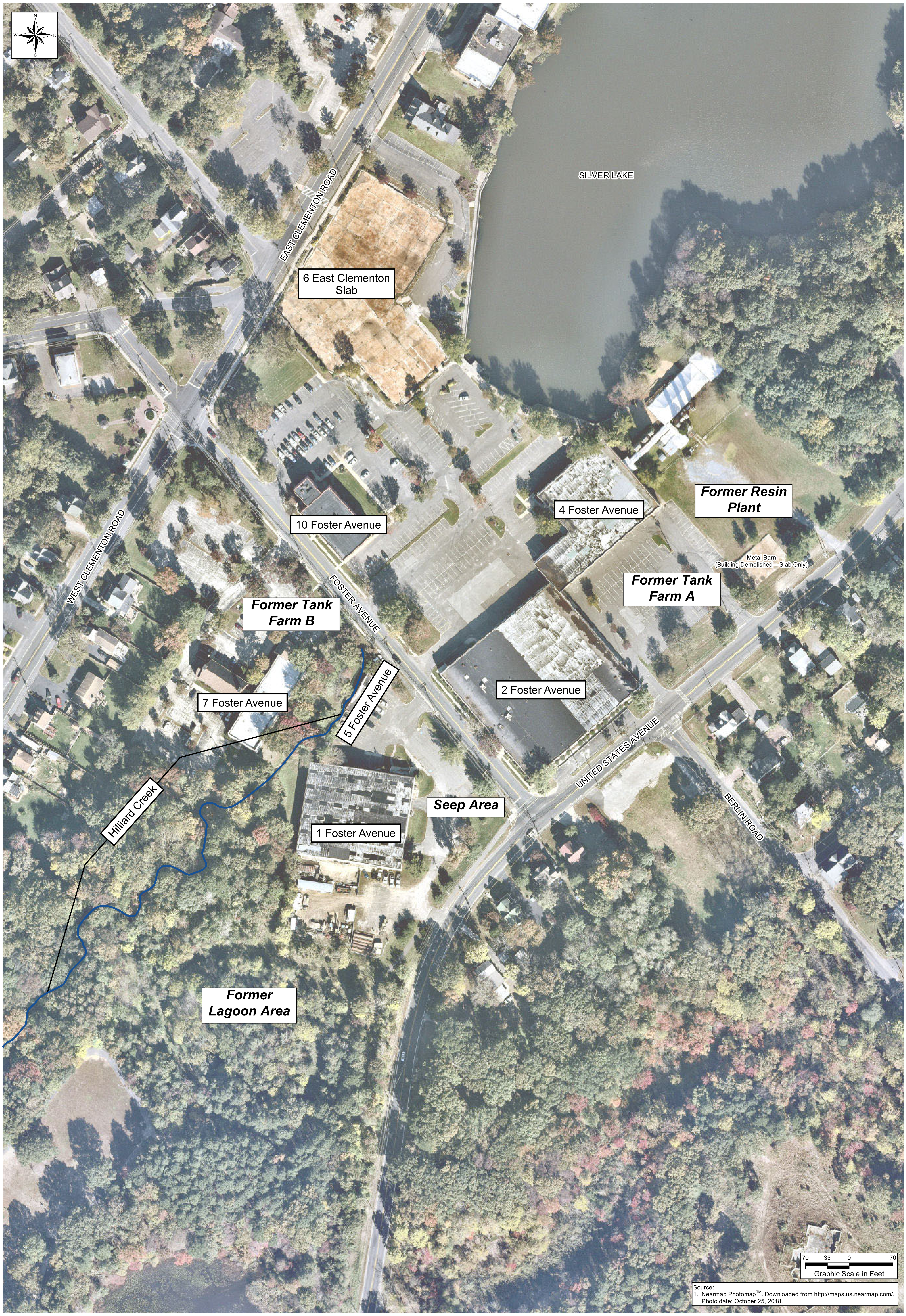
APPENDIX I: Figures

L:\SHERWIN\GIS\MXD\2019_01_FMP_FS\23265_Comp_Site_Map.mxd

PROJECT NAME: Former Manufacturing Plant Feasibility Study	TITLE: COMPREHENSIVE SITE MAP
CLIENT NAME: The Sherwin-Williams Company	
REPORT DATE: January 2019	DATE: 1/10/2019
	FIGURE #: 1



Weston Solutions, Inc. 205 Campus Drive Edison, New Jersey 08837-3939 TEL: (732) 417-5800 Fax: (732) 417-5801 http://www.westonsolutions.com	REPORT DATE: February 2014	PROJECT MANAGER: S. Jones	CLIENT NAME: The Sherwin-Williams Company	DRAWING TITLE: FORMER MANUFACTURING PLANT 1975 AERIAL PHOTOGRAPH
	DRAWING: 14333_FMP_1975_Aerial.mxd PATH: L:\SHERWIN\GIS\MXD\ 2014_02_EPA_Meeting_021114\	CHECKED BY: A. Fischer		
	REVISION No. 0	CONTRACT No. DELIVERY ORDER NO.	PROJECT NAME: Sherwin-Williams Remedial Investigation	
	WORK ORDER No. 20076.022.048.0002	DRAWN/MODIFIED BY: K. Heulitt DATE CREATED: 2-6-2014		Figure 2 SCALE: 1" = 70' DATE: 2-6-2014

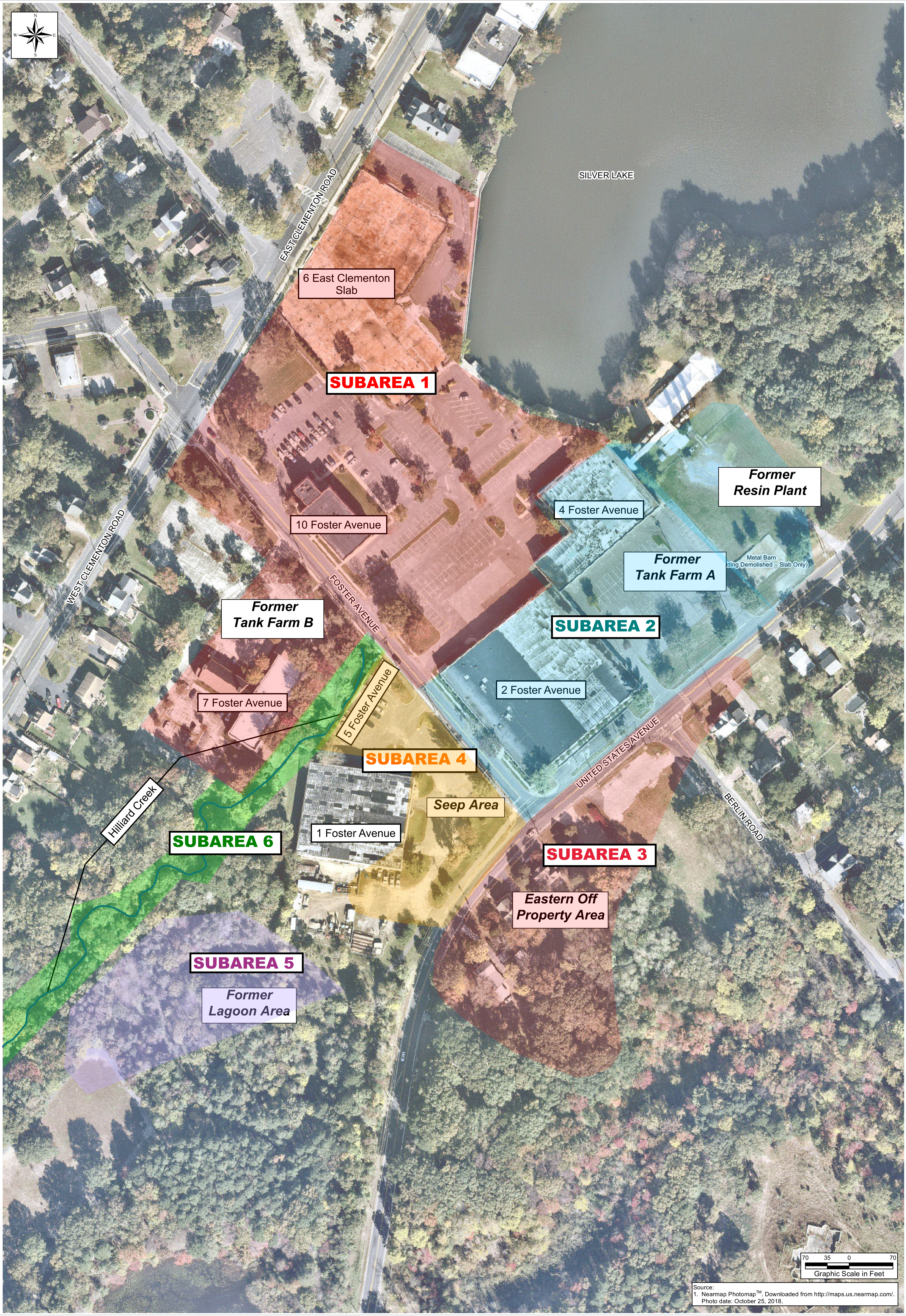


WESTON SOLUTIONS

Weston Solutions, Inc.
205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com

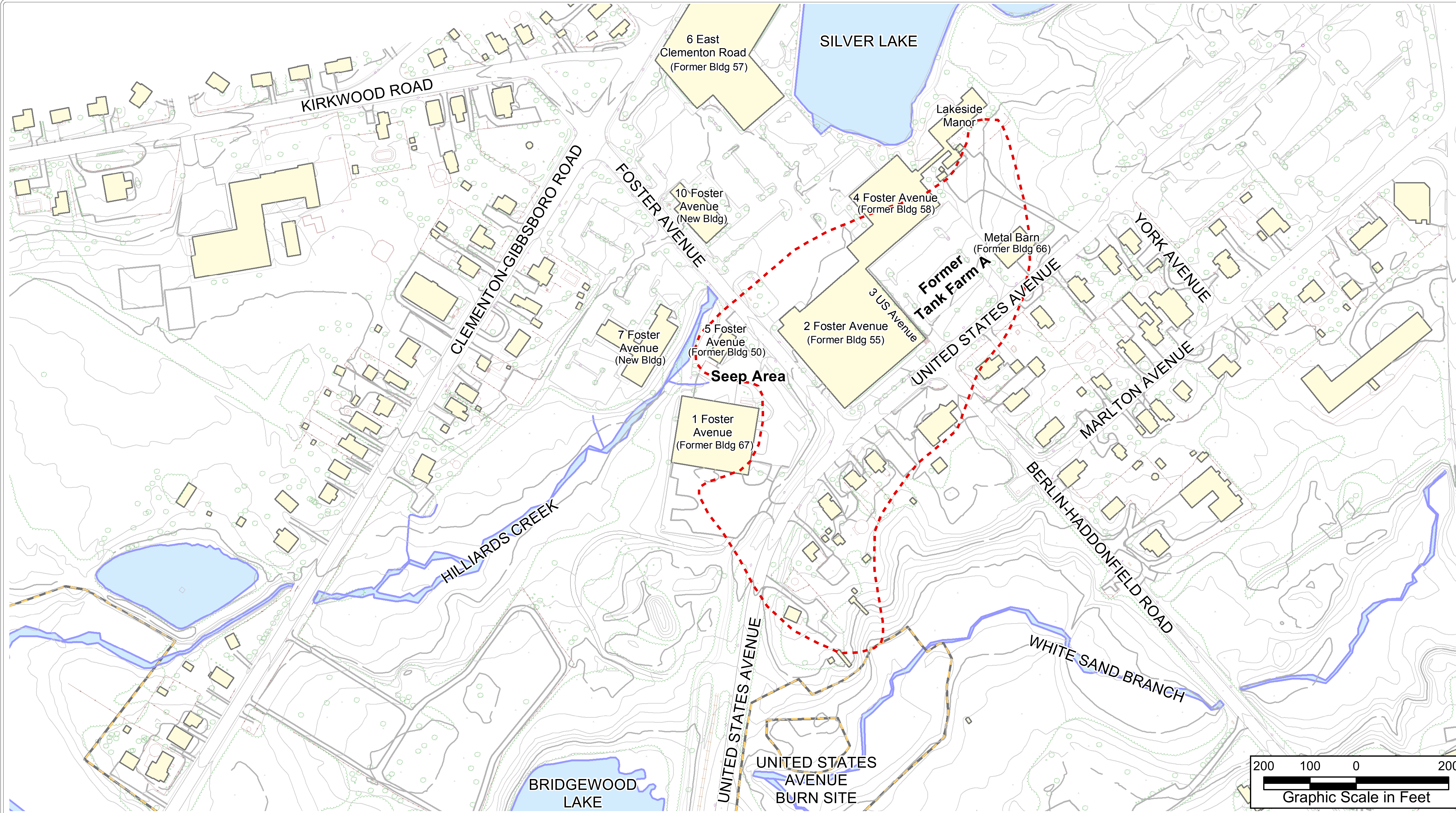
SHERWIN WILLIAMS

REPORT DATE: February 2019	PROJECT MANAGER: D. Kane	CLIENT NAME: The Sherwin-Williams Company	**Figure 3:**
DRAWING: 23525_FMP_Site_Aerial_Hist_Labels.mxd PATH: L:\SHERWIN\GIS\MXD\2019_02_FMP\	CHECKED BY: A. Fischer		**Site Layout**
REVISION No. 0	CONTRACT No. DELIVERY ORDER NO:	PROJECT NAME: Sherwin-Williams Remedial Investigation	
WORK ORDER No. 20076.022.090.0001	DRAWN/MODIFIED BY: J. Heaton DATE CREATED: 2/13/2019		ATTACHMENT: 2 SCALE: 1" = 70' DATE: 2/13/2019



Source:
1. Nearmap Photomap™. Downloaded from http://maps.us.nearmap.com/. Photo date: October 25, 2018.

WESTON SOLUTIONS	REPORT DATE: February 2019	PROJECT MANAGER: D. Kane	CLIENT NAME: The Sherwin-Williams Company	**Figure 4: Site Sub Areas**
Weston Solutions, Inc. 205 Campus Drive Edison, New Jersey 08837-3939 TEL: (732) 417-5800 Fax: (732) 417-5801 http://www.westonsolutions.com	DRAWING: 23525_FMP_Site_Aerial_Hist_Labels.mxd PATH: L:\SHERWIN\GIS\MXD\2019_02_FMP\	CHECKED BY: A. Fischer	PROJECT NAME: Sherwin-Williams Remedial Investigation	ATTACHMENT: 2
	REVISION No. 0	CONTRACT No. DELIVERY ORDER NO.		SCALE: 1" = 70'
	WORK ORDER No. 20076.022.090.0001	DRAWN/MODIFIED BY: J. Heaton DATE CREATED: 2/13/2019		DATE: 2/13/2019



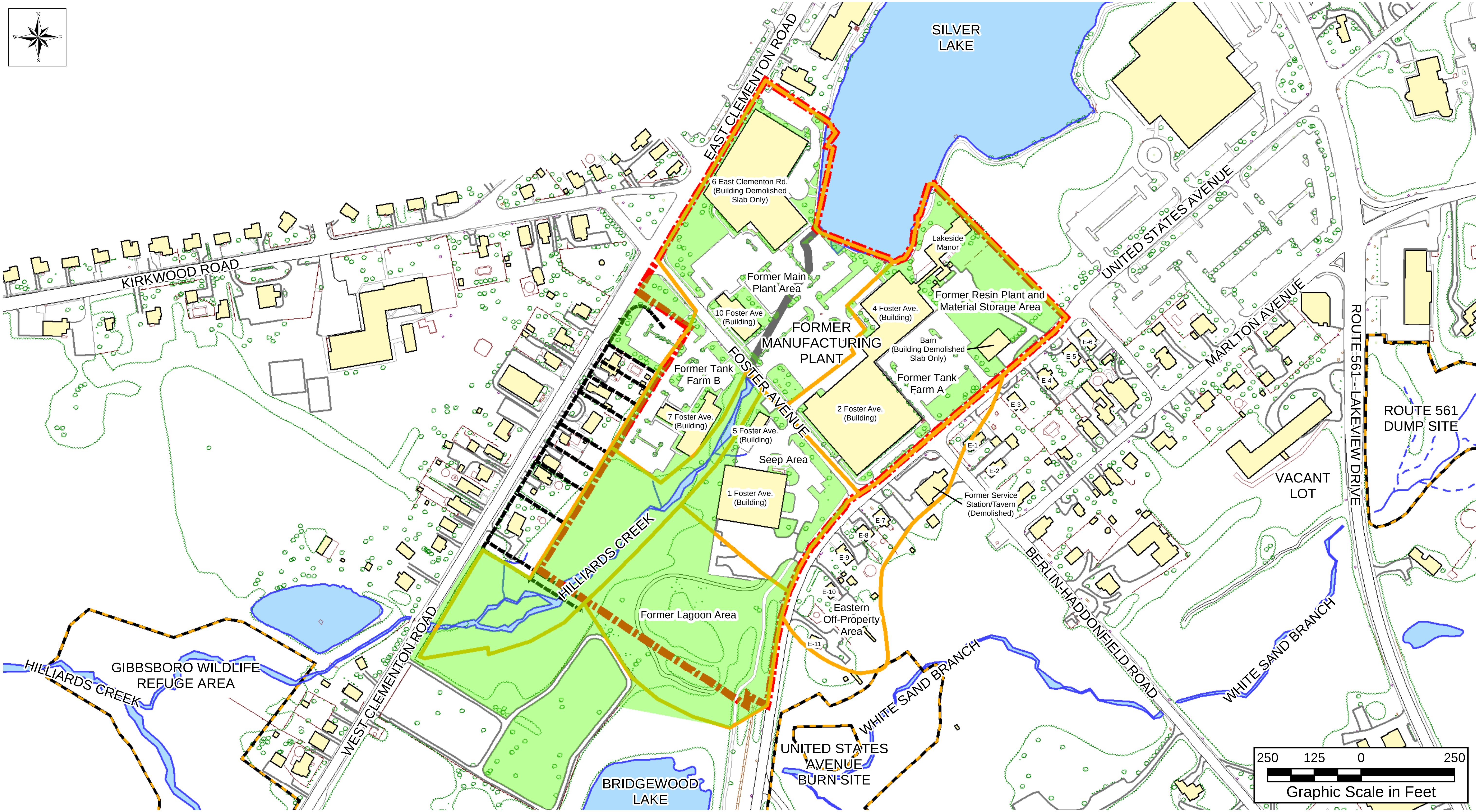
L:\SHERWIN\GIS\MXD\2019_02_FMP\24129_FMP_LNAPL_Extent_All_Inferred.mxd 2:51:26 PM 6/3/2019 heulittk

Legend

Inferred Extent of LNAPL

Source:
EHS Support. Figure 6: Interpreted Extent of LNAPL. Undated.

PROJECT NAME:	Former Manufacturing Plant LNAPL Investigation Report
CLIENT NAME:	The Sherwin-Williams Company
REPORT DATE:	May 2019
TITLE:	EXTENT OF LNAPL
DATE:	5/30/2019
FIGURE #:	5



L:\SHERWIN\GIS\MXD\2019_01_FMP_FS\23982_FMP_Remedial_Units_Proposed_Changes.mxd

Legend

- Former Manufacturing Plant Remedial Units
- Former Manufacturing Plant Extent
- Unpaved Areas
- Surveyed Property Boundary (2015)
- Approximate Location of Silver Lake Conveyance

PROJECT NAME: Former Manufacturing Plant Feasibility Study

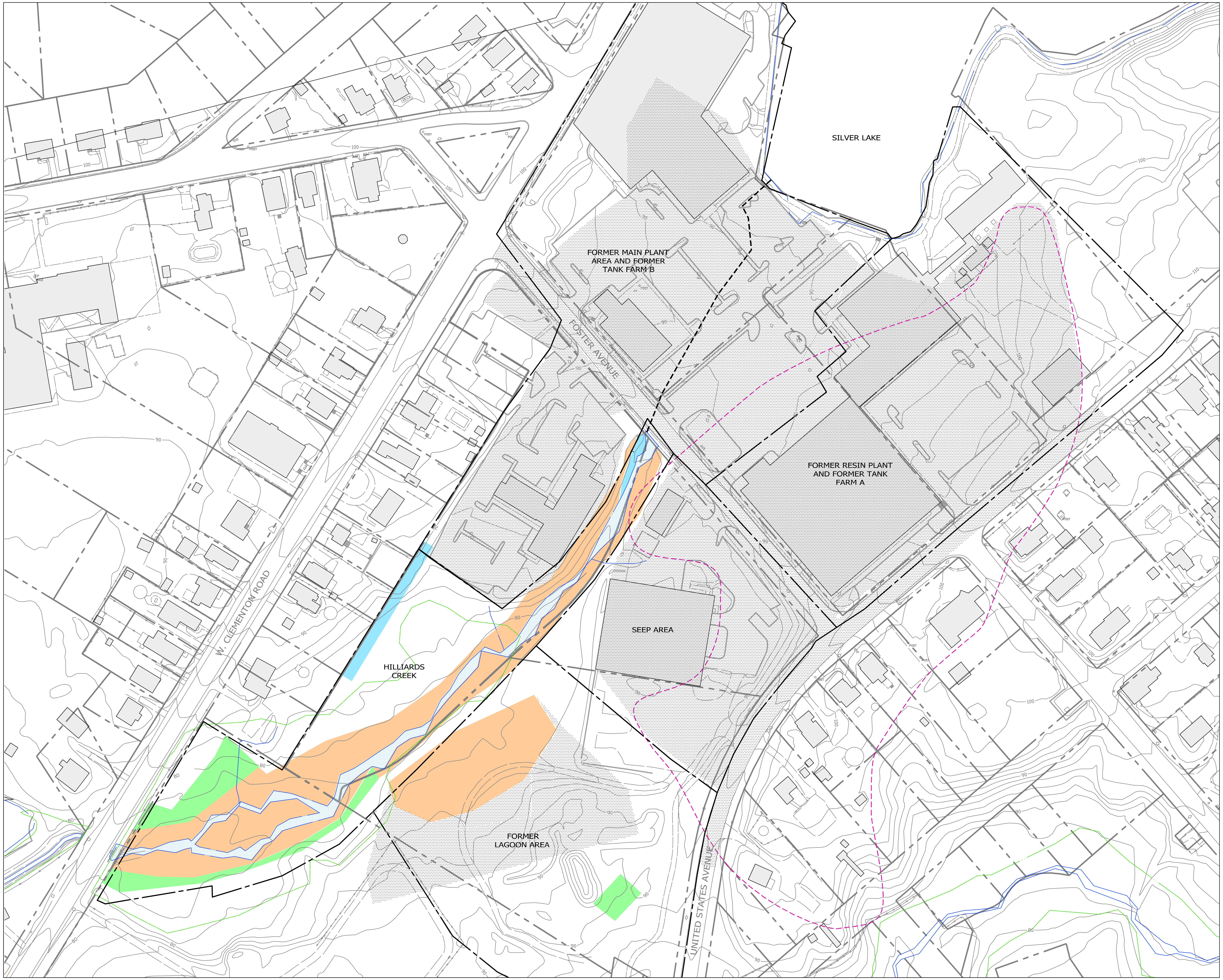
CLIENT NAME: The Sherwin-Williams Company

REPORT DATE: May 2019

TITLE: FORMER MANUFACTURING PLANT PAVED vs. VEGETATED COVER

DATE: 4/26/2019

FIGURE #: 6



LEGEND

- INTERPRETED EXTENT OF LNAPL
- PROPERTY LINE
- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- 1-FOOT EXCAVATION FOR PRGs AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 2 FEET
- EXISTING SURFACE COVER REMAINS AND IS MAINTAINED AS CAP

NOTES:

1. PRG - PRELIMINARY REMEDIATION GOALS.
2. RDCSRS - NEW JERSEY DEPARTMENT ENVIRONMENTAL PROTECTION RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARDS.
3. ALL CAPS REPRESENT ENGINEERING CONTROLS.
4. DEED NOTICES ARE TO BE ESTABLISHED AS INSTITUTIONAL CONTROLS FOR ALL PROPERTIES WITH A CAP.
5. LNAPL MANUAL RECOVERY TO BE IMPLEMENTED FOR THE SEEP AREA AND THE FORMER RESIN PLANT AND TANK FARM A UTILIZING EXISTING MONITORING WELLS.

SOURCE:

1. BASEMAP, WESTON SOLUTIONS, 2016.
2. PARCELS OF CAMDEN COUNTY, NEW JERSEY 2016, CAMDEN COUNTY IMPROVEMENT AUTHORITY, 2/26/2014, GIS SHP FILE http://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

0 70 140
SCALE: 1" = 70'

TITLE:
FIGURE 7
SOIL REMEDIAL ALTERNATIVE 2

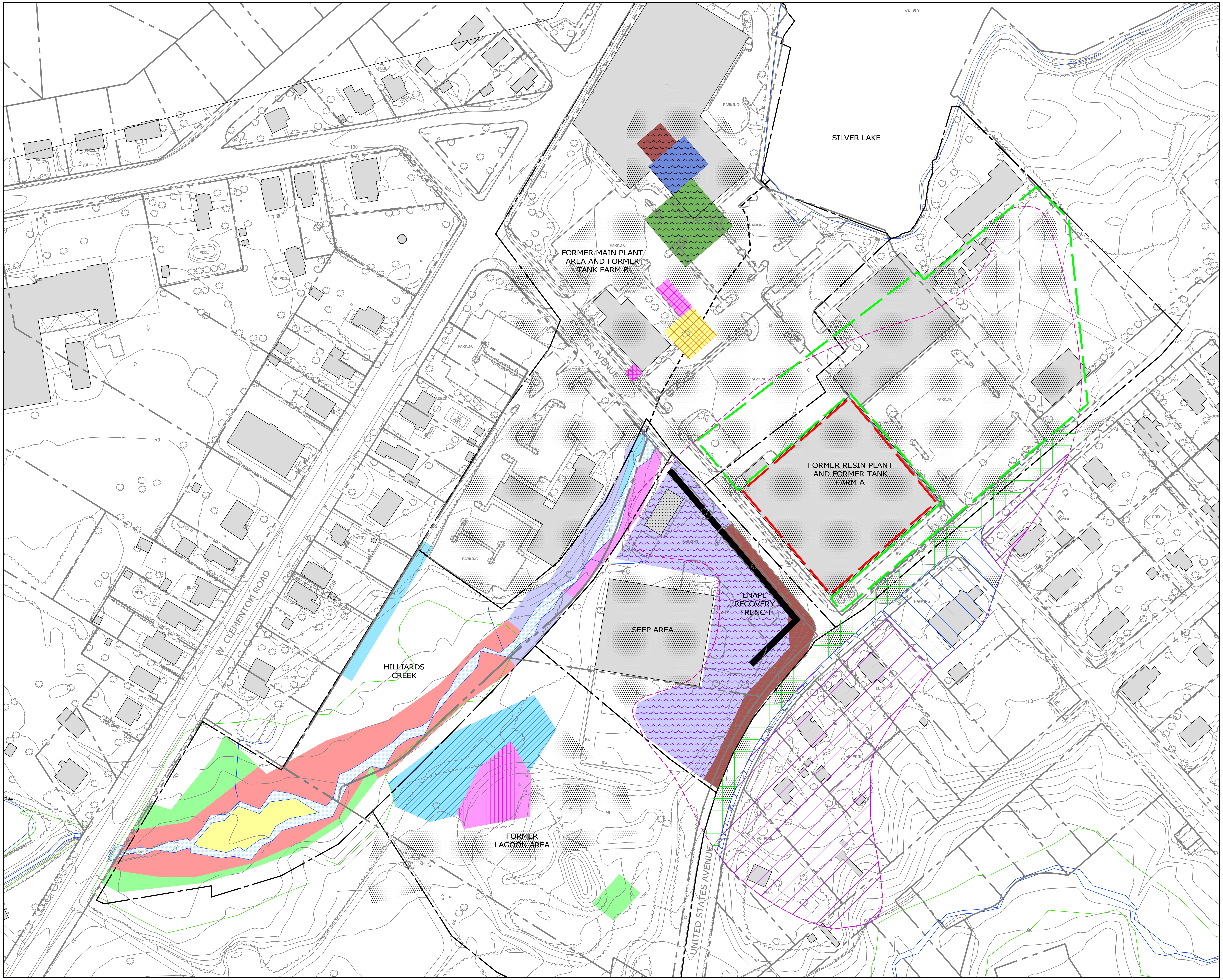
LOCATION:
THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

DATE: 1/10/19

FILENAME: 204027_FMP_FS_SOIL

LAYOUT: SOIL_ALT2_R1

THE ELM GROUP
345 WALL STREET, PRINCETON, NEW JERSEY 08540
4936 YORK ROAD, SUITE 1000, HOLICONG, PENNSYLVANIA 18928
612 MAIN STREET, BOONTON, NEW JERSEY 07005
2436 EMRICK BOULEVARD, BETHLEHEM, PENNSYLVANIA 18020
www.ExploreELM.com



LEGEND

- INTERPRETED EXTENT OF LNAPL
- PROPERTY LINE
- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- 1-FOOT EXCAVATION FOR PRGs AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 3-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 4-FOOT EXCAVATION FOR PRGS AND RDCSRS AND NO CAP
- 5-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 6-FOOT EXCAVATION FOR PRGS AND RDCSRS AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 2 FEET
- 6-FOOT EXCAVATION FOR PRGS AND RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 6 FEET
- 4-FOOT EXCAVATION FOR TSCA COMPLIANCE AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 4 FEET
- 6-FOOT EXCAVATION FOR TSCA COMPLIANCE AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 6 FEET
- 5-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 10-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 12-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 15-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- EXISTING SURFACE COVER REMAINS AND IS MAINTAINED AS CAP
- EXTENT OF LNAPL EXTRACTION RECOVERY SYSTEM
- EXTENT OF LNAPL BIOREMEDIATION TREATMENT AREA
- AMENDMENT INJECTIONS USING DIRECT-PUSH
- SOIL GAS EXTRACTION AND PRESSURIZED AMENDMENT INJECTIONS
- CONTINGENT AMENDMENT INJECTIONS USING DIRECT-PUSH

NOTES:

1. PRG - PRELIMINARY REMEDIATION GOALS.
2. RDCSRS - NEW JERSEY DEPARTMENT ENVIRONMENTAL PROTECTION RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARDS.
3. ALL CAPS REPRESENT ENGINEERING CONTROLS.
4. DEED NOTICES ARE TO BE ESTABLISHED AS INSTITUTIONAL CONTROLS FOR PORTIONS OF FOSTER AVENUE AND UNITED STATES AVENUE.
5. PRGs APPLY TO THE TOP 1 FOOT OF SOIL IN UNDEVELOPED AREAS.
6. TSCA-EPA TOXIC SUBSTANCE COMPLIANCE ACT (40 CFR 760) - REMOVAL OF POLYCHLORINATED BIPHENYLS (PCBs) ABOVE 50 mg/Kg.
7. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 IS ENHANCED LNAPL BIODEGRADATION AND SOIL GAS REMOVAL.
8. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 INJECTION WELLS AND SOIL GAS EXTRACTIONS WELLS TO BE INSTALLED ON THE FORMER TAVERN/SERVICE STATION PROPERTY AND ON WEST SIDE OF UNITED STATES AVENUE.
9. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 PRESSURIZED NUTRIENT INJECTION WELLS TO BE INSTALLED ALONG THE UNITED STATES AVENUE RIGHT OF WAY EAST OF UNITED STATES AVENUE AND SOUTH OF THE FORMER TAVERN/SERVICE STATION.
10. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 DIRECT-PUSH NUTRIENT INJECTIONS WOULD BE INSTALLED BENEATH PROPERTIES E-1, E-7, E-8, E-9, E-10 AND E-11 WHERE LNAPL IS PRESENT.
11. OPERATION OF A NUTRIENT INJECTION AND SOIL GAS RECOVERY SYSTEMS.

SOURCE:

1. BASEMAP, WESTON SOLUTIONS, 2016.
2. PARCELS OF CAMDEN COUNTY, NEW JERSEY 2016, CAMDEN COUNTY IMPROVEMENT AUTHORITY, 2/26/2014, GIS SHP FILE http://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

0 70 140

SCALE: 1" = 70'

TITLE:

FIGURE 8
SOIL REMEDIAL ALTERNATIVE 3 AND EASTERN OFF-PROPERTY AREA ALTERNATIVE 2

LOCATION:

THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

DATE: 7/19/19

FILENAME: 204027_FMP_FS_SOIL_REV3

LAYOUT: SOIL ALT3 EOP ALT2

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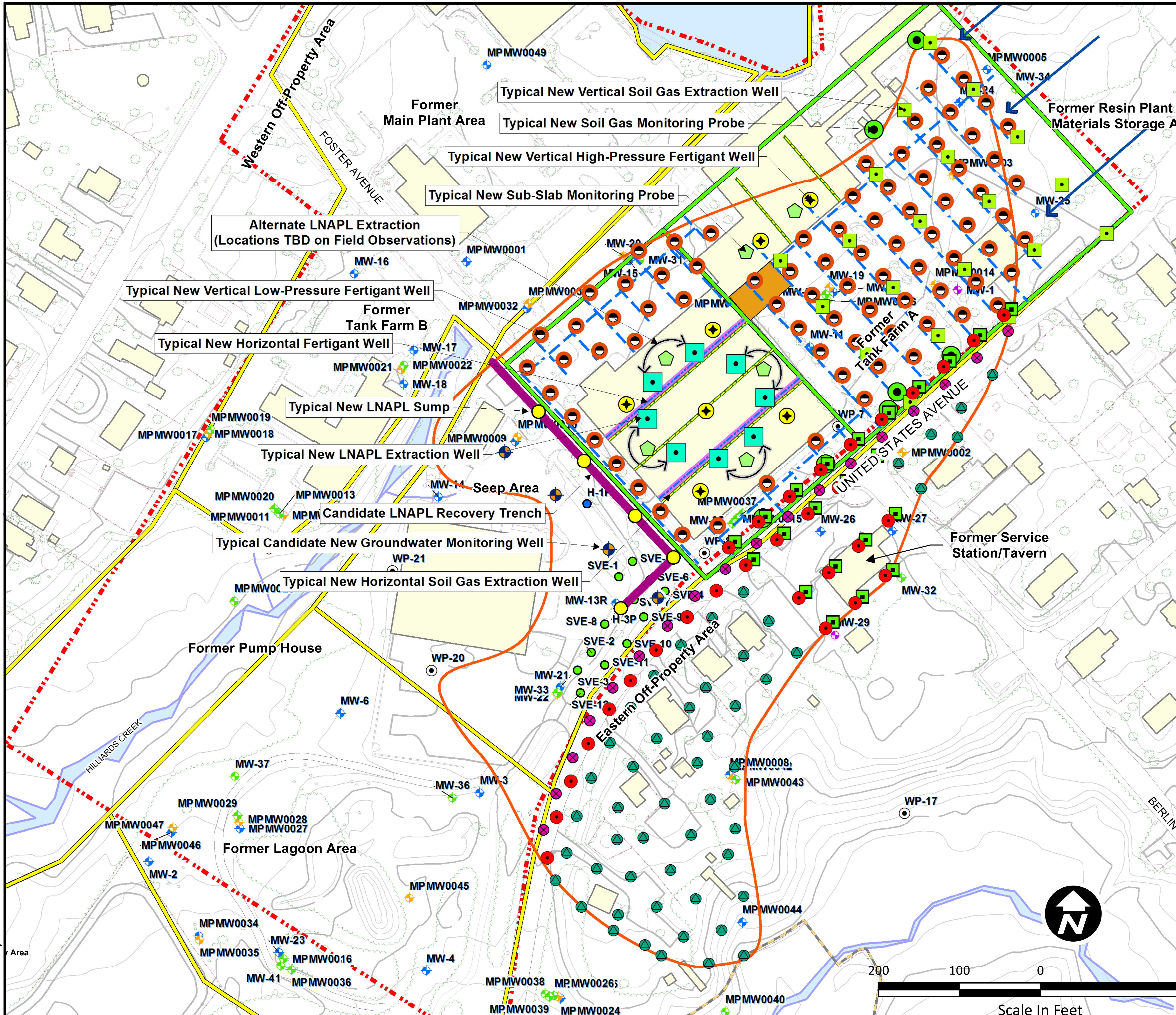

Legend

- Contingent Direct-Push Amendment Emplacement Points
- Injection Direct-Push Amendment Emplacement Points
- New Pressurized Amendment Emplacement Wells
- New Soil Gas Extraction Well
- New LNAPL Extraction Well
- New Vertical Low-Pressure Fertigant Well
- New Vertical Soil Gas Extraction Well
- New Soil Gas Monitoring Probe
- New Sub-Slab Monitoring Probe
- New Vertical High-Pressure Fertigant Well
- Candidate New Groundwater Monitoring Wells
- New LNAPL Sumps
- Candidate LNAPL Reovery Trench
- New Horizontal Fertigant Well
- New Horizontal Soil Gas Extraction Well
- Alternate LNAPL Extraction (Locations TBD on Field Observations)
- Flow Direction
- New Buried Pipe Trenches
- Interpreted Extent of LNAPL
- Free Product Recovery Point
- Soil Vapor Extraction Well
- Piezometer
- Shallow Monitoring Well
- Shallow-Intermediate Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Former Manufacturing Plant Remedial Units
- Former Manufacturing Plant Extent

Conceptual Layout Soil FS Infrastructure Related to NAPL

FORMER MANUFACTURING PLANT
FEASIBILITY STUDY
THE SHERWIN-WILLIAMS COMPANY

EHS Support

Figure 9

Reviewed By:

J:\EHSS_GIS\C05552_ThePaintCo\01_ANALYSIS\20180110_InvestigationReport\FigureX_InfrastructureBioremediation.mxd

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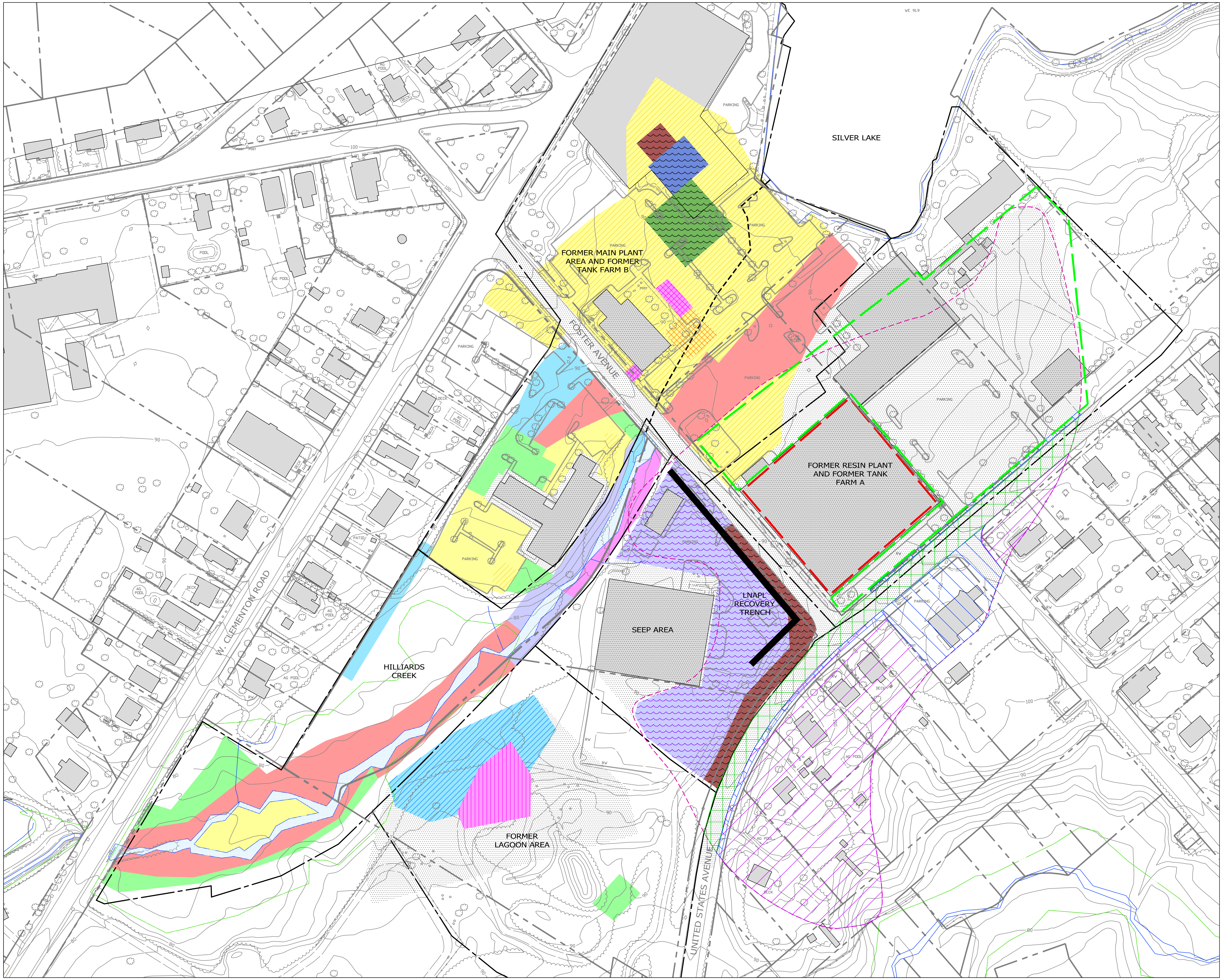

LEGEND

- INTERPRETED EXTENT OF LNAPL
- PROPERTY LINE
- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- 1-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 3-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 4-FOOT EXCAVATION FOR PRGS AND RDCSRS AND NO CAP
- 5-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 6-FOOT EXCAVATION FOR PRGS AND RDCSRS AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 2 FEET
- 4-FOOT EXCAVATION FOR RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 4 FEET
- 6-FOOT EXCAVATION FOR PRGS AND RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 6 FEET
- 4-FOOT EXCAVATION FOR TSCA COMPLIANCE AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 4 FEET
- 6-FOOT EXCAVATION FOR TSCA COMPLIANCE AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 6 FEET
- 5-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 10-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 12-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 15-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- EXISTING SURFACE COVER REMAINS AND IS MAINTAINED AS CAP
- EXTENT OF LNAPL EXTRACTION RECOVERY SYSTEM
- EXTENT OF LNAPL BIOREMEDIATION TREATMENT AREA
- AMENDMENT INJECTIONS USING DIRECT-PUSH
- SOIL GAS EXTRACTION AND PRESSURIZED AMENDMENT INJECTIONS
- CONTINGENT AMENDMENT INJECTIONS USING DIRECT-PUSH

NOTES:

1. PRG - PRELIMINARY REMEDIATION GOALS.
2. RDCSRS - NEW JERSEY DEPARTMENT ENVIRONMENTAL PROTECTION RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARDS.
3. ALL CAPS REPRESENT ENGINEERING CONTROLS.
4. DEED NOTICES ARE TO BE ESTABLISHED AS INSTITUTIONAL CONTROLS FOR PORTIONS OF FOSTER AVENUE AND UNITED STATES AVENUE.
5. PRGs APPLY TO THE TOP 1 FOOT OF SOIL IN UNDEVELOPED AREAS.
6. TSCA-EPA TOXIC SUBSTANCE COMPLIANCE ACT (40 CFR 760) - REMOVAL OF POLYCHLORINATED BIPHENYLS (PCBs) ABOVE 50 mg/Kg.
7. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 IS ENHANCED LNAPL BIODEGRADATION AND SOIL GAS REMOVAL.
8. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 INJECTION WELLS AND SOIL GAS EXTRACTIONS WELLS TO BE INSTALLED ON THE FORMER TAVERN/SERVICE STATION PROPERTY AND ON WEST SIDE OF UNITED STATES AVENUE.
9. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 PRESSURIZED NUTRIENT INJECTION WELLS TO BE INSTALLED ALONG THE UNITED STATES AVENUE RIGHT OF WAY EAST OF UNITED STATES AVENUE AND SOUTH OF THE FORMER TAVERN/SERVICE STATION.
10. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 DIRECT-PUSH NUTRIENT INJECTIONS WOULD BE INSTALLED BENEATH PROPERTIES E-1, E-7, E-8, E-9, E-10 AND E-11 WHERE LNAPL IS PRESENT.
11. OPERATION OF A NUTRIENT INJECTION AND SOIL GAS RECOVERY SYSTEMS.

SOURCE:

1. BASEMAP, WESTON SOLUTIONS, 2016.
2. PARCELS OF CAMDEN COUNTY, NEW JERSEY 2016, CAMDEN COUNTY IMPROVEMENT AUTHORITY, 2/26/2014, GIS SHP FILE http://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

0 70 140

SCALE: 1" = 70'

TITLE:

FIGURE 10
SOIL ALTERNATIVE 4

LOCATION:

THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

DATE: 9/30/2019

FILENAME: 204027_FMP_FS_SOIL_ALT3_rev1

LAYOUT: EPA_FIG10

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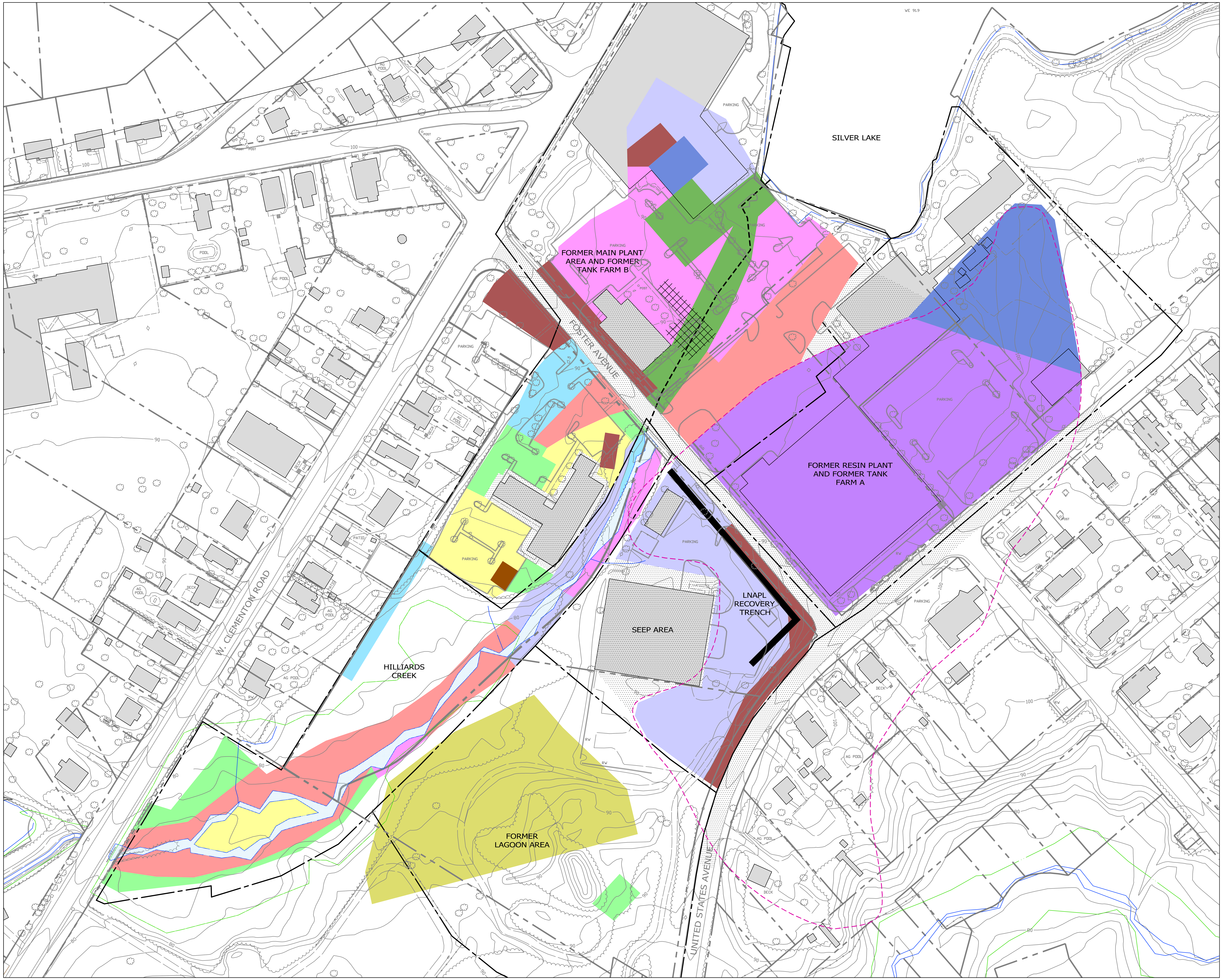

LEGEND

- INTERPRETED EXTENT OF LNAPL
- PROPERTY LINE
- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- 1-FOOT EXCAVATION AND NO CAP
- 2-FOOT EXCAVATION AND NO CAP
- 3-FOOT EXCAVATION AND NO CAP
- 4-FOOT EXCAVATION AND NO CAP
- 5-FOOT EXCAVATION AND NO CAP
- 6-FOOT EXCAVATION AND NO CAP
- 8-FOOT EXCAVATION AND NO CAP
- 10-FOOT EXCAVATION AND NO CAP
- 12-FOOT EXCAVATION AND NO CAP
- 15-FOOT EXCAVATION AND NO CAP
- 20-FOOT EXCAVATION AND NO CAP
- 25-FOOT EXCAVATION AND NO CAP
- TSCA PCB 4 AND 6-FOOT EXCAVATIONS
- EXISTING SURFACE COVER REMAINS AND IS MAINTAINED AS CAP

NOTES:
1. PRG - PRELIMINARY REMEDIATION GOALS.
2. RDCSRS - NEW JERSEY DEPARTMENT ENVIRONMENTAL PROTECTION RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARDS.
3. ALL CAPS REPRESENT ENGINEERING CONTROLS.
4. DEED NOTICES ARE TO BE ESTABLISHED AS INSTITUTIONAL CONTROLS FOR PORTION OF FOSTER AVENUE AND UNITED STATES AVENUE.
5. PRGs APPLY TO THE TOP 1 FOOT OF SOIL IN UNDEVELOPED AREAS.
6. TSCA-EPA TOXIC SUBSTANCE COMPLIANCE ACT (40 CFR 760) - REMOVAL OF POLYCHLORINATED BIPHENYLS (PCBs) ABOVE 50 mg/Kg.

SOURCE:
1. BASEMAP, WESTON SOLUTIONS, 2016.
2. PARCELS OF CAMDEN COUNTY, NEW JERSEY 2016, CAMDEN COUNTY IMPROVEMENT AUTHORITY, 2/26/2014, GIS SHP FILE http://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

0 70 140

SCALE: 1" = 70'

TITLE:

FIGURE 11
SOIL REMEDIAL ALTERNATIVE 5

LOCATION:

THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

DATE: 9/30/2019

FILENAME: 204027_FMP_FS_SOIL_REV4

LAYOUT: EPA FIG 11

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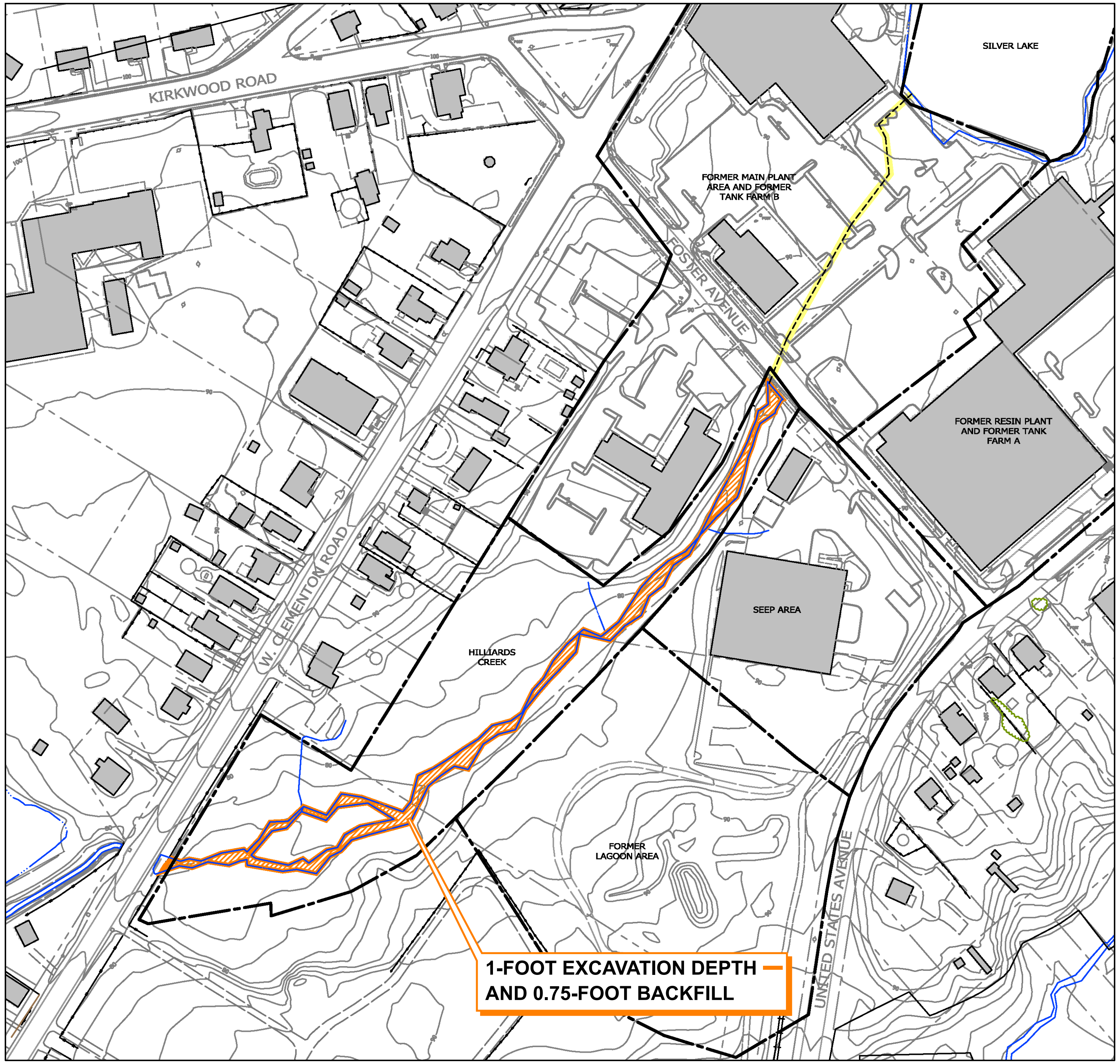
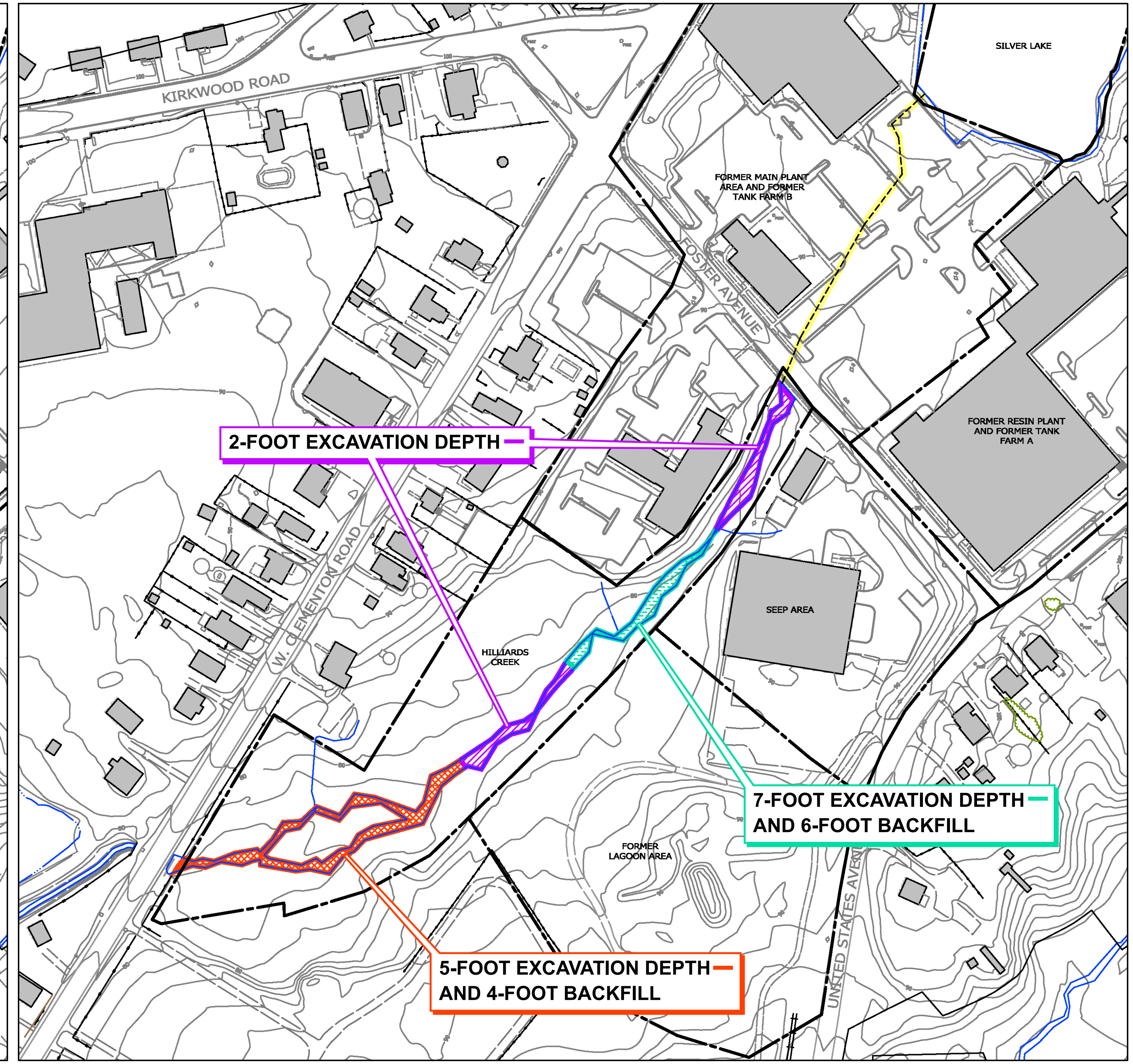
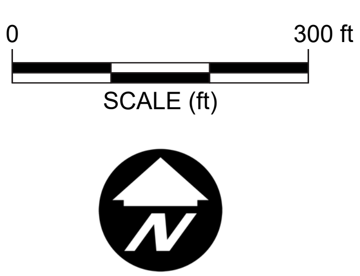
SEDIMENT ALTERNATIVE 2



SEDIMENT ALTERNATIVE 3





NOTES:

1. PRGs - PRELIMINARY REMEDIATION GOALS.
2. PROPOSED EXCAVATIONS ARE TO REMEDIATE ALL SEDIMENT WITH CONTAMINANT CONCENTRATIONS EXCEEDING THE PRGs.

SOURCE:

1. BASEMAP, WESTON SOLUTIONS, 2016.

LEGEND

- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- SILVER LAKE CONVEYANCE
- REMOVAL OF ALL SEDIMENT FROM CONVEYANCE LINE

Figure 12

Sediment Alternatives 2 Versus 3

THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

APPENDIX II-A: Clean up Goals Tables

Table 1 – Cleanup Goals for Soil and Sediments* Contaminants of Concern

Contaminants	NJ Residential Direct Contact Soil Remediation Standard (mg/kg)	NJ Non-Residential Direct Contact Soil Remediation Standard** (mg/kg)	Default NJ Impact to GW Screening Levels - IGWSSL (Above the Water Table) (mg/kg)	Ecological PRGs for Upper Hilliards Creek Floodplain Soils (top 1 foot) and Sediments (both mg/kg)	Site Specific Soil Value for Saturated Soils (mg/kg)
Metal Contaminants					
Arsenic	19	19	19	19	50
Cyanide	47	680	20	58	---
Lead	400***	800	90	213	---
Semi-Volatile Organic Compound Contaminants					
Naphthalene	6****	17	25	---	---
Pentachlorophenol	0.9	3	0.3	---	15
Volatile Organic Compound Contaminants					
Benzene	2	5	0.005	---	---
Polycyclic Aromatic Hydrocarbons (PAHs) Contaminants					
Benzo(a)anthracene	5	17	0.8	---	---
Benzo(b)fluoranthene	5	17	2	---	---
Benzo(a)pyrene	0.5	2	0.2	---	---
Dibenzo(a, h)anthracene	0.5	2	0.8	---	---
Indeno (1,2,3 – CD) pyrene	5****	17	7	---	---
Polychlorinated Biphenyls (PCBs) Contaminants					
Aroclor 1254 *****	0.2	1	0.2	---	---
Aroclor 1260*****	0.2	1	0.2	---	---

*The ecologically derived sediment cleanup goal (values) are also being utilized for the top 1 foot of floodplain soils.

**The NJDEP Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS) are applicable to soil contaminants which may exist under Foster and United States Avenue.

*** Additionally, to achieve the risk reduction goal established for the Site, which is to limit the probability of a child's blood lead level exceeding 5 µg/dL to 5% or less, the average lead concentration across the surface of the remediated area must be at or below 200 mg/kg.

**** The RDCSRS will be used as a cleanup goal when the RDCSRS is more stringent than the IGWSSL.

*****TSCA regulations apply to PCBs concentrations greater than 50 mg/kg and will be excavated when found above these concentrations.

Table 2 – Cleanup Goals for LNAPL Contamination

Contaminant	NJ Groundwater Quality Standards	NJ Interim Groundwater Quality Standards for Tentatively Identified Compounds (TICs) µg/L	Methane Concentrations
Petroleum Hydrocarbons*	None Noticeable	--	--
Total VOC and/or SVOC TIC Compounds in groundwater**	--	500 µg/L	--
Individual VOC and/or SVOC TIC Compound in groundwater**	--	100 µg/L	--
Total Carcinogenic VOC and/or SVOC TIC Compounds in groundwater**	--	25 µg/L	--
Individual Carcinogenic VOC and/or SVOC TIC Compound in groundwater**	--	5 µg/L	--
Indoor air methane concentrations must be addressed:	--	--	Not to exceed the Lower Explosive Limit (LEL)

* LNAPL at Site is comprised of residual petroleum hydrocarbons (likely the source of the methane), degraded mineral spirits, and a combination of SVOC and VOC TICs.

**The EPA preferred OU2 actions will address soil contamination in shallow groundwater. EPA will select a future remedial alternative to address groundwater contamination at the Site as part of Operable Unit 3 (OU3).

APPENDIX II-B: ARARs and TBCs Tables

Table 1 Location Specific ARARs for Sherwin-Williams/Hilliards Creek Superfund Site OU2				
Regulatory Level	**Citation**	**Description**	**Status**	**Comment**
State	New Jersey Freshwater Wetlands Protection Act Rules (N.J.A.C 7:7A).	Constitutes the rules governing the implementation of the Freshwater Wetlands Protection Act and the New Jersey Water Pollution Control Act as it relates to freshwater wetlands.	Applicable	Applicable to remediation activities within Upper Hilliards Creek.
State	New Jersey Flood Hazard Area Control (N.J.A.C 7:13).	Sets forth the requirements governing activities in the flood hazard area or riparian zone of a regulated water.	Applicable	Applicable to remediation activities within Upper Hilliards Creek.
State	New Jersey Division of Fish, Game, and Wildlife Rules (N.J.A.C 7:25).	Supplements the statutes governing fish and game laws in the State of New Jersey.	Applicable	Applicable to aquatic and wildlife areas within the Site boundary.
Federal	Fish and Wildlife Coordination Act (16 USC 661 *et seq*.).	Requires actions to protect fish or wildlife when diverting, channeling, or modifying a stream.	Applicable	Applicable to remediation activities within Upper Hilliards Creek.
Federal	National Historic Preservation Act.	Establishes a program for the preservation of historic properties in the United States.	Potentially Applicable	Potentially applicable during remedial activities if scientific, historic, or archaeological artifacts are identified during implementation of the remedy.

Table 2
Action-Specific ARARs for
Sherwin-Williams/Hilliards Creek Superfund Site OU2

Regulatory Level	Citation	Description	Status	Comment
State	NJ - Technical Requirements for Site Remediation (N.J.A.C. 7:26E) and Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C. 7:26C)	Specifies requirements for remedial activities under New Jersey cleanup programs, including requirements for institutional and engineering controls for contaminated soils left in place and for contaminated groundwater in excess of standards.	Relevant and Appropriate	Substantive requirements applicable if contaminated soils remain at levels above NJ soil remediation standards.
State	NJ - Pollutant Discharge Elimination System Rules (N.J.A.C. 7:14A)	Establishes standards for groundwater and surface water discharges that may alter the physical, chemical or biological properties of State waters	Applicable	The project will meet substantive requirements for surface water or groundwater discharges from the remedial activities which will be performed in OU2.
State	NJ – Air Pollution Rules (N.J.A.C. 7:27)	Establishes air quality standards for discharge of pollutants to air for protection of public health and preservation of ambient air quality.	Applicable	Substantive requirements applicable to remedial activities that result in air emissions during soil remediation (excavation) activities, which may include vapor emission control measures required during the excavation of LNAPL-impacted soils. .
State	NJ – Well Construction and Maintenance Rules (N.J.A.C. 7:9D)	Establishes requirements for installation and decommissioning of wells.	Applicable	Substantive requirements applicable to a remedial action that involves construction or abandonment of wells.
State	NJ - Soil Erosion and Sediment Control Act (N.J.S.A. 4:24-43 and N.J.A.C. 2:90-1)	Establishes soil erosion and sediment control standards for construction projects that result in soil erosion.	Applicable	Applicable to remedial construction activities that result in total land disturbance greater than or equal to 5000 sf^2.
State	NJ - Hazardous Waste Regulations (N.J.A.C. 7:26G)	Describes methods for identifying hazardous wastes and lists known hazardous wastes.	Applicable	Applicable to determine if hazardous waste is identified and managed during site remediation.
State	NJ – Noise Control Rules (N.J.A.C. 7:29)	Sets forth regulations relating to the control and abatement of noise from industrial, commercial, public service or community service facilities.	Relevant and Appropriate	Applicable to establishing limits on the noise that can be generated during remedial activities.

Table 2 – continued
Action-Specific ARARs
Sherwin-Williams/Hilliards Creek Superfund Site OU2

Regulatory Level	Citation	Description	Status	Comment
State	NJ – Storm Water Management (N.J.A.C. 7:8)	Establishes requirements for managing and controlling storm water from construction.	Applicable	Applicable if remedial activities include total land disturbance exceeding regulatory threshold.
State	Discharges of Petroleum and Other Hazardous Substances (N.J.A.C 7:1E)	Establishes guidelines and procedures to be followed in the event of a discharge of hazardous substance and defines hazardous substance in New Jersey.	Relevant and appropriate	Applicable for remedial activities to address LNAPL contamination.
State	NJ Solid Waste Rules (N.J.A.C. 7:26)	Governs the registration, operation, maintenance, and closure of sanitary landfills, other solid waste facilities, and solid waste transportation operations in the State of New Jersey.	Applicable	Applicable for on-site management of solid wastes generated during OU2 activities.
State	NJ Worker and Community Right-to-Know Regulations (N.J.A.C 7:1G)	Establishes procedures by which employers provide chemical inventory reporting to inform employees and communities of the potential hazards.	Relevant and appropriate	Applicable to the various nutrients, used for bioremediation of LNAPL, that will be stored on-site and used, during in-situ activities on-site and on residential properties.
State	NJ Recycling Rules (N.J.A.C. 7:26A)	Describes the requirements for operating recycling centers and the conduct of recyclable materials generators and transporters.	Relevant and Appropriate	Applicable to recyclable materials (e.g., concrete) generated during OU2 activities.
Federal	Resource Conservation and Recovery Act (40 CFR 268)	Establishes responsibilities and standards for the management of hazardous and non-hazardous wastes.	Applicable	Applicable for on-site management of hazardous and non-hazardous wastes generated by remedial activities.
Federal	Toxic Substance Control Act (40 CFR 761.61)	Defines the approaches that may be used to remediate and dispose of PCB-containing environmental media.	Applicable	Applicable
Federal	DOT Rules for Hazardous Materials Transportation (49 CFR 107, 171.1-172.604)	DOT Rules for Hazardous Materials Transportation (49 CFR 107, 171.1-172.604)	Applicable	Applicable
Federal	National Ambient Air Quality Standards (40 CFR 50)	Establishes air quality standards for specific criteria pollutants, including lead.	Applicable	Applicable during soil remediation activities (excavation), which may include dust and vapor emission control measures required during excavation of LNAPL-impacted soils.

Table 2 – continued
Action-Specific ARARs
Sherwin-Williams/Hilliards Creek Superfund Site OU2

Regulatory Level	Citation	Description	Status	Comment
Federal	Clean Water Act, Section 404 (33 U.S.C. 1344) as it pertains to wetlands. 40 CFR Part 230 40 CFR §§ 230.91–.98	Regulates discharge of dredged or fill material into wetlands adjacent to navigable waters.	Applicable	Applicable to remediation activities within Upper Hilliards Creek. On-site activities will be properly conducted to minimize adverse effects

Table 3
Chemical-Specific ARARs for
Sherwin-Williams/Hilliards Creek Superfund Site OU2

Regulatory Level	Citation	Description	Status	Comment
State	NJ Ground Water Quality and Surface Water Quality Standards (N.J.A.C 7:9C and N.J.A.C. 7:9B)	Establishes designated uses of the State's groundwater and specifies groundwater quality standards (GWQS) for protection of groundwater and for groundwater remediation. Regulates activities respecting protection and enhancement of surface water resources and specifies surface water quality standards (SWQS) for protection of surface water.	Applicable	GWQS are identified as remedial goals for LNAPL at the Site and surface water monitoring will be required.
State	NJ Surface Water Quality Standards (N.J.A.C 7:9B)	Establishes designated uses of the State's surface water and specifies surface water quality standards (SWQS) for protection of surface water.	Applicable	Applicable during floodplain soil and sediment remediation activities; which may require de-watering activities and result in subsequent surface water discharges to Hilliards Creek.
State	NJ Soil Remediation Standards (N.J.A.C. 7:26D)	Establishes the minimum standards for the remediation of contaminated soil.	Applicable	NJDEP RDCSRS and NRDCSRS are identified as remedial goals for Site related soil COCs. Per USEPA May 12, 2010 letter to NJDEP the ingestion/dermal exposure pathway SRS are ARARs, but SRS for the inhalation pathway is not an ARAR.[1]

1.Letter dated May 12, 2010, USEPA Region 2 to NJDEP Site Remediation Program regarding Application of New Jersey's Site Remediation Standards at Federal-Lead Superfund Sites.

Table 4
To be Considered (TBCs) for
Sherwin-Williams/Hilliards Creek Superfund Site OU2

Regulatory Level	Citation	Description	Status	Comment
State	NJ Soil Cleanup Criteria for Chromium (September 2008, Revised April 2010)	Provides guidance on soil cleanup criteria for trivalent and hexavalent chromium concentrations.	TBC	
State	NJDOT Standard Specifications – Soil and Sediment Control Measures (1996)	NJDOT standards are typically used to develop the appropriate plans for sediment and soil erosion controls required under New Jersey Soil Conservation Act.	TBC	
State	NJDEP Guidance Document, "Capping of Inorganic and Semivolatile Contaminants for Impact to Groundwater Pathway", Version 1.0, March 2014.	Provides guidance on capping of inorganic and semivolatile contaminants.	TBC	
State	NJDEP Site Remediation Program, "Technical Guidance on the Capping of Sites Undergoing Remediation", Version 1.0, July 2014.	Provides guidance for conducting remediation to comply with NJDEP requirements established by Technical Requirements for Site Remediation N.J.A.C. 7:26E	TBC	
State	NJDEP Guidance for the Evaluation of Immobile Chemicals for the Impact to Ground Water Pathway", June 2008.	This guidance provides procedures to evaluate potential impacts to groundwater from immobile chemicals.	TBC	
State	NJDEP Site Remediation Program, "Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria", Version 1.0, September 2012.	This guidance provides procedures on use of alternate methods to achieve compliance with applicable remediation standards.	TBC	
State	NJDEP Site Remediation Program, "Presumptive and Alternative Remedy Technical Guidance", Version 2.0, August 2013	Provides guidance for conducting remediation to comply with NJDEP requirements established by Technical Requirements for Site Remediation N.J.A.C. 7:26E	TBC	
State	NJDEP Site Remediation Program, "Monitored Natural Attenuation Technical Guidance", Version 1.0, March 2012	Provides guidance for conducting remediation to comply with NJDEP requirements established by Technical Requirements for Site Remediation N.J.A.C. 7:26E	TBC	

Table 4 – continued
TBCs
Sherwin-Williams/Hilliards Creek Superfund Site OU2

Regulatory Level	Citation	Description	Status	Comment
Federal	"Policy on Floodplains and Wetlands Assessments for CERCLA Actions", 1985.	Requires that CERCLA actions meet the substantive requirements of Floodplain Management Executive Order (EO 11988) and Protection of Wetlands Executive Order (EO 11990).	TBC	
Federal	Fish and Wildlife Coordination Act Advisories	Advisories on the effects of pollutants and other activities on wildlife, including migratory birds and fish, and wildlife habitat authorized under the Fish and Wildlife Coordination Act.	TBC	
Federal	Executive Order 11988 Floodplain Management	Requires federal agencies to avoid, to the extent possible, long and short-term adverse impacts associated with the occupancy and modification of floodplains, and avoid support of floodplain development wherever there is a practicable alternative.	TBC	The potential effects of the remedy will be evaluated to ensure that the planning and decision making reflect consideration of flood hazards and floodplains management, including restoration and preservation of natural undeveloped floodplains.
Federal	Executive Order 11990 Protection of Wetlands	Requires federal agencies to provide leadership and take actions to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.	TBC	A wetland assessment will be performed as part of the remedy.

APPENDIX II-C: HHRA Risk Tables

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

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil (0-2 ft bgs)

Exposure Point	Chemical of Concern[1]	Concentration Detected (Qualifier)		Concentration Units	Frequency of Detection	Exposure Point Concentration[2] (EPC)	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Surface soil on NFA[3] (Subareas 1 and 2)[5,6]	Arsenic	0.97	696.5(+)	mg/kg	122/123	43	mg/kg	95% KM (Chebyshev) UCL
	Aroclor 1260	0.003(J)	52	mg/kg	50/105	3	mg/kg	KM H-UCL
	Benzo(a)pyrene	0.0023(J)	31	mg/kg	104/121	1	mg/kg	KM H-UCL
Surface Soil on SFA[4] (Subareas 1 and 4)[5,7]	Antimony	0.3(J)	1090(J)	mg/kg	33/54	119	mg/kg	95% KM (Chebyshev) UCL
	Benzo(a)pyrene	0.012(J)	37	mg/kg	50/59	12	mg/kg	KM H-UCL
Surface Soil on UNDV (Subarea 5)[8]	Arsenic	0.37(J)	1125(+)	mg/kg	150/158	124	mg/kg	95% KM (Chebyshev) UCL
	Cyanide	0.07(J)	353(J)	mg/kg	106/159	88	mg/kg	KM H-UCL

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soils (0-10 ft bgs)

Exposure Point	Chemical of Concern[1]	Concentration Detected (Qualifier)		Concentration Units	Frequency of Detection	Exposure Point Concentration[2] (EPC)	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Soil on NFA[3] (Subareas 1 and 2)[5,6]	Aroclor 1260	0.0029(J)	1200	mg/kg	99/275	25	mg/kg	95% KM (Chebyshev) UCL

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment (0-0.5 ft bgs)

Exposure Point	Chemical of Concern[1]	Concentration Detected (Qualifier)		Concentration Units	Frequency of Detection	Exposure Point Concentration[2] (EPC)	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Sediment in UHC (Subarea 6)[9]	Arsenic	1.3(J)	1720(J)	mg/kg	12/12	1700	mg/kg	99% Chebyshev (Mean, Sd) UCL
	Chromium[10]	4.2	2070(J)	mg/kg	14/14	1826	mg/kg	99% KM (Chebyshev) UCL
	Cyanide	0.17(J)	651(J)	mg/kg	7/8	651	mg/kg	Maximum Concentration

Footnotes:
(1) Lead was also identified as a site-related COC; the medium-specific EPCs for lead can be found in Table 7.
(2) The UCLs were calculated using EPA's ProUCL software (Version 5.1); when available, UCLs were used as EPCs.
(3) The NFA includes the northern portion of Subarea 1 and Subarea 2.
(4) The SFA includes the southern portion of Subarea 1 and Subarea 4.
(5) Subarea 1 encompasses the former main plant area.
(6) Subarea 2 is comprised of Tank Farm A.
(7) Subarea 4 includes the Seep Area.

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

(8) Subarea 5 is made up of the Former Lagoon Area.

(9) Subarea 6 includes Upper Hilliards Creek.

(10) Two risk estimates were calculated for exposure to chromium in sediments in the absence of speciated data. The first assumed that 100% of the chromium identified exists in the hexavalent form. The corresponding EPC to this method is displayed in the table. Within soils, 5% of the total chromium detected was found to exist in the hexavalent state. Risks related to sediment were also assessed by applying this 5% ratio to the total chromium EPC, which is 91 mg/kg.

Definitions:

" +" = Value is the average of a parent sample and a field duplicate sample

EPC = Exposure point concentration

ft bgs = Feet below ground surface

J = Estimated value (qualifier)

mg/kg = Milligrams per kilogram

UCL = Upper confidence limit of mean

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	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Soil	Soil (0-10 feet)	NFA[1] (Subareas 1 and 2)[3,4] SFA[2] (Subareas 1 and 4)[3,6] EUSA (Subarea 3)[5] UNDV (Subarea 5)[7]	Utility Worker	Adult	Ingestion Dermal Inhalation	Quantitative	Exposure to soil during utility work
				Construction Worker	Adult	Ingestion Dermal Inhalation	Quantitative	Exposure to soil during future construction activities
Current/Future	Soil	Soil (0-2 feet)	UNDV (Subarea 5)[6]	Recreator	Adult	Ingestion Dermal Inhalation	Quantitative	Exposure to soil while visiting site
					Adolescent	Ingestion Dermal Inhalation	Quantitative	Exposure to soil while visiting site
Future	Soil	Soil (0-2 feet)	NFA[1] (Subareas 1 and 2)[3,4] SFA[2] (Subareas 1 and 4)[3,6] EUSA (Subarea 3)[5] UNDV (Subarea 5)[7]	Outdoor Worker	Adult	Ingestion Dermal Inhalation	Quantitative	Exposure to soil outdoors while working at the site
Future	Soil	Soil (0-2 feet)	NFA[1] (Subareas 1 and 2)[3,4] SFA[2] (Subareas 1 and 4)[3,6] EUSA (Subarea 3)[5] UNDV (Subarea 5)[7]	Resident	Adult	Ingestion Dermal Inhalation	Quantitative	Exposure to soil at future residence
					Child	Ingestion Dermal Inhalation	Quantitative	Exposure to soil at future residence
Current/Future	Sediment	Sediment	UHC (Subarea 6)[8]	Recreator	Adult	Ingestion Dermal	Quantitative	Exposure to sediment while wading in Upper Hilliards Creek
					Adolescent	Ingestion Dermal	Quantitative	Exposure to sediment while wading in Upper Hilliards Creek
Current/Future	Surface Water	Surface Water	UHC (Subarea 6)[8]	Recreator	Adult	Dermal	Quantitative	Exposure to surface water while wading in Upper Hilliards Creek
					Adolescent	Dermal	Quantitative	Exposure to surface water while wading in Upper Hilliards Creek

Footnotes:

(1) The NFA includes the northern portion of Subarea 1 and Subarea 2.

(2) The SFA includes the southern portion of Subarea 1 and Subarea 4.

(3) Subarea 1 encompasses the former main plant area.

(4) Subarea 2 is comprised of Tank Farm A.

(5) Subarea 3 includes the off property area across United States Avenue from the main plant area.

(6) Subarea 4 includes the Seep Area.

(7) Subarea 5 is made up of the Former Lagoon Area.

Table 2
Selection of Exposure Pathways

(8) Subarea 6 includes Upper Hilliards Creek.

Definitions:
EUSA = East of United States Avenue
NFA = North of Foster Avenue
SFA = South of Foster Avenue
UNDV = Undeveloped Area
UHC = Upper Hilliards Creek

Summary of Selection of Exposure Pathways

This table describes the exposure pathways associated with the varying media (soil, sediment and surface water) 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	Sources of RfD Target Organ	Dates of RfD
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Blood	1000	IRIS	2/1/1991
Arsenic[2]	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Skin	3	IRIS	2/1/1993
Chromium[6]	Chronic	3.0E-03	mg/kg-day	0.025	7.5E-05	mg/kg-day	Non Observed	900	IRIS	9/3/1998
Cyanide	Chronic	6.0E-04	mg/kg-day	1	6.0E-04	mg/kg-day	Reproductive	3,000	IRIS	9/28/2010
Lead[3]	Chronic	NA	mg/kg-day	1	NA	mg/kg-day	See Footnote 3	NA	NA	NA
Aroclor 1260[4]	Chronic	2.0E-05	mg/kg-day	1	2.0E-05	mg/kg-day	Immunological	300	IRIS	11/1/1996
Benzo(a)pyrene	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	Developmental	3.0E+02	IRIS	1/19/2017

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	Sources of RfD Target Organ	Dates of RfC
Antimony	Chronic	NA	mg/m^3	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	1.5E-05	mg/m^3	NA	NA	Lung	30	CalEPA	12/1/2008
Chromium	Chronic	1.0E-04	mg/m^3	NA	NA	Respiratory	300	IRIS	9/3/1998
Cyanide[5]	Chronic	8.0E-04	mg/m^3	NA	NA	Endocrine	3,000	IRIS	9/28/2010
Lead[3]	Chronic	NA	mg/m^3	NA	NA	NA	NA	NA	NA
Aroclor 1260	Chronic	NA	mg/m^3	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	2.0E-06	mg/m^3	NA	NA	Developmental	3,000	IRIS	1/19/2017

Footnotes:

(1) Adjusted RfD for Dermal = Oral RfD x Oral Absorption Efficiency for Dermal (RAGS E, 2004)
(2) An oral relative bioavailability factor of 60% was used when quantifying risks from soil ingestion.
(3) Risks and hazards from lead exposure are not evaluated in the same manner as the other contaminants; See Table 7 for the summary of risks resulting from lead exposure.
(4) Based on aroclor 1254.
(5) Based on hydrogen cyanide and cyanide salts.
(6) Based on chromium VI.

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 = Provisional Peer Reviewed Toxicity Values, U.S. EPA

Summary of Toxicity Assessment

This table provides noncarcinogenic 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 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
Antimony	NA	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA
Arsenic[1]	1.5E+00	$(mg/kg\text{-}day)^{-1}$	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	4/10/1998
Chromium[4]	5.0E-01	$(mg/kg\text{-}day)^{-1}$	2.0E+01	$(mg/kg\text{-}day)^{-1}$	NA	NJDEP	4.0E+04
Cyanide	NA	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	9/28/2010
Lead[2]	NA	$(mg/kg\text{-}day)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	11/1/1993
Aroclor 1260[3]	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	6/1/1997
Benzo(a)pyrene	1.0E+00	$(mg/kg\text{-}day)^{-1}$	1.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	1/19/2017

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline	Source	Date
Antimony	NA	$(\mu g/m^3)^{-1}$	NA	NA	NA	NA	NA
Arsenic	4.3E-03	$(\mu g/m^3)^{-1}$	NA	NA	A	IRIS	4/10/1998
Chromium[4]	8.4E-02	$(\mu g/m^3)^{-1}$	NA	NA	A	IRIS	9/3/1998
Cyanide	NA	$(\mu g/m^3)^{-1}$	NA	NA	NA	NA	NA
Lead[2]	NA	$(\mu g/m^3)^{-1}$	NA	NA	NA	NA	NA
Aroclor 1260[3]	5.7E-04	$(\mu g/m^3)^{-1}$	NA	NA	B2	IRIS	6/1/1997
Benzo(a)pyrene	6.0E-04	$(\mu g/m^3)^{-1}$	NA	NA	B2	IRIS	1/19/2017

Footnotes:

(1) An oral relative bioavailability factor of 60% was used when quantifying risks from soil ingestion.

(2) Risks and hazards from lead exposure are not evaluated in the same manner as the other contaminants; See Table 7 for the summary of risks resulting from lead exposure.

(3) Based on aroclor 1254.

(4) Based on chromium VI.

Definitions:

IRIS = Integrated Risk Information System, U.S. EPA
NA = Not available
NJDEP = New Jersey Department of Environmental Protection
$(\mu g/m^3)^{-1}$ = 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
B2 = Probable 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:		Resident at NFA (Subareas 1 and 2)[3,5,6]						
Receptor Age:		Child						
Medium	**Exposure Medium**	**Exposure Point**	**Chemical Of Concern**	**Primary target Organ**	**Noncarcinogenic Hazard Quotient**			
					Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
Soil	Surface Soil	Surface Soil on NFA	Arsenic	Skin	1.1	0.13	0.0009	1.2
			Aroclor 1260	Immunological	2.0	0.68	NA	2.7
							Soil Hazard Index Total[1] =	**7**
							Receptor Hazard Index[1] =	**7**
							Skin HI=	**2**
							Immunological HI=	**3**
Scenario Timeframe:		Future						
Receptor Population:		Resident at SFA (Subareas 1 and 4)[4,5,7]						
Receptor Age:		Child						
Medium	**Exposure Medium**	**Exposure Point**	**Chemical Of Concern**	**Primary target Organ**	**Noncarcinogenic Hazard Quotient**			
					Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
Soil	Surface Soil	Surface Soil on SFA	Antimony	Blood	3.8	NA	NA	3.8
							Soil Hazard Index Total[1] =	**4**
							Receptor Hazard Index[1] =	**4**
							Blood HI=	**4**
Scenario Timeframe:		Future						
Receptor Population:		Resident at the UNDV (Subarea 5)[8]						
Receptor Age:		Child						
Medium	**Exposure Medium**	**Exposure Point**	**Chemical Of Concern**	**Primary target Organ**	**Noncarcinogenic Hazard Quotient**			
					Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
Soil	Surface Soil	Surface Soil on UNDV	Arsenic	Skin	3.2	0.38	0.0025	3.6
			Cyanide	Reproductive/Endocrine[2]	1.9	NA	1.4	3.3
							Soils Hazard Index Total[1] =	**9.7**
							Receptor Hazard Index[1] =	**10**
							Skin HI=	**4**
							Endocrine HI=	**2**
							Reproductive HI=	**2**
Scenario Timeframe:		Current/Future						
Receptor Population:		Recreator at the UNDV and UHC (Subareas 5 and 6)[8,9,10]						
Receptor Age:		Child						
Medium	**Exposure Medium**	**Exposure Point**	**Chemical Of Concern**	**Primary target Organ**	**Noncarcinogenic Hazard Quotient**			
					Ingestion	**Dermal**	**Inhalation**	**Exposure Routes Total**
Soil	Surface Soil	Surface Soil on UNDV	Arsenic	Skin	1.5	0.16	0.0004	1.5
			Cyanide	Reproductive	0.8	NA	0.2	1.0
							Soils Hazard Index Total[1] =	**3.4**
Sediment	Sediment	Sediment in UHC	Arsenic	Skin	5.5	0.65	NA	6.1
			Cyanide	Reproductive	1.7	NA	NA	1.7
							Sediment Hazard Index Total[1] =	**8.5**
							Receptor Hazard Index[1] =	**12**
							Skin HI=	**8**
							Reproductive HI=	**3**
Scenario Timeframe:		Current/Future						
Receptor Population:		Recreator at the UNDV and UHC (Subareas 5 and 6)[8,9,10]						
Receptor Age:		Adolescent						

Table 5
Risk Characterization Summary - Noncarcinogens

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	Surface Soil on UNDV	Arsenic	Skin	0.2	0.04	0.0004	0.3
							Soils Hazard Index Total[1] =	**0.8**
Sediment	Sediment	Sediment in UHC	Arsenic	Skin	0.9	0.40	NA	1.4
							Sediment Hazard Index Total[1] =	**1.8**
							Receptor Hazard Index[1] =	**3**
							Skin HI=	**2**

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker at NFA (Subareas 1 and 2)[3,5,6]
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary target Organ	Noncarcinogenic Hazard Quotient			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Soil	Soil on NFA	Aroclor 1260	Immunological	3.6	1.6	NA	5.2
							Soils Hazard Index Total[1] =	**6**
							Receptor Hazard Index[1] =	**6**
							Immunological HI=	**5**

Footnotes:

(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.
(2) The target organ for ingestion exposure is the reproductive system and the target organ for inhalation is the endocrine system.
(3) The NFA includes the northern portion of Subarea 1 and Subarea 2.
(4) The SFA includes the southern portion of Subarea 1 and Subarea 4.
(5) Subarea 1 encompasses the former main plant area.
(6) Subarea 2 is comprised of Tank Farm A.
(7) Subarea 4 includes the Seep Area.
(8) Subarea 5 is made up of the Former Lagoon Area.
(9) Subarea 6 includes Upper Hilliards Creek.
(10) Total hazards for recreators reflect exposures to floodplain surface soils, UHC sediments and UHC surface water. Only the pathways and chemicals yielding risks above EPA thresholds are shown in this table.

Definitions:

NA = Not available
NFA = North of Foster Avenue
UHC = Upper Hilliards Creek
UNDV = Undeveloped Area
SFA = South of Foster Avenue

Table 6
Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident at NFA (Subareas 1 and 2)[3,5,6]
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	Surface soil on NFA	Arsenic	5.5E-05	7.8E-06	2.0E-08	6.3E-05
			Aroclor 1260	9.2E-06	3.6E-06	3.8E-07	1.3E-05
			Benzo(a)pyrene	9.5E-06	2.8E-06	1.9E-10	1.2E-05
						Soil Risk Total[1]=	**2E-04**
						Total Risk[1]=	**2E-04**

Scenario Timeframe: Future
Receptor Population: Resident at SFA (Subareas 1 and 4)[4,5,7]
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	Surface soil on SFA	Benzo(a)pyrene	1.1E-04	3.2E-05	2.2E-09	1.4E-04
						Soil Risk Total[1]=	**3E-04**
						Total Risk[1]=	**3E-04**

Scenario Timeframe: Future
Receptor Population: Resident at the UNDV (Subarea 5)[8]
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Soil	Surface Soil	Surface soil on UNDV	Arsenic	1.6E-04	2.3E-05	5.9E-08	1.8E-04
						Soil Risk Total[1]=	**3E-04**
						Total Risk[1]=	**3E-04**

Scenario Timeframe: Current/Future
Receptor Population: Recreator at the UNDV and UHC (Subareas 5 and 6)[8,9]
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Sediment	Sediment	Sediment in UHC	Arsenic	7.2E-04	8.5E-05	NA	8.0E-04
			Chromium[10]	3.1E-03	NA	NA	3.1E-03
						Sediment Risk Total[1]=	**4E-03**
						Total Risk[1,2]=	**4E-03**

Scenario Timeframe: Current/Future
Receptor Population: Recreator at the UNDV and UHC (Subareas 5 and 6)[8,9]
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Sediment	Sediment	Sediment in UHC	Chromium[10]	1.1E-04	NA	NA	1.1E-04
						Sediment Risk Total[1]=	**2E-04**
						Total Risk[1,2]=	**2E-04**

Scenario Timeframe: Current/Future
Receptor Population: Recreator at the UNDV and UHC (Subareas 5 and 6)[8,9]
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Sediment	Sediment	Sediment in UHC	Arsenic	8.6E-05	5.2E-05	NA	1.4E-04
						Sediment Risk Total[1]=	**2E-04**
						Total Risk[1,2]=	**2E-04**

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]).

(2) The Total Risks for the UNDV reflect exposures to floodplain surface soils, UHC sediments and UHC surface water. Only the pathways and chemicals yielding risks above EPA thresholds are shown in

Table 6
Risk Characterization Summary - Carcinogens

this table.

(3) The NFA includes the northern portion of Subarea 1 and Subarea 2.

(4) The SFA includes the southern portion of Subarea 1 and Subarea 4.

(5) Subarea 1 encompasses the former main plant area.

(6) Subarea 2 is comprised of Tank Farm A.

(7) Subarea 4 includes the Seep Area.

(8) Subarea 5 is made up of the Former Lagoon Area.

(9) Subarea 6 includes Upper Hilliards Creek.

(10) Chromium risks displayed for sediment were based on the assumption that 100% of the chromium identified exists in the hexavalent form. Risks based on the 5% ratio (Table 1) were 2E-04 for the child recreator, which still exceeds the target risk range, and 5E-06 for the adolescent, which is within the target risk range (1E-06 to 1E-04).

Definitions:

NA = Not available
NFA = North of Foster Avenue
UHC = Upper Hilliards Creek
UNDV = Undeveloped Area
SFA = South of Foster Avenue

Table 7
Risk Characterization Summary - Lead
Medium-Specific Exposure Point Concentration and Resultant Risks

Scenario Timeframe: Future
Receptor Population: Resident (Child)

Exposure Area	Exposure Media	Lead Exposure Point Concentration[1] (EPC)	EPC Units	Geometric Mean Blood Lead Level	Lead Risk[2]
NFA (Subareas 1 and 2)[3,5,6]	Soil (0-0.5ft)	230	mg/kg	3	14%
SFA (Subareas 1 and 4)[4,5,7]	Soil (0-0.5ft)	2,925	mg/kg	19	99.8%
UNDV (Subarea 5)[8]	Soil (0-0.5ft)	339	mg/kg	3.9	31%

Scenario Timeframe: Current/Future Future
Receptor Population: Recreator (Child)

Exposure Area	Exposure Media	Lead Exposure Point Concentration[1] (EPC)	EPC Units	Geometric Mean Blood Lead Level	Lead Risk[2]
UNDV/UHC (Subareas 5 and 6)[8,9]	Soil (0-2ft) + Sediment (0-0.5ft)	1,189	mg/kg	10	93%

Scenario Timeframe: Current/Future Future
Receptor Population: Recreator (Adult)

Exposure Area	Exposure Media	Lead Exposure Point Concentration[1] (EPC)	EPC Units	Geometric Mean Blood Lead Level	Lead Risk[2]
UNDV/UHC (Subareas 5 and 6)[8,9]	Soil (0-2ft) + Sediment (0-0.5ft)	1,189	mg/kg	2	3%

Scenario Timeframe: Future
Receptor Population: Outdoor Worker

Exposure Area	Exposure Media	Lead Exposure Point Concentration[1] (EPC)	EPC Units	Geometric Mean Blood Lead Level	Lead Risk[2]
NFA (Subareas 1 and 2)[3,5,6]	Soil (0-2ft)	303	mg/kg	1	64%
SFA (Subareas 1 and 4)[4,5,7]	Soil (0-2ft)	1,880	mg/kg	3.3	19%
UNDV (Subarea 5)[8]	Soil (0-2ft)	665	mg/kg	1.6	2%

Scenario Timeframe: Current/Future
Receptor Population: Utility Worker

Exposure Area	Exposure Medium	Lead Exposure Point Concentration[1] (EPC)	EPC Units	Geometric Mean Blood Lead Level	Lead Risk[2]
NFA (Subareas 1 and 2)[3,5,6]	Soil (0-10ft)	296	mg/kg	0.6	0.01%
SFA (Subareas 1 and 4)[4,5,7]	Soil (0-10ft)	911	mg/kg	0.7	0.03%
UNDV (Subarea 5)[8]	Soil (0-10ft)	682	mg/kg	0.7	0.02%

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker

Exposure Area	Exposure Medium	Lead Exposure Point Concentration[1] (EPC)	EPC Units	Geometric Mean Blood Lead Level	Lead Risk[2]
NFA (Subareas 1 and 2)[3,5,6]	Soil (0-10ft)	296	mg/kg	1.5	1%
SFA (Subareas 1 and 4)[4,5,7]	Soil (0-10ft)	911	mg/kg	3.2	18%
UNDV (Subarea 5)[8]	Soil (0-10ft)	682	mg/kg	2.6	9%

Footnotes:

(1) The lead EPC in soil was the arithmetic mean of all samples collected from a given soil depth interval.

(2) Lead risks are expressed as the probability of having a blood lead level greater than 5 micrograms per deciliter (µg/dL); EPA's risk reduction goal is to limit the probability of a child's blood lead concentration exceeding 5 µg/dL to 5% or less.

(3) The NFA includes the northern portion of Subarea 1 and Subarea 2.

(4) The SFA includes the southern portion of Subarea 1 and Subarea 4.

(5) Subarea 1 encompasses the former main plant area.

(6) Subarea 2 is comprised of Tank Farm A.

Table 7
Risk Characterization Summary - Lead
Medium-Specific Exposure Point Concentration and Resultant Risks

(7) Subarea 4 includes the Seep Area.
(8) Subarea 5 is made up of the Former Lagoon Area.
(9) Subarea 6 includes Upper Hilliards Creek.

Definitions:
ft = Feet below ground surface
mg/kg = milligram per kilogram
NFA = North of Foster Avenue
UHC = Upper Hilliards Creek
UNDV = Undeveloped Area
SFA = South of Foster Avenue
ug/dL = microgram per deciliter

APPENDIX III: Administrative Record Index

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

11/18/2019

REGION ID: 02

Site Name: SHERWIN-WILLIAMS/HILLIARDS CREEK
CERCLIS ID: NJD980417976
OUID: 02
SSID: 02QN
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
564986	11/18/2019	ADMINISTRATIVE RECORD INDEX FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	5	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
565481	02/18/2016	LEVEL D HEALTH AND SAFETY PLAN FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	198	Work Plan		(WESTON SOLUTIONS, INC.)
565480	03/22/2016	PNEUMATIC TESTING OF EXISTING SUB-SLAB PROBES MEMORANDUM FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	535	Memorandum	(THE SHERWIN-WILLIAMS COMPANY)|VOCAIRE,RACHEL (THE SHERWIN-WILLIAMS COMPANY)	(GEOSYNTEC CONSULTANTS)
565482	04/08/2016	SHERWIN WILLIAM'S RESPONSE TO US EPA COMMENTS ON THE SUMP DEPRESSURIZATION WOK PLAN FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	5	Memorandum		(THE SHERWIN-WILLIAMS COMPANY)
565479	07/01/2016	SUMP DEPRESSURIZATION AND VENTING REPORT FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	21	Report		(WESTON SOLUTIONS, INC.)
543980	10/05/2017	HUMAN HEALTH RISK ASSESSMENT FOR THE FORMER MANUFACTURING PLANT, SOILS FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1252	Letter	KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)	VOCAIRE,RACHEL (THE SHERWIN-WILLIAMS COMPANY)
565484	11/27/2017	DRAFT SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	11	Chart/Table		(US ENVIRONMENTAL PROTECTION AGENCY)

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11/18/2019

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Site Name: SHERWIN-WILLIAMS/HILLIARDS CREEK
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Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
501231	02/14/2018	TRANSMITTAL OF THE FORMER MANUFACTURING PLANT REMEDIAL INVESTIGATION REPORT OU2 AND SHERWIN-WILLIAMS COMPANY'S RESPONSE TO COMMENTS FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	2	Letter	KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)	VOCAIRE,RACHEL (THE SHERWIN-WILLIAMS COMPANY)
501233	02/14/2018	SHERWIN-WILLIAMS COMPANY'S RESPONSE TO US EPA COMMENTS ON THE FORMER MANUFACTURING PLANT REMEDIAL INVESTIGATION REPORT OU2 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	14	Notes		
501235	02/28/2018	NJDEP'S APPROVAL OF THE REVISED REMEDIAL INVESTIGATION REPORT OU2 FOR THE FORMER MANUFACTURING PLANT AREA FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1	Letter	KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)	VOGEL,LYNN (NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)
542708	03/07/2018	SHERWIN-WILLIAMS RESPONSE TO COMMENTS REGARDING THE 12/14/2017 OU2 DRAFT BASELINE ECOLOGICAL RISK ASSESSMENT FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	6	Report		
542710	03/07/2018	BASELINE ECOLOGICAL RISK ASSESSMENT (BERA) OU2 FOR THE FORMER MANUFACTURING PLANT SITE GIBBSBORO, NEW JERSEY FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1737	Report	(THE SHERWIN-WILLIAMS COMPANY)	(GRADIENT CORPORATION)
501232	03/08/2018	TRANSMITTAL OF THE REVISED FORMER MANUFACTURING PLANT REMEDIAL INVESTIGATION REPORT OU2 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1	Letter	KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)	VOCAIRE,RACHEL (THE SHERWIN-WILLIAMS COMPANY)
501236	03/08/2018	REVISED REMEDIAL INVESTIGATION REPORT OU2 FOR THE FORMER MANUFACTURING PLANT AREA FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	511	Report		(WESTON SOLUTIONS, INC.)

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DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
501237	03/08/2018	REVISED REMEDIAL INVESTIGATION REPORT OU2 FOR THE FORMER MANUFACTURING PLANT AREA - APPENDICES A TO D FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	194	Report		(WESTON SOLUTIONS, INC.)
501238	03/08/2018	REVISED REMEDIAL INVESTIGATION REPORT OU2 FOR THE FORMER MANUFACTURING PLANT AREA - APPENDICES E TO M FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	818	Report		(WESTON SOLUTIONS, INC.)
501239	03/08/2018	REVISED REMEDIAL INVESTIGATION REPORT OU2 FOR THE FORMER MANUFACTURING PLANT AREA - APPENDIX N FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1630	Report		(WESTON SOLUTIONS, INC.)
501240	03/08/2018	REVISED REMEDIAL INVESTIGATION REPORT OU2 FOR THE FORMER MANUFACTURING PLANT AREA - APPENDICES O TO T FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	6539	Report		(WESTON SOLUTIONS, INC.)
501234	03/12/2018	US EPA'S APPROVAL OF THE REVISED REMEDIAL INVESTIGATION REPORT OU2 FOR THE FORMER MANUFACTURING PLANT AREA FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1	Letter	VOCAIRE,RACHEL (THE SHERWIN-WILLIAMS COMPANY)	KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)
565470	07/31/2018	CORRESPONDENCE REGARDING THE CLEANUP OF THE FORMER MANUFACTURING PLANT FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	3	Letter	(US ENVIRONMENTAL PROTECTION AGENCY)|KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)	(BOROUGH OF GIBBSBORO)
565473	10/02/2018	LNAPL INVESTIGATION REPORT FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	568	Report		(EHS SUPPORT, LLC)

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565474	10/02/2018	LNAPL INVESTIGATION REPORT - APPENDIX D FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	14554	Report		(EHS SUPPORT, LLC)
565475	10/02/2018	LNAPL INVESTIGATION REPORT - APPENDICES E-T FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	5694	Report		(EHS SUPPORT, LLC)
565476	10/02/2018	TRANSMITTAL OF THE LNAPL INVESTIGATION REPORT FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	1	Letter	(US ENVIRONMENTAL PROTECTION AGENCY)|KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)	(THE SHERWIN-WILLIAMS COMPANY)|VOCAIRE,RACHEL (THE SHERWIN-WILLIAMS COMPANY)
565472	10/04/2018	TECHNICAL MEMORANDUM ON THE EVALUATION OF THE APPLICABILITY OF THERMAL-ENHANCED RECOVERY FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	16	Memorandum		(EHS SUPPORT, LLC)
565471	11/14/2018	US EPA COMMENTS ON THE EVALUATION OF THE APPLICABILITY OF THERMAL-ENHANCED RECOVERY FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	6	Letter	(THE SHERWIN-WILLIAMS COMPANY)|VOCAIRE,RACHEL (THE SHERWIN-WILLIAMS COMPANY)	(US ENVIRONMENTAL PROTECTION AGENCY)|KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)
565477	01/11/2019	FINAL FEASIBILITY STUDY FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	392	Report		(THE ELM GROUP INCORPORATED)
565478	05/03/2019	FINAL FEASIBILITY STUDY ADDENDUM FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	119	Report		(THE ELM GROUP INCORPORATED)
565483	07/01/2019	SUMMARY OF THE REGIONAL REMEDY REVIEW TEAM PROCESS FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	20	Memorandum	WOOLFORD,JAMES (US ENVIRONMENTAL PROTECTION AGENCY)	EVANGELISTA,PAT (US ENVIRONMENTAL PROTECTION AGENCY)

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Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
585594	10/18/2019	NJDEP NONCONCURRENCE LETTER REGARDING THE PROPOSED PLAN FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLARDS CREEK SITE	2	Letter	EVANGELISTA,PAT (US ENVIRONMENTAL PROTECTION AGENCY)	PEDERSEN,MARK,J (NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)
550218	11/15/2019	PROPOSED PLAN FOR OU2 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	39	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX IV: State Concurrence Letter

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation and Waste Management Program
Mail Code 401-06
P.O. Box 420
Trenton, New Jersey 08625-0420
Telephone: 609-292-1250

PHILLIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R McCABE
Commissioner

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

July 15, 2020

RE: Sherwin-Williams/Hilliards Creek Superfund Site, Former Manufacturing Plant
Gibbsboro, Camden County, New Jersey
PI No. G000004382, EA No. RPC000005

Dear Mr. Evangelista:

The New Jersey Department of Environmental Protection (Department) has reviewed the Record of Decision for the Sherwin-Williams/Hilliards Creek Superfund Site, Operable Unit (OU) 2, prepared by the U.S. Environmental Protection Agency (EPA) Region II, which addresses soil, sediments, surface water and light non-aqueous phase liquid (LNAPL) at the Former Manufacturing Plant (FMP) and the upper portion of Hilliards Creek.

The Selected Remedy includes:

- Excavation and off-site disposal of contaminated soils and LNAPL-impacted soils, backfill and restoration of excavation areas, with installation of capping system, and establishment of institutional controls, as needed.
- Installation of LNAPL recovery system and bioremediation injection system to stimulate ongoing LNAPL biodegradation.
- Installation of a soil gas extraction system to mitigate impacts due to LNAPL biodegradation.
- Installation of a LNAPL recovery trench to prevent LNAPL transport into areas undergoing excavation.
- Sediment excavation and surface water monitoring of Upper Hilliards Creek.

The Department acknowledges that residential properties (OU1) were addressed by the September 2015 Record of Decision (ROD) and that in the future, OUs will address groundwater contamination (OU3), and the remaining portions of Hilliards Creek, Kirkwood Lake, and Silver Lake (OU4).

The Department concurs with the selected remedy for sediment and surface water and with the selected remedy for soil on those parcels that will not require a deed notice. However, because property owner consent to the implementation of a remedy that requires a cap and deed notice has not been obtained, the Department cannot concur with the Record of Decision at this time. If property owner consent is obtained, the Department will concur with the overall selected remedy.

Should you wish to discuss this matter further please feel free to contact me at (609) 292-1250.

Sincerely,

Mark J. Pedersen, Assistant Commissioner
Site Remediation and Waste Management Program

CC: Lynn Vogel, NJDEP, BCM

APPENDIX V: Responsiveness Summary

APPENDIX V

RESPONSIVENESS SUMMARY

Operable Unit 2 of the Sherwin-Williams/Hilliards Creek Superfund Site

Gibbsboro, New Jersey

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for Operable Unit 2 (OU2) of the Sherwin-Williams/Hilliards Creek Superfund Site (Site) and EPA's responses to those comments.

All comments summarized in this document have been considered in EPA's final decision for the selection of the cleanup response for OU2 of the Site. This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

This section provides the history of the community involvement and interests regarding the Site.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

This section contains summaries of oral and written comments received by EPA at the public meeting and during the public comment period, and EPA's responses to these comments.

The last section of this Responsiveness Summary includes attachments, which document public participation in the remedy selection process for this Site. They are as follows:

Attachment A contains the Proposed Plan that was distributed to the public for review and comment;

Attachment B contains the public notice that appeared in the Courier-Post

Attachment C contains the transcripts of the public meeting; and

Attachment D contains the public comments received during the public comment period. (Note: personal information, such as email addresses, home addresses, and phone numbers contained in the letters and emails were redacted to protect the privacy of the commenters).

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The subject of this Record of Decision (ROD) and Responsiveness Summary is the second Operable Unit of the Sherwin-Williams/Hilliards Creek Superfund Site located in Gibbsboro, New Jersey. The Sherwin-Williams/Hilliards Creek Superfund Site along with the United States Avenue Burn Superfund Site and the Route 561 Dump Site comprise three Sites collectively referred to as the "Sherwin-Williams Sites" located in Gibbsboro and Voorhees, New Jersey. Public interest in the Sherwin-Williams Sites has been high. EPA has held public meetings for these Sites for many years, to discuss different aspects of cleanup at the Sherwin Williams Sites.

On November 25, 2019, EPA released the Proposed Plan and supporting documentation for the cleanup response for OU2 of the Sherwin-Williams/Hilliards Creek Superfund Site to the public for comment. EPA made these documents available to the public in the administrative record repositories maintained at the EPA Region 2 office (located at 290 Broadway, New York, New York), the Gibbsboro Hall/Library (49 Kirkwood Road, Gibbsboro, New Jersey) and the M. Allan Vogelson Regional Branch Library – Voorhees (203 Laurel Road, Voorhees, New Jersey). These documents were also made available online at: https://www.epa.gov/superfund/sherwin-williams. EPA published a notice of availability for these documents in the Courier-Post and opened a public comment period from November 25, 2019 to December 30, 2019.

On December 5, 2019, EPA held a public meeting at the Gibbsboro Senior Center at 250 Haddonfield-Berlin Road in Gibbsboro to discuss the Proposed Plan for OU2 of the Sherwin-Williams/Hilliards Creek Superfund Site. The purpose of this meeting was to inform local officials and interested citizens about the Superfund process, to present the Proposed Plan for the Site and to respond to questions. At the meeting, EPA reviewed the history of the Site, the results of the investigation of contamination at the Site, and details about the Proposed Plan before taking questions from meeting attendees. The transcript of this public meeting is included in this Responsiveness Summary as Attachment C.

During the public comment period, EPA received a request to extend the public comment period. EPA granted the request and extended the public comment period by thirty days. EPA issued a press release announcing the extension of the public comment period to January 29, 2020.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

A. SUMMARY OF QUESTIONS AND EPA'S RESPONSES FROM THE PUBLIC MEETING CONCERNING THE SHERWIN-WILLIAMS/HILLIARDS CREEK SUPERFUND SITE – DECEMBER 5, 2019.

A public meeting was held December 5, 2019, at 7:00 pm at the Gibbsboro Senior Center, 250 Haddonfield-Berlin Road, Gibbsboro, New Jersey. Following a brief presentation of the investigation findings, EPA presented the Proposed Plan and the preferred alternative for the Site, received comments from interested citizens, and responded to questions regarding the remedial alternatives under consideration. Comments and questions raised by the public following EPA's presentation and EPA's responses at the meeting are categorized by relevant topics and are presented as follows:

Comment #1: One commenter asked EPA to define what a deed notice was.

EPA Response: A deed notice informs current and prospective holders of a property that contamination exists on the property at a level that may restrict certain uses of, or access to, all or part of a property, specifies the delineation of those restrictions, and provides a description of all specific engineering controls at the property in order to prevent exposure to contaminants remaining on the property. Additional information on deed notices in the State of New Jersey can be found at the New Jersey Department of Environmental Protection (NJDEP) website, at: https://www.nj.gov/dep/srp/regs/arrcs/.

Comment #2: One commenter asked whether the OU1 Steven Drive properties, located in Voorhees, New Jersey and remediated in 2019, would be the only properties with deed restrictions.

EPA Response: No deed notices will be applied to the residential properties as part of the OU1 remedy. Soil cleanups are to the levels which will address soil contamination above the NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRS) and are intended to provide for unrestricted use.

Comment #3: One commenter asked whether any of the OU2 soil alternatives included removing every molecule of contamination out, thus negating the need for a deed notice.

EPA Response: No soil alternative would remove every molecule of contamination from the Site. CERCLA requires EPA to address contamination that poses an unacceptable risk to human health and/or the environment. CERCLA requires that a remedy is protective of human health and the environment, but it does not require the complete removal of contamination. In order to address unacceptable risk, EPA develops cleanup goals based on concentration levels of contaminants that are determined to be protective of human health and the environment. The human health cleanup goals are generally at the conservative (or most protective) portion of EPA's acceptable risk range. Removing every molecule of contamination from the Site would result in cleanup goals lower than cleanup thresholds that are protective of human health and the environment.

Comment #4: One commenter asked EPA to describe what capping, as a remedy, entailed.

EPA Response: Capping is an engineering control that involves placing a cover (i.e., asphalt, concrete, soil, etc.) over contaminated soil. Caps do not destroy or remove contaminants in the soil, instead, they isolate contaminants and keep contaminants in place to avoid the spread of contamination. Caps prevent people and wildlife from coming into direct contact with contaminants.

Comment #5: One commenter asked EPA when the OU4 ROD for the Waterbodies, of the Sherwin-Williams/Hilliards Creek Superfund Site, will be issued.

EPA Response: EPA anticipates a ROD for the Waterbodies OU for the Sherwin-Williams/Hilliards Creek Superfund Site will be issued in 2021.

Comment #6: One commenter asked why the remediation of Kirkwood Lake cannot be performed concurrently with other work, which is occurring upstream. Additionally, it was asked, by the same commenter, why does Kirkwood Lake have to be performed last.

EPA Response: The source areas of the Sherwin-Williams/Hilliards Creek, U.S. Avenue Burn, and Route 561 Dump Sites are located in Gibbsboro, New Jersey. These source areas exhibit high levels of contaminants connected to waterbodies that transport these contaminants to downstream locations. EPA generally addresses continuing source areas of contamination before addressing lower levels of contaminated media located downgradient to avoid recontamination of completed remedies.

Comment #7: Several commenters expressed frustration towards EPA's insistence that remediation of Kirkwood Lake cannot be performed (now), due to EPA's concerns regarding potential recontamination of the Lake, yet EPA has directed the Sherwin-Williams Company (Sherwin-Williams) to complete remediation of the residential properties since 2016. A resident inquired why there is not concern by EPA for the potential of recontamination of the residential properties.

EPA Response: The paint manufacturing facility operated from approximately 1850 – 1977. The manufacturing operations released significant quantities of contamination directly into Hilliards Creek that impacted the floodplain soils. These historic discharges, which occurred when the plant was in operation, are in contrast to the present conditions, with no on-going facility releases. Although the potential for sediment, and consequently contaminant, migration and redistribution exists as a physical force in waterbodies, the potential for recontamination of the floodplain soils, through sediment deposition, has greatly diminished. EPA considers the potential for recontamination of remediated properties to be very low.

Comment #8: A commenter asked how often residential properties and Hilliards Creek will be retested following completion of remediation activities.

EPA Response: Site conditions will be monitored during remedial activities. Based on monitoring data, EPA will determine if it is necessary to direct Sherwin-Williams to resample any portions of the waterbodies and/or residential properties upon completion of remediation activities.

Comment #9: A commenter inquired about the volumes of bioremediation amendments that would be injected to address light non-aqueous phase liquid (LNAPL).

EPA Response: The OU2 Feasibility Study (FS) estimated that 50,000,000 gallons of water, mixed with 100,000 pounds of sulfate and 20,000 pounds of phosphate will be injected into the shallow groundwater in order to address LNAPL contamination. However, prior to these large-scale injections, Sherwin-Williams will perform a Pilot Study, a smaller scale injection effort, which may lead to revisions of the FS estimates.

Comment #10: A commenter asked if U.S. Avenue will be "torn up" to complete LNAPL remediation efforts.

EPA Response: The selected remedy does not include excavation of LNAPL beneath the U.S. Avenue roadway. It is anticipated that bioremediation injections would be performed upgradient of U.S. Avenue. It is expected that the initial injection points will be located upgradient and adjoining the road. The radius of the amendment injection will extend beneath a portion of the road. Groundwater flow will also move amendments from their initial injection points and radius of injection to portions of the road downgradient to groundwater flow. Injections within the roadway will be performed if it is found that these upgradient injections are not successful in remediating the LNAPL beneath the U.S. Avenue roadway.

Comment #11: One commenter asked if the injection and monitoring wells will be stick-up or flush-mounted.

EPA Response: Experience at other sites involving injection of amendments into shallow soils indicates that many of the injections will be conducted using temporary injection points. Once the injections are completed, the temporary injection points will be sealed and soil placed on top of the injection point. It is anticipated that longer-term monitoring wells will be installed in the injection areas to monitor the rate of LNAPL remediation. It is anticipated that most of the monitoring wells will be mounted flush with the ground surface. EPA will work with Sherwin-Williams to determine which construction design is most suitable for injection and monitoring purposes and take into consideration each property owner's input.

Comment #12: A commenter had a concern regarding the safety of the methane collection system.

EPA Response: A soil vapor extraction system will be designed to withdraw methane gas, a byproduct of the LNAPL biodegredation process, from the treated soil. The soil vapor extraction system will use negative pressure to ensure the methane gas is drawn from the subsurface soil and is captured in a secure collection system. Soil vapor extraction systems, mechanically engineered systems to remove vapors, have been successfully and safely used at many soil remediation sites.

Comment #13: Several commenters asked if we would meet with them in the future, as the remedy was implemented, and if we could keep them appraised of the progress.

EPA Response: Community updates will be provided to keep the public updated of remedial design and remedial action efforts. In addition, based on the public's interest, EPA may hold public availability sessions, in which EPA could present the updates to community members.

Comment #14: A commenter asked what entails "Upper Hilliards Creek".

EPA Response: In the context of Operable Unit 2 of the Sherwin-Williams/Hilliards Creek Superfund Site, Upper Hilliards Creek is defined as the stretch of Hilliards Creek which flows from Foster Avenue, through the Former Lagoon Area, past Cedar Grove Cemetery, and to West Clementon Road, in Gibbsboro, New Jersey.

B. WRITTEN COMMENTS AND EPA'S RESPONSES RECEIVED DURING THE PUBLIC COMMENT PERIOD FROM THE COMMUNITY –

The public comment period is the time during which EPA accepts comments from the public on proposed actions and decisions. The public comment period initially ran from November 25, 2019 to December 30, 2019, however, a 30-day extension was requested and subsequently granted. Therefore, EPA's public comment period for the Proposed Plan for OU2 ran from November 25, 2019 to January 29, 2020. EPA accepted comments during the extended comment period. EPA's responses to the comments are provided below.

Comment #15: The Borough of Gibbsboro commented that listing three sites on the National Priorities List (NPL) has adversely impacted property values in Gibbsboro and leaving contamination behind represents an unacceptable potential hazard and loss of value. The Borough stated that deed notices and caps diminish the desirability of property and opposed their use. The Borough urged EPA to maximize the removal of contaminants and minimize the use of caps and institutional controls such as deed notices.

EPA Response: The Dump Site was proposed for listing in 1998 and was not finalized. EPA, more recently, revaluated the need to place the Dump Site on the NPL, but elected not to, due to Sherwin-Williams' compliance with the 1999 Administrative Order on Consent (AOC) to conduct remedial investigation/feasibility study (RI/FS) activities. The Sherwin-Williams/Hilliards Creek Superfund Site and the United States Avenue Burn Superfund Site are both on the NPL.

Using the results of the RI for OU2, EPA considered a number of technologies to address contamination at the FMP area. The FS identified the most viable cleanup alternatives for soil, sediment and LNAPL and then evaluated them based on the nine remedy selection evaluation criteria required by CERCLA and its regulations found in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 C.F.R. § 300.430, and described in the ROD and Proposed Plan. The remedial alternative that represented the best trade-offs, per the nine criteria, included: LNAPL treatment, excavation and removal of contaminated soil or sediment, capping contaminated soil, and institutional controls for portions of the Site.

Capping of contaminated soil is a common method utilized to contain contamination. A cap is an engineered remedy in which an area is covered using materials such as clean soil and vegetation or asphalt to prevent contact with, and minimize migration of, contaminated material. Under the selected alternative, institutional controls, such as deed notices, will be required for portions of the Site, located in commercially zoned areas, where contamination above soil residential cleanup standards remain. These institutional controls will identify areas where the contaminants in soil remain and will provide notification requirements if the portion of the Site covered by the deed notice needs to be accessed or disturbed.

It is not EPA's intention that the remediation activities interfere with current or anticipated future use of any portion of the Site. The selected soil remedy will remove approximately 67,000 cubic yards of contaminated soil. Proposed excavation depths, to be refined in remedial design, will reduce potential direct contact with contaminated soils. The negative impact to a property's value will be reduced when the cleanup response activities are completed.

Comment #16:   The Borough of Gibbsboro commented that EPA must evaluate an alternative that removes all contamination.

<u>EPA Response</u>: Although CERCLA requires that a remedy be protective of human health and the environment, it does not require the complete removal of contamination, or cleanup to pristine conditions. Under the NCP, 40 C.F.R. § 300.430(a)(1)(iii), EPA is expected to use engineering controls, such as containment, for waste that poses a relatively low long-term threat or where treatment is impracticable. EPA may use institutional controls, such as deed restrictions to supplement engineering controls for short- and long-term management to prevent or limit exposure to contaminants. Complete removal of residual levels of contaminants at depth presents greater implementability (one of the nine criteria cited above) issues by increasing excavation depths below the groundwater table, increasing the volume of soil to be dewatered and removed and provides minimal gain in contaminant mass removal or long-term risk reduction. Potential short-term risks (another one of the nine criteria cited above) to Site workers and the community would be increased by the larger volume of excavated soil, the volatility of excavated contaminants, and increase of vapor and water containment and treatment generated by deep excavations. EPA selected a protective remedy that represents the best balance considering all nine criteria.

Comment #17:   The Borough of Gibbsboro commented that none of the remedial alternatives considered by EPA adequately address contamination beneath Berlin Road, U.S. Avenue or Foster Avenue, and also indicated that utilities will require future maintenance and eventual replacement. The Borough commented that future developers, the Borough, and utility companies should not bear the risks of having to dig in contaminated soils in order to update, replace, or install future utility service; and that EPA's decision to utilize existing roadways as caps defers dealing with such contamination.

<u>EPA Response</u>: It is anticipated that through bioremediation, LNAPL (which flows with shallow groundwater) present within portions of roadways (i.e., Berlin Road, U.S. Avenue, and Foster Avenue), will be adequately addressed and deed notices will not be required.

For contamination other than LNAPL, Sherwin-Williams will be responsible for conducting future additional sampling beneath the roadways to identify the specific area(s) that will require a deed notice due to the presence of non-LNAPL related contamination (i.e., metals) that exceed residential cleanup standards. The roles and responsibilities for the operation and maintenance activities associated with the roadways, utilized as caps, will be developed with the input of the Borough and Sherwin-Williams. The approved Operation and Maintenance (O&M) Plan for capped areas, including roadways, will also include provisions for the handling of material beneath the caps, consistent with deed notice requirements, should it become necessary to install or repair subsurface utilities beneath them.

Comment #18: The Borough of Gibbsboro commented that the remedial alternatives considered by EPA do not account for the future costs that local governments and utilities will incur to repair, maintain and replace infrastructure within roadways and that the selected alternative must satisfactorily address roadway and utility easement contamination and enable the Borough's sewage collection system to be constructed as originally designed. The Borough stated its opposition to the use of roads or parking lots as caps and commented that if caps are used, the Borough and utilities must be provided specific guidance on constructing and maintaining infrastructure within a contaminated volume.

<u>EPA Response</u>: Under CERCLA, EPA is authorized to expends funds (response costs) to clean up contaminated sites, and also has authority to require responsible parties to undertake cleanups. In evaluating remedial alternatives, EPA considers the costs of constructing, operating and maintaining the remedial actions. The infrastructure costs identified by the Borough are not remedial costs as such and would not have been included in the cost estimate for the alternatives. EPA acknowledges the Borough's concerns; and anticipates that the Borough's sewage collection system may be constructed as originally planned. While the deed notices incorporated as part of the remedy will provide restrictions on excavations into deed noticed areas, they will not prohibit such intrusive work. The required notifications for digging within a deed noticed area as well as specific controls for excavated soil management will be provided in the deed notice. As stated above in response to Comment #17, specific roles and responsibilities of parties responsible for the maintenance and repair of roadways will be provided in an O&M Plan. EPA is committed to working cooperatively with Gibbsboro and/~~-~~or utilities to ensure that they are appropriately informed of Site conditions and are able to undertake any necessary construction and repairs with appropriate precautions in place.

Comment #19: The Borough of Gibbsboro commented that, in conjunction with the remediation activity at the FMP area, the Silver Lake dam (earthen embankment that includes the boardwalk) and the Silver Lake conveyance system (culvert), which includes channel/piping under the parking lot north of Foster Avenue and to the embankment south of Foster Avenue, must be inspected and repaired, if necessary, to the highest standard. The Borough commented that the Silver Lake culvert should be replaced, as part of the remedial efforts, to guarantee its long-term viability. The Borough also indicated that leaving the existing Silver Lake culvert for future replacement by others does not provide for a complete remediation effort.

EPA Response: The selected remedy will include excavation of soil in a majority of the areas discussed above. The Foster Avenue roadway and the 10 Foster Avenue building will remain in place. While approximate depths and extent of excavation activities are presented in the ROD, Sherwin-Williams will be responsible for conducting comprehensive remedial design sampling to determine the exact limits of excavation. The Foster Avenue embankment, as well as the Silver Lake dam, are both within or adjoining the proposed excavation footprints. Remedial design sampling will delineate the contamination in these areas and excavation limits will be developed with greater precision and accuracy. Features, which may be directly affected by implementation of the selected remedy, will be assessed and a determination will be made as to whether they are stable, or require replacement/repair. Sherwin-Williams and EPA will work closely with the Borough during the remedial design to ensure all concerns are addressed in a timely manner, to ensure efficient implementation of the selected remedy.

Comment #20: The Borough of Gibbsboro commented that, due to the time it will take to implement EPA's selected remedy at the FMP area, it will subsequently take an unacceptably long period of time to enable redevelopment of the area, and that the remedy fails to address public rights-of way.

EPA Response: The scope of the remediation is extensive and consists of several different remedial components. EPA and Sherwin-Williams will work with the Borough during remedial design to identify areas/roadways that may be remediated sooner than other areas and proceed with that work in a safe and expeditious manner. Areas of roadways containing residual levels of contamination above residential cleanup standards will be addressed by capping and deed notices.

Comment #21: The Borough of Gibbsboro commented that EPA should require Sherwin Williams to complete the public infrastructure at the FMP area and commercial and residential properties.

EPA Response: The requested requirement is outside the scope of the selected remedy and is a request that needs to be resolved between Sherwin-Williams and the Borough.

Comment #22: The Borough of Gibbsboro inquired if a remedy is safe, why does it require inspection every five years to ensure it remains effective?

EPA Response: The objective of a selected remedy is to prevent contaminant exposure pathways to receptors so as to address unacceptable risk. Capping and institutional controls meet this objective by eliminating exposure. Since contaminants will remain beneath the cap above residential cleanup standards in some areas of OU2, EPA is required by Section 121(c) of CERCLA to conduct five- year reviews to ensure that the cap continues to function as designed.

Comment #23: The Borough of Gibbsboro commented that current and future owners of these properties must not be saddled with the costs of dealing with residual contaminated soils.

EPA Response: The selected remedy protects human health and the environment. Under CERCLA, EPA cleans up contamination that presents an unacceptable human health or ecological risk; and the selected remedy will do so including at the properties addressed as part of OU2. As explained in response to Comment #16, CERCLA does not require the complete removal of contamination, or cleanup to pristine conditions. To the extent that current and future property owners of property within OU2 have concerns about costs associated with residual contamination, those concerns are outside the scope of CERCLA, or this remedy selection process.

Comment #24: The Borough of Gibbsboro commented that both the Borough and Brandywine Realty LLC want Sherwin-Williams to construct a parking lot and a park on parts of an FMP lot upon completion of the remediation.

EPA Response: As previously performed at the Dump Site, Sherwin-Williams, with EPA oversight, will engage the Borough, property and business owners early in the design process to determine the needs of the interested parties with regard to restoration of the properties following remediation.

Comment #25: The Borough of Gibbsboro commented that Soil Alternative 5 should be chosen because Soil Alternative 4 takes a lengthy time to implement.

EPA Response: While timeframes for the implementation of Soil Alternative 5 may be shorter than Soil Alternative 4, the selection of Soil Alternative 4 represents the best balance of tradeoffs among the nine remedy selection criteria cited above particularly with regard to short-term effectiveness, and implementability.

Comment #26: The Borough of Gibbsboro commented that in the event residents or businesses are required to vacate their properties during the cleanup process, their expenses should be covered by Sherwin-Williams. The commenter asked if they do not need to vacate the properties, how will they be protected from exposure during the cleanup process and will businesses be compensated for lost or reduced business during construction?

EPA Response: The selected remedy does not require relocation of residents or businesses. The impact on businesses will be minimized to the extent practicable while implementing the cleanup response in an efficient and safe manner. A dialogue with property and business owners will be established early in the design stage of the project to obtain property and business owners' input and address their concerns. This dialogue will continue through the completion of cleanup response activities. CERCLA does not provide for EPA to compensate business owners for loss of business during remediation.

Comment #27: The Borough of Gibbsboro expressed a number of concerns related to the design and implementation of the cleanup response including the soil removal process, on-site and off-site stockpiling of contaminated soils, decontamination of vehicles used to transport contaminated soils, and hours of operation.

EPA Response: EPA will work with the local government to address their concerns during design and implementation of the cleanup response. All remediation work will comply with local ordinances regarding hours of operation and all vehicles leaving the Site containing contaminated soil or sediment will be decontaminated. EPA is committed to protecting human health and the environment during implementation of the response and minimizing the impact to property owners and businesses. The cleanup response will include such elements as securing contaminated soils after they have been excavated, prior to offsite transport, and complying with applicable requirements such as the federal Resource Conservation and Recovery Act, and, to the extent consistent with CERCLA Section 121(e)(1) (which provides that permits are not required for on-site work), applicable state laws and regulations and local ordinances.

EPA is committed to working with the Borough of Gibbsboro on its list of specific concerns contained in the comment letter and will address specific concerns as follows:

a) Off-site storage of contaminated soils must be in sealed drums or within a volume that is not easily penetrated. Based on EPA's experience with similar volumes of soil at other remediation sites, it is not feasible to load such large quantities of soil into drums. Once excavated, soils will be staged in areas designed for temporary containment that will meet design specifications for security, dust, and erosion controls until the soils are removed from the staging areas.

b) No material should be stored for off-site more than seven days. When possible, soil and sediment may be direct loaded for shipment off-site, however, it is anticipated that the vast majority of soil and sediment will require staging to prepare for and coordinate off-site shipments. Every effort will be made to remove staged soils as quickly as possible, however a seven-day limit for staging bulk soil is not feasible given the quantities to be handled and removed from the Site.

c) Off-site storage should be screened such that it cannot be seen from any residence, business, public building, public recreation area or public street. As practicable, work areas including storage areas, will receive screening. However, due to the scope of the work and the terrain in which some of the work will take place (such as low-lying areas) it may not be possible to completely screen all work areas.

d) No material should be stored on-site more than 24 hours. EPA's selected cleanup response calls for the removal of an estimated 67,000 cubic yards of soil in a 32-month period and an estimated 1,400 cubic yards of sediment in a three-month period. As stated above, every effort will be made to remove staged soils as quickly as possible, however a 24-hour limit for staging bulk soil and sediment is not feasible given the quantities to be handled and removed from the Site. Stockpiled soil and sediment will be secured until they are shipped off-site. The Borough's request that no material be stored on-site for longer than 24 hours would impose very substantial limitations on work, without adding protectiveness. As noted above, cleanup response activities will be conducted using appropriate engineering controls to maintain protection of human health and the environment.

Comment #28: A commenter stressed their concerns about the potential for recontamination of areas already remediated or to be remediated, ahead of performing the remediation of Hilliards Creek.

EPA Response: See EPA's response to Comment #7.

Comment #29: A commenter stated that Sherwin-Williams has influence over EPA and EPA's decision-making processes.

EPA Response: EPA's relationship to Sherwin-Williams is that of a federal agency, overseeing work pursuant to administrative enforcement instruments and a court-ordered consent decree. Sherwin-Williams has conducted RI/FS tasks under the 1999 AOC. Under EPA's direction and oversight, Sherwin-Williams performed RI/FS tasks at each of the three Sherwin-Williams Sites. EPA oversight of Sherwin-Williams' work is performed in consultation with the NJDEP, to ensure such work is conducted in accordance with federal and state environmental laws and regulations. At the completion of the RI/FS process, EPA, in consultation with NJDEP, presents its preferred remedial alternatives in the Proposed Plan, which is subject to public review and comment. EPA selects a remedy after receiving and taking public comments into consideration. Future remedial actions at the United States Avenue Burn Superfund Site and the Sherwin-Williams/Hilliards Creek Superfund Site, will be performed by Sherwin-Williams, per a Consent Decree, with EPA oversight.

Comment #30: A commenter had several concerns regarding Silver Lake including: the degree to which Silver Lake and its contaminated sediments represent a source of contamination, the lake's potential to re-contaminate downstream areas if it is not addressed first, whether the lake should be drained or kept as is, and that Sherwin-Williams should place funds in trust for the future maintenance and management of the lake, which includes potential maintenance of the Silver Lake dam.

EPA Response:

a) <u>The degree to which Silver Lake and its contaminated sediments represent a source of contamination</u>. The Site was placed on the NPL in 2008 and sediments within the entire lake were sampled in 2009. Sampling results showed a relatively small area of sediments, adjacent to the FMP area, where sediments are above ecological cleanup goals. A future waterbodies ROD will present the approximate extent to which sediments may be remediated within the lake. Based on the current data, sediments within Silver Lake do not represent a source of contamination that poses a high level of risk to ecological receptors.

b) <u>The lake's potential to re-contaminate downstream areas, if the lake is not remediated first</u>. The OU2 ROD addresses sediments within the Silver Lake culvert as well as the sediments and floodplain soils of Upper Hilliards Creek. EPA anticipates a 2020 Proposed Plan for remaining waterbodies which will detail the preferred remedy for the impacted waterbodies (OU4), which includes Silver Lake. EPA anticipates that work under the OU2 ROD (excavation of upland soils and LNAPL bioremediation) can be coordinated with the implementation of the upcoming OU4 remedy to allow for sequencing remediation of any selected Silver Lake remediation prior to downgradient areas.

c) Whether Silver Lake should be drained or kept as a man-made lake. Silver Lake is owned by Brandywine Realty, LLC. The decision of how the lake is maintained is not a component of the remedy selected.

d) Sherwin-Williams should place funds in trust for the future maintenance and management of the lake, which includes potential maintenance of the Silver Lake dam. Under CERCLA, Congress appropriates funds to EPA for the cleanup of contaminated sites. However, the law does not authorize EPA to direct responsible parties to establish funds for the concerns raised in this comment.

Comment #31: A commenter stated that fair compensation for decreased property values should be administered to the affected members of the public. The commenter stated that Alternative 4 will use remediation structures (associated with LNAPL treatment) that will decrease surrounding property values. The commenter stated that Alternative 5, which does not use remediation structures, would not have as great an impact on surrounding property values. The commenter therefore concludes that Alternative 4 should include costs for compensating property owners for diminished value of their properties.

EPA Response: The cost difference between Soil Alternative 4 and Soil Alternative 5 is due to the estimated volumes of soil to be excavated; 67,000 cubic yards versus 300,000 cubic yards, respectively. Implementation of Alternative 5 would involve the use of much more extensive temporary remediation structures than Alternative 4. Alternative 5 would use structures for the extraction and treatment of groundwater encountered by excavation below the water table as well as tented structures for vapor mitigation. These structures would be removed following completion of the remedy. Compensation to property owners is not a cost component of either alternative. CERCLA does not provide for EPA to use appropriated funds to compensate parties for the concerns raised in this comment. See also responses to Comments #16 and #23.

Attachment A: Proposed Plan

Superfund Proposed Plan

U.S. Environmental Protection Agency, Region II

Sherwin-Williams/Hilliards Creek Superfund Site
Operable Unit 2
Gibbsboro, New Jersey

November 2019

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the U.S. Environmental Protection Agency's (EPA's) Preferred Alternative to address contaminated soil, sediment, and light non-aqueous phase liquid (LNAPL) present at the Sherwin-Williams/Hilliards Creek Superfund site (Site), located in Gibbsboro, New Jersey. This Site is comprised of the former manufacturing plant (FMP) area, Hilliards Creek, Kirkwood Lake, and portions of Silver Lake (Figure 1). This plan addresses EPA's second operable unit (OU) for the Site, referred to as OU2. Operable unit 1 (OU1) addresses shallow soil contamination on residential properties. EPA's preferred alternative for OU2 will address soil contamination present within the FMP area, LNAPL[1] within and adjoining the FMP area, and contaminated soil and sediments within Upper Hilliards Creek. Upper Hilliards Creek is the portion of Hilliards Creek that runs from Foster Avenue to West Clementon Avenue and is approximately 800 feet in length.

The preferred alternative calls for the excavation and capping of soil within portions of the FMP area. Excavated soil would be disposed of off-site. Some areas of contaminated soils would be capped, and institutional controls (ICs) in the form of deed notices would be implemented. Floodplain soils and sediments within Upper Hilliards Creek would be excavated and disposed of off-site. Surface water would be monitored. LNAPL contamination present within portions of the FMP area would be excavated, while in other areas of the FMP and at properties along U.S. Avenue, LNAPL would undergo in-situ biological treatment.

[1] LNAPL is a liquid that does not dissolve in groundwater and is lighter than water and therefore, is commonly found floating at or near the groundwater table.

MARK YOUR CALENDARS

PUBLIC COMMENT PERIOD
November 25 – December 30, 2019
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING
December 5, 2019
EPA will hold a public meeting to explain the Proposed Plan and alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Gibbsboro Senior Center, 250 Haddonfield-Berlin Road, Gibbsboro, New Jersey 08026

For more information, see the Administrative Record file at the following locations:

EPA Records Center, Region 2
290 Broadway, 18 th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday-Friday – 9 AM to 5 PM by apt

Gibbsboro Borough Hall/Library
49 Kirkwood Road
Gibbsboro, New Jersey 08026
For Library Hours:
http://www.gibbsborotownhall.com/index.php/library

M. Allan Vogelson Regional Branch Library – Voorhees
203 Laurel Road
Voorhees, New Jersey 08043
For Library Hours:
http://www.camdencountylibrary.org/voorhees-branch

Send comments on the Proposed Plan to:

Ray Klimcsak Remedial Project Manger
U.S. EPA, Region 2
290 Broadway, 19th Floor
New York, NY 10007-1866
Telephone: 212-637-3916
Email: Klimcsak.raymond@epa.gov

EPA's website for the Sherwin-Williams/Hilliards Creek Site:
http://epa.gov/superfund/sherwin-williams

Future operable units will address site-related groundwater contamination (OU3), and the remaining portions of Hilliards Creek, Kirkwood Lake, and Silver Lake (OU4).

A comprehensive Remedial Investigation (RI) was conducted by the Sherwin-Williams Company (Sherwin-Williams), with EPA oversight, under a 1999 Administrative Order on Consent (AOC). The RI included sampling of soil, sediment, surface water, soil gas, indoor air, and groundwater throughout the Site. The results of these investigations have identified areas where Remedial Action (RA) is required.

This Proposed Plan contains descriptions and evaluations of the cleanup alternatives considered for the FMP area, off-property areas that adjoin the FMP area, and Upper Hilliards Creek. EPA developed this Proposed Plan, as the lead agency, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. In consultation with NJDEP, EPA will select a final remedy for contaminated soil, sediment, surface water, and the LNAPL contamination, 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, or Superfund) 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 FMP area 2018 RI and 2019 Feasibility Study (FS) reports, as well as other documents contained in the EPA Administrative Record file. The location of the Administrative Record file is provided on the previous page. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the site-related Superfund activities performed by Sherwin-Williams, under EPA and NJDEP oversight.

SITE DESCRIPTION

Three sites collectively make up what is commonly referred to as the “Sherwin-Williams Sites,” which are located in areas of Gibbsboro and Voorhees, New Jersey. These sites are: the *Sherwin-Williams/Hilliard’s Creek Superfund site,* located in both Gibbsboro and Voorhees; the *Route 561 Dump site* (*Dump Site*) in Gibbsboro; and the *United States Avenue Burn Superfund site* (*Burn Site*) in Gibbsboro (Figure 1). The Sites represent source areas of contamination from which contaminated soil and sediment have migrated to downgradient areas within Gibbsboro and Voorhees.

The Site includes the FMP area, Hilliards Creek, Kirkwood Lake, and portions of Silver Lake. The FMP area is approximately 25 acres in size and is comprised of commercial buildings and a former waste lagoon area that is currently undeveloped wooded land. Hilliards Creek is formed by the outflow from Silver Lake. The outflow enters a culvert beneath a parking lot at the former paint manufacturing facility and resurfaces on the south side of Foster Avenue. From this point, Hilliards Creek flows in a southerly direction through the FMP area and continues downstream through residential and undeveloped areas. At approximately one mile from its origin, Hilliards Creek empties into Kirkwood Lake. Kirkwood Lake, located in Voorhees, is approximately 25 acres, with residential properties lining its northern shore.

SITE HISTORY

The former Sherwin-Williams facility was developed in the early 1800s as a saw mill and was later used as a grain mill. In 1851, John Lucas & Co., Inc. (Lucas), purchased the property and converted the grain mill into a paint and varnish manufacturing facility that produced oil-based paints, varnishes and lacquers. Sherwin-Williams purchased Lucas in the early 1930s and expanded operations at the facility. Historic features at the former facility included wastewater lagoons, above-ground storage tanks, railroad lines, drum storage areas, and numerous production and warehouse buildings (Figure 2). The facility was closed in 1977 and was sold to developer Robert K. Scarborough (Scarborough) in 1981. Scarborough renamed the former Sherwin-Williams property the “Paint Works Corporate Center” (PWCC). The developer altered some features of the property, however, several of the larger buildings were retained and later converted into office, storage, and other commercial spaces (Figure 3).

In 1978, after Sherwin-Williams closed all paint and varnish manufacturing operations, NJDEP issued a Directive to Sherwin-Williams to excavate and properly dispose of the waste material remaining in the former waste lagoons (Figure 2). These actions were completed by Sherwin-Williams in 1979, with NJDEP oversight, and resulted in the removal of approximately 8,100 cubic yards of sludge that was disposed of off-site. In 1990, Sherwin-Williams entered into an Administrative Consent Order (ACO) with NJDEP to investigate the extent of groundwater contamination, and to characterize a petroleum-like seep in the vicinity of the 1 and 5 Foster Avenue buildings. A “Seep Area” was identified and investigated, and the location of the Seep Area can be seen in Figure 3. From 1991 until 2000, five phases of RI activities were performed by Sherwin-Williams, under NJDEP oversight. In 1997, Scarborough sold the PWCC to Brandywine Realty Trust (Brandywine). Brandywine retains operation of the PWCC as commercial and office space.

In 2001, the NJDEP terminated its ACO with Sherwin-Williams. In 2002, a new release of petroleum-like product was observed in the Seep Area and reported to state and federal agencies. In response to the observed seep, EPA issued Sherwin-Williams an “Expedia Notice”. The 2002 Expedia Notice required Sherwin-Williams to perform interim actions to prevent seep-related discharges from reaching Hilliards Creek, as well as additional geophysical and soil investigations throughout the PWCC. Sherwin-Williams’ activities under the EPA 2002 Expedia Notice were completed, and the Notice was closed out by EPA in 2007. In 2008, the Sherwin-Williams/Hilliards Creek Superfund site was placed on the National Priorities List (NPL) and, under EPA oversight, RI/FS activities began pursuant to the 1999 AOC and continue at present.

SITE CHARACTERISTICS

The EPA OU2 Proposed Plan evaluates alternatives that address soil contamination present throughout the FMP area, LNAPL contamination located at the FMP and on adjoining off-property areas, and contaminated soil and sediments within Upper Hilliards Creek. Due to the large size and scope of work, EPA has designated “subareas” of the FMP area to aid in review of this plan. The six subareas of OU2 are described below. Figure 4 shows the approximate extent of each subarea provided in the description. Historic features are also provided in the subarea descriptions below. These historical Site features are shown on Figure 2.

Subarea 1: This subarea is the historic location of the former paint production buildings, the lacquer manufacturing building, and Former Tank Farm B, where above-ground storage tanks contained raw materials. This area was historically referred to as the former main plant area. It encompasses the area to the north of Foster Avenue, in the vicinity of the 10 Foster Avenue building and the 6 East Clementon slab (the building was demolished by Brandywine in 2014), and south of Foster Avenue, in the vicinity of the 7 Foster Avenue building.

Subarea 2: This area consists of Former Tank Farm A (above-ground and underground storage tanks that contained raw materials) and the Former Resin Manufacturing Area. This area includes the 2 and 4 Foster Avenue buildings, portions of Foster Avenue, and the parking areas (including the grassy lot) east of the buildings where LNAPL contamination is present.

Subarea 3: Subarea 3 is the off-property area that adjoins the FMP area. This area includes the parking area east of the 2 and 4 Foster Avenue buildings, United States Avenue, and mostly residential properties east of United States Avenue where LNAPL is found at the groundwater table.

Subarea 4: This area, known as the Seep Area, is downgradient of Former Tank Farm A. This area includes the parking/paved area adjoining the 1 and 5 Foster Avenue buildings. LNAPL historically seeped from the ground surface in this area and discharged into Hilliards Creek.

Subarea 5: Former Lagoon Area. This is the location of the former lagoons and holding basins that contained manufacturing wastes. It is currently vacant and undeveloped and contains terrestrial habitat. It is located south of Subarea 4.

Subarea 6: Upper Hilliards Creek. This area includes the floodplain soils and sediments of the portion of Hilliards Creek, approximately 800 feet long, that runs from Foster Avenue to West Clementon Road. Historically, wastes were either directly discharged to the creek, or inadvertent discharges from the lagoons were released into the creek.

Summary of Pre-Remedial Investigation Activities

The 2018 RI Report contains a comprehensive description of all "pre-RI" investigation activities performed by Sherwin-Williams under the ACO with NJDEP, and under the authority and oversight of the EPA Removal program. The 2018 RI Report also contains information from previous investigations performed by Scarborough's environmental consultants. This historic data aided EPA in directing Sherwin-Williams to perform more focused RI sampling activities (2009 – 2016), pursuant to the 1999 AOC. The RI report, containing pre-RI data, is available in the EPA Administrative Record file.

Summary of Remedial Investigation Activities

The following is a summary of the investigations and findings for the FMP area (Subareas 1, 2, 4, and 5); Upper Hilliards Creek (Subarea 6); and, off-site properties (Subarea 3) that are the focus of this Proposed Plan.

FMP Area Soil RI Sampling Approach

Sherwin-Williams collected over 3,000 soil samples from over 400 sample locations. Soil samples were collected from surface (0.0 – 2.0 feet below the surface) and subsurface (greater than 2.0 feet below the surface) intervals and were sent to laboratories for analyses. Many soil samples were collected in shallow groundwater to determine the approximate extent of LNAPL impacts. Soil samples were collected beneath the slab of the 6 East Clementon building after Brandywine demolished the building. No soil samples were collected beneath the remaining buildings in Subareas 1, 2, and 4.

FMP Soil Sample Findings

Soil data in the 2018 RI Report was compared to the NJDEP Residential Direct Contact Soil Remediation Standards (RDCSRS), often referred to as "residential soil standards". Review of the soil data collected from Subarea 1 indicates that there are broad areas of soil contamination, above residential soil standards, predominately beneath paved surfaces that consist primarily of lead and arsenic. The residential soil standards for lead and arsenic are 400 milligrams per kilogram (mg/kg) and 19 mg/kg, respectively. The highest concentration of lead is detected at 15,300 mg/kg, and the highest concentration of arsenic is detected at 863 mg/kg. These concentrations are in separate sample locations beneath the 6 East Clementon slab. The remaining detections of lead and arsenic in soil samples are found immediately east of the 6 East Clementon slab and are well below these concentrations. In a localized area, beneath the 6 East Clementon slab, arsenic contamination is present in soil both above and below the water table. Based on shallow groundwater sampling, it is likely that the arsenic in the soil below the water table is the source of arsenic groundwater contamination.

Soil sample locations containing polycyclic aromatic hydrocarbons (PAHs) above the residential soil standards are co-located with approximately seventy-five percent of the sample locations containing lead and arsenic above residential soil standards. The highest concentration of PAHs is benzo(a)pyrene at 69 mg/kg, with the majority of the remaining exceedances being well below this value. The residential soil standard for benzo(a)pyrene is 0.5 mg/kg.

A localized area of polychlorinated biphenyls (PCBs) was detected near the northern portion of the 10 Foster Avenue building. Lead, arsenic, and PAHs are also present above residential soil standards at this location. The highest concentration of the PCB Aroclor 1260 was detected at a concentration of 1,200 mg/kg. The residential soil remediation standard is 0.2 mg/kg. The remaining PCB concentrations are generally below 3.0 mg/kg. The source of PCB contamination appears to be the location of a historic electrical transformer substation.

In the southern portion of Subarea 1, south of Foster Avenue beneath the paved surfaces that surround the 7 Foster Avenue building, are areas of lead and arsenic contamination present in shallow soils, predominantly less than 4 feet deep. The highest concentration of lead detected throughout this area is present at a concentration of 3,050 mg/kg, while the highest concentration of arsenic is 138 mg/kg. PAHs exceed residential soil standards; however, they are not co-located with lead and arsenic exceedances with the same frequency as PAH exceedances in the northern portion of Subarea 1 (north of Foster Avenue). The PAH exceedances of soil standards are generally present at depths of less than two feet, but one location extended to ten feet below the paved surface. The highest concentration of benzo(a)pyrene is present at a concentration of 22 mg/kg.

Within the southern portion of Subarea 1, pentachlorophenol (PCP) is also found above the residential soil standard (0.9 mg/kg) but at a lower frequency of detection. The highest concentration of PCP is 2.7 mg/kg. PCP was detected in very few soil sample locations, generally less than two feet deep, however, the deepest detection of PCP was found at eight feet deep.

Within Subarea 5 (the former lagoon area), located to the east of Hilliards Creek and south of Subarea 4, the RI sampling results indicated the presence of PCP and PAHs. The highest concentration of PCP is 650 mg/kg, whereas the highest concentration of benzo(a)pyrene is 1.1 mg/kg. The PCP concentrations are largely detected in the subsurface soils and below the water table. The PCP-contaminated soils are residual lagoon wastes that were not addressed during the removal actions performed by Sherwin-Williams under the 1978 NJDEP Directive.

The remaining Subareas of the Site include: Subareas 2, 3, and 4, and Upper Hilliards Creek (Subarea 6), and are discussed below. Subareas 2 through 4 are impacted with LNAPL. Arsenic, lead, and PAHs, frequently detected at Subarea 1, were found on a very limited basis in Subareas 2 and 4. The contamination within Subareas 2 through 4 is almost exclusively limited to LNAPL.

LNAPL and Residual LNAPL-Impacted Soils

The LNAPL at the Site is comprised of degraded mineral spirits, residual petroleum hydrocarbons, with some aromatic and aliphatic compounds, including volatile organic compounds (VOCs), semi-volatile organic compound (SVOCs), such as benzene and naphthalene (respectively), and associated tentatively identified compounds (TICs). A TIC is a compound that can be detected by the analytical testing method, but its identity and concentration cannot be confirmed without further analytical investigation. The source of the LNAPL release is primarily located in Former Tank Farm A. The presence of LNAPL can be attributed to the chemicals historically stored in Former Tank Farm A. Spills and releases of chemicals from Former Tank Farm A migrated downward through the soil column and entered the shallow groundwater.

RI sampling activities conducted to determine the extent of LNAPL included the collection of soil samples, groundwater samples from fixed monitoring wells, aqueous grab samples, and vapor intrusion studies. Environmental screening techniques included: a photo-ionizing detector (PID), membrane interface probe (MIP), laser-induced fluorescence (LIF), and visual observations. The use of these different methodologies provided multiple lines of evidence which were used to approximate the vertical and horizontal extent of LNAPL-impacted soils. Figure 5 presents the approximate horizontal extent of LNAPL-impacted soils.

The LNAPL at the Site is lighter than water and is generally found near the groundwater table. LNAPL is the source of dissolved-phase VOCs and SVOCs in shallow groundwater.

Within Subarea 2, the water table was often encountered eight to ten feet below ground surface. Soil samples indicated VOC and SVOC TICs (components of LNAPL) often extended 10 – 15 feet below the water table. Within the Seep Area (Subarea 4), where the water table was often encountered one to three feet below ground surface, LNAPL-impacted soils were recorded up to seven feet in thickness. The water table beneath Subarea 3 (off-property area) was often not encountered until nearly 15 feet below ground surface. The LNAPL-impacted soils were less than four feet thick at the water table in this area.

Vapor Intrusion Studies

EPA initiated vapor intrusion studies in May 2008. Vapor intrusion activities included the collection of sub-slab soil gas samples beneath the basements of a number of residential properties along U.S. Avenue and Berlin Road in Gibbsboro. Analysis of sub-slab soil gas indicated no detections of VOC compounds beneath the slabs of the residential properties.

In December 2008, EPA collected sub-slab soil gas samples from beneath all commercial buildings (Subareas 1, 2, and 4) within the FMP area. The sub-slab soil gas samples detected high concentrations of several VOC compounds, such as: benzene, toluene, ethylbenzene, and xylene (BTEX) beneath the slabs of the 2 and 4 Foster Avenue buildings (Subarea 2). Former Tank Farm A, located adjacent to these buildings, contained chemical compounds used for paint, lacquer, and varnish manufacturing, including mineral spirits, benzene, toluene, and xylene. Based on the 2008 sub-slab soil gas results from beneath the 2 and 4 Foster Avenue slabs, EPA has periodically performed resampling activities.

Methane Monitoring

In 2015, as part of the periodic vapor intrusion monitoring activities, methane vapors were detected beneath the 2 and 4 Foster Avenue slabs. Methane concentrations are due to the natural breakdown processes (biodegradation) of the LNAPL. Methane concentrations have been periodically monitored to ensure that they are at acceptable levels, and the methane concentrations are used as a means to approximate the extent of LNAPL-impacted soils.

Upper Hilliards Creek RI Sampling Activities

A majority of the sampling activities within Upper Hilliards Creek were completed in 2008. However, Sherwin-Williams returned to Upper Hilliards Creek in 2016 to collect soil and sediment samples for hexavalent chromium and extractable petroleum hydrocarbons (EPHs). Sherwin-Williams again returned in 2017 to collect additional soil, sediment, and a variety of biota, to complete an analysis of a site-specific Baseline Ecological Risk Assessment (BERA) which is discussed below.

Upper Hilliards Creek Soil Sample Findings

Lead, arsenic, and PAHs were found above residential soil standards within Upper Hilliards Creek floodplain soils. PCB Aroclor 1260 was also detected above residential soil standards within Upper Hilliards Creek soils. PCBs and PAHs are frequently co-located with lead and arsenic. Concentrations of lead and arsenic remain relatively the same throughout Upper Hilliards Creek floodplain soils. Lead and arsenic concentrations are generally similar in either the 0.0 – 0.5-foot to 1.5 – 2.0-foot intervals. The highest concentrations of lead and arsenic detected were 7,580 mg/kg and 191 mg/kg, respectively. Exceedances of residential soil standards for lead and arsenic are present in shallow soil but not consistently present in soils deeper than two feet. The metal constituents antimony and cyanide were infrequently detected above the residential soil standards, 31 mg/kg and 47 mg/kg, respectively. When detected above the residential soil standards, they are co-located with the presence of lead and arsenic.

Concentrations of PAHs were generally highest in the most upstream portions of Upper Hilliards Creek near Foster Avenue, adjacent to the 1 Foster Avenue building. Concentrations of PAHs in soils are also much higher in the surface soils (0.0 – 0.5 feet in depth) than in subsurface (1.5 – 2.0 feet in depth). The highest reported concentration of benzo(a)pyrene detected in a surface soil sample was 37 mg/kg, whereas, at the same sample location, the subsurface soil concentration was 2.6 mg/kg. Concentrations of PAHs in floodplain soils decline downstream, to where the highest reported concentration of benzo(a)pyrene was detected at 8.4 mg/kg.

PCB Aroclor 1260 was also detected in floodplain soils above residential soil standards. Similar to PAHs, the highest concentrations of PCB Aroclor 1260 were found at upstream points, declining downstream, and also present at higher concentrations in surface soils than in subsurface soils.

The soil sampling activities outside of the Hilliards Creek floodplain, upland and behind residential properties, also found lead, arsenic, and PAHs, but at relatively low concentrations, and in soils less than two feet in depth. The highest reported concentrations of lead, arsenic, and benzo(a)pyrene were: 626 mg/kg, 25 mg/kg, and 0.87 mg/kg, respectively.

Upper Hilliards Creek Sediment Findings

Sediment samples were collected from approximately fifteen locations in Upper Hilliards Creek. In addition, sediment samples were collected from within the Silver Lake conveyance system, the underground culvert which connects the Silver Lake outflow to the confluence of Hilliards Creek. Sediment sample results were compared to the NJDEP lowest effect levels (LEL) for ecological receptors, which are often lower than residential soil standards.

Lead and arsenic were found most frequently and at the greatest concentrations above the NJDEP LEL of 31 mg/kg for lead and 6 mg/kg for arsenic for ecological receptors. Contaminants in sediment that exceed the LEL criteria generally require further evaluation. Other constituents found above this criterion were cadmium, chromium, copper, cyanide, mercury, zinc, PAHs, pesticides, and PCBs. These other constituents were found less frequently and are co-located with lead and arsenic.

Lead and arsenic LEL exceedances were found in sediment throughout Upper Hilliards Creek. The concentration of lead varies from below the LEL for ecological receptors to 10,900 mg/kg. The arsenic levels varied from below the LEL for ecological receptors to over 1,720 mg/kg. For both metals, the highest values were found within creek sediments in the vicinity of the former lagoon area, where several historic releases were reported to have occurred from the lagoons.

Upper Hilliards Creek Surface Water Findings

Surface water samples were collected from five locations within Upper Hilliards Creek on two occasions. One sampling event was performed after a significant rain event, and another sampling event was performed during a dry period. Surface water results were compared to the NJDEP New Jersey Surface Water Quality Standards (NJSWQS).

Analyses of the surface water showed exceedances of the NJSWQS for aluminum, iron, zinc, cyanide, and lead. As with the other media, lead is detected most frequently. Arsenic was not detected at concentrations above the NJSWQS.

The concentration of lead in surface water was compared to the NJSWQS of 5.4 micrograms/Liter (µg/L). The total lead value varied from below the NJSWQS to over 16 µg/L for total lead.

SCOPE AND ROLE OF OPERABLE UNIT

Due to the complexity of multiple properties comprising the Site and varying land uses, EPA is addressing the cleanup of the Site in several phases or OUs. OU1 consists of the residential properties that are being remediated in accordance with the EPA 2015 Record of Decision.

This Proposed Plan addresses OU2, which consists of soil, sediment, and LNAPL-impacted soils. Future operable units will address on-site groundwater contamination (OU3), and the remaining portions of Hilliards Creek, Kirkwood Lake, Silver Lake, and Bridgewood Lake (OU4).

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, Light Non-Aqueous Phase Liquid (LNAPL) in ground water 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.

PRINCIPAL THREAT WASTE

Principal threat waste is defined in the box above. Although lead and arsenic in soil and sediment act as sources to surface water contamination and contribute to groundwater contamination, these sources are not highly mobile and are not considered principal threat wastes at this Site. LNAPL, a source material present in saturated soils (largely below the water table), is considered a principal threat waste.

SUMMARY OF SITE RISKS

As part of the RI/FS, a baseline risk assessment consisting of a human health risk assessment (HHRA) and BERA were conducted to estimate 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 caused by hazardous substance exposure in the absence of any actions to control or mitigate these exposures under current and future site uses.

In the HHRA, cancer risk and noncancer health hazard estimates are based on current and future reasonable maximum exposure (RME) scenarios. These estimates were developed by taking into account various health protective estimates about the concentrations, frequency and duration of an individual's exposure to chemicals selected as contaminants of potential concern (COPCs), as well as the toxicity of these contaminants.

For the ecological risk assessment, representative ecological receptors were identified, and measurement and assessment endpoints were developed during the BERA to identify those receptors and areas where unacceptable risks are present. The final, EPA-approved, HHRA (2017) and BERA (2018) can be found in the EPA Administrative Record file, however, the following information is a summary of the findings of human health and ecological risks.

Human Health Risk Assessment Summary

EPA follows a four-step human health risk assessment process for assessing site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (see adjoining box "What is Risk and How is it Calculated" for more details on the risk assessment process).

The HHRA began with selecting COPCs in the various media (*i.e.*, soil, surface water, sediment, and soil gas) that could potentially cause adverse effects in exposed populations. COPCs are selected by comparing the maximum detected concentrations of each chemical identified with state and federal risk-based screening values. The screening of each COPC was then conducted separately for each exposure area.

Exposure areas are geographical designations created for the risk assessment in order to define areas of a site with similar anticipated use (based on zoning and other considerations) or similar levels of contamination. The 2017 HHRA presents 4 unique exposure areas, however, for the purposes of this Proposed Plan, the 6 Subareas described above will be used to summarize the 2017 HHRA findings.

<u>*Potential Exposure Pathways by Subareas*</u>

Subareas 1, 2, and 4 are currently utilized as an office and light industrial park (Figure 4). These areas are largely comprised of office buildings, paved surfaces, and several grassy areas (see Figure 6). South of Subarea 4 (Seep Area) is a large, vacant/undeveloped area, which was once the former lagoon area (Subarea 5). Upper Hilliards Creek (Subarea 6) originates south of Foster Avenue and flows for nearly a quarter mile adjacent to Subarea 5, before it traverses under West Clementon Road and continues into Kirkwood Lake. Subarea 3 consists of the existing mostly residential properties on the east side of U.S. Avenue.

WHAT IS 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 potential concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants 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 noncancer 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 noncancer 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 noncancer 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 noncancer health effects, a "hazard index" (HI) is calculated. The key concept for a noncancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer 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.

Based on current zoning and future land use assumptions, the following current and future receptor populations and routes of exposure were considered for Subareas 1 through 5:

- Construction/Utility Worker (adult): incidental ingestion, dermal contact, and inhalation of particulates and volatiles released from surface (0-2 feet) and subsurface (2-10 feet) soils.
- Outdoor Worker (adult): incidental ingestion, dermal contact, and inhalation of particulates and volatiles released from surface soils.
- Resident (child [0-6 years] and adult): incidental ingestion, dermal contact, and inhalation of particulates and volatiles released from surface soils.
- Exposure pathways specific to the Subareas 5 and 6 (due to their nature as being either a creek habitat or vacant/wooded land) included the following:
- Recreator (adult, adolescent [6-16 years], and child): incidental ingestion, dermal contact, and inhalation of particulates and volatiles released from surface soils; incidental ingestion and dermal contact of sediments, along with dermal contact with surface water while wading in Upper Hilliards Creek.

Buildings within Subareas 1, 2, and 4 have also been evaluated for potential vapor intrusion through the collection of sub-slab soil gas and indoor air data. The 2017 HHRA evaluated the potential risks associated with this pathway to the current and future commercial worker resulting from the inhalation of contaminants in indoor air.

<u>*Contaminant Exposure Evaluation Process (other than lead)*</u>

For contaminants other than lead, exposure point concentrations were estimated using either the maximum detected concentration of a contaminant or the 95% upper-confidence limit (UCL) of the average concentration. Chronic daily intakes were calculated based on the reasonable maximum exposure (RME), which is the highest exposure reasonably anticipated to occur at the Site. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures.

<u>*Lead Exposure Evaluation Process*</u>

It is not possible to evaluate risks from lead exposure using the same methodology as the other COPCs because there are no published quantitative toxicity values for lead. However, since the toxicokinetics (the absorption, distribution, metabolism, and excretion of toxins in the body) of lead are well understood, lead risks are assessed based on blood lead level (PbB), which can be correlated with both exposure and adverse health effects. Consequently, lead risks were evaluated using blood lead models, which predict PbB based on the total lead intake from various environmental media. Lead risks for non-resident adults (workers/construction workers) were assessed using the EPA Adult Lead Model (ALM). The target receptor for this model includes an adult female (of child bearing age) in order to protect a developing fetus. Lead risks for children were evaluated using the Integrated Exposure and Uptake Biokinetic (IEUBK) model. Both models estimate a central tendency (geometric mean) PbB on the basis of average or typical exposure parameter values. Therefore, the exposure point concentrations (EPCs) for lead were the arithmetic mean of all the samples within the exposure area from the appropriate depth interval.

Human Health Risk Assessment Findings by Media

In the risk assessment, two types of toxic health effects were evaluated for COPCs other than lead: cancer risk and noncancer hazard. Calculated cancer risk estimates for each receptor were compared to EPA's target risk range of $1x10^{-6}$ (one-in-one million) to $1x10^{-4}$ (one-in-ten thousand). The calculated noncancer hazard index (HI) estimates were compared to EPA's target threshold value of 1. This section provides an overview of the human health risks resulting from exposures to contaminants exceeding the target cancer risk and noncancer hazard thresholds. Risks associated with lead and vapor intrusion are discussed separately.

Surface Soil Findings

Risks and hazards were evaluated for current and potential future exposure to surface soil in each exposure area. Table 1-1 below summarizes the receptor populations in each exposure area, assessed in the HHRA, that were found to exceed EPA's cancer risk range and/or noncancer threshold criteria. In the HHRA soils from Subareas 1 and 2 were combined into one exposure area. The results for this exposure area, however, indicate that arsenic and PCB Aroclor 1260 comprised the majority of risk and hazard within only Subarea 1, particularly the area north of Foster Avenue. PCB Aroclor 1260 is localized to an area beneath the paved parking lot near the 10 Foster Avenue building. Benzo(a)pyrene and antimony were the compounds which contributed to elevated risk and hazard in the southern portion of Subarea 1 (south of Foster Avenue). Subareas 5 and 6 were combined as one exposure area in the 2017 HHRA, however, a majority of the risk and hazard was attributable to Subarea 6, due to the presence of arsenic and cyanide. No contaminants were associated with risks or hazards above EPA thresholds from Subarea 3 and 4.

Table 1-1: Summary of hazard and/or risk exceedances for surface soil by exposure area

Receptor	Hazard Index	Cancer Risk
Subareas 1 and 2 (North of Foster Avenue)		
Future Resident (child/adult)	**7**	**2×10^{-4}**
Subarea 1 (South of Foster Avenue)		
Future Resident (child/adult)	**7**	**3×10^{-4}**
Subareas 5 and 6		
Future Resident (child/adult)	**10**	**3×10^{-4}**
Current/Future Child Recreator	**4**	8×10^{-5}

*Bold indicates value above the acceptable risk range or value.

Surface and Subsurface Soil Findings

Exposure to surface and subsurface soil by future construction and utility workers were also considered in Subareas 1 through 5. No risks or hazards above EPA thresholds were identified for the utility worker. As shown in Table 1-2, Subareas 1, 5, and 6 were the only portions of the Site associated with noncancer estimates that exceeded EPA's threshold criteria for the construction worker. The cancer risks for this receptor were within the target risk range. PCB Aroclor 1260 and arsenic were the primary chemicals contributing to elevated hazard for surface and subsurface soils within Subareas 1 and 2, and Subareas 5 and 6, respectively. The hazard associated with PCB Aroclor 1260, however, was driven by elevated concentrations in Subarea 1. The hazards associated with arsenic in Subareas 5 and 6 were driven by elevated concentrations within the floodplain soils adjacent to Hilliards Creek (specific to Subarea 6).

Table 1-2: Summary of hazard and/or risk exceedances for surface/subsurface soil by exposure area

Receptor	Hazard Index	Cancer Risk
Subareas 1 and 2 (north of Foster Avenue)		
Future Construction Worker	**6**	5×10^{-6}
Subareas 5 and 6		
Future Construction Worker	**2**	8×10^{-6}

Surface Water and Sediment Findings

Exposure to surface water and sediments within Subarea 6 (Upper Hilliards Creek) by future child, adolescent, and adult recreators who may wade in this shallow stream were evaluated. Slightly elevated cancer risk was identified for the child recreator resulting from exposure to surface water. Benzo(a)pyrene comprised the majority of the risk; however, the individual cancer risk attributable to this chemical was equal to the upper bound limit of the target risk range (1×10^{-4}). Furthermore, it is likely that the risk associated with benzo(a)pyrene is overestimated, since elevated surface water concentrations were primarily attributable to suspended sediments in the samples analyzed. Therefore, benzo(a)pyrene is not considered to be a COC in surface water.

The chemicals accounting for the majority of risks and hazards in sediment included arsenic, cyanide, and chromium. However, it is likely that the risk due to chromium is overestimated because it was assumed that the chromium present is in the more toxic hexavalent form. This is conservative since chromium in the environment is generally dominated by the less toxic, trivalent form.

Table 1-3: Summary of hazard and/or risk exceedances for surface water and sediment within the Subarea 6

Receptor	Hazard Index	Cancer Risk
Surface Water		
Current/Future Child Recreator	0.3	**2 x 10^{-4}**
Sediment		
Current/Future Child Recreator	**12**	**1 x 10^{-3}**
Current/Future Adolescent Recreator	**3**	1 x 10^{-4}
Current/Future Adult Recreator	**2**	**2 x 10^{-4}**

Lead Results

Since there are no published quantitative toxicity values for lead, it is not possible to evaluate cancer and non-cancer risk estimates from lead using the same methodology as the other COCs. Consistent with EPA guidance, exposure to lead was evaluated separately from the other contaminants using blood lead modeling. The risk reduction goal for lead in soils for OU2 is to limit the probability of a child or developing fetus' PbB from exceeding 5 micrograms per deciliter (µg/dL) to 5% or less.

Lead was identified at levels contributing to PbB above the risk reduction goal for Subareas 1 and 6, and the western portion of Subarea 2, for the child resident, outdoor worker, construction worker, and/or child recreator. No risks with lead were found at levels above the risk reduction goal for the receptors evaluated in Subareas 3, 4, and 5. Exposure areas with elevated lead risks are summarized in Table 2.

Table 2: Summary of lead risks by exposure area

Receptor	Media	Probability of PbB > 5 µg/dL
Subareas 1 and 2 (north of Foster Avenue)		
Future Child Resident	Surface Soil	**14%**
Subarea 1 (south of Foster Avenue)		
Future Child Resident	Surface Soil	**99%**
Future Outdoor Worker		**19%**
Future Construction Worker	Surface/Subsurface Soil	**18%**
Subarea 6		
Future Child Resident	Surface Soil	**31%**
Future Construction Worker	Surface/Subsurface Soil	**9%**
Current/Future Child Recreator	Surface Soil/Sediment	**93%**

Vapor Intrusion Findings

During the RI, a vapor intrusion investigation was conducted to evaluate the potential migration of VOC-contaminated vapors into indoor air at seven commercial buildings on the FMP area. The buildings investigated included 1, 2, 4, 5, 7, and 10 Foster Avenue, and 6 East Clementon Road (all present in Subareas 1, 2, and 4). The indoor air and sub-slab vapor results were compared to EPA's risk-based, commercial vapor intrusion screening levels (VISLs) based on a cancer risk of $1x10^{-6}$ and hazard quotient of 1.

Results of the data collected indicated that elevated sub-slab vapor and indoor air concentrations were associated with the 2 Foster and 4 Foster Avenue buildings only (Subarea 2). These two buildings are currently unoccupied. Beneath the building slabs, a total of 12 VOCs: 1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene, benzene, cyclohexane, ethylbenzene, m,p-xylenes, n-hexane, n-nonane, o-xylene, tetrachloroethene, trichloroethene, and vinyl chloride, were detected at concentrations exceeding sub-slab VISLs. Within indoor air, 10 VOCs were identified in exceedance of VISLs, which included acrolein, benzene, benzyl chloride, bromodichloromethane, chloroform, 1,2-dichloroethane, ethylbenzene, naphthalene, 1,1,2,2-tetrachloroethane, and trichloroethene.

Since the 2 and 4 Foster Avenue buildings are currently unoccupied, the vapor intrusion pathway remains incomplete, however, the exceedances of both sub-slab and indoor air VISLs indicate the potential for the vapor intrusion pathway to be complete if these buildings were to be used in the future.

A vapor intrusion investigation was also performed at residential properties in Subarea 3. Sub-slab samples collected at residential properties indicated no exceedances of sub-slab residential VISLs.

Conclusions

Apart from Subarea 3, exposure to contaminants in surface soils, subsurface soils, and sediments found at the FMP area were found to exceed EPA's threshold criteria. Based on these results, arsenic and lead were identified as the primary COCs; however, exposure to other metals (antimony, chromium, and cyanide), PCBs (Aroclor 1260), and SVOCs (benzo(a)pyrene) were also identified in soils and/or sediment exceeding cancer risk and noncancer hazard thresholds at some of the evaluated Subareas. Antimony and chromium are not considered primary COCs, because they are not found frequently and are co-located with arsenic and lead.

Overall, the exceedances of sub-slab and indoor air VISLs indicate a potential risk to commercial workers at the 2 Foster Avenue and 4 Foster Avenue buildings. Since these buildings are currently unoccupied, the vapor intrusion pathway remains incomplete, however, the exceedances of both sub-slab and indoor air VISLs indicate potential risks if these buildings were to be used in the future.

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

Ecological Risk Assessment

A baseline ecological risk assessment was conducted to evaluate the potential for ecological risks from the presence of contaminants in the following media: sediment, surface water, pore water, and soil. The aquatic habitat is the stream, while the terrestrial habitat includes the Upper Hilliards Creek floodplain and adjacent forested areas (Subarea 6), and the Former Lagoon Area (Subarea 5, which is vacant and undeveloped. See Figure 6). Media concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors by habitat type.

Exposure of terrestrial wildlife through ingestion of contaminated soil and biota, and exposure of aquatic wildlife to contaminants in Upper Hilliards Creek (Subarea 6) through ingestion of contaminated sediment, surface water, and biota were evaluated. Biological data were collected (benthic invertebrates, fish, and soil invertebrates) to assist in understanding site-specific bioaccumulation rates and subsequent exposure to upper trophic level receptors. In addition, COC concentrations and biological responses (sediment toxicity) were evaluated to understand potential community level impacts associated with sediment COCs.

A complete summary of all exposure scenarios and ecological receptor groups may be found in the 2018 BERA) which is part of the Administrative Record file.

Summary of the Baseline Ecological Risk Assessment

Ecological risks identified in the BERA for key inorganic COCs are primarily associated with localized elevated concentrations in soil and sediment within and near Upper Hilliards Creek (Subarea 6), whereas concentrations are much lower in Subarea 5 and are expected to pose minimal risks to wildlife.

The BERA provided evidence that COCs, primarily arsenic, lead, and cyanide are present in both aquatic and terrestrial environments and pose unacceptable risk to wildlife receptors. The greatest potential for exposure and unacceptable risk in Subarea 6 (Upper Hilliards Creek) is to aquatic invertivorous receptors (spotted sandpiper) from the ingestion of contaminated sediments and food items. There is low potential for toxicity to benthic organisms; no sediment toxicity was observed in any of the sample locations. Inorganic contaminants (arsenic, lead, and manganese) may pose unacceptable risk to the aquatic community (fish) based upon the exceedance of risk-based benchmarks in pore water, surface water, and fish tissue. Overall, terrestrial wildlife risks are driven primarily by arsenic and lead. Insectivorous wildlife (the American Robin and Short-Tailed Shrew) were identified as the wildlife receptors with the highest predicted exposures and hazard quotients in the terrestrial area of the Site. Similarly, the Spotted Sandpiper was identified as the receptor with the highest exposure and hazard quotient associated with the aquatic community in Upper Hilliards Creek.

Based on the results of the ecological risk assessment, a remedial action is necessary to protect the environment from actual or threatened releases of hazardous substances.

REMEDIAL ACTION OBJECTIVES

The following remedial action objectives (RAOs) for contaminated media address the human health and ecological risks at OU2 of the Site:

Soil

- Prevent potential current and future unacceptable risks to human and ecological receptors resulting from exposure to soil.
- Minimize migration of site-related contaminants in the soil to sediment, surface water, and groundwater.

Sediment

- Prevent potential current and future unacceptable risks to human and ecological receptors resulting from exposure to sediment.
- Minimize migration of site-related contaminants in the sediment to surface water.

LNAPL

- Prevent potential current and future unacceptable risks to human and ecological receptors resulting from direct contact with LNAPL.
- Prevent potential current and future risks to human health resulting from the presence of methane in soil gas.
- Minimize migration of LNAPL-related compounds.

Vapor Intrusion

- Prevent potential current and future unacceptable risks to human receptors resulting from inhalation of VOCs and SVOCs.

Achieving RAOs relies on the remedial alternative's ability to meet final cleanup levels derived from Preliminary Remediation Goals (PRGs), which are based on such factors as Applicable or Relevant and Appropriate Requirements (ARARs), calculated human health and ecological risks, background concentrations, and reasonably anticipated future land use. The FMP area is currently zoned commercial/light industrial, however, for soil contamination, the NJDEP RDCSRS are applicable as the Borough has indicated an anticipated residential future use for the FMP. Additionally, many adjacent parcels are zoned residential. The NJDEP Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS) are applicable to soil contaminants which may exist under Foster and United States Avenue.

Within areas of the Site where soil contamination exists above the water table (i.e., unsaturated soils), EPA selected the application of the more stringent of the RDCSRS or the default NJDEP Impact to Groundwater Soil Screening Levels (IGWSSL). PCP, benzene, and napthalene have been detected in groundwater above the New Jersey Groundwater Quality Standards (NJGWQS) and have been detected in soils above their IGWSSL, therefore these compounds have been identified as COCs and their cleanup values are listed in Table 3. For areas of soil contamination that exist primarily below the water table (i.e., saturated soils), which act as a source to groundwater contamination, site-specific soil PRGs were developed to address sources of known shallow groundwater contamination in Subareas 1 and 5. Site-specific PRG values for groundwater source control were developed for arsenic and PCP in saturated soils in Subarea 1 and Subarea 5, respectively.

Finally, in Subarea 6, site-specific ecological PRGs were developed for sediment contamination and the top 1 foot of floodplain soil. These site-specific PRGs were developed from site-wide data that was collected as part of the 2018 BERA. Ecological PRGs are not applied to other subareas within the FMP area, as the other subareas do not contain significant ecological habitat. The lists of PRGs for soil and sediment can be found in Table 3. PRGs may be further modified through the evaluation of alternatives and are used to select the cleanup goals in the EPA Record of Decision.

Due to the site-specific nature of the LNAPL at the Site (i.e., high concentration of VOC and SVOC TICs, and for its presence in saturated soil), the LNAPL PRGs are based on NJDEP's Interim GWQS for TICs in groundwater. While groundwater is not the focus of this Proposed Plan, the effectiveness of the selected remedy to address LNAPL contamination will be further assessed as part of the future groundwater OU.

The presence of LNAPL contamination in shallow groundwater is also the source of indoor-air VOCs, SVOCs, and sub-slab methane concerns. Table 4 presents the LNAPL PRGs for TICs in shallow groundwater. Indoor-air and sub-slab VOC and SVOC concentrations will be compared to the chemical-specific VISLs. Methane concentrations will be compared to the lower explosive limit.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected remedy be protective of human health and the environment, be cost effective, comply with ARARs, 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, LNAPL, or sediment remediation were identified and screened for effectiveness, implementability, and cost criteria, with emphasis on effectiveness. Those technologies that passed the initial screening were then assembled into remedial alternatives.

For the soil and sediment alternatives, the proposed depths of excavation are based on the soil boring data taken during the RI. These depths were used to estimate the quantity of soil to be removed and the associated costs. The actual depths and quantity of soil to be removed will be finalized during design and implementation of the selected remedy. Full descriptions of each proposed remedy can be found in the 2019 FS which is part of the Administrative Record file.

Surface water monitoring is included as part of each soil and sediment remedial alternative except for No Action. Monitoring would be conducted on a quarterly basis to assess any changes in contaminant conditions over time. It is expected that removal of sediment, combined with soil removal, and/or capping will result in a decrease of surface water contaminants to levels below NJSWQS. If monitoring indicates that contamination levels have not decreased to below the NJSWQS, EPA may require an action in the future.

The time frames below are for construction and do not include the time to negotiate with the responsible parties, design a remedy, or procure necessary contracts. Timeframes for operation and maintenance (O&M) are also provided for alternatives that employ treatment of contaminants. The timeframe for O&M is the estimated timeframe to reach cleanup goals. Five-year reviews will be conducted as a component of the alternatives that would leave contamination in place above levels that allow for unlimited use and unrestricted exposure.

SOIL ALTERNATIVES:

Alternative 1 - No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Construction Timeframe:	*0 years*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated soil at the Site.

Soil Alternative 2 - Capping and Institutional Controls

Capital Cost:	*$4,953,000*
Annual O&M Cost:	*$55,000*
Present Worth Cost:	*$5,919,885*
Construction Timeframe:	*10 months*

This alternative would use engineering controls consisting of impermeable caps and soil covers as the primary method to prevent exposure to the contaminants in Site soils in Subareas 1, 2, 4, 5, and 6. Subarea 3 consists of a series of residential properties and one vacant, commercially owned property. No capping in Subarea 3 would be required, as there are no unacceptable risks associated with Subarea 3.

A total of approximately 8,000 cubic yards (CY) of soil would be removed and disposed of off-site under Soil Alternative 2 to accommodate the caps. The estimated limits of Soil Alternative 2 are shown in Figure 7.

Within Subareas 1, 2, and 4, existing impermeable caps, consisting of existing buildings, concrete building slabs, asphalted parking areas, and roadways would serve as the engineering controls under this alternative. Vegetated areas without existing permeable caps would be evaluated to determine if installation of a cap is needed. ICs in the form of a deed notice would be required to ensure that future use of the Site recognizes and maintains these controls.

Up to two feet of soil would be removed from Subareas 5 and 6 for the purpose of installing a cap. Following the shallow soil removal, if the RDCSRS are achieved, the area would be backfilled and revegetated. Subsurface locations, where constituents remain at concentrations greater than the RDCSRS, would receive a cap. The cap would consist of a demarcation layer, one and a half feet of common fill, and six inches of topsoil. The area would be revegetated according to regulatory requirements. A deed notice would be established for those areas where constituents remain at concentrations greater than the RDCSRS below the cap.

Soil Alternative 3 – Deep Soil Removal, LNAPL Removal/Bioremediation and Soil Gas Removal, Capping and Institutional Controls

Capital Cost:	*$23,512,000*
Annual O&M Cost:	*$629,500*
Present Worth Cost:	*$27,620,000*
Construction Time Frame:	*1 year*

Alternative 3 would remove soils from separate areas of the FMP that contain arsenic and PCP, which are a source to groundwater contamination. It would also remove PCBs from a small area, which are above Toxic Substances Control Act (TSCA) values. Alternative 3 would also rely on engineering and ICs to control exposure to the contamination at the FMP area.

A total of approximately 40,000 CY of soil would be removed and disposed of off-site under Alternative 3. The estimated limits of excavation activities are shown in Figure 8, and the estimated limits of LNAPL remediation activities are shown in Figure 9.
Soil Alternative 3 would consist of the following actions:

Subarea 1:

- Remove the soil that is the source of arsenic found in groundwater north of Foster Avenue to a depth of 15 feet.
- Remove soil, to a depth of approximately six feet, containing PCBs concentrations greater than 50 mg/kg (the concentration at which the PCBs become defined as a PCB remediation waste under TSCA) at locations adjacent to the Silver Lake conveyance north of Foster Avenue.
- Maintain the existing impermeable caps consisting of asphalted parking lots, roadways, concrete building slabs, and buildings. Locations not covered by the impermeable caps would be evaluated to determine if unsaturated soil containing contaminants at concentrations greater than the IGWSSLs would be removed or if impermeable capping would be expanded onto those areas.
- Address any underground structures that may be a potential source of contamination.

Subarea 2:

- Maintain the existing impermeable asphalt cap and soil cover.
- Cap or remove contaminants exceeding IGWSSL that are not currently paved.
- Install a LNAPL recovery system at the 2 and 4 Foster Avenue buildings.
- Install a system to deliver nutrients to the LNAPL across the Former Resin Plant/Tank Farm A area to stimulate existing LNAPL biodegradation.
- Install a system to remove methane and other soil gas from the subsurface.
- Address any underground structures that may be a potential source of contamination.

Subarea 3:

- Install injection wells and soil gas extraction wells on the former tavern/service station property, and on the west side of U.S. Avenue.

- Install pressurized nutrient injection wells along the U.S. Avenue right-of-way east of U.S. Avenue and south of the former tavern/service station.

- Install soil gas extraction and treatment, and nutrient mixing and injection systems in the eastern parking area of the 2 and 4 Foster Avenue buildings.

- Install piping beneath U.S. Avenue from the former tavern/service station to the 2 and 4 Foster Avenue parking area.

- Conduct direct push nutrient injections in those areas beneath impacted properties along U.S. Avenue where LNAPL is present.

- Operate the nutrient injection and soil gas recovery systems.

Subarea 4:

- Remove soil containing LNAPL from the Seep Area to an approximate depth of five to seven feet.

- Restore the excavation area and reinstall the parking area.

- Install a collection trench south of Foster Avenue to prevent LNAPL transport under Foster Avenue from the parking area east of 2 and 4 Foster Avenue (source of LNAPL) to the Seep Area and Upper Hilliards Creek.

Subarea 5:

- Remove soil from the western portion of the Former Lagoon Area to a depth of approximately eight feet below ground surface to address the source of pentachlorophenol in groundwater.

- Remove any additional unsaturated soil where pentachlorophenol is present at concentrations greater than the default IGWSSL.

- Restore the excavation areas and maintain the existing soil cap that is present across the remainder of the former Lagoon Area.

Subarea 6:

- Remove all soil containing constituents greater than the ecological PRGs in the top one foot of the Upper Hilliards Creek flood plain.

- Remove all soil at depths greater than one foot where constituents are present at concentrations greater than the lower of the RDCSRS or IGWSSL throughout the Upper Hilliards Creek floodplain.

Soil Alternative 4 – Deep and Intermediate Soil Removal, LNAPL Removal/Bioremediation, Soil Gas Removal, Capping and Institutional Controls

Capital Cost:	*$30,151,000*
Annual O&M Cost:	*$692,500*
Present Worth Cost:	*$34,259,000*
Construction Time Frame:	*2.5 years*

Under Alternative 4, the scope of the remediation in Subarea 1 differs from Alternative 3. All of the other elements in Alternative 4 are the same as those presented in Alternative 3. A total of approximately 67,000 CY of soil would be removed and disposed of off-site under Alternative 4. Figures 9 and 10 show the limits of LNAPL and soil cleanup actions, respectively, for this alternative.

Subarea 1:

- Excavate all soil contamination exceeding the RDCSRS or IGWSSL (whichever is lower) at the FMP north of Foster Avenue to a depth of four feet below the soil surface. The excavation to remove exceedances of RDCSRS or IGWSSL to four feet would apply to all areas except existing building footprints, as the majority of the contamination is located in the top four feet of soil. Areas within the four-foot excavation footprint that exceed RDCSRS or IGWSSL would receive either a soil or impermeable cap. An impermeable cap would be required for areas where contaminant levels exceeding the IGWSSL remain between the water table and the excavation bottom. A soil cap may be used for soil remaining below the excavated areas that do not exceed IGWSSL values or where IGWSSL do not apply (below the water table) but RDCSRS exceedances remain.

- Excavate soil contamination exceeding the RDCSRS or IGWSSL (whichever is lower) on the 7 Foster Avenue commercial lot to a depth of four feet below the soil surface in all areas except for the 7 Foster Avenue building footprint. Areas within the excavated footprint that exceed RDCSRS or IGWSSL would receive either a soil or impermeable cap. An impermeable cap would be required for areas where contaminant levels exceeding the IGWSSL remain between the water table and the excavation bottom. A soil cap may be used for soil remaining below the excavated areas that do not exceed IGWSSL values or where IGWSSL do not apply (below the water table) but RDCSRS exceedances remain.

- Address any underground structures that may be a potential source of contamination.

Soil Alternative 5 –Excavation to Depth and Institutional Controls

Capital Cost:	*$104,893,000*
Annual O&M Cost:	*$1,000*
Present Worth Cost:	*$105,574,000*
Construction Time Frame:	*8 years*

This alternative would remove and dispose of off-site all accessible soil exceeding PRGs (RDCSRS or IGWSSL, whichever is lower) and all soil containing LNAPL, regardless of depth. A total volume of approximately 300,000 CY of soil would be removed and disposed of off-site under Alternative 5; the estimated limits of the excavation are shown in Figure 11.

The scope of Alternative 5 would be:

Subarea 1:

- Removal of the parking areas on the property adjacent to the 7 Foster Avenue building, and the parking areas and a portion of the 6 East Clementon Road building slab on the property adjacent to the 10 Foster Avenue building.

- Removal of soil to a depth of one to ten feet adjacent to the 7 Foster Avenue building.

- Removal of soil to depths of five to fifteen feet on the property currently occupied by the 6 East Clementon Road building slab and adjacent to the 10 Foster Avenue building.

- Removal of any underground structures that may represent a source of contamination.

- Backfilling all areas to existing grade.

- Existing roadways, where contamination would remain, would serve as caps. ICs would be applied.

Subarea 2:

- Removal of the 2 and 4 Foster Avenue buildings and building slabs.

- Removal of the parking area and former red barn building slab.

- Removal of soil containing LNAPL to a depth of 25 feet below ground surface.

- Removal of any below ground structures that may represent potential sources of contamination.

- Removal of soil to seven to ten feet on the slopes towards Foster Avenue and U.S. Avenue, and backfilling all areas to existing grade.

Subarea 3:

- Demolition and replacement of several smaller buildings such as garages and storage sheds.

- Temporary relocation of residents from five residential properties and workers from one commercial property, for as long as one year each.

- Management of several million gallons of groundwater containing LNAPL.

- Installation of approximately 3,200 linear feet (100,000 ft^2) of shoring.

- Excavation of approximately 80,000 CY of soil.

- Disposal of approximately 20,000 CY of the excavated soil containing LNAPL, importing 20,000 CY of replacement soil, and reuse of 60,000 CY of soil.

- Restoration of properties to current conditions.

Subarea 4: (same as Alternative 3)

- Remove soil containing LNAPL from the Seep Area to an approximate depth of five to seven feet.

- Restore the excavation area and reinstall the parking area.

- Install a collection trench south of Foster Avenue to prevent LNAPL transport under Foster Avenue from the parking area east of 2 and 4 Foster Avenue (source of LNAPL) to the Seep Area and Upper Hilliards Creek.

Subarea 5:

- Remove soil to a depth of approximately 20 feet throughout the northwest portion of the Former Lagoon Area.

- Backfill to grade and restore.

Subarea 6:

- Remove all soil containing constituents greater than the ecological PRGs in the top one foot of the Upper Hilliards Creek flood plain.

- Remove all soil at depths greater than one foot where constituents are present at concentrations greater than the RDCSRS or IGWSSL (whichever is lower) throughout the Upper Hilliards Creek floodplain.

<u>SEDIMENT ALTERNATIVES</u>:

Sediment Alternative 1 – No Action

Capital Cost:	*$0*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$0*
Timeframe:	*0 years*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated sediment within Upper Hilliards Creek (Subarea 6).

Sediment Alternative 2 - Targeted Removal of Surface Sediment with Contaminants Greater than PRGs, Capping and Natural Recovery

Capital Cost:	*$1,377,000*
Annual O&M Cost:	*$16,500*
Present Worth Cost:	*$1,610,000*
Construction Time Frame:	*2 months*

One foot of sediment containing constituents at concentrations greater than the PRGs would be removed from Upper Hilliards Creek. Approximately 310 CY of sediment would be removed under this alternative. The extent of excavation is shown in Figure 12. A cap would then be installed, consisting of 6 inches of sand, covered by 3 inches of stone, that would act as an armoring layer. Natural sedimentation would then be allowed to fill in above the armoring layer and reestablish the current elevation of the stream. As part of this alternative, the sediment that has accumulated in the Silver Lake conveyance system, located beneath the parking area between the 2 and 4 Foster Avenue buildings and the 10 Foster Avenue building, and the sediment that is in the concrete culvert south of Foster Avenue, would be removed and disposed of off-site.

Sediment Alternative 3 – Removal of All Sediment with Contaminants Greater than PRGs

Capital Cost:	*$1,730,000*
Annual O&M Cost:	*$0*
Present Worth Cost:	*$1,759,000*
Construction Time Frame:	*3 months*

This alternative would consist of excavation of all sediment in Upper Hilliards Creek, the Silver Lake conveyance system, and concrete culvert containing contaminants at concentrations greater than the PRGs. Approximately 1,400 CY of sediment would be removed under this Alternative. The extent of excavation is shown in Figure 12. The areas where sediment would be removed would be backfilled with clean material that would both remain stable and provide habitat for the benthic community. Because all contaminants present at concentrations greater than the PRGs would be removed and disposed of off-site, there would be no need for a cap.

The estimated limits of Sediment Alternatives 2 and 3 are shown in Figure 12.

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.

EVALUATION OF ALTERNATIVES

The NCP lists nine criteria that EPA uses to evaluate the remedial alternatives individually and against each other to select a remedy. This section of the Proposed Plan considers the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. Seven of the nine evaluation criteria are discussed below. The final two criteria, "State Acceptance" and "Community Acceptance" are discussed at the end of the document. A detailed analysis of each of the alternatives is in the 2019 FS report.

EVALUATION OF SOIL ALTERNATIVES

1. Overall Protection of Human Health and the Environment

Alternative 1, No Action, would not be protective of human health or the environment since it does not include measures to prevent exposure to contaminated soil.

Alternative 2 would provide limited protection of human health and to ecological receptors. All exposure pathways would be eliminated by soil removal (in the ecological habitat areas), existing and new capping (in other areas of the Site), and ICs (Deed Notices). The soil removal and capping in the ecological habitat areas would prevent transport of soil containing contaminants into surface water bodies. However, under this alternative, sources of groundwater contamination would remain, no actions to remove or contain the LNAPL would be performed, and no actions would be conducted to mitigate the soil gas vapors beneath the 2 and 4 Foster Avenue buildings. Therefore, there would remain the possibility that, without ongoing manual recovery activities, discharges of LNAPL to Upper Hilliards Creek and potential indoor exposure to vapors originating in the subsurface would continue.

Alternatives 3 and 4 would protect human health and the environment by eliminating all exposure pathways through a combination of soil excavation, LNAPL treatment, and use of existing structures for capping. The soil removal and capping in the ecological habitat areas would prevent transport of soil containing contaminants into surface water bodies. In contrast to Alternative 2, under Alternatives 3 and 4, sources of groundwater contamination would be removed, LNAPL would be addressed by a combination of removal and bioremediation, and a subsurface soil ventilation system would remove vapors beneath the 2 and 4 Foster Avenue buildings. Alternative 5 would achieve protectiveness by excavating all impacted soils as well as LNAPL contamination. Alternatives 2, 3, 4, and 5 would require Deed Notices where constituents remain in soil at concentrations greater than the RDCSRS.

2. Compliance with Applicable or Relevant and Appropriate Requirements

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

Alternative 1 would not meet ARARs.

Alternatives 2 through 5 would address chemical-specific ARARs, such as NJDEP RDCSRS, by removing contaminated soil, both in the shallow and deep zones, and capping and placing deed notices to eliminate direct contact. Action-specific ARARs would be met by Alternatives 2 through 5 during the construction phase by proper design and implementation of the action, including disposal of excavated soil at the appropriate disposal facility. The capping elements of these alternatives would meet action-specific ARARs. These alternatives would also be required to meet location-specific ARARs, such as NJDEP Wetlands Protection Act Rules.

3. Long-Term Effectiveness and Permanence

Alternative 1 would not provide long-term effectiveness or permanent protection to ecological receptors, groundwater, or surface water because the soil contaminants would remain uncontrolled.

Alternative 2, capping, would provide long-term effectiveness and permanence for control of direct contact exposure to soil contaminants as long as the cap is maintained, and the provisions of the deed notices are followed.

Alternative 3 would provide a greater degree of long-term effectiveness and permanence by a combination of capping, removal of metals, PCBs, and PCP from soil, as well as a combination of LNAPL removal and bioremediation.

Alternative 4 has the same components of Alternative 3. In addition, Alternative 4 would also include excavation of soil contaminants to a depth of four feet beneath Subarea 1 commercial properties (except under existing building footprints). The four-foot excavation of Alternative 4 provides for greater long-term protectiveness than Alternative 3 because it does not solely rely on ICs and existing shallow surficial caps to protect against potential releases and exposures from incidental shallow utility installations, maintenance, repair, or improvements common to active commercial and light industrial facilities.

Alternative 5 provides the greatest degree of long-term effectiveness and permanence. Under Alternative 5, all subsurface soil containing constituents at concentrations greater than the PRGs would be removed from the Site except for areas beneath roadways and remaining buildings.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 would not reduce the toxicity, mobility, or volume of soil contaminants since no material would be treated, removed, or capped.

Alternative 2, capping, would reduce mobility of contaminants but it involves no treatment of the contaminants, and therefore, no reduction in toxicity or volume. The principal threat waste LNAPL would not be treated under this alternative.

Alternatives 3 and 4 would provide the highest degree of reduction of toxicity, mobility, or volume through treatment. The principal threat waste LNAPL, would be treated through the construction of a recovery system in Subarea 2, which would reduce the LNAPL mobility, while LNAPL bioremediation would reduce its toxicity, mobility, and volume.

Alternative 5 does not provide for reduction of toxicity, mobility, or volume through treatment because soil removal, not treatment, would be used for this alternative.

5. Short-Term Effectiveness

Short-term effectiveness considers the effects the implementation of an alternative will have on the community, workers, and the environment, and the amount of time until an alternative effectively protects human health and the environment.

Alternative 1 does not present any short-term risks to site workers or the environment because it does not include active remediation work.

Under Alternatives 2 through 5, potential adverse short-term effects to the community increase with each successive alternative.

Risks to site workers, the community, and the environment include potential short-term exposure to contaminants during soil excavation. Potential exposures and environmental impacts associated with dust and runoff would be minimized with proper installation and implementation of dust and erosion control measures and monitoring. Subareas 5 and 6 of the Site consist of wooded areas and wetlands. Under Alternatives 2 through 5, it would be necessary to remove trees and vegetation, as well as disrupt the small streams and associated wildlife in Subareas 5 and 6. Alternatives in which the largest quantity of soil is removed would have the greatest area of impact, would require the longest period of time to complete, and would have the highest potential for short–term adverse effects. Among Alternatives 2 through 5, Alternative 2 would take the shortest time to achieve protection of human health and the environment and would, therefore, have the lowest potential for short-term adverse effects. Alternative 5 would involve the most invasive method of soil remediation and would take the longest time to implement and, therefore, would have the highest potential for short-term adverse effects.

6. Implementability

Because Alternative 1 would not entail any construction, it would be most easily implemented.

Alternative 2, capping, is readily implementable since much of the area in need of capping would rely on the existing buildings, concrete building slabs, and asphalted parking areas and roadways, with the exception of Subareas 3, 5, and 6.

Alternatives 3 through 5 have common implementability issues related to the removal of contaminated soil and installation of the caps. These include short-term traffic disruption on West Clementon Road, Foster Avenue and United States Avenue. The amount of disruption depends on the location of the contaminated soil, the amount of soil removed and the amount of time it takes for removal.

The increased volume of soil removal associated with Alternatives 3, 4, and 5 increases the implementation difficulties compared to Alternative 2.

In Alternatives 3 through 5, deep excavations to remove groundwater source areas in Subareas 1 and 5 present implementability challenges. Alternative 4 presents greater implementability challenges than Alternative 3, and Alternative 5 presents greater implementability challenges than Alternative 4, due to the additional volume of soil to be removed. The implementation issues related to road disruptions, capping, and off-site disposal can be managed through common engineering controls.

7. Cost

The total estimated present worth costs of the Soil Alternatives, calculated using the 7% discount rate, are:

- Alternative 1 - $0
- Alternative 2 - $5,919,885
- Alternative 3 - $27,620,000
- Alternative 4 - $34,259,000
- Alternative 5 - $105,574,000

EVALUATION OF SEDIMENT ALTERNATIVES

1. Overall Protection of Human Health and the Environment

Alternative 1 is not protective of human health or the environment because no action would be taken to address sediment contamination.

Alternative 2 would provide protection of human health and the environment by removing the sediment containing the highest concentrations of constituents and providing a cap to prevent human and ecological exposure to the remaining sediment that contains contaminants at concentration greater than the cleanup goals.

Alternative 3 would provide human health and ecological receptor protection by removing the sediment containing contaminants at concentrations greater than the PRGs and placing clean material in the stream bed as part of the restoration.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

There are no promulgated sediment cleanup values, therefore site-specific protective cleanup values were developed and can be met. Alternatives 2 and 3 would comply with action and location-specific ARARs that apply to remediation and filling in floodplains, work in wetland areas (NJDEP Wetlands Protection Act Rules), waste management (Resource Conservation Recovery Act Land Disposal Restrictions), and storm water management.

3. Long-Term Effectiveness and Permanence

Alternative 1 would allow existing contamination, and ecological exposures and risks to remain. No routine monitoring of contaminants or site conditions would be conducted to determine if natural processes are reducing the surface concentrations of contaminants in sediment.

The cap associated with Alternative 2 would be installed in Upper Hilliards Creek sediment. This alternative would be effective in maintaining protection of human health and the environment in the capped section of the water body. Such protectiveness would remain only as long as the cap remains in place. This alternative would require continued maintenance to ensure long-term effectiveness.

Alternative 3 would remove all sediment contamination from Upper Hilliards Creek. Alternative 3 would be more effective and have a higher degree of permanence than Alternative 2 since all contaminated sediment exceeding PRGs would be removed under Alternative 3.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

The major contamination in sediment at the Site is metals. The sediment alternatives, except No Action, involve removal and/or capping of the sediment. Although removal of the contaminated sediment would decrease the volume, and capping would decrease the mobility of contamination at the Site, no sediment alternative reduces the toxicity, mobility, or volume through treatment. Volume of contaminants at the Site would be reduced to a greater extent in Alternative 3 versus Alternative 2, as more contamination is removed from the Site; however, volume would not be reduced through treatment. Contaminants in excavated sediment would be transferred to a landfill without treatment.

5. Short-Term Effectiveness

Alternative 1 does not present any short-term risks to the community, site workers, or the environment because this alternative does not include remediation work.

Alternatives 2 and 3 involve excavation and thus have potential for short-term adverse effects. Potential risks posed to site workers, the community, and the environment during implementation of each of the sediment alternatives could be due to wind-blown or surface water transport of contaminants. Any potential impacts associated with dust and runoff would be minimized through proper installation and implementation of dust and erosion control measures. The areas would be monitored throughout the construction.

The potential risk of sediment release could increase with Alternatives 2 and 3, due to removal of existing vegetation. However, this could be managed with proper engineering controls. There is little difference in the implementation time from the shortest (two months) to the longest (three months). Therefore, Alternatives 2 and 3 are equal in terms of short-term effectiveness.

6. Implementability

Sediment Alternative 1 would not include any construction, and therefore would be easily implemented.

Alternatives 2 and 3 require sediment removal and face similar implementability challenges. Such challenges include access to low lying saturated areas, control of surface water flow, controlling groundwater intrusion into excavation areas, streambed stabilization, and wetland restoration.

The implementability challenges increase with the volume of sediment to be removed. Alternative 2 calls for the least amount of sediment removal and therefore presents the least amount of implementability challenges among the alternatives. In contrast, Alternative 3 poses slightly higher implementability challenges since it requires the largest remediation area and involves deeper removal of sediment.

7. Cost

The total estimated present worth costs of the Sediment Alternatives, calculated using the 7% discount rate, are:

- Alternative 1 - $0
- Alternative 2 - $1,610,000
- Alternative 3 - $1,759,000

PREFERRED ALTERNATIVES

The preferred soil alternative for the OU2 cleanup of the Sherwin-Williams/Hilliards Creek Superfund site is Alternative 4, Intermediate and Deep Soil Removal, LNAPL Removal/Bioremediation, Soil Gas Removal, Capping and Institutional Controls. The preferred alternative for sediment is Alternative 3, Excavation. As discussed above, the surface water will be monitored to determine the effectiveness of the implemented soil and sediment remedies. Together, these three elements comprise EPA's Preferred Alternatives.

Soil:

The Preferred Soil Alternative 4 (Figures 9 and 10) involves excavation, capping, off-site disposal of soil, and bioremediation of LNAPL. The major components of the Preferred Soil Alternative include:

- Excavation, transportation, and disposal of 67,000 CY of contaminated soil from Subareas 1, 4, 5, and 6.

- Excavation of soil up to depths of 15 feet in Subarea 1, to remove saturated soils containing arsenic that are the source to shallow groundwater contamination.

- Removal of soil in Subarea 1 containing PCBs at concentrations greater than 50 mg/kg.

- Removal of any underground structures that may be a source of contamination from all six subareas.

- Installation of a cap in Subareas 1, 2, 4, and 5.

- Restoration and revegetation of Subareas 1 and 5.

- Installation of a LNAPL recovery system Subarea 2.

- Injection of nutrients to stimulate existing LNAPL biodegradation in Subareas 2 and 3.

- Installation of a system to remove soil gas for the subsurface in Subarea 2.

- Excavation of soil containing LNAPL from Subarea 4 to an approximate depth of five to seven feet.

- Installation of a collection trench south of Foster Avenue to prevent LNAPL transport to Subareas 4 and 6.

- Removal of soil from Subarea 5 to a depth of 8 feet below ground surface to address the source of PCP in groundwater.

- Development of a site-specific impact to groundwater cleanup goal for PCP in Subarea 5, and removal of unsaturated soil exceeding such goal.

- Restoration of excavated areas and maintenance of the existing soil cap present across the remainder of Subarea 5.

- Excavation of all soil and sediment contaminants greater than their cleanup goals in Subarea 6.

- ICs, such as a deed notice, to inform the user of potential exposure to residual soils which exceed levels that allow for unrestricted use in Subareas 1, 2, 4, and 5. ICs would be established for areas of roadways that exceed NRDCSRS.

This alternative will remove soil within the saturated zones that contribute contaminants to groundwater in Subareas 1 and 5. By removing these saturated soils, the concentrations of contaminants in groundwater that exceed ground water quality standards (NJGWQS) is expected to be reduced. This alternative would generally remove the highest concentrations of soil contamination in Subarea 1, while capping remaining areas soils with lower concentrations.

The Preferred Soil Alternative was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through a combination of bioremediation of deep LNAPL, off-site disposal of soil contaminants, and the use of engineering and institutional controls, and is expected to allow the Site to be used for its reasonably anticipated future land use, which is commercial/residential. The Preferred Soil Alternative reduces the risk within a reasonable time frame, at a cost comparable to other alternatives, and provides for long-term reliability of the remedy.

The Preferred Soil Alternative will achieve cleanup goals that are protective for residential use. Though the remedy will be protective for this use, it will not achieve levels that would allow for unrestricted use since contamination would be left at depth in some areas, and therefore, ICs, such as deed notices will be required. Five-year reviews will be conducted since contamination will remain above levels that allow for unlimited use and unrestricted exposure.

Sediment:

The Preferred Sediment Alternative 3 (Figure 12) includes excavation of sediment with contaminant levels greater than the PRGs from Subarea 6. The major components of the Preferred Sediment Alternative include:

- Construction of a stream diversion system to allow access to sediments.
- Excavation of contaminants to depths ranging from 2 to 7 feet below sediment surface.
- Excavation, transportation, and disposal of an estimated 1,400 CY of contaminated sediment.
- Dewatering and processing of excavated sediment.
- Stream bank revegetation and restoration.

Deeper excavations of contaminated sediment will occur from the portion of Upper Hilliards Creek adjacent to the 1 Foster Avenue building. After remediation of sediment, the restored stream banks, riparian zone, and wetlands will be monitored for a period of five years to assure successful restoration of these areas.

The Preferred Sediment Alternative was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through off-site disposal of sediment by reducing contaminant levels in Upper Hilliards Creek. The Preferred Sediment Alternative 3 reduces risk within a reasonable timeframe, at a cost comparable to the other alternatives, and provides for long-term reliability of the remedy.

Surface Water:

Surface water monitoring will be conducted on a quarterly basis to assess any changes in contaminant conditions over time. It is expected that removal of contaminated sediment, combined with soil removal, and/or capping will result in a decrease of surface water contaminants to levels below NJSWQS. If monitoring indicates that contamination levels have not decreased to below the NJSWQS, EPA may require an action in the future.

The Preferred Alternatives are believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time. EPA believes the Preferred Alternatives will be protective of human health and the environment, will comply with ARARs, will be cost-effective, and will utilize permanent solutions. The selected alternatives may change in response to public comment or new information. The total present worth cost for both the soil and sediment preferred alternatives is $36,018,000.

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

State Acceptance

The state of New Jersey concurs with EPA's Preferred Alternatives for soil and sediment, however, the state cannot concur with the capping and institutional control component of the preferred soil alternative unless the property owners provide their consent to the placement of a cap and a deed notice.

Community Acceptance

Community acceptance of the Preferred Alternatives will be evaluated after the public comment period ends and will be described in the Record of Decision. Based on public comment, the Preferred Alternatives could be modified from the version presented in this Proposed Plan. The Record of Decision is the document that formalizes the selection of the remedy for a site.

COMMUNITY PARTICIPATION

EPA provided information regarding the cleanup of OU2 for the Site through meetings, the Administrative Record file for the Site, and announcements published in the local newspaper. EPA encourages the public to gain a more comprehensive understanding of the Site.

The dates for the public comment period, the date, the location and time of the public meeting, and the locations of the Administrative Record file are provided on the front page of this Proposed Plan.

For further information on EPA's Preferred Alternative for OU2 of the Site, please contact:

Ray Klimcsak
Remedial Project Manager
Klimcsak.Raymond@epa.gov
(212) 637-3916

U.S. EPA
290 Broadway 19th Floor
New York, New York 10007-1866

Pat Seppi
Community Relations
Seppi.Pat@epa.gov
(212) 637-3679

U.S. EPA
290 Broadway 26th Floor
New York, New York 10007-1866

On the Web at:
http://epa.gov/superfund/sherwin-williams

Table 3 - Preliminary Remediation Goals for Soil and Sediments* Contaminants of Concern

Contaminants	NJ Residential Direct Contact Soil Remediation Standard (mg/kg)	NJ Non-Residential Direct Contact Soil Remediation Standard** (mg/kg)	Default NJ Impact to GW Screening Levels - IGWSSL (Above the Water Table) (mg/kg)	Ecological PRGs for Upper Hilliards Creek Floodplain Soils (top 1 foot) and Sediments (both mg/kg)	Site Specific Soil Value for Saturated Soils (mg/kg)
Metal Contaminants					
Arsenic	19	19	19	19	50
Cyanide	47	680	20	58	---
Lead	400***	800	90	213	---
Semi-Volatile Organic Compound Contaminants					
Naphthalene	6****	17	25	---	---
Pentachlorophenol	0.9	3	0.3	---	15
Volatile Organic Compound Contaminants					
Benzene	2	5	0.005	---	---
Polycyclic Aromatic Hydrocarbons (PAHs) Contaminants					
Benzo(a)anthracene	5	17	0.8	---	---
Benzo(b)fluoranthene	5	17	2	---	---
Benzo(a)pyrene	0.5	2	0.2	---	---
Dibenzo(a, h)anthracene	0.5	2	0.8	---	---
Indeno (1,2,3 – CD) pyrene	5****	17	7	---	---
Polychlorinated Biphenyls (PCBs) Contaminants					
Aroclor 1254	0.2	1	0.2	---	---
Aroclor 1260	0.2	1	0.2	---	---

*The ecologically derived sediment cleanup values are also being utilized for the top 1 foot of floodplain soils.
**The NJDEP Non-Residential Direct Contact Soil Remediation Standard (NRDCSRS) are applicable to soil contaminants which may exist under Foster and United States Avenue.
*** Additionally, to achieve the risk reduction goal established for the Site, which is to limit the probability of a child's blood lead level exceeding 5 µg/dL to 5% or less, the average lead concentration across the surface of the remediated area must be at or below 200 mg/kg.
**** The RDCSRS will be used as a cleanup goal when the RDCSRS is more stringent than the IGWSSL.

Table 4 – Preliminary Remediation Goals for LNAPL Contamination

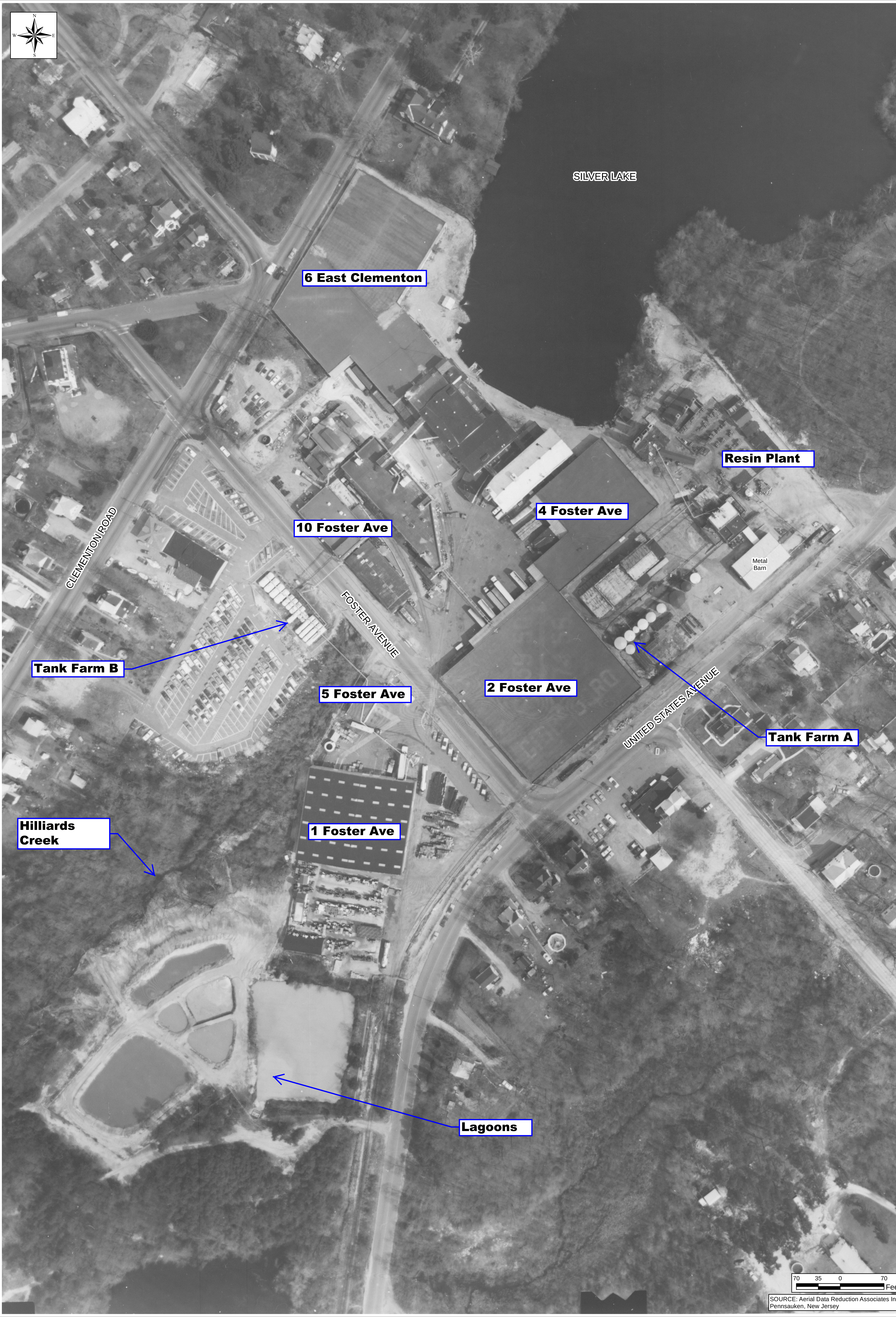
Contaminant	NJ Groundwater Quality Standards	NJ Interim Groundwater Quality Standards for Tentatively Identified Compounds (TICs) µg/L	Methane Concentrations
Petroleum Hydrocarbons*	None Noticeable	--	--
Total VOC and/or SVOC TIC Compounds in groundwater**	--	500 µg/L	--
Individual VOC and/or SVOC TIC Compound in groundwater**	--	100 µg/L	--
Total Carcinogenic VOC and/or SVOC TIC Compounds in groundwater**	--	25 µg/L	--
Individual Carcinogenic VOC and/or SVOC TIC Compound in groundwater**	--	5 µg/L	--
Indoor air methane concentrations must be addressed:	--	--	Not to exceed the Lower Explosive Limit (LEL)

* LNAPL at Site is comprised of residual petroleum hydrocarbons (likely the source of the methane), degraded mineral spirits, and a combination of SVOC and VOC TICs.

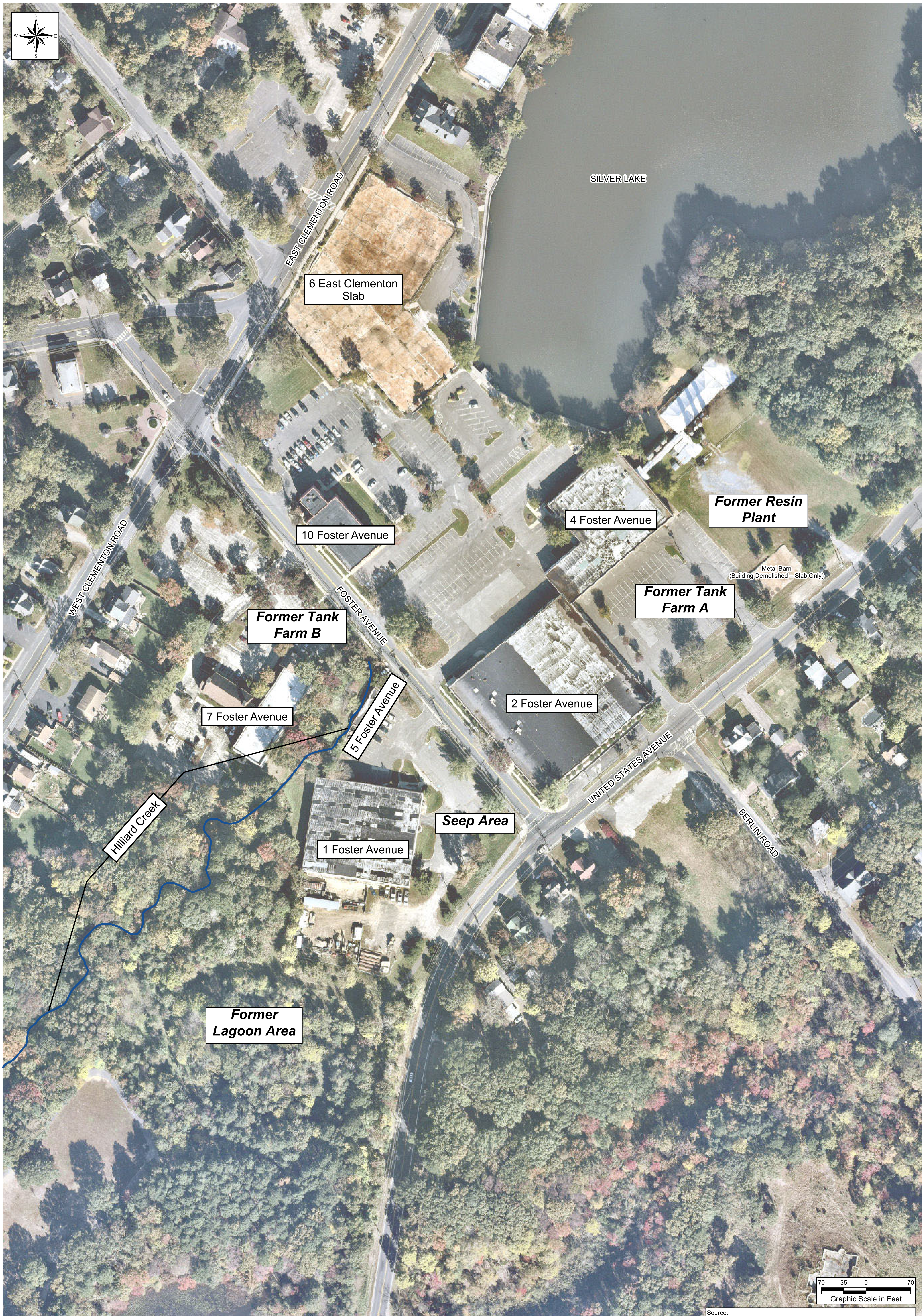
**The EPA preferred OU2 actions will address soil contamination in shallow groundwater. EPA will select a future remedial alternative to address groundwater contamination at the Site as part of Operable Unit 3 (OU3).

L:\SHERWIN\GIS\MXD\2019_01_FMP_FS\23265_Comp_Site_Map.mxd

PROJECT NAME:	TITLE:
Former Manufacturing Plant Feasibility Study	COMPREHENSIVE SITE MAP
CLIENT NAME: The Sherwin-Williams Company	
REPORT DATE: January 2019	DATE: 1/10/2019 — FIGURE #: 1



WESTON SOLUTIONS SM Weston Solutions, Inc. 205 Campus Drive Edison, New Jersey 08837-3939 TEL: (732) 417-5800 Fax: (732) 417-5801 http://www.westonsolutions.com	REPORT DATE: February 2014	PROJECT MANAGER: S. Jones	CLIENT NAME: The Sherwin-Williams Company	DRAWING TITLE: FORMER MANUFACTURING PLANT 1975 AERIAL PHOTOGRAPH
	DRAWING: 14333_FMP_1975_Aerial.mxd PATH: L:\SHERWIN\GIS\MXD\2014_02_EPA_Meeting_021114\	CHECKED BY: A. Fischer		
	REVISION No. 0	CONTRACT No. DELIVERY ORDER NO.	PROJECT NAME: Sherwin-Williams Remedial Investigation	
	WORK ORDER No. 20076.022.048.0002	DRAWN/MODIFIED BY: K. Heulitt DATE CREATED: 2-6-2014		Figure 2 | SCALE: 1" = 70' | DATE: 2-6-2014

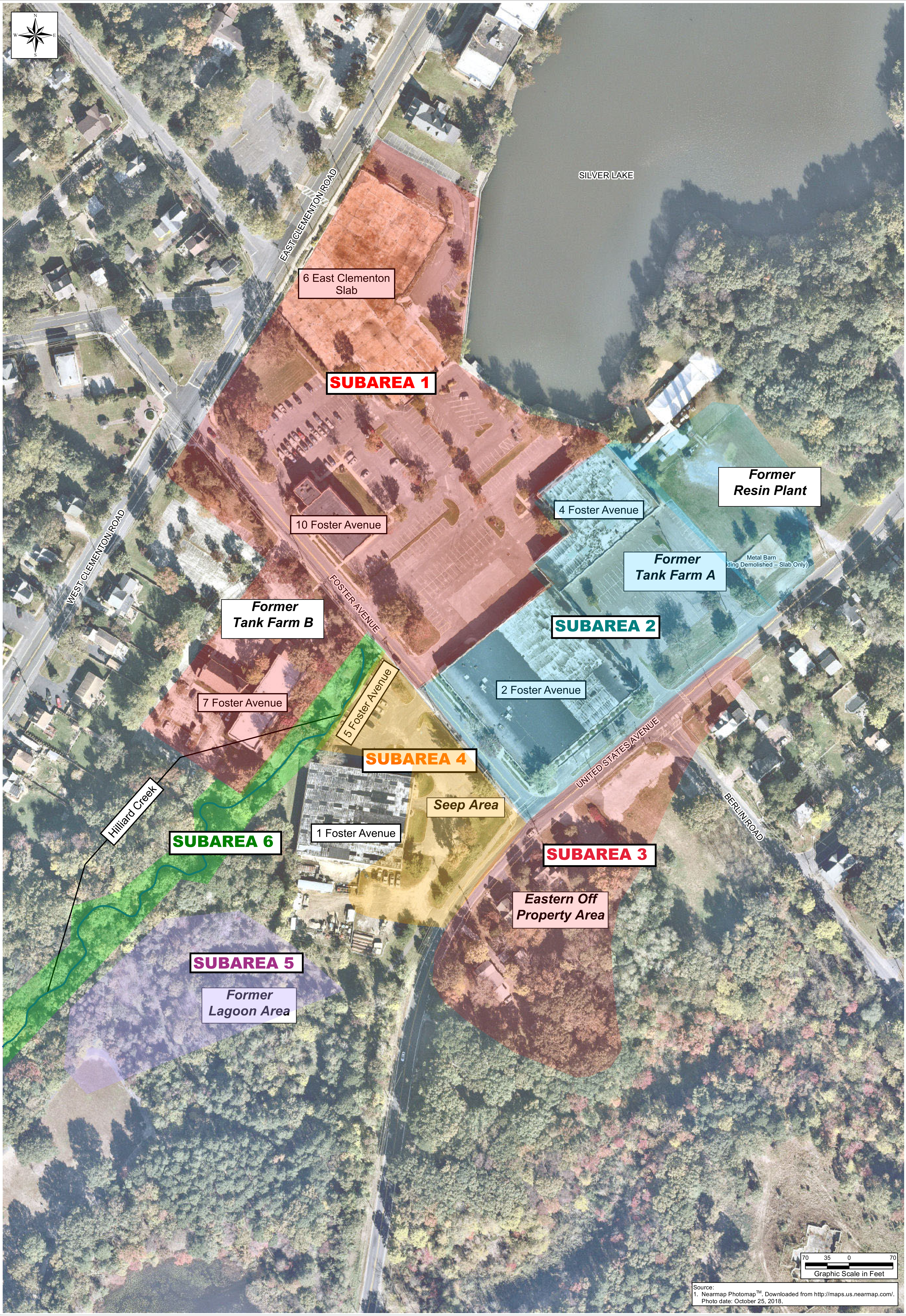


Source:
1. Nearmap Photomap™. Downloaded from http://maps.us.nearmap.com/. Photo date: October 25, 2018.

WESTON SOLUTIONS

Weston Solutions, Inc.
205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com

REPORT DATE: February 2019	PROJECT MANAGER: D. Kane	CLIENT NAME: The Sherwin-Williams Company	**Figure 3: Site Layout**
DRAWING: 23525_FMP_Site_Aerial_Hist_Labels.mxd PATH: L:\SHERWIN\GIS\MXD\2019_02_FMP\	CHECKED BY: A. Fischer		
REVISION No. 0	CONTRACT No. DELIVERY ORDER NO.	PROJECT NAME: Sherwin-Williams Remedial Investigation	
WORK ORDER No. 20076.022.090.0001	DRAWN/MODIFIED BY: J. Heaton DATE CREATED: 2/13/2019		ATTACHMENT: 2 SCALE: 1" = 70' DATE: 2/13/2019



Source:
1. Nearmap Photomap™. Downloaded from http://maps.us.nearmap.com/. Photo date: October 25, 2018.

Weston Solutions, Inc.
205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com

REPORT DATE: February 2019	PROJECT MANAGER: D. Kane
DRAWING: 23525_FMP_Site_Aerial_Hist_Labels.mxd PATH: L:\SHERWIN\GIS\MXD\2019_02_FMP\	CHECKED BY: A. Fischer
REVISION No. 0	CONTRACT No. DELIVERY ORDER NO.
WORK ORDER No. 20076.022.090.0001	DRAWN/MODIFIED BY: J. Heaton DATE CREATED: 2/13/2019

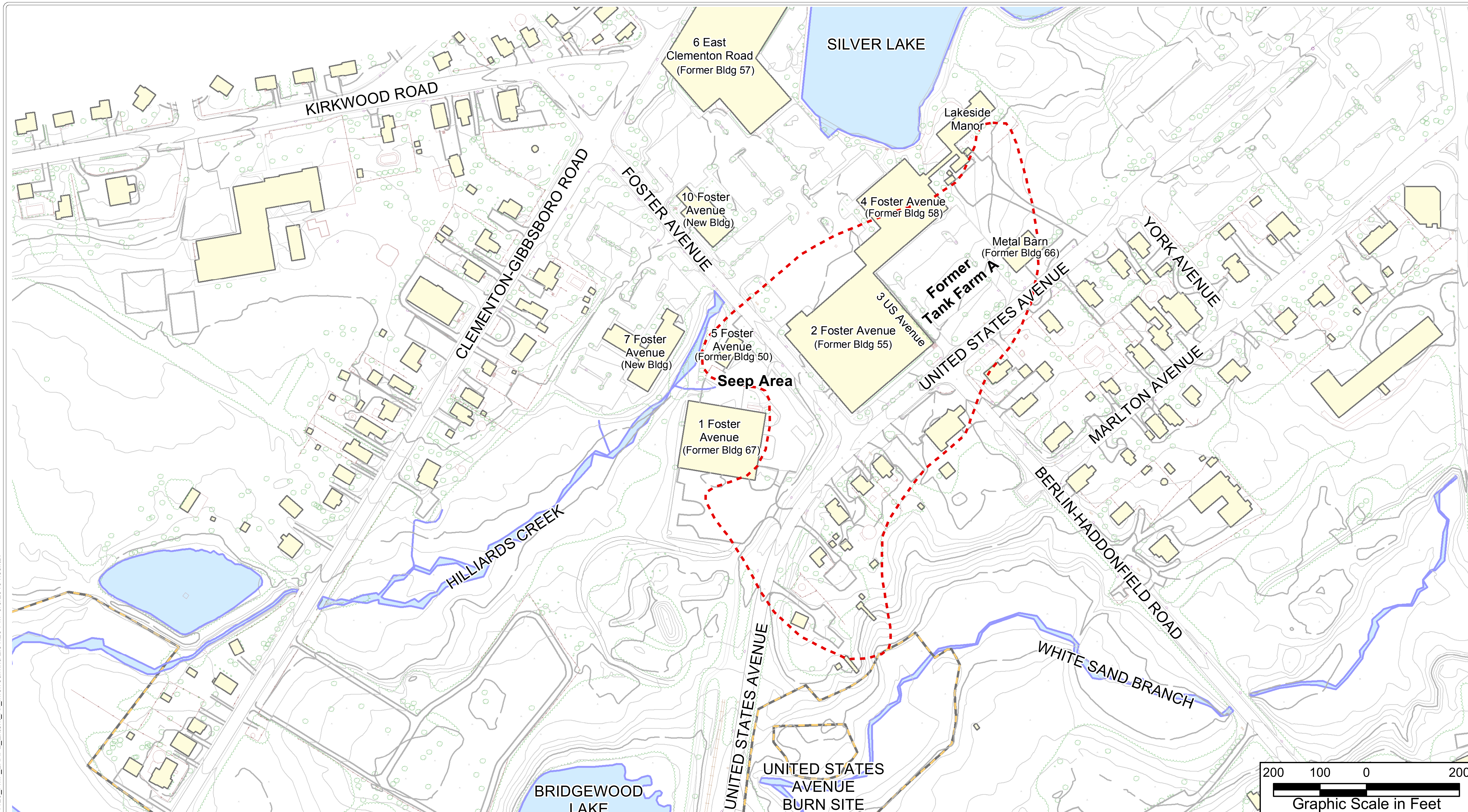
CLIENT NAME: The Sherwin-Williams Company

PROJECT NAME: Sherwin-Williams Remedial Investigation

Figure 4:

Site Sub Areas

ATTACHMENT: 2 SCALE: 1" = 70' DATE: 2/13/2019



Legend

Inferred Extent of LNAPL

Source:
EHS Support. Figure 6: Interpreted Extent of LNAPL. Undated.

L:\SHERWIN\GIS\MXD\2019_02_FMP\24129_FMP_LNAPL_Extent_All_Inferred.mxd 2:51:26 PM 6/3/2019 heulittk

PROJECT NAME:
Former Manufacturing Plant
LNAPL Investigation Report

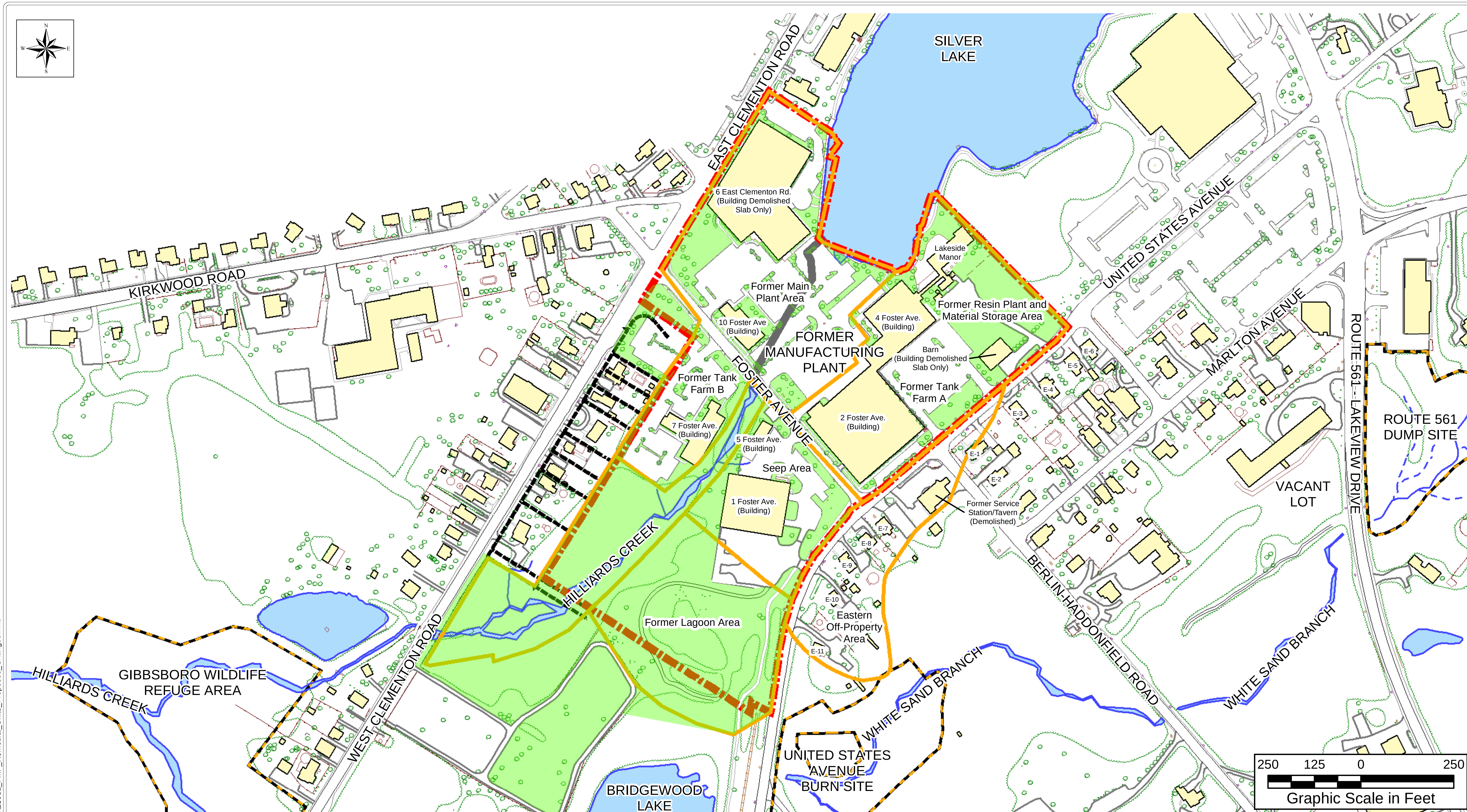
CLIENT NAME:
The Sherwin-Williams Company

REPORT DATE:
May 2019

TITLE:
EXTENT OF LNAPL

DATE:
5/30/2019

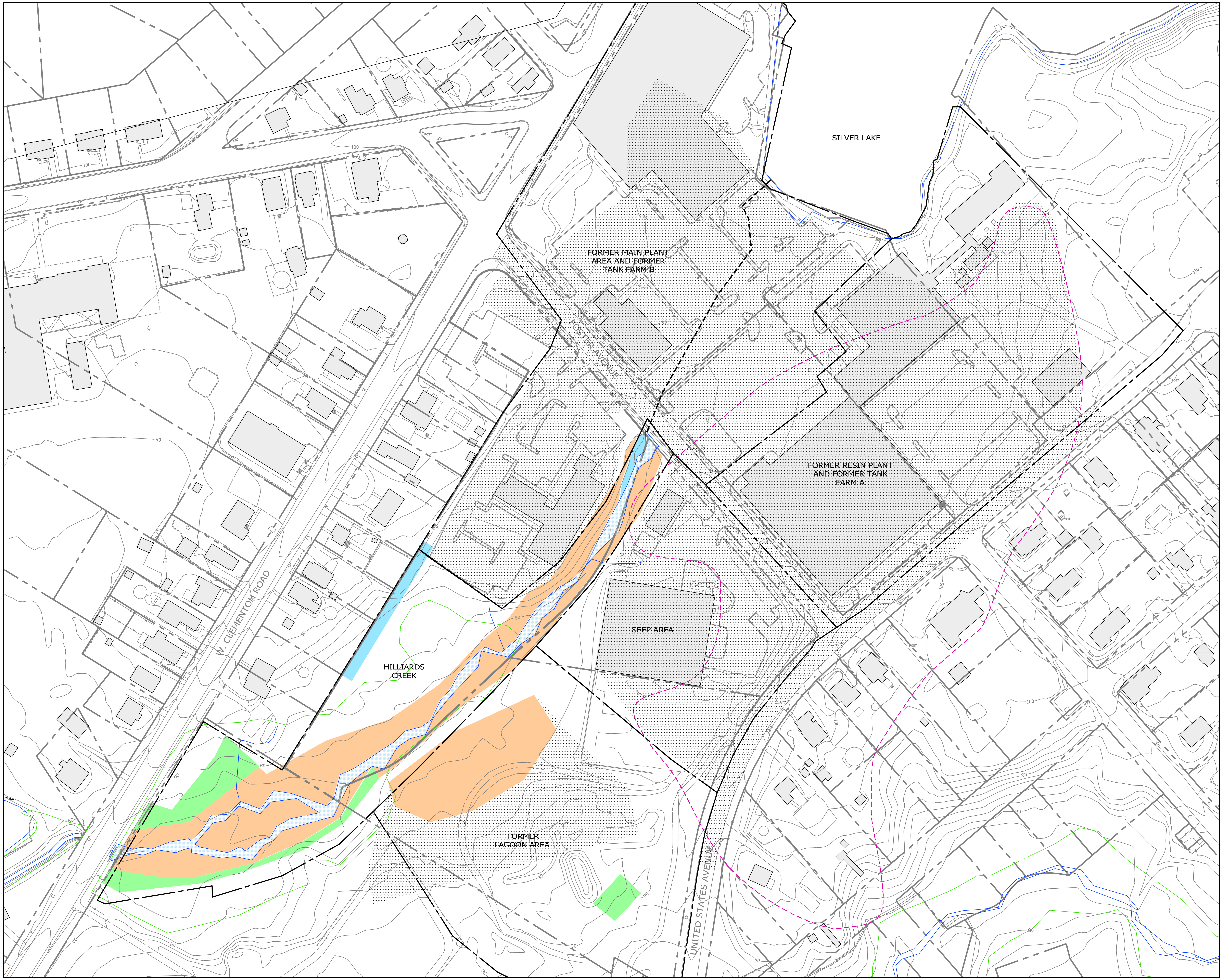
FIGURE #:
5



Legend

- Former Manufacturing Plant Remedial Units
- Former Manufacturing Plant Extent
- Unpaved Areas
- Surveyed Property Boundary (2015)
- Approximate Location of Silver Lake Conveyance

PROJECT NAME: Former Manufacturing Plant Feasibility Study	TITLE: FORMER MANUFACTURING PLANT PAVED vs. VEGETATED COVER	
CLIENT NAME: The Sherwin-Williams Company		
REPORT DATE: May 2019	DATE: 4/26/2019	FIGURE #: 6



LEGEND

- INTERPRETED EXTENT OF LNAPL
- PROPERTY LINE
- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- 1-FOOT EXCAVATION FOR PRGs AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 2 FEET
- EXISTING SURFACE COVER REMAINS AND IS MAINTAINED AS CAP

NOTES:
1. PRG - PRELIMINARY REMEDIATION GOALS.
2. RDCSRS - NEW JERSEY DEPARTMENT ENVIRONMENTAL PROTECTION RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARDS.
3. ALL CAPS REPRESENT ENGINEERING CONTROLS.
4. DEED NOTICES ARE TO BE ESTABLISHED AS INSTITUTIONAL CONTROLS FOR ALL PROPERTIES WITH A CAP.
5. LNAPL MANUAL RECOVERY TO BE IMPLEMENTED FOR THE SEEP AREA AND THE FORMER RESIN PLANT AND TANK FARM A UTILIZING EXISTING MONITORING WELLS.

SOURCE:
1. BASEMAP, WESTON SOLUTIONS, 2016.
2. PARCELS OF CAMDEN COUNTY, NEW JERSEY 2016, CAMDEN COUNTY IMPROVEMENT AUTHORITY, 2/26/2014, GIS SHP FILE http://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

0 70 140

SCALE: 1" = 70'

TITLE:

FIGURE 7
SOIL REMEDIAL ALTERNATIVE 2

LOCATION:

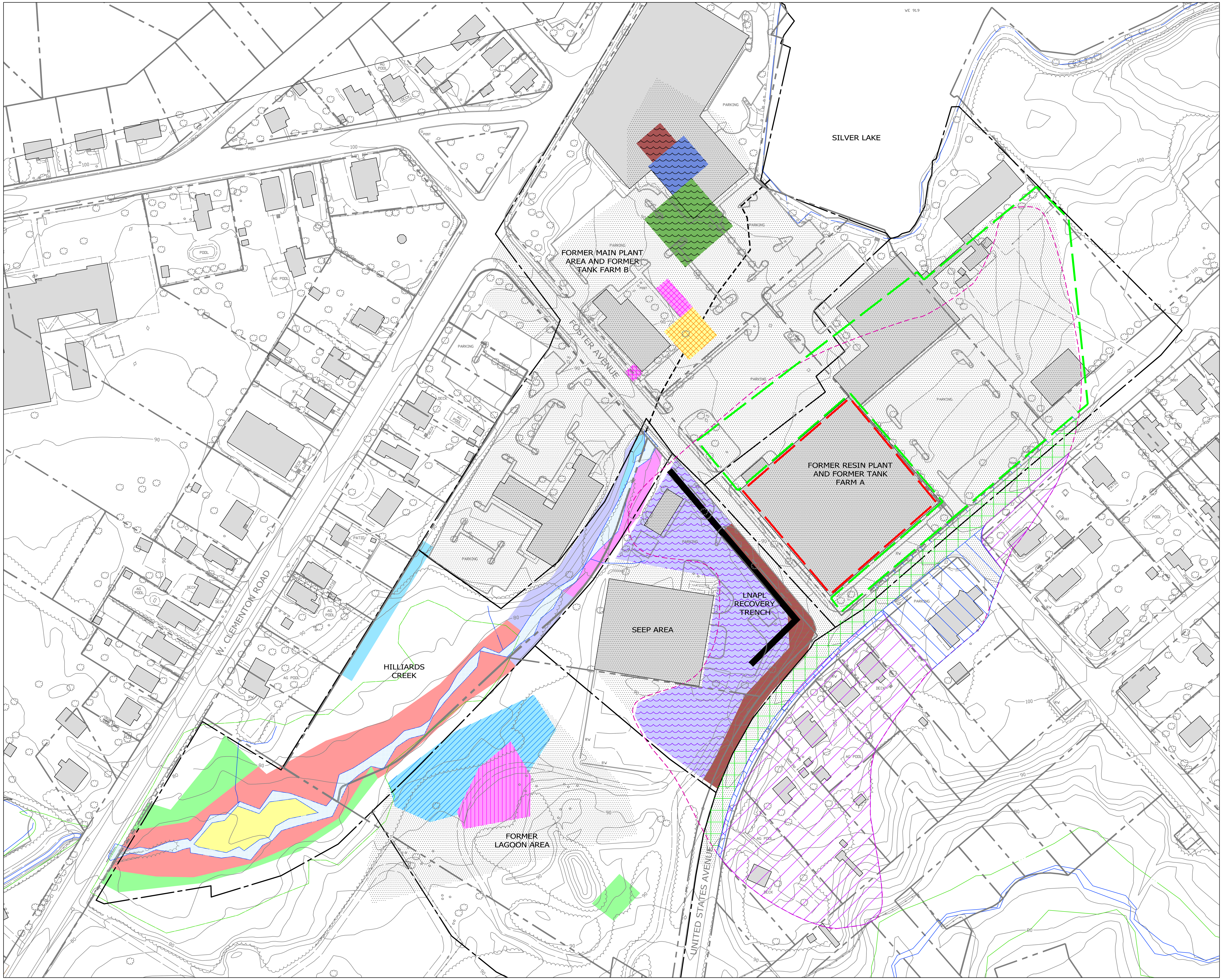
THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

DATE: 1/10/19

FILENAME: 204027_FMP_FS_SOIL

LAYOUT: SOIL_ALT2_R1

THE ELM GROUP
345 WALL STREET, PRINCETON, NEW JERSEY 08540
4936 YORK ROAD, SUITE 1000, HOLICONG, PENNSYLVANIA 18928
612 MAIN STREET, BOONTON, NEW JERSEY 07005
2436 EMRICK BOULEVARD, BETHLEHEM, PENNSYLVANIA 18020
www.ExploreELM.com



LEGEND

- INTERPRETED EXTENT OF LNAPL
- PROPERTY LINE
- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- 1-FOOT EXCAVATION FOR PRGs AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 3-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 4-FOOT EXCAVATION FOR PRGS AND RDCSRS AND NO CAP
- 5-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 6-FOOT EXCAVATION FOR PRGS AND RDCSRS AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 2 FEET
- 6-FOOT EXCAVATION FOR PRGS AND RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 6 FEET
- 4-FOOT EXCAVATION FOR TSCA COMPLIANCE AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 4 FEET
- 6-FOOT EXCAVATION FOR TSCA COMPLIANCE AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 6 FEET
- 5-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 10-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 12-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 15-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- EXISTING SURFACE COVER REMAINS AND IS MAINTAINED AS CAP
- EXTENT OF LNAPL EXTRACTION RECOVERY SYSTEM
- EXTENT OF LNAPL BIOREMEDIATION TREATMENT AREA
- AMENDMENT INJECTIONS USING DIRECT-PUSH
- SOIL GAS EXTRACTION AND PRESSURIZED AMENDMENT INJECTIONS
- CONTINGENT AMENDMENT INJECTIONS USING DIRECT-PUSH

NOTES:

1. PRG - PRELIMINARY REMEDIATION GOALS.
2. RDCSRS - NEW JERSEY DEPARTMENT ENVIRONMENTAL PROTECTION RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARDS.
3. ALL CAPS REPRESENT ENGINEERING CONTROLS.
4. DEED NOTICES ARE TO BE ESTABLISHED AS INSTITUTIONAL CONTROLS FOR PORTIONS OF FOSTER AVENUE AND UNITED STATES AVENUE.
5. PRGs APPLY TO THE TOP 1 FOOT OF SOIL IN UNDEVELOPED AREAS.
6. TSCA-EPA TOXIC SUBSTANCE COMPLIANCE ACT (40 CFR 760) - REMOVAL OF POLYCHLORINATED BIPHENYLS (PCBs) ABOVE 50 mg/Kg.
7. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 IS ENHANCED LNAPL BIODEGRADATION AND SOIL GAS REMOVAL.
8. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 INJECTION WELLS AND SOIL GAS EXTRACTIONS WELLS TO BE INSTALLED ON THE FORMER TAVERN/SERVICE STATION PROPERTY AND ON WEST SIDE OF UNITED STATES AVENUE.
9. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 PRESSURIZED NUTRIENT INJECTION WELLS TO BE INSTALLED ALONG THE UNITED STATES AVENUE RIGHT OF WAY EAST OF UNITED STATES AVENUE AND SOUTH OF THE FORMER TAVERN/SERVICE STATION.
10. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 DIRECT-PUSH NUTRIENT INJECTIONS WOULD BE INSTALLED BENEATH PROPERTIES E-1, E-7, E-8, E-9, E-10 AND E-11 WHERE LNAPL IS PRESENT.
11. OPERATION OF A NUTRIENT INJECTION AND SOIL GAS RECOVERY SYSTEMS.

SOURCE:

1. BASEMAP, WESTON SOLUTIONS, 2016.
2. PARCELS OF CAMDEN COUNTY, NEW JERSEY 2016, CAMDEN COUNTY IMPROVEMENT AUTHORITY, 2/26/2014, GIS SHP FILE http://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

0 70 140

SCALE: 1" = 70'

TITLE:

FIGURE 8
SOIL REMEDIAL ALTERNATIVE 3 AND EASTERN OFF-PROPERTY AREA ALTERNATIVE 2

LOCATION:

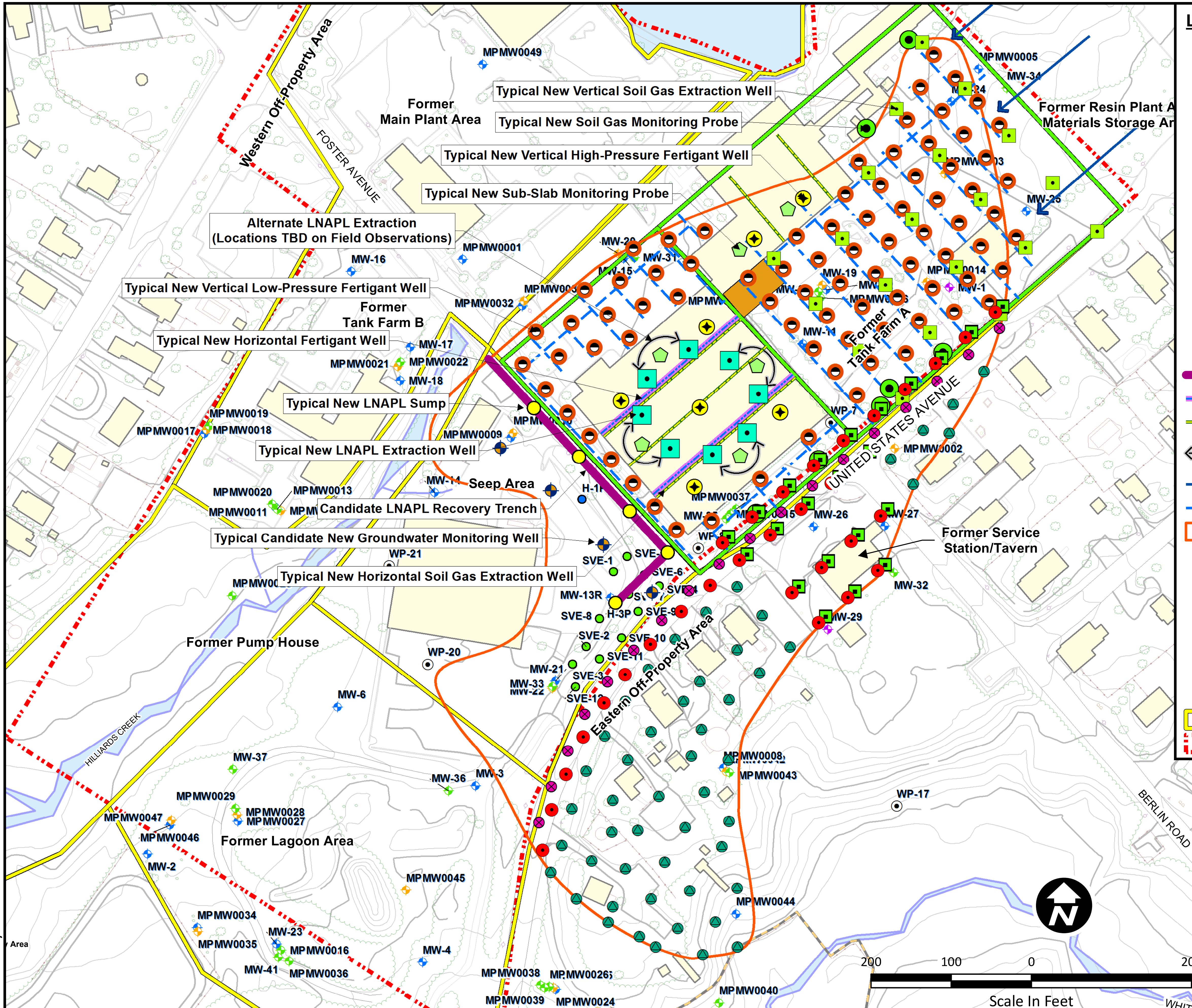
THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

DATE: 7/19/19

FILENAME: 204027_FMP_FS_SOIL_REV3

LAYOUT: SOIL ALT3 EOP ALT2

THE ELM GROUP
345 WALL STREET, PRINCETON, NEW JERSEY 08540
4936 YORK ROAD, SUITE 1000, HOLICONG, PENNSYLVANIA 18928
612 MAIN STREET, BOONTON, NEW JERSEY 07005
2436 EMRICK BOULEVARD, BETHLEHEM, PENNSYLVANIA 18020
www.ExploreELM.com



Conceptual Layout
Soil FS
Infrastructure Related to NAPL

FORMER MANUFACTURING PLANT
FEASIBILITY STUDY
THE SHERWIN-WILLIAMS COMPANY

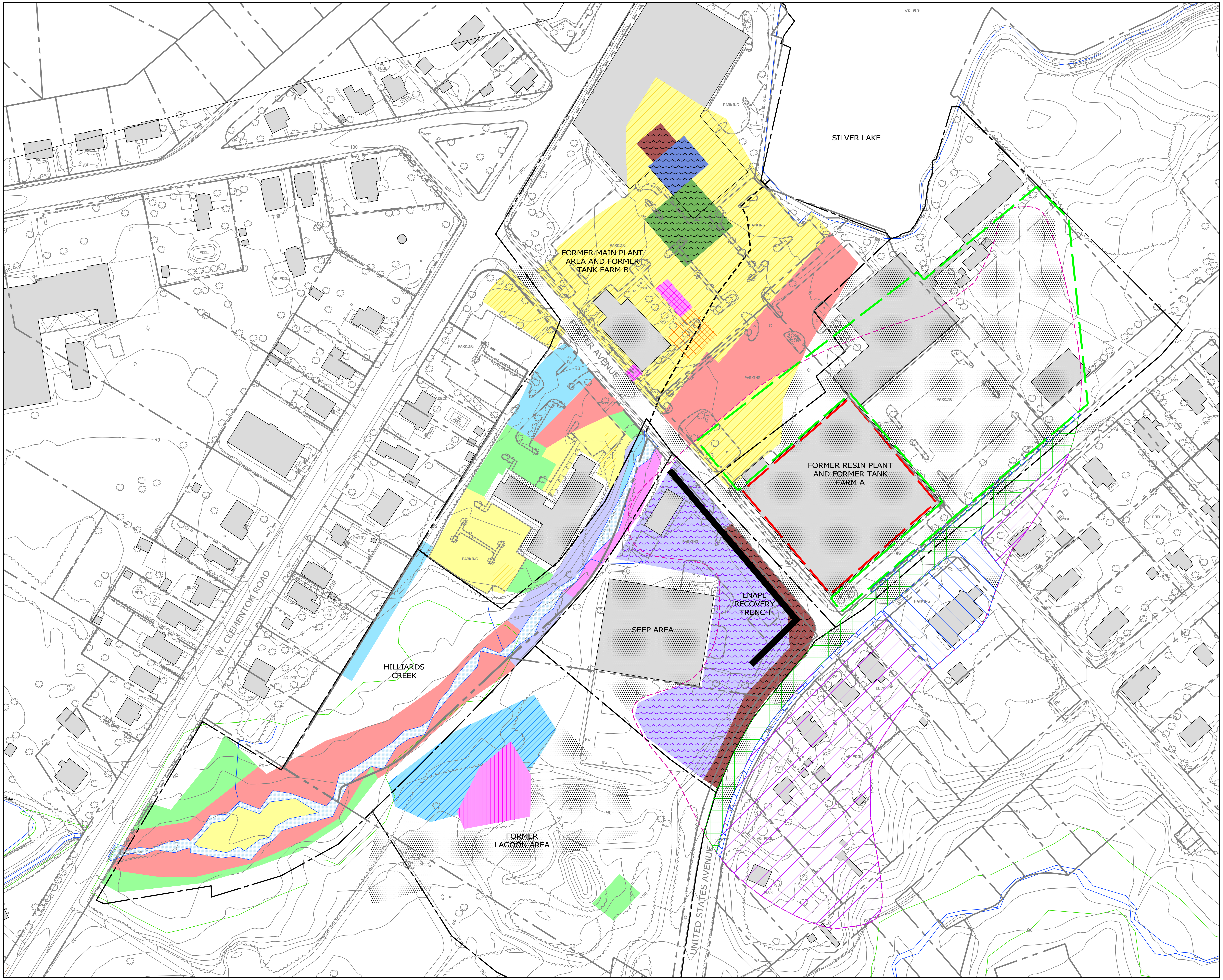
EHS Support

Figure 9

Reviewed By:

J:\EHSS_GIS\C05552_ThePaintCo\01_ANALYSIS\20180110_InvestigationReport\FigureX_InfrastructureBioremediation.mxd

Printed 6/3/2019 2:31:39 PM by Mick.Osburn



LEGEND

- INTERPRETED EXTENT OF LNAPL
- PROPERTY LINE
- FORMER MANUFACTURING PLANT REMEDIAL UNITS
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- 4-FOOT EXCAVATION FOR PRGS AND RDCSRS AND NO CAP
- 5-FOOT EXCAVATION FOR PRGs AND RDCSRS AND NO CAP
- 6-FOOT EXCAVATION FOR PRGS AND RDCSRS AND NO CAP
- 2-FOOT EXCAVATION FOR PRGs AND RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 2 FEET
- 4-FOOT EXCAVATION FOR RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 4 FEET
- 6-FOOT EXCAVATION FOR PRGS AND RDCSRS AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 6 FEET
- 4-FOOT EXCAVATION FOR TSCA COMPLIANCE AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 4 FEET
- 6-FOOT EXCAVATION FOR TSCA COMPLIANCE AND CAP FOR CONSTITUENTS GREATER THAN RDCSRS AT DEPTHS GREATER THAN 6 FEET
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- 10-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 12-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- 15-FOOT EXCAVATION FOR GROUND WATER SOURCE CONTROL AND NO CAP
- EXISTING SURFACE COVER REMAINS AND IS MAINTAINED AS CAP
- EXTENT OF LNAPL EXTRACTION RECOVERY SYSTEM
- EXTENT OF LNAPL BIOREMEDIATION TREATMENT AREA
- AMENDMENT INJECTIONS USING DIRECT-PUSH
- SOIL GAS EXTRACTION AND PRESSURIZED AMENDMENT INJECTIONS
- CONTINGENT AMENDMENT INJECTIONS USING DIRECT-PUSH

NOTES:

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8. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 INJECTION WELLS AND SOIL GAS EXTRACTIONS WELLS TO BE INSTALLED ON THE FORMER TAVERN/SERVICE STATION PROPERTY AND ON WEST SIDE OF UNITED STATES AVENUE.
9. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 PRESSURIZED NUTRIENT INJECTION WELLS TO BE INSTALLED ALONG THE UNITED STATES AVENUE RIGHT OF WAY EAST OF UNITED STATES AVENUE AND SOUTH OF THE FORMER TAVERN/SERVICE STATION.
10. EASTERN OFF-PROPERTY AREA ALTERNATIVE 2 DIRECT-PUSH NUTRIENT INJECTIONS WOULD BE INSTALLED BENEATH PROPERTIES E-1, E-7, E-8, E-9, E-10 AND E-11 WHERE LNAPL IS PRESENT.
11. OPERATION OF A NUTRIENT INJECTION AND SOIL GAS RECOVERY SYSTEMS.

SOURCE:

1. BASEMAP, WESTON SOLUTIONS, 2016.
2. PARCELS OF CAMDEN COUNTY, NEW JERSEY 2016, CAMDEN COUNTY IMPROVEMENT AUTHORITY, 2/26/2014, GIS SHP FILE http://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

0 70 140

SCALE: 1" = 70'

TITLE:

FIGURE 10
SOIL ALTERNATIVE 4

LOCATION:

THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

DATE: 9/30/2019

FILENAME: 204027_FMP_FS_SOIL_ALT3_rev1

LAYOUT: EPA_FIG10

THE ELM GROUP
345 WALL STREET, PRINCETON, NEW JERSEY 08540
4936 YORK ROAD, SUITE 1000, HOLICONG, PENNSYLVANIA 18928
612 MAIN STREET, BOONTON, NEW JERSEY 07005
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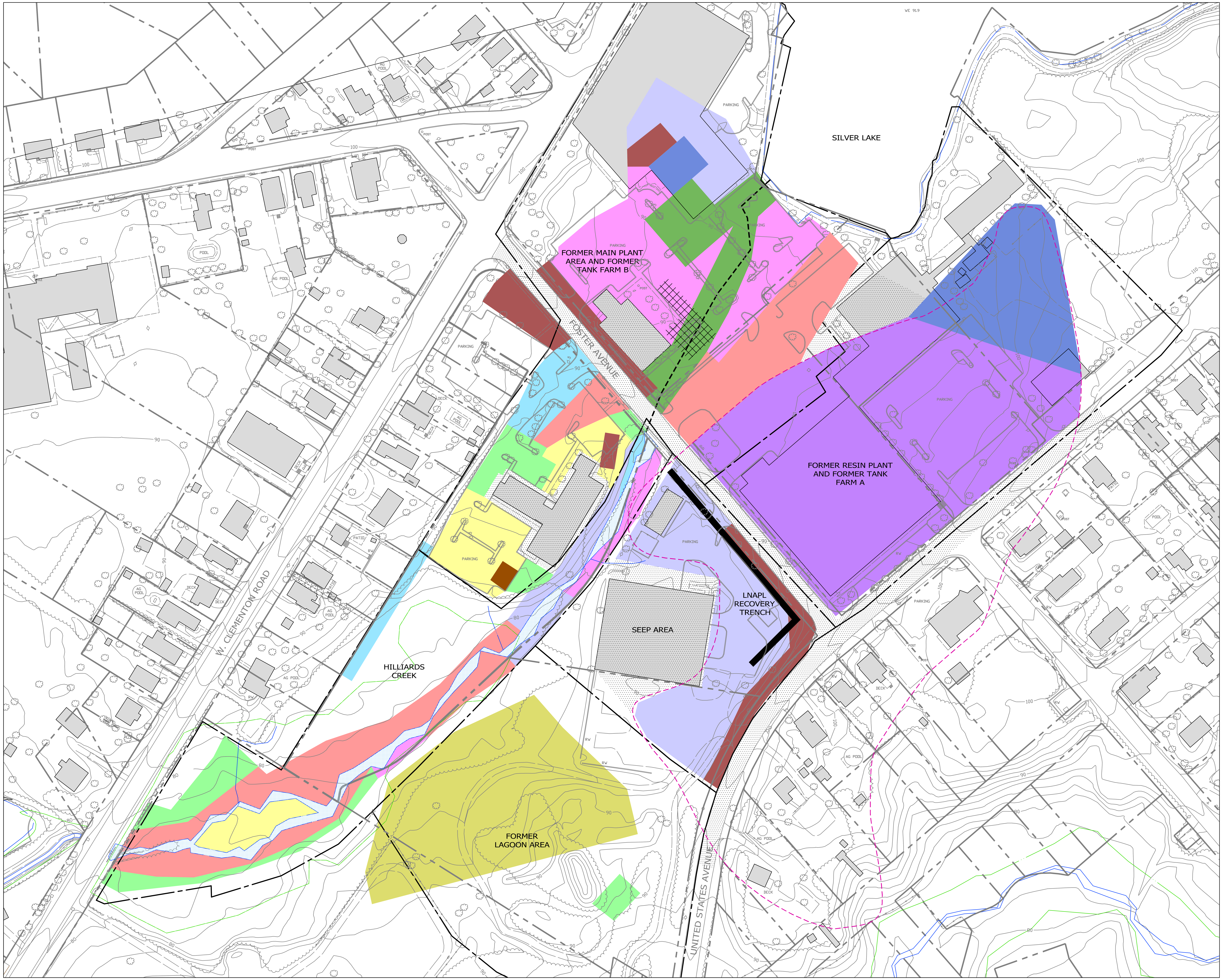

LEGEND

- INTERPRETED EXTENT OF LNAPL
- PROPERTY LINE
- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- 1-FOOT EXCAVATION AND NO CAP
- 2-FOOT EXCAVATION AND NO CAP
- 3-FOOT EXCAVATION AND NO CAP
- 4-FOOT EXCAVATION AND NO CAP
- 5-FOOT EXCAVATION AND NO CAP
- 6-FOOT EXCAVATION AND NO CAP
- 8-FOOT EXCAVATION AND NO CAP
- 10-FOOT EXCAVATION AND NO CAP
- 12-FOOT EXCAVATION AND NO CAP
- 15-FOOT EXCAVATION AND NO CAP
- 20-FOOT EXCAVATION AND NO CAP
- 25-FOOT EXCAVATION AND NO CAP
- TSCA PCB 4 AND 6-FOOT EXCAVATIONS
- EXISTING SURFACE COVER REMAINS AND IS MAINTAINED AS CAP

NOTES:
1. PRG - PRELIMINARY REMEDIATION GOALS.
2. RDCSRS - NEW JERSEY DEPARTMENT ENVIRONMENTAL PROTECTION RESIDENTIAL DIRECT CONTACT SOIL REMEDIATION STANDARDS.
3. ALL CAPS REPRESENT ENGINEERING CONTROLS.
4. DEED NOTICES ARE TO BE ESTABLISHED AS INSTITUTIONAL CONTROLS FOR PORTION OF FOSTER AVENUE AND UNITED STATES AVENUE.
5. PRGs APPLY TO THE TOP 1 FOOT OF SOIL IN UNDEVELOPED AREAS.
6. TSCA-EPA TOXIC SUBSTANCE COMPLIANCE ACT (40 CFR 760) - REMOVAL OF POLYCHLORINATED BIPHENYLS (PCBs) ABOVE 50 mg/Kg.

SOURCE:
1. BASEMAP, WESTON SOLUTIONS, 2016.
2. PARCELS OF CAMDEN COUNTY, NEW JERSEY 2016, CAMDEN COUNTY IMPROVEMENT AUTHORITY, 2/26/2014, GIS SHP FILE
http://njgin.state.nj.us/NJ_NJGINExplorer/DataDownloads.jsp

0 70 140
SCALE: 1" = 70'

TITLE:
FIGURE 11
SOIL REMEDIAL ALTERNATIVE 5

LOCATION:
THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

DATE: 9/30/2019

FILENAME: 204027_FMP_FS_SOIL_REV4

LAYOUT: EPA FIG 11

THE ELM GROUP
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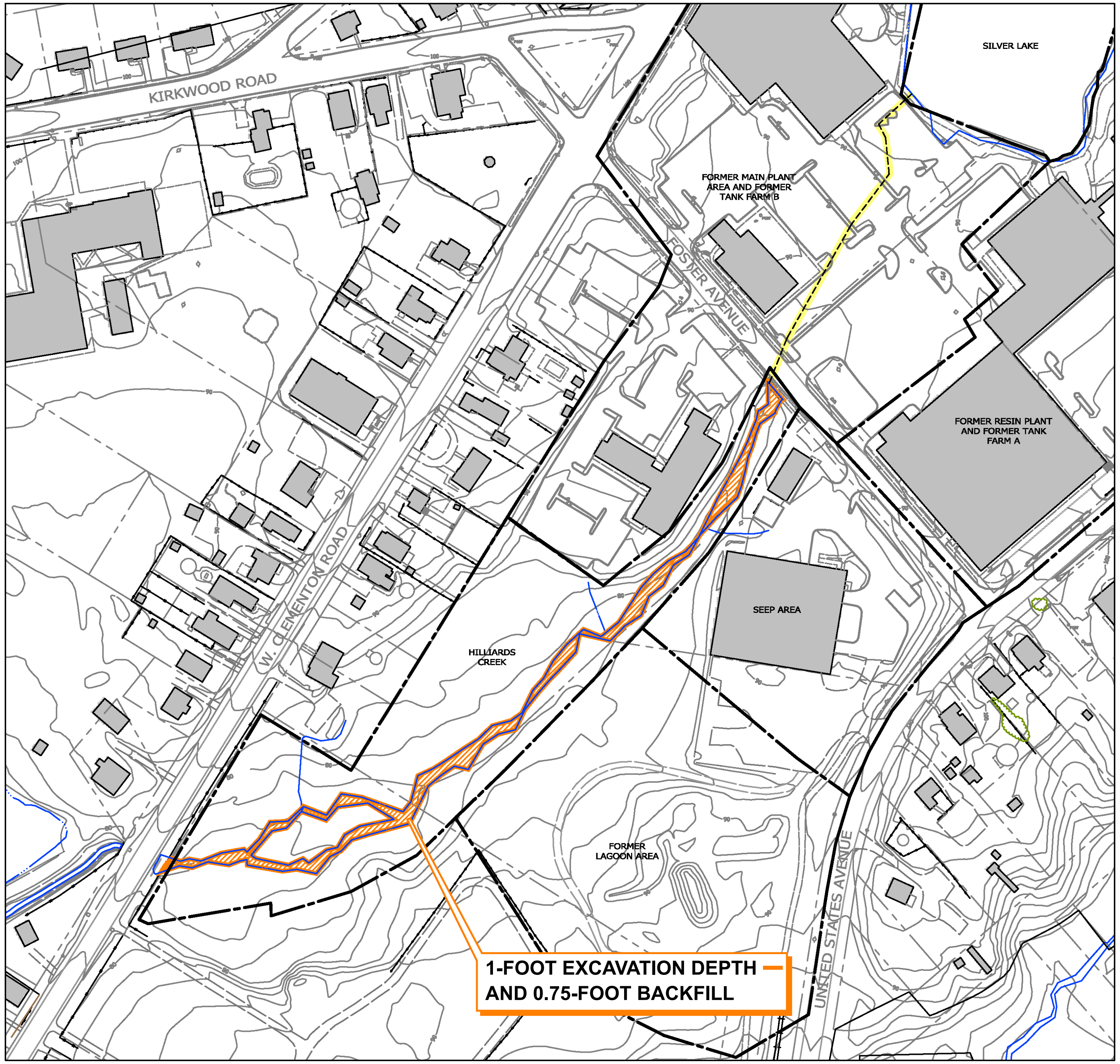
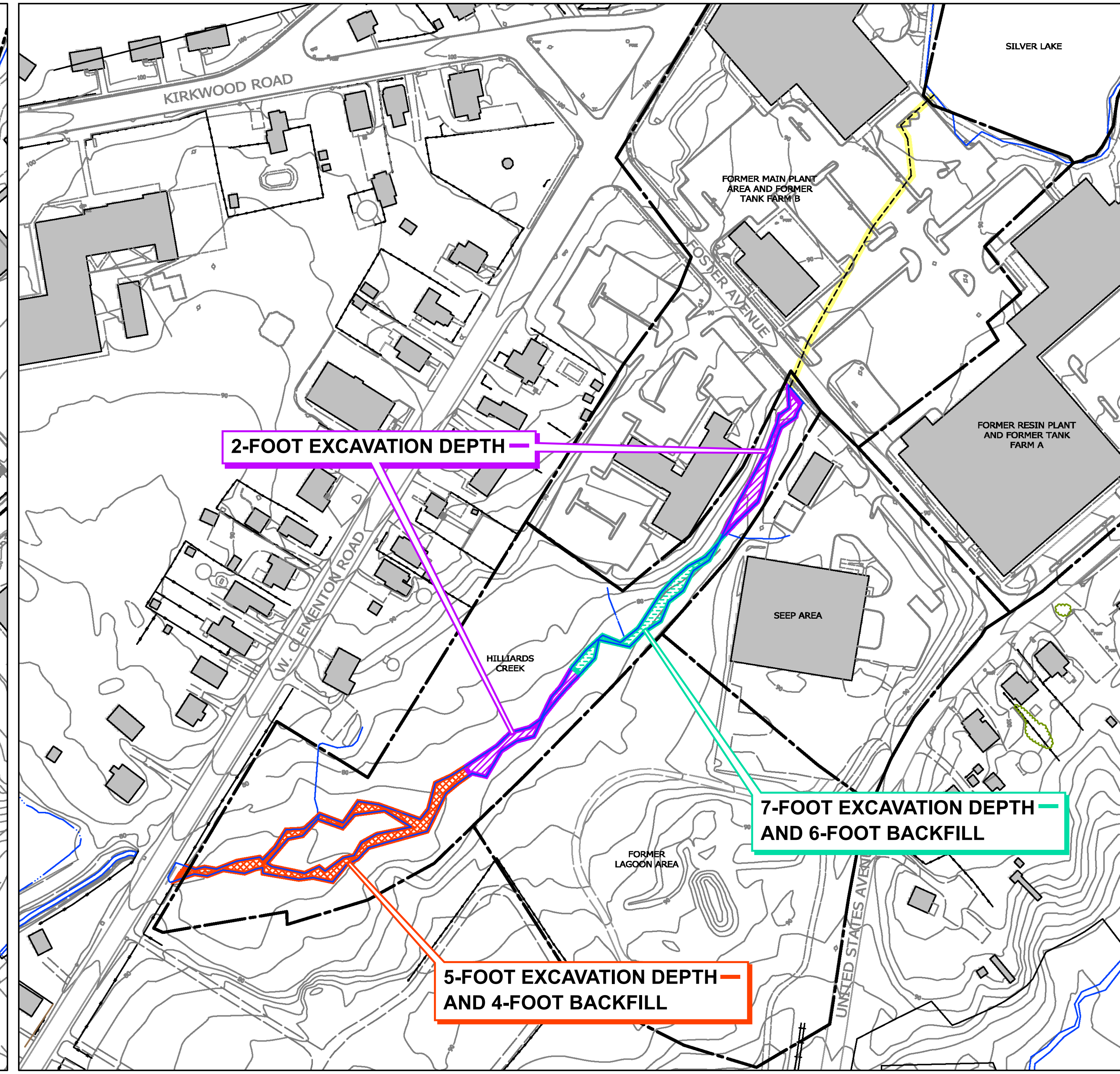
SEDIMENT ALTERNATIVE 2



SEDIMENT ALTERNATIVE 3



0 300 ft

SCALE (ft)

NOTES:

1. PRGs - PRELIMINARY REMEDIATION GOALS.
2. PROPOSED EXCAVATIONS ARE TO REMEDIATE ALL SEDIMENT WITH CONTAMINANT CONCENTRATIONS EXCEEDING THE PRGs.

SOURCE:

1. BASEMAP, WESTON SOLUTIONS, 2016.

LEGEND

- FORMER MANUFACTURING PLANT REMEDIAL UNITS
- SILVER LAKE CONVEYANCE
- REMOVAL OF ALL SEDIMENT FROM CONVEYANCE LINE

Figure 12

Sediment Alternatives 2 Versus 3

THE SHERWIN-WILLIAMS COMPANY
FORMER MANUFACTURING PLANT
GIBBSBORO, NEW JERSEY

Attachment B: Public Notice

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

INVITES PUBLIC COMMENT ON THE PROPOSED PLAN

FOR THE SHERWIN WILLIAMS/HILLIARDS CREEK SUPERFUND SITE

GIBBSBORO, NEW JERSEY

The U.S. Environmental Protection Agency (EPA) announces the opening of a 30-day comment period on the preferred plan to address contaminated soil, sediment and light non-aqueous phase liquid (LNAPL) present on the Sherwin Williams/Hilliards Creek Superfund site, located in Gibbsboro, Camden County, New Jersey. The preferred remedy and other alternatives are identified in the Proposed Plan.

The comment period begins on November 25, 2019 and ends on December 30, 2019. As part of the public comment period, EPA will hold a public meeting on Thursday, December 5 at 7PM at the Gibbsboro Senior Center, 250 Haddonfield-Berlin Road, Gibbsboro, NJ.

The Proposed Plan is available electronically at the following address: http://epa.gov/superfund/sherwin-williams

Written comments on the Proposed Plan, postmarked no later than close of business Monday, December 30, may be emailed to Klimcsak.raymond@epa.gov or mailed to Ray Klimcsak, US EPA, 290 Broadway, 19th Floor, New York, NY 10007-1866.

The Administrative Record files are available for public review at the following information repositories:

Gibbsboro Borough Hall/Library, 49 Kirkwood Rd., Gibbsboro, NJ, 08026, M. Allen Vogelson Library – Voorhees, 203 Laurel Rd., Voorhees, NJ or at the USEPA – Region 2, Superfund Records Center, 290 Broadway, 19th Floor, New York, NY 10007-1866.

For more information, please contact Pat Seppi, EPA's Community Liaison, at 646.369.0068 or seppi.pat@epa.gov.

CP-0010588954

Attachment C: Public Meeting Transcript

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 2

- -

SHERWIN-WILLIAMS/HILLIARDS CREEK SUPERFUND SITE

PROPOSED PLAN PUBLIC MEETING

OPERABLE UNIT TWO

- -

Senior Center
250 Haddonfield-Berlin Road
Gibbsboro, New Jersey 08026

December 5, 2019
7:00 p.m.

REPORTED BY: Sharon Ricci, RMR, CRR

- - -

APPEARANCES

- - -

EPA PRESENT:

PAT SEPPI, COMMUNITY INVOLVEMENT COORDINATOR
RICHARD PUVOGEL, PROJECT MANAGER
RAY KLIMCSAK, REMEDIAL PROJECT MANAGER
JULIE NACE, REMEDIAL PROJECT MANAGER
NICK MAZZIOTTA, PROJECT RISK ASSESSOR

PUBLIC PARTICIPATION:
MAYOR EDWARD CAMPBELL

- - -

P R O C E E D I N G S

- - -

MS. SEPPI: I appreciate everybody being here.

Mayor Campbell, would you like to do the welcome, please.

MAYOR CAMPBELL: Good evening.

We have a tradition in Gibbsboro. We would like to honor Americans at the start of all meetings, so I would ask everybody to rise as we pledge allegiance to our flag.

- - -

(Pledge of Allegiance recited)

- - -

MAYOR CAMPBELL: I just have a couple of comments for everyone.

Number one, I know that there are people here from boards and other government agencies, and I know the EPA and DEP will do their own introductions, but those that are Voorhees, Gibbsboro, Camden County assembly, Congress, if any of those folks are here, if you want to stand up and just introduce yourself.

Is there anybody here?
So, Jack, stand up. You're Gibbsboro council.
MR. FLYNN: Jack Flynn, Gibbsboro council.
MAYOR CAMPBELL: Ed Madden, you're with the Environmental Commission.
Stand up.
And Board of Education?
MR. LITTLEFORD: Scott Littleford, Board of Education, Gibbsboro.
MAYOR CAMPBELL: Anyone from Voorhees Township?
(No response)
MAYOR CAMPBELL: Assembly?
(No response)
MAYOR CAMPBELL: Congress?
(No response)
MAYOR CAMPBELL: The last meeting we had every entity on the planet that was here, and I just thought --
MS. SEPPI: We did, you're right.
MAYOR CAMPBELL: -- that it would be appropriate to let everybody know that our representatives have been very engaged in

what's going on here.

So I hope you, like me, are pleased with the pace that this cleanup is seeing right now. It took a long time. I think EPA has been very responsive. And to their credit, Sherwin-Williams as well. Things are moving very quickly. They're going to move even faster.

And we're going to hear much more today on what's going to happen with the former manufacturing plant, which for most of us means the Paintworks and a little bit more.

Logistically, when you leave, I would strongly suggest you go through the parking lot and go out at the light out here. You can get out at the light. Do not go over this way. It's a little dark. And it's much safer to go out through the parking lots to the light.

And with that, I would just like to thank EPA. You know, we've been back and forth over the years, but I give you a tremendous amount of credit.

Ray and Rich, you came down here,

we had a meeting probably six months or a year ago on this. And when I saw the plant, I was really pleased. I think you heard a lot of the concerns that the government body had.

So with that, thank you. We appreciate all you're doing.

Pat?

MS. SEPPI: Thank you, Mayor. Thank you for your remarks. We appreciate that.

Well, first of all, I want to thank everybody for being here this evening. It's a very nice turnout and we're happy to see that. And I would like to do some introductions first, the people from EPA who are here that are involved with this project.

Rich, do you want to?

MR. PUVOGEL: I am Rich Puvogel. I am Ray's supervisor and Julie's supervisor at EPA.

MR. KLIMCSAK: Ray Klimcsak, RPM for projects.

MS. SEPPI: Why don't you say what RPM stands for.

MR. KLIMCSAK: Remedial project

manager. I am sorry. No acronyms.

MS. NACE: Hi, I am Julie Nace. I am also a remedial project manager for the site and I mainly work on the burn site section and the waterbody section, all the lakes and creeks.

MR. MAZZIOTTA: I am Nick Mazziotta. I am the project risk assessor.

MS. SEPPI: And we have somebody from DEP.

MS. VOGEL: Hi. I am Lynn Vogel. I am the New Jersey DEP case manager for the site.

MS. SEPPI: Thank you, Lynn.

And we also have representatives from the State Department of Health, who will be happy to stay after this meeting if you have any question for them. Okay.

So the reason that we're here tonight, as -- oh, raise your hand.

AUDIENCE MEMBER: Right here.

MS. SEPPI: So the reason we're here tonight is to talk about the former manufacturing facility, our plant -- RM -- FMP. No. I am just kidding. The former manufacturing facility. And Upper Hilliards Creek and then some of the other off-site properties. So that's the basis of having this meeting tonight.

So the public comment period has started. Hopefully everybody has had a chance to read the proposed plan. It is on our web page.

At the end of the meeting, I do have a few copies here that I can hand out. If anybody would like to have a hard copy of it, that's fine. And I also have another handout for after the meeting.

And the public comment period ends December 30th. We just made it a little bit longer than usual because of the holidays. So you have until close of business December 30th to get your comments in to Ray.

And what will happen after that is once the public comment period closes, we put together -- or Ray puts together what's called a responsiveness summary. And that will be like a summary of all the comments and questions that are asked here tonight.

Now, if you haven't been to an EPA

meeting before, you'll notice that is a little bit more formal. We have Sharon Ricci, our stenographer, is here. So she'll be taking down, making a transcript of everything that's said here tonight.

And all your questions and answers, as I said, will be in that responsiveness summary. And once that's done, the next document that you will see is what's called our record of decision.

We call them RODs. That's our final legal document that will detail the way we plan to go ahead and clean up the site. So we expect to have that in the summer. I would say some time in the summer.

So as I said, tonight's meeting is more formal. There are sign-in sheets. And like the major said, we would appreciate you signing in so we could build up an email list so we could get back to you with anything that's coming up in the future.

One thing I do like to ask -- and I know it's difficult to do, but if you could hold your questions until the end of Ray's presentation, that would be really helpful.

Because sometimes I understand you'll have questions. But, you know, if you can remember them and hold them to the end. A lot of times your questions get answered as the presentation goes on.

And once the presentation is over and we open it up to you, I have a microphone. I'll go around. And everybody can give us their questions or their comments so that Sharon will be able to hear you.

So I think, with that, we're all set. Ray, open to you.

MR. KLIMCSAK: We're set. Okay. Thank you, Pat.

MS. SEPPI: You're welcome.

MR. KLIMCSAK: Good evening, everybody. As Pat mentioned, tonight's meeting is the -- for EPA to present its proposed plan. I realize that the proposed plan is a meaty document. Tonight my task is to summarize the proposed plan and explain some of the key details to you.

I am going to hit -- the presentation is about 40 slides. I am going to hit -- for the first part I am going to hit site summary. After that, I am going to move into the investigation and the findings, and then I am going to move into what the alternatives were that were considered and ultimately present to you what EPA's preferred remedies are for the impacted soils, which includes LNAPL -- and I'll go into explaining what LNAPL is -- as well as sediments.

And after that, we'll take questions. And we're here to hear what those are and hopefully answer those questions.

So with the next slide, what I have here is I'll start with what -- what EPA commonly refers to as the Sherwin-Williams sites. I'll try to use the laser pointer here.

The Sherwin-Williams/Hilliards Creek Superfund site includes Silver Lake, as well as the former manufacturing plant. And you may hear me tonight refer to that as the FMP area. It includes the FMP area, as well as all of Hilliards Creek, which is a little over a mile long, which then goes into Kirkwood Lake, which is about eight-tenths of a mile long.

Wastes from the former plant were then disposed at two separate source areas. The first is the Route 561 dump site. That's up near the Wawa parking lot. And this spring and summer you likely saw some of the cleanup activities in progress. More or less emanating from the dump side is a small tributary called White Sands Branch. That flows into the United States Avenue burn site and into Bridgewood Lake.

So those are the three sites. Tonight's focus is on the former manufacturing plant, as well as the stretch of what we term Upper Hilliards Creek. That's the portion of Hilliards Creek from Foster Avenue to West Clementon Road.

Next slide, please.

So up here I have a snapshot of -- or an aerial of what the plant looked like while in operation. This is taken from the 1970's. There are -- to orient you, here is the base of Silver Lake, here is West Clementon Road or Clementon Road, which is the western boundary. And then on the eastern boundary is United States Avenue.

There's a couple key features that I would like to point out.

One is a very dominant feature. These are the lagoons area. These were lagoons which accepted waste material from the plant. They were periodically dried and then dumped at either the dump site or the burn site.

Two other key features is a former tank farm here, which sat on Foster Avenue. And then another key feature is this tank farm here which was located near 2 Foster Avenue, which was along United States Avenue.

That -- this tank farm, specifically that we call tank farm A, is a feature that I am going to be discussing through the night. And I'll refer to it as tank farm A. And I want you to keep that area in mind.

Finally, before I move onto the next slide, you'll see just north of Foster there was a lot of buildings and other manufacturing -- there was lacquer manufacturing. So north of Foster Avenue is a key area that I'll be discussing as well.

Next slide, please.

So this is an aerial of almost what it looks like today. You'll notice the 6 East Clementon building was taken down, consistent with a slab. That was taken down by Brandywine. Brandywine is the current property owner of the FMP. You'll notice that the tank farms are gone. I am sorry. You'll notice that the lagoons are gone. These lagoons were addressed by Sherwin-Williams shortly after the plant closed under a DEP order.

Two other features that you'll notice is that tank farm A was removed, as well as this tank farm here by Foster Avenue. And 7 Foster Avenue was constructed shortly after the plant was closed.

And, finally, the other key feature is you'll see that several of the previously existing structures still remain, but there's a large debris of parking lot surfaces.

Next slide, please.

So real quickly. This slide -- I am not going to go into great detail, but it is to impress upon you the level of sampling which occurred that helped us create this proposed plan and come up with alternatives. Shown on here are sampling locations. They included soil, surface water, sediment, soil gas. There was a multitude of samples.

And the other point that I would like to note is that at each location there were numerous intervals collected in order to help determine the extent of contamination that could be present.

I do have here an arrow -- and I'll mention this several times. The groundwater flowing through the FMP is pretty much in that direction.

Thank you.

Okay. So with all those samples that were collected, what exactly did we find? So this is a figure that you'll find in the proposed plan. And we've broken the FMP area into several subareas. I currently just want to discuss this area shown here in red. This is referred to as subarea 1.

Subarea 1 is primarily contaminated with lead and arsenic. We don't have LNAPL. And, again, I'll discuss exactly what LNAPL is in the coming slides. But the lead and arsenic is primarily below the pavement of -- beneath the pavement of the parking surfaces and beneath areas of 6 East Clementon.

Next slide. There are two areas that I'll be discussing in detail. There is an area beneath the 6 East Clementon slab where the contamination goes between -- you know, down to depths of 15 feet. This is below the water table. This appears to be a source of shallow groundwater contamination in that area.

And the second area is near here, near the 10 Foster Avenue building. There are PCBs that were detected. And this coincides with the area that had the former transformers when the plant was in operation. So that's a quick summary of subarea 1.

And the next slide I am going to start going into detail of the LNAPL. We've turned subarea 2, which includes the 4, 2 Foster Avenue structures, as well as former tank farm A; subarea 3 includes a series of residential properties on U.S. Avenue and; finally, subarea 4 is in the area of the parking lot area near the Gibbsboro Police Station and the 1 Foster Avenue structure.

Next slide, please.

Okay. What I have on here is just a visual to give you an idea of LNAPL. I am going to define it. It's light non-aqueous phase liquid. That's going to be the last time you're going to hear me say that. We're going to use LNAPL.

This is not what exists at the site today. This is just to provide you a visual, because up to this point you always heard us kind of discuss lead and arsenic.

What is LNAPL? Well, it's the result of the spills from the former tanks, specifically tank farm A. You know, what was stored in the tanks? I had listed a couple of things that could have been up there. They were paint solvents, they could have included mineral spirits, could have been benzene, naphthalene, xylene. These were organic compounds that were either used in paint manufacturing or resident manufacturing, lacquer manufacturing, or used to clean equipment that was used to make paint.

The LNAPL exists at the water table, so we don't see it in the soil column. We see that it floats on the water table. And we also know through the data that it is biodegrading on its own. Now, how do we know that? When we've done soil gas testing, we've detected methane, and that's one of the detections of biodegradation.

Finally, this stuff has not just sat in the subsurface since the plant closed. Sherwin-Williams has performed numerous actions to remove as much LNAPL as they can through other methods.

And, finally, the LNAPL is the cause of some vapor concerns that are in 2 and 4 Foster, but I should note that 2, 4 and 1 Foster Avenue structures are all vacant.

Next slide, please.

Finally, the last two subareas. I'll start with subarea 5. Through that intensive sampling that was performed, we found that there were some residuals that were present in the lagoon area that may not have been captured when the plant closed and actions were performed to remove them.

And then, finally, subarea 6, Upper Hilliards Creek, that stretch from Foster Avenue down to West Clementon. What we do find in the floodplain soils, as well as in the sediments, are mostly lead and arsenic.

So that's just a quick walk-through of all the sampling that was performed in the entire FMP area and some of the off-property areas as well.

Next slide, please.

The proposed plan goes into great detail of the human health risk assessment that was conducted. I am not going to spend a lot of time on it. Nick and I are here and available to discuss any questions you have.

But I will say that a human health risk assessment and an ecological risk assessment were performed, both identified unacceptable risks due to exposure to either soil, sediments; and for the particular case of 2 and 4 Foster Avenue, vapors from those historic releases of the organic compounds.

In addition -- and if you recall, when I talked about some of those areas in 6 East Clementon underneath the slab where there was potential arsenic -- well, there was arsenic present that was causing shallow groundwater contamination, as well as that area down in the former lagoon area where we -- some residuals were still left behind, there is the potential for subsurface soil contamination that is causing shallow groundwater contamination.

So at the completion of the human health risk assessment, when we've identified a potential for risks, that then allows EPA to take an action. We define objectives which, in the case of soil and sediment, we want to prevent direct contact. With LNAPL we want to prevent -- address LNAPL impacts. And, finally, we want to address those source of shallow groundwater contamination.

We then define what the criteria are. We define soil cleanup criteria. I didn't mention it, but the FMP area is zoned commercial. However, we are going to plan to clean up to residential direct contact standards. And then within those areas of Upper Hilliards Creek, we're going to address the floodplain soils, as well as sediments, we're going to address them up to ecological criteria. Very often the ecological criteria are even more stringent than the residential criteria.

Next slide.

Okay. Stay with me, folks, because we're almost halfway through and I am going to have a lot of figures. But we've now identified a series of alternatives to address impacted soils. And I have on here five alternatives. We always include the no action. That's listed up here as alternative 1. That is a requirement of Superfund to consider.

Very quickly, I'll say that beginning with alternative 2 and moving towards alternative 5, we start with an element of capping being the most strong element of that alternative. And keep in mind, what do we want to do? We want to prevent direct contact exposure, and capping is often a method that EPA selects.

Moving all the way to alternative 5, we have full excavation of all contamination. In between we have alternatives 3 and 4, which include a series of capping and removal. However, instead of removing the LNAPL by excavation in alternative 5, there is an element of bioremediation of the LNAPL that I'll discuss in detail in alternatives 3 and 4.

So let's start with alternative 2. If we could go right to the figure.

So because of the size of the FMP area, I have to break the slides into north of Foster Avenue and south of Foster Avenue. If you recall, I said alternative 2 is almost exclusively a capping remedy. And as it exists, the structures, as well as the parking surfaces would serve as the cap to prevent direct contact. So pretty much what you see is what would be implemented.

South of Foster Avenue. South of Foster Avenue, I didn't use an aerial. I have this figure here. These colors represent excavation depths that would either remove all the contamination present, or shown in orange are excavation to two feet that then would allow a cap to be constructed.

We're going to move right on in to

soil alternative 3, which I said included elements of capping, excavation and LNAPL treatment.

Okay. North of Foster Avenue, if you recall, I was hitting upon that area where there was the shallow groundwater contamination due to the arsenic concentrations. These would be targeted areas that would go down to 15 feet or more in order to remove that source of arsenic contamination.

The PCB area that I said was near 10 Foster Avenue, again, that would be targeted excavation to remove those PCBs. I am going to hold off on this area, folks, because I am going to discuss that in the LNAPL area, the detail. But pretty much everywhere else not excavated would be capped.

South of Foster. South of Foster Avenue, instead of the floodplain soils, instead of going down to two feet and capping, alternative 3 would include excavating everything to depth within the floodplain of Upper Hilliards Creek. That area of the former lagoon where I said, hey, there was a source of shallow groundwater contamination, there would be excavations up to six to eight feet to remove those sources of shallow groundwater contamination.

I am going to hold off on this area and we're going to go through a series of slides which address the LNAPL contamination.

If we could go to the next slide, please.

I have on here as a reminder, here's 4 Foster Avenue structure and here is the 2 Foster Avenue structure. This was the location of the former tank farm A. And shown here in red is the approximate extent of what we know to be the LNAPL impacted soils.

Next slide.

One of the first elements of addressing the LNAPL would be excavating the LNAPL within the parking lot area of 1 Foster and 5 Foster Avenue. Why is that? It's because the LNAPL is at its shallowest depth. It's right beneath the parking lot surface and it goes down between three to five feet. Because the groundwater flows in this direction, as I mentioned earlier, we would have a recovery trench that runs along Foster Avenue, as well as U.S. Avenue, to collect any mobile LNAPL that could potentially be flowing while the excavation is ongoing.

I want to keep in mind, as we move to the next slide, the LNAPL element is something that builds upon additional elements.

Shown within the 2 Foster Avenue structure, which I previously mentioned is vacant, we have LNAPL extraction wells located in 2 Foster Avenue.

Next slide.

Okay. There's a lot of dots on here, but it's in symbols. But I am going to describe them using -- identifying the red symbols and then the green symbols. The red symbols are permanent injection wells. As I mentioned earlier, the LNAPL is naturally biodegrading. These injection wells would be used to inject nutrients to help biostimulate the biodegradation of the LNAPL.

Shown in green -- because I mentioned they could produce methane, this natural biodegradation, and if we were going to stimulate it we definitely want to introduce a means to help collect any gas that could be off-gassed. Those units in green are meant to be soil gas monitoring probes, as well as soil gas extraction wells.

And, finally, in the next slide, the last element of the LNAPL shown in blue here are not permanent wells but they're temporary wells. So it would be a matter of coming out for the day and going down to a depth to inject the nutrients in order to biostimulate -- to help biodegradation occur.

Next slide, please.

All right. Soil alternative 4. We're almost there, folks. I got one more alternative after this.

Soil alternative 4 includes all of the elements that I just described in alternative 3; however, it adds additional subsurface soil excavation of those non-LNAPL impacted soils both north and south of Foster Avenue.

You remember that subarea 1 which included both north and south of Foster Avenue?

So earlier I mentioned that alternative 3 included those -- well, I am sorry. Soil alternative 4 includes the element of getting the shallow groundwater out -- sources of shallow groundwater. But it includes this additional excavation area up to four feet shown in yellow, or with these colors we actually capture all of the contamination present.

So this would be a much broader attempt to get contamination that exists in the subsurface.

And, finally -- and, well, I have as a reminder that soil alternative 4 includes the LNAPL.

Finally, soil alternative 5 would be full excavation of all the contamination. What would that include? I'll show it in the next figure. There would be extensive excavation performed both north and south of Foster Avenue for those metals, but it would also include excavating out the LNAPL which exists in the subsurface. That would require demolition of the 2 and 4 Foster Avenue buildings. South of Foster. As well as going even deeper for areas of potential sources of groundwater contamination.

And then, finally, in the next slide, the excavation element of alternative 5 would also be implemented on the residential properties. What I didn't mention is that there's literally 14 feet of clean fill that would be taken out in order to get just the 2- to- 3-foot layer of potential LNAPL with that alternative.

Next slide.

Okay. So how does EPA come about coming up with the preferred alternative? Well, we considered nine criteria. The first two are the most important. These are the threshold criteria. They consider overall protection of human health and it considers cleanup standards, compliance with state and federal regulations.

Based on those first two criteria, the no action absolutely drops out. That soil alternative 2, that alternative that included almost exclusively capping, well, EPA very often selects remedies that include capping and it does work for a lot of contaminants;

however, capping the LNAPL would not really work as it's just -- it would not really speed up the breakdown of that LNAPL.

So because of that, both alternative 1 and alternative 2 are not moving on to the next consideration.

Next slide.

That leaves soil alternatives 3, 4 and 5. And then we -- then we consider those against what we term the "balancing criteria." I am just going to quickly define what those five criteria are.

The first one reads long-term effectiveness and permanence. Essentially, that is, hey, at the end of the day when that alternative is implemented, how well does it reduce risk and what is the permanence of that implemented alternative?

Reduction of toxicity, mobility, volume through treatment. Well, full excavation doesn't necessarily do that because digging up all that contamination and taking it elsewhere certainly doesn't reduce any of those criteria. However, alternatives 3 and 4, through bioremediation of the LNAPL, they certainly meet that criteria well.

Short-term effectiveness. Well, this is essentially during implementation of the remedy, what sort of adverse impacts could happen either to the workers or to the community?

Implementability. Well, that's, hey, do we have the equipment available to perform the work? Well, for excavation we certainly do. We have the trucks, the excavation equipment. Implementability for the LNAPL? Yes, we have the science to do the bioremediation. So that's the implementability.

Finally, costs. I have not mentioned the cost of the three alternatives, but the cost of alternative 3 is approximately 27 million; alternative 4 is approximately 35 million; alternative 5 is approximately 105 million.

The final two criteria are modifying criteria and they are state -- the State of New Jersey, DEP acceptance, as well as the community's acceptance. And part of that is being here tonight to hear from you all to hear what you have to say about what EPA's preferred alternative is.

With the next slide, based on the -- in the next slide I am showing you what EPA's preferred alternative is. It presents itself to the best of all the balancing criteria. We feel that it is the best component to do the work and to remove the most contamination.

Next slide.

So I have on here -- and I am not going to go through the whole thing, but I just want to point out that as part of implementation of any remedy, EPA always considers human health protective measurements.

So real quick, with any alternative selected we would do air monitoring, we would do dust control. Because of LNAPL and the potential for soil gas, we would monitor soil gas. We would take measures to prevent any soil gas from affecting the residential properties which exist so close to the FMP area.

Next slide, please.

Folks, we made it through soil. I mentioned that there's still Upper Hilliards Creek. And this is going to be very quick. There were three alternatives considered for Upper Hilliards Creek contaminated sediments. The three include the no action under alternative 1.

Under alternative 2 I have the removal of surface sediment, and that would allow for a cap to be installed. And, finally, full removal of all sediments, regardless of depth, down to criteria.

And the next slide I have shown on the left I have soil -- sediment alternative 2, which is the element where we would excavate a foot, which would then allow for a cap to be installed.

And on the right I have excavation to depth regardless of depth. I mean, you'll notice on there you'll see some pretty deep excavation footprints. And, quite honestly, that is due to the fact that through studies of variables, we have seen that Hilliards Creek was chanellized over time with the FMP use. So that explains why the sediments are contaminated so deep.

Next slide.

I am presenting to you what EPA's preferred alternative is. It is full excavation of all sediments. And then in the next slide, I'll explain somewhat why. The estimated cost is very different. The estimated time frames are not very different at all.

And, finally, and most strongly, the excavation of all sediments, regardless of depth, has been something that EPA has selected at the dump site with White Sands Branch, and also at the U.S. Avenue burn site with White Sands branch in Honeywell.

Next slide, please.

So next steps. Tonight we'll be taking questions. As Pat had pointed out, we're in the public comment period. I'll accept your written comments through mail. We'll address those -- as Pat pointed out, we'll address those in the responsiveness summary as part of the record of decision.

That record of decision is targeted for late spring, early summer. And then we would work with Sherwin-Williams to begin development of predesign investigation work plans and hopefully get out and implement the remedy shortly thereafter.

I'll just -- no, I am not going to say more. I'll save it.

So, finally, I have the last slide. And hopefully, folks, that wasn't too long or painful, and I would love to open it up for questions. And we could throw a light on if anybody would not want any slides showing up. We could always do that.

MS. SEPPI: Okay. Before we start that -- thank you, Ray. I just wanted to remind you that we do have a stenographer here tonight. So when you stand up and give your question or your comment, would you please state your name first so we'll make sure that we have it for the record.

And I've told Sharon that if she doesn't hear somebody or needs -- just to, you know, jump in if she needs you to repeat something. But what I'll do -- we want everybody out there to hear your questions too. So if you would like to come up to the front and talk into the mic for that, or I could certainly come to you and hold the mic for you.

One thing I did want to say is I apologize to the former manufacturing plant, but I have another site in Vineland that's called the FMF, the former manufacturing facility. And I went to say the initials and I went -- I had no idea what I was going to say. But I do know it's the FMP.

So with that, Sharon, are you all set?

Does anybody have a question or a comment? Let me turn this mic on. Is this working?

MS. HAINES: Hey. Tracy Haines, 15 U.S. Avenue.

I know we talked before about the -- I call it the acupuncture thing. The methane gas collection, how safe is that? How does that look?

MR. KLIMCSAK: Yeah. So on the residential properties we've performed -- specifically on your properties and others, EPA has performed two rounds of subslab soil gas samples. We have never saw any detections.

And I may have briefly mentioned it, but you have like 14 feet of clean fill before you get to the water table where the LNAPL is.

We're not seeing that there is any soil gas on your property. I mentioned there would be those soil gas -- if we could maybe go back. You know, there would be a series of methods that if the bioremediation was occurring both on the FMP property and your property, I mentioned that there were these green units that were meant to capture soil gas.

You'll see that they could always be expanded onto U.S. Avenue or elsewhere. So, I mean, we would be monitoring that. The collection -- and, again, this would be really hammered out in design. This isn't the final picture of what would be implemented. But this soil gas recovery system would collect that gas. They would be conceptually a unit shown here in orange that's configured close to the 4 Foster Avenue structure.

So, I mean, all of any gas would be pulled that way and not towards your property.

MS. HAINES: Okay.

MS. SEPPI: Does that answer your question?

MS. HAINES: Not really. But I wanted to think about --

MR. KLIMCSAK: And who said that?

MS. HAINES: The biodegradable happens. All right. That's what the little orange ones are, yes?

MR. KLIMCSAK: I am sorry?

MR. PUVOGEL: The soil injections.

MS. HAINES: The soil injections.

MR. KLIMCSAK: Right.

MS. HAINES: Okay. Then methane gas is created from the activity.

MR. KLIMCSAK: Yes.

MS. HAINES: How is that extracted so it's not a danger to us?

MR. KLIMCSAK: Again --

MS. HAINES: How is it extracted?

MR. KLIMCSAK: There would be vacuum systems that would pull the vapors back onto a unit that's on the FMP property.

MS. HAINES: So you would have to come to our properties to collect it or it's a feed system or --

MR. KLIMCSAK: Again, I wouldn't anticipate that you have that scenario going on in your property because the sampling performed on your property is showing that no vapors are there. But, I mean, those -- as I said, this is conceptual. It's showing that it's only on the FMP area. It's along U.S. Avenue.

MS. HAINES: But the LNAPL, when it's treated with the biodegradable solution, will create methane --

MR. KLIMCSAK: Potentially create, correct.

MS. HAINES: That's what I am talking about. When that -- should it create the methane, how is it getting away from us?

MR. KLIMCSAK: Well, the other means would be to put in a soil vapor mitigation system in your home. And it's very similar to like radon units that are installed for different scenarios.

I don't know --

MS. HAINES: I am still confused.
MR. PUVOGEL: From a conceptual layout, this is a conceptual --
MS. HAINES: Right. I understand that. But as the science goes --
MR. PUVOGEL: Right. A series of extraction wells are put in the area where we're going to have large quantities of methane.
Under the 2 and 4 Foster area, we have a layer of methane, although -- a layer of LNAPL. Excuse me. Although it generally sits on the water table. And that area where it was spilled over years and years and years, we have a larger, a greater depth of LNAPL, that's where we expect the larger amounts of methane to be produced as bioremediation occurs.
In those areas we installed soil vapor extraction wells down to the area where bioremediation is taking place. That's put under negative pressure -- each well is put under negative pressure and brought to that unit where it's identified in the center of 2 and 4 Foster Avenue. And from there the gas

is -- it's under negative pressure so
everything is drawn towards those wells.
It depends on how much gas is
produced and where the wells are located, what
the spacing of the wells would be. So those
are parts of --
MS. HAINES: So for our area,
United States Ave, our few properties, those
things are going to be put down and the
science is going to happen, the biodegradable
is going to happen.
And you don't know how much or if
methane gas is going to be created?
MR. PUVOGEL: Right. Methane gas
is being created right now, but at such small
degrees.
MS. HAINES: And is that in between
the LNAPL and the soil?
MR. PUVOGEL: It's right above the
LNAPL layer. Methane gas rises through the
soil column to a certain degree, depending on
how much is there. In an area where you
have -- across the street where you have
basically a one- to- two-foot layer tops that
we found so far, there's not much there.

There wouldn't be a large volume of methane gas produced over a very short period of time.

But, again, there's other things to consider when we go forward and design this. If that were to occur. Detections that we weren't feeling safe with, then a soil mitigation or a soil --

MR. KLIMCSAK: Vapor mitigation.

MS. HAINES: Vapor mitigation system.

MR. PUVOGEL: Would be put in.

MS. HAINES: So you would meet with all us again --

MR. PUVOGEL: Oh, gosh, through the design system, yes.

MS. HAINES: So we would know what's going on and so that we would feel safe in our homes with the methane gas being created.

MR. PUVOGEL: Every step of the way there would be some pile of studies conducted beforehand to determine what would be produced out there with some testing first. The nutrients would be injected in there, it would

stimulate the population of the microbes,
which would in sense, although simplistically,
expand that population in response to the
nutrients and then go and eat up the nutrients
and starve themselves and go and eat up the
hydrocarbons. That's very oversimplistic
but --

MS. HAINES: I understand. I have
a cesspool. I understand completely what
you're saying.

Okay. Thanks.

MS. SEPPI: Thanks, Tracy.

Another question? Well, there's
got to be another question.

MS. MANCINI: I am Anita Mancini.
I live on Berlin Road. And I am somewhat out
out of the loop, so if someone already asked
this question at a previous meeting, I
apologize.

But since Foster Avenue has been so
engaged -- and, Ed, you might need to weigh in
on this question -- since our police station
was so engulfed in mold many years ago, is
there a causal relationship between the mold
at the police station and all of this

component?

MR. KLIMCSAK: I wouldn't know the answer to that.

MR. PUVOGEL: The mold is generally a function of moisture in the air. I don't think it --

MS. MANCINI: Only moisture, not these --

MR. PUVOGEL: Microbes?

MS. MANCINI: Uh-huh.

MR. PUVOGEL: Microbes are pretty much everywhere, depending on which ones.

MS. MANCINI: But these things are not everywhere.

Ed, can we assume that there's no causal relationship between all of these -- I am going to call them toxins since that seems like a nice general word -- and what happened at our police station?

MAYOR CAMPBELL: The mold was in the --

MS. SEPPI: I am sorry, Ed, can you repeat that.

MAYOR CAMPBELL: The mold in the police station was related to a leak in the roof, which Brandywine repaired and mitigated all the mold.

MS. SEPPI: Thank you. That was Mayor Campbell.

MS. SEPPI: Thank you. Any other questions?

Is this working? Oh, now it is. Yeah.

Any other questions?

MS. HEADLEY: I have a question. My name is Barbara Headley.

How rapidly do you expect this, these injections to work? I mean, clearly you've got a certain evaporation percentage doing nothing.

So what's your time frame and what's the volume of stuff that you're going to put in that's going to, you know, make this process happen? And what -- is the process going to be five times faster, ten times faster, fifteen times faster? There's got to be some kind of a relationship between what you're putting in and, you know, the amount of time that you'll get to these levels that you want.

MR. KLIMCSAK: I'll try to answer
that. It's kind of a two-part answer.
I mean, number one, you know, as
we've discussed with Sherwin-Williams, there
would certainly be a pilot study done first.
So, I mean, that figure that shows that
spacing isn't necessarily what would be done.
It would be a pilot study done that would
inform us as to spacing that -- you know, the
injection rate, the balance of nutrients being
injected.
But based on all of the available
science that Sherwin-Williams has presented to
us, we anticipate, you know, meeting criteria
within seven to eight years.
So, I mean, that would be -- that's
the estimated time frame to meet criteria, you
know, within the groundwater. We're using
groundwater as the means to measure the
success of treatment.
MS. HEADLEY: And then how often do
you come out and test, like, your -- you know,
is that now every three months do you come
out -- like, you start your process and then
what's your regimen for -- you know, what's

your process for that?

MR. KLIMCSAK: Yeah. I mean, it certainly would change. I mean, I mentioned the pilot study. After the pilot study, we would go with maybe a full round of application.

You know, maybe we say, hey, after that injection we go to these monitoring wells that exist. I mean, I don't have those up here. We literally have a network of monitoring wells that exist.

We would use -- you know, go out and collect data and see if we're actually coming up with a reduction in the concentration of groundwater contaminants and then go from there.

MR. PUVOGEL: And they also have multiple tests that can occur not just measuring directly the contaminant levels, but also the soil gas, that would be measured as well. And that would be measured on a very frequent basis.

MS. HEADLEY: Is it stupid to assume that these things you're putting in to help these break down, are these all natural things that we don't have to worry about? You know how sometimes the remedy is worse than the ailment initially.

So it's one of these things where initially things get worse before they get better?

MR. PUVOGEL: Well, the injectates are basically food for the microbes or the bacteria, basically putting in nitrates, sulfides, sulfates. And they hit the ground and they consume that.

MS. HEADLEY: But are these considered natural things, like natural soil things that we're putting back in to create the balance?

MR. PUVOGEL: Yes, they do occur naturally, but they're somewhat refined for these purposes.

MS. HEADLEY: Right. But at the end of the day, once these get in and they all break down, and then everything becomes ecologically more stable again and normal again?

MR. PUVOGEL: Yeah.

MS. HEADLEY: And then how often

would you get together -- first off, I think
your research is very in-depth.
            How often would you get together
with us once you do some of these tests and
whatnot? Like, how would everybody know how
you're making out?
            Because it seems very well thought
out and like you've taken a lot of
consideration, so it would be interesting to
see as you start down your process -- I mean,
you hope everything goes as planned or it's
easier, but we all know that that's not the
reality.
            MR. PUVOGEL: Well, what we stay
pretty much in contact with the folks --
especially the folks that we're doing it on
their properties particularly.
            But I think, Ed, you had mentioned
that Sherwin-Williams has been working with
you to provide information to the town and you
can disseminate in sharing with the community
in the weekly newsletters and such.
            MAYOR CAMPBELL: Every issue the
town crier --
            MR. PUVOGEL: And that's just one

of the tools we like to use, but we like to use other ones. We like to use more community engagement as we go down the road. We like to talk to people more and share with them what we find, and Sherwin-Williams would like to share with them what they find. And the door is open. Pat Seppi here is our community relations coordinator.

MS. SEPPI: We have a web page also. So any time we have any type of results or anything, we could put that on our web page for you to take a look at.

That's why I was kind of insistent about people signing in tonight, so we could put together a good email list so we could send information out to you. So if you do want that kind of information, please make sure that you have your email on there also. Thank you.

MS. HEADLEY: May I ask you just one other question about capping?

So is capping just -- is it a simplistic description? Are we just digging down and then just putting fresh top soil, or are we putting some kind of like a clay kind of thing and then a top soil? Like, what contact exactly is capping?

MR. KLIMCSAK: Well, I know for like subarea 1, that area where we were going down to four feet, I mean, there would likely be -- first of all, a demarcation layer that in the event of future, you know, reconstruction in that area, it would alert workers that, hey, we're coming upon an area that below this depth, you know, there was some contamination, they would be -- you know, HAZWOPER 40-hour OSHA trained.

There could be an impermeable membrane placed at depth and then it would be at -- not just four feet, but it would be a column of clean fill.

MR. PUVOGEL: Yeah. And then they already identified the first step, that the demarcation areas -- it's basically sometimes we use a hydro visibility fence to lay that down at the bottom of the excavation that people can see, and then a layer of geotextile above that for additional. And then the cap itself is sometimes structured, depending on what we work with. And DEP, what their requirements are for a specific capping. And depending on where it is, some area where you want that cap to be impermeable, some areas it could be permanently capped.

But the structure underneath the cap, usually a gravel layer, and then a layer of subsoil and then a layer of topsoil. Or depending upon what the future use is.

MS. HEADLEY: So, in other words, it's not a one-size-fits-all. You're going to take every section and you're going to be environmentally conscious for that particular area?

MR. PUVOGEL: Right. Right.

MS. HEADLEY: Okay. Thank you.

MS. SEPPI: Really good questions. Thank you.

And a lot of those I know, as Rich and Ray said, will be in the design, you know, so we'll get into more of the details by then. Thanks.

Any other questions?

MAYOR CAMPBELL: Ed Campbell, mayor.

Just one thing that hasn't been

stated with capping. There will be things called --

COURT REPORTER: I am sorry. I can't hear.

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(A brief discussion was held off the record)

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MS. SEPPI: If you could speak up a little bit or come up here. We want to make sure that Sharon hears everything you say. You have to hold it like this.

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(A brief discussion was held off the record)

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MAYOR CAMPBELL: So correct me if I misspeak, but with capping what will happen is -- there's contamination that's still out there. There will be things called deed notices that are placed on those properties. And a deed notice is a permanent record that's going to be in a deed.

If you live close to those properties, they will be listed in a database as contaminated sites. Even though it could be built upon to a residential standard, that is what will be left when there are deed notices.

And you should understand that. And if you are not in favor of deed notices, then you should submit public comments on that matter. And I had asked earlier, my understanding is all of the alternatives would have had deed notices as a result.

So there was no consideration to literally removing every molecule. And I just think that is something that the public should understand, right? These are still going to be hazardous sites in the database.

MS. SEPPI: I think the gentleman in the back had something.

MR. KLIMCSAK: Well, for the residential properties, the soil is not contaminated.

MAYOR CAMPBELL: Just the former manufacturing plant where there are caps.

MR. KLIMCSAK: So I just want to make that clear to the residents, what's contaminated is the groundwater. And in the state of New Jersey, you know, residents don't own the groundwater, so I wouldn't anticipate that the residents, when treated with, you know, for the LNAPL, would end up with deed notices.

MR. PUVOGEL: Right.

MAYOR CAMPBELL: But when you sell your house, there's a record that that's there and you're close to it and it has to be disclosed.

MR. WOOLNER: And there goes the value in the toilet.

MS. SEPPI: I am sorry, sir. Would you give us your name?

MR. WOOLNER: Brian Woolner, broker of record, owner, Dot and Company Realtors.

MS. SEPPI: And your comment, Brian?

MR. WOOLNER: Comment is what the mayor just talked about. What's going to happen to all those properties?

And here is another question: Are you planning on tearing up the asphalt on United States Avenue?

One time I heard through the grapevine that, yes, that is all going to be torn up, all the contamination taken away and we were getting all fresh soil and blacktop. Then I heard that there is a new chemical that you're going to take two inches of asphalt off, spray this new chemical, and then repave and everything is going to be hunky dory.

Meanwhile, the five houses there, we have no sewer. We all have cesspools. Are we going to be allowed to dig in our backyard to have a septic system installed?

MR. KLIMCSAK: Well, Brian, I know that you came to a meeting that I was at with Sherwin-Williams, and Sherwin-Williams explained to you their conceptual plan to install sewage in the back of the property using the paver street --

MR. WOOLNER: Is that still on the -- are we still on that?

MR. KLIMCSAK: As far as I believe, that has not been taken off the table.

MR. WOOLNER: Because you didn't mention that at all.

MR. KLIMCSAK: Because there's no

reason for me to get into your personal case, Brian.

But this would -- you were at the meeting with me this summer.

MR. WOOLNER: Yes. You're right.

MR. KLIMCSAK: When we met in July when it was a courteous thing to do with the property owners on U.S. Avenue to explain to you in advance of tonight and hearing it in front of a lot of other people, it was a one-on-one meeting with the residents. So I would bank on -- I don't know about the -- you know, any material being placed two inches underneath the pavement. That was never discussed.

The alternatives that are being considered are in the proposed plan. That's out for public comment. They were discussed by me tonight. And I'll just say again what was explained to you this summer.

MR. WOOLNER: All right. I just want to make sure we're still on for that.

MR. KLIMCSAK: Thank you.

MS. SEPPI: Thank you, Brian.

Anybody else have a question? Yes,

ma'am. Would you -- don't forget your name, please.

MS. MAGJUKA: Yes. I am Betty Magjuka. I live on Hilliards Road.

So my first question, which does not pertain to you two -- but since Mayor Campbell just brought it up, maybe Ed or Brian could tell somebody who's ignorant, what is a deed restriction and how does it --

MR. WOOLNER: When you go to try to sell your house, the buyer gets a copy of your deed restriction. And they say, oh, my gosh, what is this?

MS. MAGJUKA: Okay.

MAYOR CAMPBELL: Ed Campbell, mayor.

It's not going to be on your property. The residential property is being cleaned up completely, am I correct? All the residential properties.

The issue -- the point that I am making is within the paperwork, within the U.S. Ave burn site, within the dump site there's still contamination being left behind. It's being cleaned up, it's being capped, it's safe for people to be there. If it's a park or whatever its use is. The paperwork can even be residential.

But it will still be listed in the database as a hazardous site and there will be on top of that deed notices on those lots that say you can't dig more than four feet or ten feet, something like that.

So you probably don't care about that specifically. But the fact that it's in the database that says that there's a contaminated site 200 feet from your property, 500 feet from your property, I think we, the folks that are representing the people here who were elected -- you should be aware of that. And I think that if you don't like that, you should submit a comment or you should speak here.

Things that are said here will be part of the record that EPA will evaluate. You can also email Ray, you can submit comments. They're going to tell you how to submit comments. But you should do that.

Otherwise, you know, those deed notices are going to be there and that's going

to be a record in the database probably
forever.
MS. MAGJUKA: Okay. Thank you for explaining that. But I had a second question.
MR. KLIMCSAK: Yeah. Go ahead. And I am sorry. Before you go on, are you one of the properties that were --
MS. MAGJUKA: No. No. But I --
MR. KLIMCSAK: Because I had an answer regarding deed notices on that but --
MS. MAGJUKA: It was something I didn't know.
And you might not be able to answer this, but my concern more is Hilliards Creek. And I know there's been remediation done on Hilliards Creek near Hilliards Road and Kirkwood Road, the corner there. How often -- now that it's been remediated, how often is it tested?
MR. KLIMCSAK: The creek or properties?
MS. MAGJUKA: Both.
MR. KLIMCSAK: So the creek sediments -- I am trying to envision if you're on the corner there by Hilliards Road and

Kirkwood Road?

MS. MAGJUKA: That's not my house but --

MR. KLIMCSAK: I know. That was one of the residential properties which were addressed. The creek sediments still need to be addressed and the floodplain soils on the opposite side still need to be addressed.

But what we see most often with the properties on the creek -- on Hilliards Creek is that most of the contamination is at subsurface. So, I mean -- I think it's really the result of when the plant operated. I mean, the plant operated from 1850 all the way to 1970. I think a lot of the contamination happened in the early years and then there was almost, you know, clean -- or cleaner sediments deposited on top.

We don't anticipate that there would be any recontamination on properties. But the creek that -- you know, the creek sediments will be addressed in a future, you know, operable unit or the next phase. I mean -- I am sorry.

Julie Nace is the remedial project

manager who will be cleaning up the next phase of sites which includes the waterbodies that includes all of Hilliards Creek, Kirkwood Lake, Bridgewood Lake and a portion of Silver Lake.

MS. MAGJUKA: And about when would that occur?

MR. KLIMCSAK: The record of decision is targeted for, you know, next year. But I'll let Julie --

MS. NACE: Hi. I just wanted to make sure the first part of your question was answered.

So you want to know after it's cleaned up, how often is it monitored?

MS. MAGJUKA: Yes.

MS. NACE: So -- well, before they clean up, they find out exactly where the contamination is, they dig it all out and test it so they know that it's clean. And so do you need to -- they do --

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(A brief discussion was held off the record)

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MS. NACE: Right. So it will be all cleaned. It will be tested right after they dig it out, they'll know that it's cleaned.

MS. MAGJUKA: And then it's just assumed that it's clean forever?

MS. NACE: Uh-huh.

MR. PUVOGEL: And then if it's warranted, we would come in and spot test shortly after the remediation is completed to make sure it is done.

MS. NACE: And to clean up the creeks and the lakes and make sure that they don't get recontaminated, we work from upstream to downstream. So we'll be working from Silver Lake down through the creeks to Bridgewood Lake, down through the creeks all the way to Kirkwood Lake.

So the proposed plan like Ray presented to you tonight for the waterbodies, all the water areas is also coming out hopefully this year.

MS. SEPPI: Next year. This is 2019.

MS. NACE: Oh, I am in 2020

already.

But because we have to work from upstream to downstream, from the sources of contamination down to Kirkwood Lake, and we can't do everything at once, we're going to work in phases.

So you see the dump site happening now, the burn site will start probably next year. Residential site's already happened. And then the last stage will be all of the waterbodies. So you probably won't be happy when I say this, but it could be potentially eight years until we get all the way down to Kirkwood Lake.

MS. MAGJUKA: Okay. I mean, can you explain to me -- I don't quite understand. So they cleaned the soil off of Hilliards Creek on Hilliards Road, but the water is not cleaned yet. So wouldn't we still be carrying some of these toxins onto the cleaned, quote, unquote, cleaned area?

MS. NACE: From the creek back up onto the land?

MS. MAGJUKA: Yeah.

MS. NACE: They did a lot of

recontamination studies and they found that the sediment stays at the bottom of the creek. But -- yeah.

MS. SEPPI: Thank you. Any more questions? Alice?

MS. JOHNSTON: Hi. Alice Johnston. I was -- I grew up on Stevens Drive, and our property was remediated this summer, as most of you know. And because the remediation did not extend to the end of our property because our property goes into the lake, we are going to have deed restrictions. And I have not heard anything about that.

Ray, when we spoke about that during the summer, you were going to talk to the legal department and see if there was something that could be done to prevent that. And now we're talking about eight years for the lake to get cleaned out. That means I have a deed restriction until you guys get the lake done.

I mean, I don't plan on living forever, so I'll probably sell my home at some point. It's not a good thing to have a deed restriction on your property.

MR. KLIMCSAK: Right. So I
recently received the remedial action report
for the cleanup on Stevens Drive, as well as
the other property close to your home. I will
be drafting letters to you.

And as I mentioned to you
previously, I think how we would craft it is
that the upland soil portion of your property
is clean, and that could be something that
could be provided to perspective purchasers.

I mean, we also did take out a
portion of, you know, sediments by your
property as well, you know, with the sheet
piling that was put in. But, you know, your
properties on Stevens Drive are unique in that
the property lines do extend into a portion of
the Hilliards Creek.

And, you know, we do point out that
there would be sediments, you know,
contaminated in there that wouldn't be
addressed until a later time.

MR. PUVOGEL: I think the key in
that letter is we would address that, in the
letter, that there's a future remediation plan
for that. We wouldn't subject a property like

that to a deed notice. That's ultimately
going to be cleaned up.
MS. JOHNSTON: The other question I
have is you mentioned in your presentation the
parameters of Upper Hilliards Creek, but your
voice kind of dropped at one point and I
didn't get the full description.
Can you please just repeat where
that begins and where it ends?
MR. KLIMCSAK: Yeah. I mean, it's
very non-technical. It's that portion that is
pretty much the headwaters of Hilliards Creek
that starts at Foster Avenue. You know, for
everybody, Silver Lake is basically the
headwaters of Hilliards Creek. Silver Lake
goes through a culvert that's buried
underneath the parking lot north of Foster
Avenue. Hilliards Creek daylights at Foster
Avenue and then runs maybe -- I don't know,
approximately a thousand feet to West
Clementon Road, just past the cemetery. I am
blanking on the name of the cemetery.
MS. JOHNSTON: Cedar Grove.
MR. KLIMCSAK: Cedar Grove. For
the purposes of this proposed plan, we're

calling Upper Hilliards Creek that stretch from Foster Avenue to West Clementon. And the reason we're addressing that is its proximity to the former lagoon area, as well as the LNAPL that exists from -- you know, within the 1 Foster Avenue parking lot.

It's kind of tough to make out, but it's -- you know, that stretch here.

MS. JOHNSTON: I have another question.

Is Stevens Drive the only set of properties in Voorhees that is going to have a deed restriction, or does this go to other properties as well down the lake?

MR. PUVOGEL: There's no place to restrict the residential properties. They're going to be cleaned up and remediated fully. The deed restriction that was discussed earlier is for the commercial properties in the FMP area.

MS. JOHNSTON: Okay. But because you're addressing this and you're going to send the letter for property owners --

MR. PUVOGEL: Yes.

MS. JOHNSTON: So will every

property owner get that or just the property
owners on Stevens Drive?
MR. PUVOGEL: Every property owner would get a letter that the phase of remediation has been cleaned up, identifying what has been done, the limits of excavation and the limits of the cuts and showing the clean sample points, and basically documenting that your property has been cleaned up.
MS. SEPPI: Any other questions? You got a question?
Yes, sir.
MR. EVANS: Dave Evans, 18 United States Avenue, Gibbsboro; 10 Stevens Drive, Kirkwood.
I have two questions. First one is carrying on from Alice's question. My understanding is that the waterbody that is part of our properties, halfway out into the headwater of Kirkwood Lake, that property has some -- will have some deed restriction on or some notice to the property that it's still contaminated until eight years later when the bodies are taken care of?
MR. KLIMCSAK: I mean, I -- you

know, I can't really answer that question.
It's -- you know, to have contaminated
sediments that are underneath a waterbody
to have a deed notice on it doesn't
really --
MR. EVANS: Well, Ray, here's the
question -- because you're going to be
remediating upstream to downstream.
MR. KLIMCSAK: No. I know. You're
asking, hey, my property --
MR. EVANS: So the property has the
possibility of being contaminated from
excavation work that's done upstream through a
flood event which happened. So that would
flood onto our properties.
Now, I understand that you're going
to do monitoring of the properties on an
annual basis or continual basis, but that part
of the waterbody is still going to be
contaminated until you clean up from upstream
all the way downstream.
Is that correct?
MR. KLIMCSAK: And, again, I am
saying that -- where you're pointing out from
the shoreline, your property, into the lake

where there's sediments and you own a portion of that, to me that seems unusual that a deed notice would be placed on sediments that are underneath the water.

Granted, it's your property, but, I mean, we'll have to get an answer for you on that.

MR. EVANS: So fair, from a legal standpoint, I would have to make notification to a perspective buyer of the property that that exists, right?

MR. KLIMCSAK: Again, I am going to have to get an answer for you.

MR. EVANS: From a legal standpoint, yes.

Second question, former manufacturing plant. You said that the monitoring wells that are going to be across the street from my property, 18 United States Avenue, the gridwork that's in there, what's that going to look like? Are they above surface?

MR. KLIMCSAK: I think they're flush mounts.

MR. EVANS: And then the vacuum

system that would be put in is all subsoil?
MR. KLIMCSAK: I mean, this is conceptual. I couldn't tell you at this point.
MR. PUVOGEL: I can tell you that there's subsurface piping used in general in areas where they want to be hidden. In the commercial areas there may be aboveground piping.
MR. EVANS: So no sort of construction or anything would be done on those properties?
MR. KLIMCSAK: While remediation is taking place?
MR. EVANS: Yeah. Or in the future. I mean, how long are these monitoring wells and vapor extraction units --
MR. KLIMCSAK: I would say monitoring wells -- separate from the whole issue to address the LNAPL, what I didn't discuss is there's still a deep groundwater issue and that's going be a future ROD. You know, I would always envision that there would be some network of monitoring wells for some period of time --

MR. EVANS: But the deep injection wells and the vapor recovery.

MR. KLIMCSAK: Yes. Again, I kind of gave an estimate of maybe seven to eight years in order to meet groundwater standards.

MR. PUVOGEL: And many of the injection wells, particularly on the residential properties, would consist of a small rig coming in, drilling a hole, a temporary hole in the ground, injecting at that point and then filling that up with grout and covering it up, so there's no structure or monitoring casing on that position. And there would be a lot of positions.

In some cases, depending on the studies that occur, wells would be placed either on 15 feet off center or 24 feet off center or close to eight feet off center. It depends on what we find. But there would be a lot of injections to get those nutrients in the right position where they could do the most good and act the quickest.

But on many of those injections they are temporary and they consist of coming in the day, injecting, and moving off. But they might be repeated, might need one or two or three injections as we go.

MR. EVANS: But up to, say, seven or eight years that they're going to be on the property?

MR. PUVOGEL: Not particularly every year. For bioremediation --

MR. EVANS: The injection -- the ones that will be on the site will be -- may be there for seven or eight years for vapor extraction and --

MR. PUVOGEL: Uh-huh, possibly.

MR. EVANS: Thank you.

MS. SEPPI: Anybody else with a question?

Alice?

MS. JOHNSTON: Again, Alice Johnston. I am just curious, if there's no concern about the water from the lake washing up on our properties and bringing more chemicals again, why can't the lake be cleaned concurrently with the rest of the project that's ongoing? Why does it need to wait until last?

AUDIENCE MEMBER: They're not

concerned about recontamination.

- - -

(A brief discussion was held off the record.)

- - -

MS. NACE: So, yeah, we're targeting the higher source areas of contamination upstream to downstream. We don't anticipate recontamination, but we like to do it the smart way, from upstream to downstream, not targeted, the burn site, the dump site, the FMP where the highest sources of contamination are from and then work down.

MR. PUVOGEL: The concentrations on the dump site and the burn site are in orders of a magnitude greater than any other area we'll find, even the FMP. So these have a high potential to contaminate downstream areas, particularly the sediments like you pointed out.

MR. JOHNSTON: Then how does it make sense to remediate our properties? The lake overflows on my property regularly. And, David, yours too. And everyone else that lives on Stevens Drive.

I mean, that doesn't make me comfortable after all -- I mean, we went through hell this year getting, having that remediation done. Those trucks were literally ten feet from my kitchen window. And they're big, heavy equipment. They went five and a half feet deep and I had no backyard. Okay. It was not a pleasant thing to have my house rocking and rolling for four months straight non-stop. And then another month of contractors in doing landscaping, whatever. And they're still not done with me, believe it or not. I had contractors there again today and Monday. That's another issue.

My point is, the lake overflows regularly. It's not once in a while. It's not, you know, just when we have a major flood. It's a common, routine thing. And I have trouble believing that if you're so concerned about this contamination going downstream and you want to clean it up first, then what makes you think we're not going to have it back in our backyards again.

And then what, are you going to

come in again and tear everything out?

MS. NACE: Okay. I'll address it in three parts.

So we do not anticipate recontamination. But to be ultra safe, we're going to go the way -- if it would recontaminate, we want to get those areas first, but we don't anticipate that happening. And all the contamination in the lake is in the sediments on the bottom. It's not floating in the water. So it would have to be high-energy flood pushing all that sediment all up into your property to recontaminate.

Just some water coming up and down --

MS. JOHNSTON: And just so you know, the water came up far enough that they had to come ten foot from my window. So it's coming up approximately 50 foot from the lake.

MS. NACE: But it was -- yeah. And then.

MS. JOHNSTON: That's not an unusual thing, Julie, is what I am saying to you. It's not like it only happens once every

hundred years.
MS. NACE: No, I didn't say it did.
MS. JOHNSTON: This happens regularly. At least once a year I get that kind of water in my backyard.
MS. NACE: And I guess the third part would be if there was recontamination, which, again, I -- now I am repeating myself -- we do not anticipate just from the water -- we would come back and --
MS. JOHNSTON: Oh, my God. I don't even want to talk about that.
MS. NACE: No, I don't either. But I don't think it's going to happen.
MS. JOHNSTON: The lake needs to be cleaned out really. I mean, this is -- it's unacceptable. There's no other way to put it. There's no reason things can't be done concurrently.
I am not asking for Gibbsboro to be put on hold. They had the worst of the contamination. And by the way, I had the worst contaminated property -- according to EPA, I had the worst contaminated property and I was never notified of that. I was not happy

to find that out this summer. And it was told to me because I was not agreeing to allow the remediation to occur because I wanted it to be done in concert with the lake because I didn't want disruption twice.

MR. RUMEN: So maybe the EPA can tell us how the contamination from the manufacturing plant originally got onto her soils.

MS. SEPPI: I am sorry. I don't want to interrupt you. If you could just give us your name.

MR. RUMEN: Nate Rumen on Clementon Road.

Answer the question, please.

MR. KLIMCSAK: How did it get there?

MR. RUMEN: Yeah.

MR. KLIMCSAK: Again, I said it previously. The plant operated from 1850 to --

MR. RUMEN: Via the water, right?

MR. KLIMCSAK: -- whatever, 1972 or '76. And, I mean, this is when the plant was actively discharging, you know, wastes into the creek.

MR. RUMEN: But it got there via water?

MR. KLIMCSAK: No. It got into the sediments that caused it. The metals don't dissolve in water. They get bound to the sediment particles.

MR. RUMEN: But the sediment is being transported by the water, correct?

MR. KLIMCSAK: That's correct. But let's agree on something. It's not dissolved in water.

So any time somebody says --

MR. RUMEN: I am not saying it is. But I am saying that --

MR. KLIMCSAK: You asked me to answer the question.

MR. RUMEN: It doesn't mean that it can't get under the property again.

MR. KLIMCSAK: Let me answer the question. That's what you asked, right?

So when these people say, hey, suddenly I see this water coming onto my property, it must be recontaminated again. Again, it's not dissolved in water, the metals. Lead and arsenic don't dissolve in water. They get bound to sediment particles.

And like I said, it would take a lot of sediments, as Julie said, a catastrophic release or a wave of sediments to be dumped onto a property. And you would notice sediments on a property at that point and, hey, maybe we got to test it.

But just because you see a rain event and inundation of water and the water recedes, it's not suddenly contaminated.

MR. RUMEN: So what's the plan to keep the Silver Lake dam from never, ever being compromised.

MR. KLIMCSAK: I don't know.

MR. RUMEN: Because that would seem to be the most likely situation there, where we would have a high energy event come down through the watershed and recontaminate everything.

Which brings me to another question. I asked when I was here in 2016 whether or not you folks had been monitoring the sediments of Silver Lake, and you looked

at me like I had five heads. Why would we
care about that?
So have you gone and checked it
yet?
MR. KLIMCSAK: Yeah. Actually,
Julie's next operable unit addresses Silver
Lake. There's very little contaminated
sediments in Silver Lake.
When I showed the figure of where
the plant existed, it's not a gradient of
Silver Lake. It's at -- the plant's at the
base of Silver Lake.
MS. NACE: The base of Silver Lake
has contaminated sediment, up against the dam,
and that will be removed.
MR. RUMEN: So you are excavating
the southern --
MR. KLIMCSAK: Well, again, to say
that would be ahead of --
MR. RUMEN: Because I don't see any
of that in what you guys were talking about.
MR. KLIMCSAK: Well, that's the
next operable unit that Julie has.
MS. NACE: In 2020.
MR. RUMEN: But that's upstream of

everything that you're talking about tonight. So shouldn't you do that first?

MS. NACE: So just because my proposed plan for the waterbodies -- or EPA's proposed plan for the waterbodies comes out in 2020, it doesn't mean we can't make some changes that make sense when we come in and do the cleanup actions.

So if there's the bottom part of Silver Lake that needs to be remediated at the same time of the FMP, we talked to Sherwin-Williams and we're going to discuss not holding off on that and moving, again, upstream to downstream.

MR. KLIMCSAK: So, Nate, essentially -- I mean, the FMP area is so big that there's the potential to sequence the work, like you're expressing, to come into an area where we would address the sediments in Silver Lake and then be hitting Upper Hilliards Creek. I mean, I don't know the exact size of the FMP area.

Just -- and, again, I don't want to say that EPA selected alternative 4. It's the preferred alternative. But just the excavation activities alone associated with alternative 4 are estimated at three years. And with Julie's ROD targeted for next year, it could be possible that the sequencing of work would allow Silver Lake sediments to be addressed, and then we would address Upper Hilliards Creek sediments.

So that's certainly something that would, you know, be incorporated into the thoughts of the remedial design.

MS. SEPPI: Just one more thing I wanted to mention. Obviously, all of your comments and questions are being recorded here tonight.

But if you go home and you think of other questions or you talk to other people who have questions or comments, please urge them to send them into Ray up until December 30th. You know -- and they'll be addressed also in that responsiveness summary. You may go home and think of something that you wanted to ask tonight and totally forgot.

So please -- and, you know, tell your friends and neighbors the same thing.

Any other question?

MS. HAINES: Tracy Haines again. Basically -- I mean, you all had said this before. All these projects are broken into workable units?

MS. SEPPI: Operable units, yes.

MS. HAINES: And they're all going to overlap, correct?

There's going to be instances where Ray's and Julie's overlap because it makes sense.

MS. SEPPI: Uh-huh.

MS. HAINES: And it's going to be hopefully easier on us, yes?

MR. KLIMCSAK: Yes.

MS. SEPPI: Yes.

MS. HAINES: Okay. Just want to make sure.

MS. SEPPI: Yes.

Sharon, are you okay? Do you need a break or anything?

MAYOR CAMPBELL: Ed Campbell, mayor.

Maybe you could tell people when -- from today, when would you expect the first shovel to the ground? Just put

it -- you're going to start a design phase
after the ROD issue and then -- it's not going
to start tomorrow.

MR. KLIMCSAK: It's not going to
start tomorrow.

One of the key and unique features
of, you know, today is that back in 2018 the
consent decree -- '19?

MR. PUVOGEL: 2018.

MR. KLIMCSAK: 2018. Typically
when EPA would complete a record of decision,
we would then negotiate a new legal agreement
with Sherwin-Williams, and that could
certainly take time.

We recently -- I think in
2018 -- completed a consent decree. This is a
global consent decree that we no longer have
to enter into individual legal agreements.
This consent decree will cover my FMP operable
unit 2, it will address Julie's operable unit
4, the sediments, and then my operable unit 3,
the deep groundwater.

So essentially after the ROD is
completed, we do a specific statement of work
with Sherwin-Williams. Sherwin-Williams would

begin development predesign investigation
sampling to then move into remedial design.
You know, shovels in the ground, honestly,
maybe two years from now on the FMP.

MAYOR CAMPBELL: I just want people
to know that it doesn't start tomorrow just
because you made the decision in 30 days.

MS. SEPPI: No. That's a really
good point. Because design does take some
time. Yes.

Anybody else?

(No response)

MS. SEPPI: All right. I
think -- I mean, certainly you're welcome --
and you should probably go take a look -- I
don't even need this. I have such a loud
voice.

Go to our web page. You would find
the proposed plan there electronically. And
right on the front page of our web page is a
link that will take you straight to the
proposed plan. As I said, we have a few
copies here tonight if you would like a hard
copy.

Also, if you just go to Google, the

easiest way to get to our web page is Google Sherwin-Williams, slash, Hilliards Creek Superfund site, and it will take you right to our web page. And that's probably worthwhile because, you know, there's a lot of information on there, a lot of past history, a lot of things have been done, a lot of the documentation that's already been done. And so I would suggest that you do that if you have some time. Okay.

MAYOR CAMPBELL: Pat, before we adjourn, there are some other elected officials and representatives that have joined us. Perhaps they could just identify themselves.

MS. SEPPI: Certainly.

MAYOR CAMPBELL: So that the public would know --

MS. SEPPI: Who's here, yes.

MAYOR CAMPBELL: George, maybe you could start.

MR. HAAF: George Haaf, chief of Gibbsboro Fire Department.

MAYOR CAMPBELL: Dennis?

MR. DEICHERT: Dennis Deichert. I

am on the Board of Education at Eastern High School. Thank you very much for your votes this year. I know I was running unopposed, but it was nice to see that many people come out.

MR. NASH: I am Jeff Nash, Camden County freeholder and liaison to the Parks Department, which the county owns Kirkwood Lake.

MR. SPELLMAN: Lawrence Spellman, Voorhees Township.

MS. McCANN JOHNS: Maggie McCann Johns. I am the director of the Parks Department for Camden County.

MAYOR CAMPBELL: And did we miss anybody?

(No response)

MAYOR CAMPBELL: So I just think you should know, you have people that represent you, that they care, they're here, they've been actively involved in this, to their credit.

MS. SEPPI: All right. Thank you. Thank you very much, everybody, for coming. And don't forget to send in any additional comments you might have and share that with anybody who might have comments also that couldn't make it here tonight.

Thanks again.

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(Matter concluded at 8:29 p.m.)

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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.

____
Court Reporter - Notary Public

Attachment D: Written Comments

January 24, 2020

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Via email and US Mail

RE: Comments regarding US EPA's Superfund Proposed Plan for the Sherwin-Williams/Hilliards Creek Superfund Site Operable Unit 2 (Former Manufacturing Plant)

Dear Ray,

This memorandum provides comments on behalf of the Gibbsboro Governing Body, Gibbsboro Combined Planning/Zoning Board, and the Gibbsboro Environmental Commission regarding the above referenced plan dated November 2019.

Residents and property owners in Gibbsboro appreciate the efforts to date by US EPA to engage with and consider the feedback provided by the community and in particular property owners that will continue to deal with the fallout of the area's industrial heritage.

The former manufacturing plant (FMP) area includes much of an office park known locally as the Paintworks. The Paintworks has been the major business center within Gibbsboro.

The following section, Summary of Comments, summarizes the Borough's feedback on US EPA's proposed plan. It is followed by a more detailed discussion of the Borough's position, rationale for our positions, and supporting information.

Summary of Comments

We fully support the US EPA's approach to the order of remedies being determined and implemented. Residential properties in Gibbsboro and Voorhees Township are the top priority then sites from the sources at the 561 Dump Site, US Avenue Burn Site and FMP downstream to Kirkwood Lake. We continue to emphasize that speed must not, in any way, take priority over the quality and completeness of the remedies.

We fully support US EPA's plan to deal with floodplain soils and sediments within the upper Hilliards Creek from Foster Avenue to West Clementon Road.

With respect to US EPA's plan for soils, we have several areas of concern:

1. **Opposition to the use of Institutional Controls such as Deed Notices and Caps** - Our primary concern continues to be the residual contamination that is left behind – presumably addressed by caps (roadways or parking lots) and deed notices. Post-cleanup residual contamination places a burden on future owners and diminishes the desirability of property. Accordingly, it is less valuable than "clean" property. For these reasons we oppose the use of caps and deed notices as controls. We urge US EPA to go beyond Alternative 4, or Alternative 5, and require Sherwin-Williams to maximize the contaminants that are removed and absolutely minimize the use of institutional controls such as caps and deed notices. EPA must evaluate an alternative that removes <u>all</u> contamination, including that which is at depth or located within rights-of-way. We oppose the use of institutional controls. And as you know, the Borough is in the process of taking ownership of several lots within the FMP.

2. **Silver Lake Dam/Embankment, Outflow to Foster Avenue, and Embankment at Foster Avenue** – Brandywine's most recent Dam Safety Inspection Report for Silver Lake Dam, prepared by Langan Engineering and Environmental Services, indicates that the dam is in fair condition. In conjunction with the remediation activity at the FMP, the dam, embankment, channel/piping to Foster Avenue under the parking lots and the embankment at Foster Avenue/Hilliards Creek must be inspected and repaired to the highest standard. This is most important if contamination is left on the site. According to Greg Fusco, the Gibbsboro Borough Engineer, the outflow piping has been documented in the report to be a seven (7) feet wide brick arch pipe which appears to be original to the dam structure and has obviously outlived its useful life. Leaving this structure in the ground for future replacement by others does not provide for a complete remediation effort regarding the removal and disposal of related soils. There is also a concern with the arch pipe embankment wall at Foster Avenue which has been documented to be in very poor condition. The wall is currently bulging and is being monitored for movement since the wall provides structural support for the Foster Avenue roadway.

3. **Sewer Service: Unrecovered Damages and Future Service** – From 1988 through 1991 the Borough undertook a significant project to design and construct sanitary sewer facilities within Gibbsboro. Discovery of contamination in the FMP area led to the deletion of several properties and streets from the project. Today those areas remain without access to public sewer facilities. The selected remedy must enable completion of the project as originally designed in a timely manner. While Alternative 4 will result in much of the contamination at the FMP being mitigated, the drawback is that it will take an unacceptably long period of time to enable redevelopment of the area and fails to address public rights-of-way. For this reason, we again urge US EPA to go beyond Alternative 4, require Sherwin-Williams to maximize the contaminants that are removed, and require Sherwin-Williams to build to complete the public infrastructure at the FMP for

commercial and residential properties. (Details and supporting information are contained in subsequent paragraphs and attachments.)

4. **Address Contamination beneath Public Rights-of-Way and Roads** – None of the alternatives considered by US EPA, including alternative 5, adequately addresses contamination beneath Berlin Road, United States Avenue or Foster Avenue. Within and beneath those roadways are (or will be) utilities that require maintenance and eventual replacement. Viewing a roadway as a cap serves to defer the costs of dealing with such contamination.

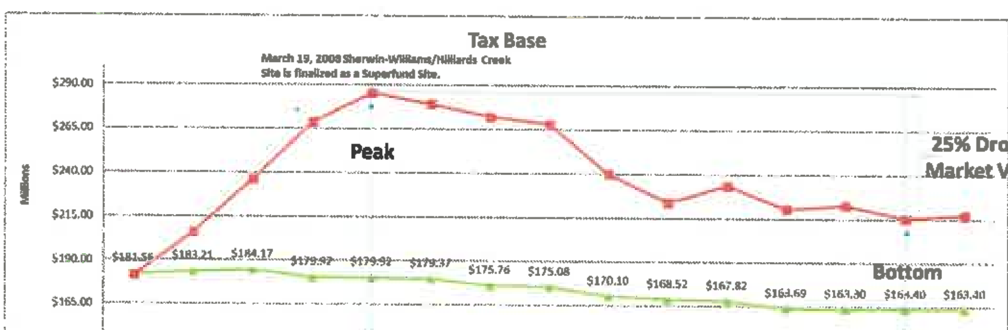
5. **Operational Comments During Implementation** – We offer a number of comments regarding the implementation of the selected remedy to ensure effective communication with public officials and safety officers, employees, property owners, and residents.

The remainder of this memorandum provides additional details concerning the Borough's positions.

Economic Impact of Superfund Designations on Gibbsboro Property Values

The environmental impact of the industrial operation by Sherwin-Williams on Gibbsboro is irrefutable. Consequently, the economic development of the community has been significantly and adversely impacted. The former factory was in the heart of our small, 2.2 square mile town, that boasts a population under 2,500. Prior to the finalization of the Sherwin-Williams/Hilliards Creek listing, the third and final proposed Superfund listing in Gibbsboro, home values in Gibbsboro were rising at rates well above average for Camden County. That all changed with the third listing which sparked a decline in property values and the demolition of several commercial buildings that were directly within the contaminated region or nearby.

The approximate market value of the Gibbsboro tax base has dropped by nearly $70 million since the EPA finalized the Sherwin-Williams/Hilliards Creek listing.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Assessed	$181.56	$183.21	$184.17	$179.92	$179.92	$179.47	$175.76	$175.08	$170.10	$168.52	$167.82	$163.69	$163.30	$163.40	$163.40
Market	$181.36	$205.86	$236.12	$268.74	$285.58	$279.26	$272.08	$268.07	$239.81	$223.77	$233.70	$220.52	$222.60	$215.29	$217.32

While the entire town has been impacted financially, it is reasonable to conclude that the impact has been greater to property owners in the immediate vicinity of the sites: along York Avenue, Marlton Avenue, Foster Avenue, and portions of Berlin Road, South United States Avenue, West Clementon Road, Lakeview Drive, and Haddon Avenue. This area includes several residences and most of the Paintworks. It took ten (10) years for the Borough to get US EPA to remove the suspicion created by former Governor Jon Corzine's erroneous letter to US EPA that implicated a much broader contaminated area than known to NJ DEP. The confusion it caused killed redevelopment efforts at the Paintworks. Brandywine Realty is still struggling to redevelop the property.

The remediation of the Superfund sites, and their impact on humans and property, is the Borough's top priority. However, the adverse economic impact the town, and its property owners, has incurred, and will incur in the future, cannot be ignored. From the Borough's perspective, leaving any contamination behind represents a potential hazard and loss of value, which is unacceptable. One must ponder "If a remedy is safe, then why does it require inspection every five years to ensure it remains effective?" The existence of institutional controls such as caps and deed notices restrict development or redevelopment. And residual contamination remains in federal, state and local databases as a contaminated site reducing the desirability of the land. US EPA is requiring deed notices at the 561 Dump Site and US Avenue Burn Site. Enough is enough: We oppose deed notices at the FMP.

Future Borough Ownership of Select Brandywine Properties

As previously conveyed to US EPA, the Borough of Gibbsboro will become the owner of two properties within the FMP and intends to monetize them. Gibbsboro will also maintain control of a third property via a 99-year lease.

Gibbsboro will own Block 8.01 Lot 3.09 consisting of approximately three (3) acres located at the intersection of East Clementon Road and Foster Avenue that is the site of the former 6 East Clementon Road office building that was demolished a few years ago. This lot is part of the FMP and requires some remediation. Both the Borough and Brandywine want Sherwin-Williams to construct a parking lot and park on parts of this lot as the remediation completes.

The Borough will also own Block 8.01 Lot 3.07 consisting of approximately two (2) acres including the historic Varnish Stacks. This lot is part of the FMP and requires remediation. If EPA's preferred alternative, Alternative 4, is implemented, we realize that the remediation of this lot, and others contaminated with LNAPL, will require a lengthy period of time to be completed. The development of this parcel, and other adjacent properties, should not be impeded for such a long period of time. Alternative 5, is a better solution for the municipality, its residents, businesses and property owners,

The Borough will continue to lease the building presently housing the Gibbsboro Police Station.

The Borough does not want institutional controls or development limitations on any of its properties.

Sewer Service: Unrecovered Damages and Future Service

The Borough has unrecovered damages from a 1988-90 major project to extend sewer service areas of Gibbsboro that was significantly impacted by the discovery of contamination within portions of Berlin Road, United States Avenue, Foster Avenue, and Clementon Road. EPA was previously supplied a copy of the September 4, 1989 feasibility study, required by NJ DEP, which evaluated options for re-routing the system around confirmed contamination. The contamination cost Gibbsboro hundreds of thousands of dollars in investigations and additional redesign and construction costs. The original project was delayed and ultimately construction was bifurcated to accommodate the directed redesign of the system around the Paintworks.

The redesigned sewer system resulted in increased energy and maintenance cost due to waste being "double-pumped" to a county sewer interceptor. (The Berlin Road pump station originally pumped waste to Kirkwood Road where it flowed via gravity lines to the Kirkwood road interceptor. Instead it is pumped to a manhole in Lakeview Drive, flows to the West Clementon Road pump station and is again pumped to the Kirkwood Road manhole.)

In addition to the direct costs incurred by Gibbsboro, the Borough lost key connection fees and operating revenues because several properties had to be excluded from sewer service because they were unreachable due to contamination. (The Borough was required by NJ DEP to establish a monitoring program for the remaining septic systems in the original planned sewer service area. Of the five buildings along Foster Avenue, only 7 Foster could be connected to the system leaving 1, 2, 4, and 9 Foster Avenue on septic systems. The Borough Engineer indicates that the septic systems are substandard and have outlived their useful life.) This change to the scope of the original sewer project reduced the customer base for the sewer utility. A direct result of that was that the sewer utility system's debt service was significantly greater than planned due to the reduced number of equivalent users. As a direct result of the contamination, today Gibbsboro has one of the largest local connection fees (nearly $ 6,000) and local user fees in Camden County. These fees, required to operate the system, are a result of the changes required by NJ DEP to avoid the FMP contamination, and have contributed to a prolonged development recession for businesses and homeowners in Gibbsboro.

As part of the remediation the Borough requests that:

1. The Borough wants to recover the inflation adjusted costs of the redesign, construction and operation of the redesigned collection system.

2. The remedy needs to enable the construction of the sewer system as originally designed within portions of Berlin Road, United States Avenue, Foster Avenue, and Clementon Road and provide service for those excluded from

service in 1989. Preferably, we want Sherwin-Williams, or its agents, to complete the project as originally envisioned, connecting existing buildings and covering the costs of those connections for residents and businesses.

3. The design of the FMP remedy needs to enable future development and redevelopment of the FMP/Paintworks area including underground sewer, water, and other utilities. Private developers, the Borough, and utilities do not want to be digging in contaminated soils to provide future utility service.

Silver Lake Dam/Embankment, Outflow to Foster Avenue, and Embankment at Foster Avenue

A major concern for Gibbsboro is the long-term maintenance of the Silver Lake Dam/embankment and outflow to Hilliards Creek at Foster Avenue. According to Brandywine's Dam Safety Inspection Report for Silver Lake Dam, prepared by Langan Engineering and Environmental Services, the dam/embankment is in fair condition. Brandywine has created a management association to manage and share the cost of maintaining the lake, trail, and the common spaces around the FMP. Given the condition of the embankment and dam, the Borough feels that the scope of remediation must include upgrades to the embankment to improve its safety rating. Current and future owners of these properties must not be saddled with the costs of dealing with residual contaminated soils.

The outflow of Silver Lake traverses under parking lots to Hilliards Creek at Foster Avenue. During remedy design, that channel must be inspected and replaced or slip-lined to guarantee its long-term viability.

The embankment at Foster Avenue must also be reconstructed as it has been documented to be in "POOR" condition in the NJDEP Dam Safety Inspection Report. The shoulder must be enlarged to enable completion of the Borough's eight feet wide multi-purpose trail along Foster Avenue. The connection between the intersection of Foster Avenue and West Clementon Road has been deferred by Gibbsboro until the remediation is complete. During remediation, Sherwin-Williams should construct the segment between the intersection and the Gibbsboro Police Station.

Operational Comments for Use During the Implementation of the Cleanup of the Former Manufacturing Plant in Gibbsboro Borough, Camden County, New Jersey

1. Continue the practice of pre-briefing local members of the governing body and public safety officials concerning plans hazards, triage areas, hours of operation, and contact numbers for use in the event of an emergency.

2. Continue the practice of supplying regular briefings concerning plans and progress so the municipality can keep citizens informed.

3. Continue the practice of providing information for the local newsletter and distribution via NIXLE, a text communication vehicle.

4. Establish a program to monitor indoor air quality during the time when bioremediation is in effect to assure that employees remain in a safe workplace.

5. None of the alternatives considered by US EPA, including alternative 5, address contamination within Berlin Road, United States Avenue or Foster Avenue. Within and beneath those roadways are utilities that require maintenance and eventual replacement that have not been considered in any alternative and, as such, defer the costs of dealing with such contamination. Broken sewer or water lines cannot be left unaddressed for EPA or Sherwin-Willliams to mobilize, study, and solve the pollution problem at a future time. The alternatives considered by EPA do not account for the future cost that governments and utilities will incur to repair, maintain and replace infrastructure within roadways. The selected alternative must satisfactorily address roadway and utility easement contamination to be acceptable to Gibbsboro and enable the Borough's sewage collection system to be constructed as originally designed. We oppose the use of roads or parking lots as caps. If US EPA ignores the Borough's objection to the use of a road as a cap, then it must provide specific guidance to utilities and the Borough on constructing and maintaining infrastructure within a contaminated volume.

6. Regarding the Soil Removal Process:
    a. Specific residences and businesses should be notified of a tentative schedule involving the cleanup of their property at least 30 days in advance. Final confirmation should be supplied seven days in advance. The local police and governing bodies should receive the same notices.
    b. Where necessary, contractors should contract with the local Borough Clerk to arrange for local police to provide security for activities within or near to roadways and to provide safe access to roads for construction traffic.
    c. The implementation plan needs to address how dust will be controlled and, depending on the plan, how contaminated particles in dust will be collected and processed.
    d. In the event residents or businesses are required to vacate their properties during the cleanup process, their expenses should be covered by Sherwin-Williams. If they do not need to vacate the properties, how will they be protected from exposure during the cleanup process? Will businesses be compensated for lost or reduced business during construction?

7. Regarding the offsite stockpiling of contaminated soils:

a. Any areas that are to be used to stockpile contaminated soils need to be secured from public access.
b. Proposed storage areas should be disclosed to the public and approved by the governing body and public safety officials.
c. Transportation routes to local stockpiling sites should be disclosed to the public and approved by the local governing body.
d. The transportation of contaminated soils must be in sealed drums or in vehicles that are loaded such that no material or dust will escape.
e. Offsite storage of contaminated soils must be in sealed drums or within a volume that is not easily penetrated.
f. No material should be stored off site more than seven days.
g. Offsite storage should be screened such that it cannot be seen from any residence, business, public building, public recreation area, or public street.

8. Regarding the stockpiling of contaminated soils on site:
   a. Any properties on which contaminated soils are temporarily stored need to be secured from public access.
   b. Proposed areas should be disclosed to the public and approved by the local municipality.
   c. The on-site storage of contaminated soils must be in sealed drums or within a volume that is not easily penetrated.
   d. No material should be stored on site more than 24 hours.

9. Regarding the decontamination of vehicles used to transport contaminated soils, a process needs to be established to remove contaminated particles from trucks before allowing transit on public streets. The process needs to address the collection and security of contaminated particles removed during the decontamination process. These processes need to be disclosed to the public and the local governing body.

10. To the greatest extent possible, operations and stockpiles should be screened from public view.

11. All work within Gibbsboro shall comply with local ordinances regarding hours of operation, commercial operations and noise.

Summary

The FMP is a significant property within Gibbsboro, from an historical, recreational, and valuation perspective. Its location near the center of Gibbsboro and on Silver Lake makes it the focal point of the community and central Camden County. Each day hundreds of people traverse the trail around the lake to enjoy the park-like atmosphere. That tranquil setting made the FMP area the source of most of Gibbsboro's non-residential tax base. The contamination and resulting Superfund designation resulted in the area being devastated by the stigma attached to the Superfund designation. ***We ask that US EPA give great weight to the economic impact this three-decade long saga has laid on Gibbsboro, its residents, businesses, and taxpayers and order a remediation that enables this property to gain a <u>complete</u>, clean bill of health and not allow it to become a perpetual record as a contaminated site within state and federal databases.***

Please do not hesitate to contact me should additional discussion be beneficial in aiding US EPA in finalizing its proposed plan for the FMP.

Very truly yours,

Edward G. Campbell, III
Mayor
Borough of Gibbsboro

Enclosures:

1. 1989 Feasibility Study for Modifications to the Gibbsboro Borough Sanitary Sewerage Collection System in the Area of the Paint Works Office Complex … dated September 4, 1989

cc: Pete Lopez, Regional Administrator US EPA
Rich Puvogel, Manager US EPA
Steve Maybury, Bureau Chief NJ DEP
Lynn Vogel, Case Manager NJ DEP
Gibbsboro Planning Board/Professionals
Gibbsboro Borough Council/Professionals
Congressman Donald Norcross
State Senator James Beach
Assemblywoman Pam Lampitt
Assemblyman Louis Greenwald

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COMMERCIAL
INDUSTRIAL
CONSTRUCTION
MANAGEMENT

SURVEYING

CONSTRUCTION
RESIDENTIAL
COMMERCIAL
INDUSTRIAL
GOVERNMENTAL

FEASIBILITY STUDY

for

MODIFICATIONS TO THE
GIBBSBORO BOROUGH SANITARY SEWERAGE COLLECTION SYSTEM
IN THE AREA OF THE
PAINT WORKS OFFICE COMPLEX
GIBBSBORO BOROUGH SANITARY SEWERAGE COLLECTION PROJECT
GIBBSBORO BOROUGH, CAMDEN COUNTY, NEW JERSEY

Date: September 4, 1989

(KEI #16GB1857)

E.P.A. PROJECT NUMBER 6340871-01

Prepared by:

Charles J. Riebel, Jr., P.E., P.P., P.L.S.
Gibbsboro Borough Engineer

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1.0 Summary and Recommendations

Soil contaminated with Petroleum Hydrocarbons and Volatile Organics has been found in test boring holes that have been performed on Foster Avenue and South United States Avenue around the Paint Works Office Complex. The presence of these contaminated soils will prevent the installation of the 6" P.V.C. Force Main on Foster Avenue and a portion of the alignment of the 8" P.V.C. Gravity Main as proposed in the approved Gibbsboro Sanitary Sewerage Collection System.

Under the direction of the New Jersey Department of Environmental Protection Bureau of Engineering South Municipal Waste Water Assistance Elements, the Borough of Gibbsboro has evaluated alternatives to construct the proposed collection system within the area of Paint Works Office Complex considering the effects of the contaminate soils.

A cost effective plan has been selected which eliminates the construction of the 6" force main on Foster Avenue and postpones construction of the 8" gravity main on South United States Avenue until remedial action is taken to clean the soil contamination around the Paint Works Complex. The selected alternative will re-route the required force main up Marlton Avenue and Along Haddonfield-Berlin Road (County Route #561) to Manhole C18 proposed on Clementon Avenue.

Along with the selected Alternative, the following design modifications will also be required to be made to the Gibbsboro Sewerage Collection System.

1. To eliminate the force main on Foster Avenue an 8" P.V.C. force main 3255 feet long will have to be constructed from the Berlin Road pump station up Marlton Avenue and along Haddonfield-Berlin Road (County Route #561) to Manhole C18 located on Clementon Avenue.

2. The proposed 4" diameter, 7.5 horsepower pumps in the pump station will have to up graded to 6" diameter, 25 horsepower pumps which will have to be capable of pumping against a TDH of 73 feet. The pump station wet-well will have to be increased in size to a minimum of 7 feet in diameter. The new pumping rate will be approximately 600 GPM.

3. The proposed 8" gravity main on Clementon Avenue will have to be increased to a 10" gravity main from Manhole C18 to the Gibbsboro Road Pump Station to handle the additional flow do to the increase in the new pumping rate. Also, the slope of the 10" main will have to be increased to 0.005 1/1 between Manhole HA9 and C14, and 0.007 1/1 between Manhole C11 and the pump station.

4. The pumps in the Gibbsboro Road pump station will have to be upgraded to 8" diameter, 50 horsepower pumps capable

of pumping against a TDH approximately equal to 82 feet. The new pumping rate will be 1050 GPM.

5. The 6" P.V.C. force main along Clementon Avenue will have to be increased to an 8" diameter P.V.C. force main.

6. The slope of the proposed 10" gravity main on Kirkwood Road will have to be increased to a minimum 0.0073 1/1 for the entire length of the main.

The selected alternative has been chosen because it is the most economical solution compared to the other alternatives presented. Also, the selected alternative will not adversely impact any environmentally sensitive areas along the new alignment. Finally, the selected alternative will not involve working with any contaminated soils around the Paint Works Office Complex.

2.0 INTRODUCTION

2.1 Purpose and Scope

The Borough of Gibbsboro has received a Construction Grant from the New Jersey Department of Environmental Protection and has completed final engineering plans and specifications for the proposed Gibbsboro sanitary sewerage collection system. Prior to adverting the project for construction in late July, 1989, it was brought to the attention of the New Jersey Department of Environmental Protection Bureau of Engineering South Municipal Wastewater Assistance Element that extensive soil contamination exists along portions of the proposed collection/conveyance route in the vicinity of The Paint Works Office Complex. In order to evaluate the potential problems that could occur from installing the proposed system in areas where the soil contamination exists, the New Jersey Department of Environmental Protection Bureau of Engineering South Municipal Wastewater Assistance Element has requested the Borough of Gibbsboro to delineation of the extent of the contamination and provide an analysis of the impact that this contamination would have on the proposed collection/conveyance system.

This report has been prepared to review and analyze the existing conditions, proposed alternatives and recommended solutions for the Gibbsboro sanitary sewerage collection system in the area of The Paint Works Office Complex.

3.0 EXISTING CONDITIONS

3.1 Project Location

The Paint Works Office Complex surrounds the Silver Lake which is bordered by Gibbsboro-Clementon Road on the West, Foster Avenue on the South, South United States Avenue on the East and Haddonfield-Berlin Road (County Route Number 561) on the North. The Paint Works Office Complex is the original site of the Lucas Paint Works which manufactured paint products from 1852 to 1930. The Paint Works facility was then purchased, owned, and operated by the Sherwin-Williams Paint Company who manufactured paint products at the facility well into the 1960's. (1) In the late 1970's the facility was converted to an office complex by the Scarborough Corporation.

The Gibbsboro sanitary sewerage collection system proposes to install an 8" P.V.C. gravity main along Clementon Road (County Route Number 686) and an 8" P.V.C. gravity main along South United States Avenue in the vicinity of The Paint Works Office Complex. A major link in the proposed Gibbsboro sanitary sewerage collection system occurs along Foster Avenue in the form of a 6" P.V.C. force main which will connect the Northeast Stumptown Section of the Borough of Gibbsboro, via a pump station, to the Southwest Kirkwood Road Interceptor. This Interceptor will then convey the flow to the Camden County Municipal Utilities Authority Regional Sanitary Sewerage Collection System located on Kirkwood Road.

The depth of the proposed 8" main on Clementon Road is approximately 11 feet and is located approximately one (1) foot into the ground water table. The proposed depth of the 6" force main on Foster Avenue ranges between 3 and 4 feet and does not encounter the ground water table as designed. The proposed 8" main on South United States Avenue varies in depth from 4 feet to 20 feet and approximately 300 linear feet of main is located within the ground water table.

3.2 Delineation

The New Jersey Department of Environmental Protection Division of Water Resources, Southern Bureau of Regional Enforcement which has offices located in The Paint Works facility has informed the Borough of Gibbsboro that soil and groundwater contamination has been noted on Foster Avenue and South United States Avenue. This contamination has not been properly delineated by the New Jersey Department of Environmental Protection or by others due to impending litigation.

In accordance with directions from both the Southern Bureau of Regional Enforcement and the Municipal Wastewater Assistance Element, the Borough of Gibbsboro has developed a Sampling Plan to help delineate the soil contamination around The Paint Works Complex within the proposed alignment of the sewer project.

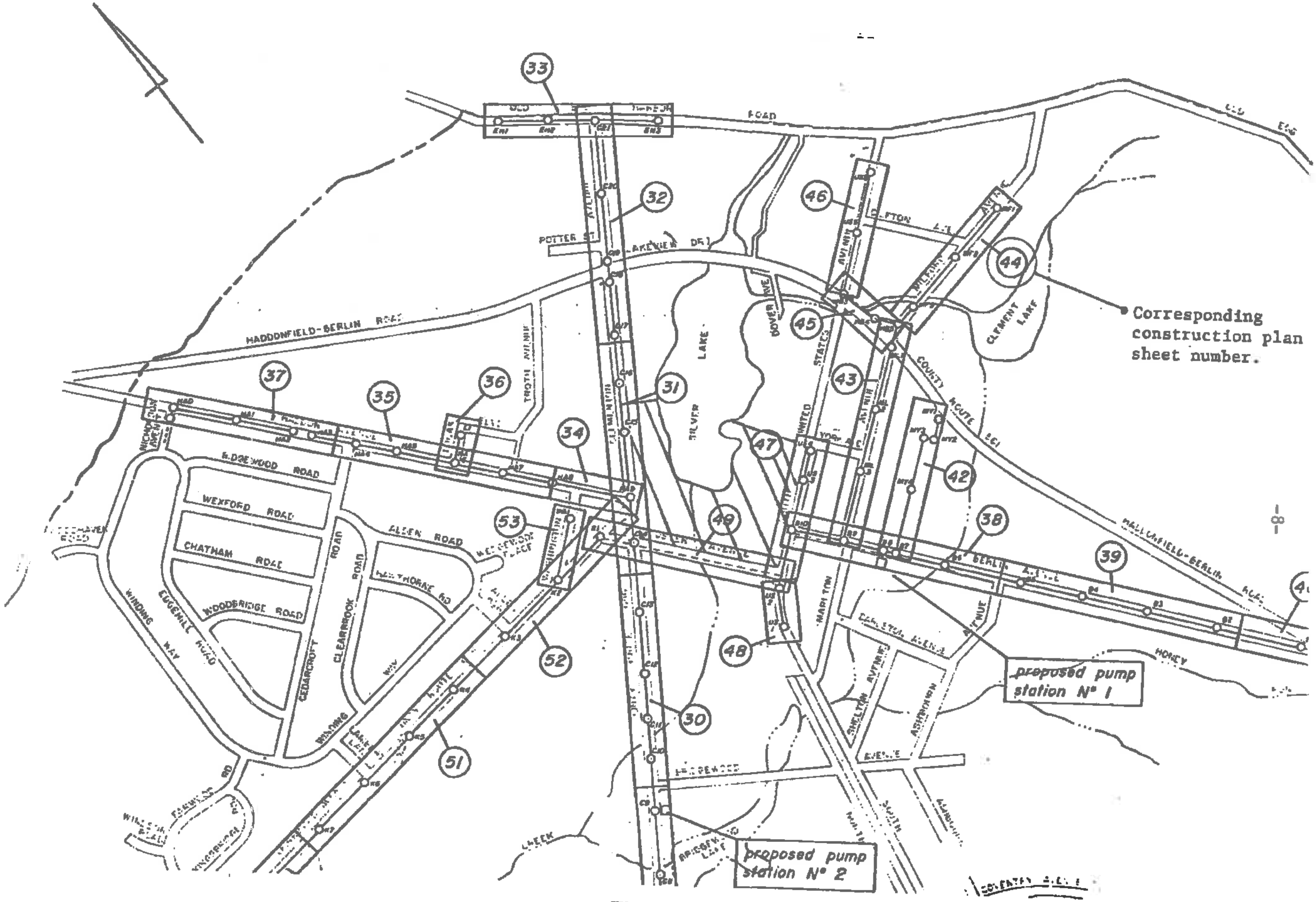


Figure #2
Proposed Gibbsboro Sanitary Sewerage Collection System In The Vacinity Of The Paint Works Complex

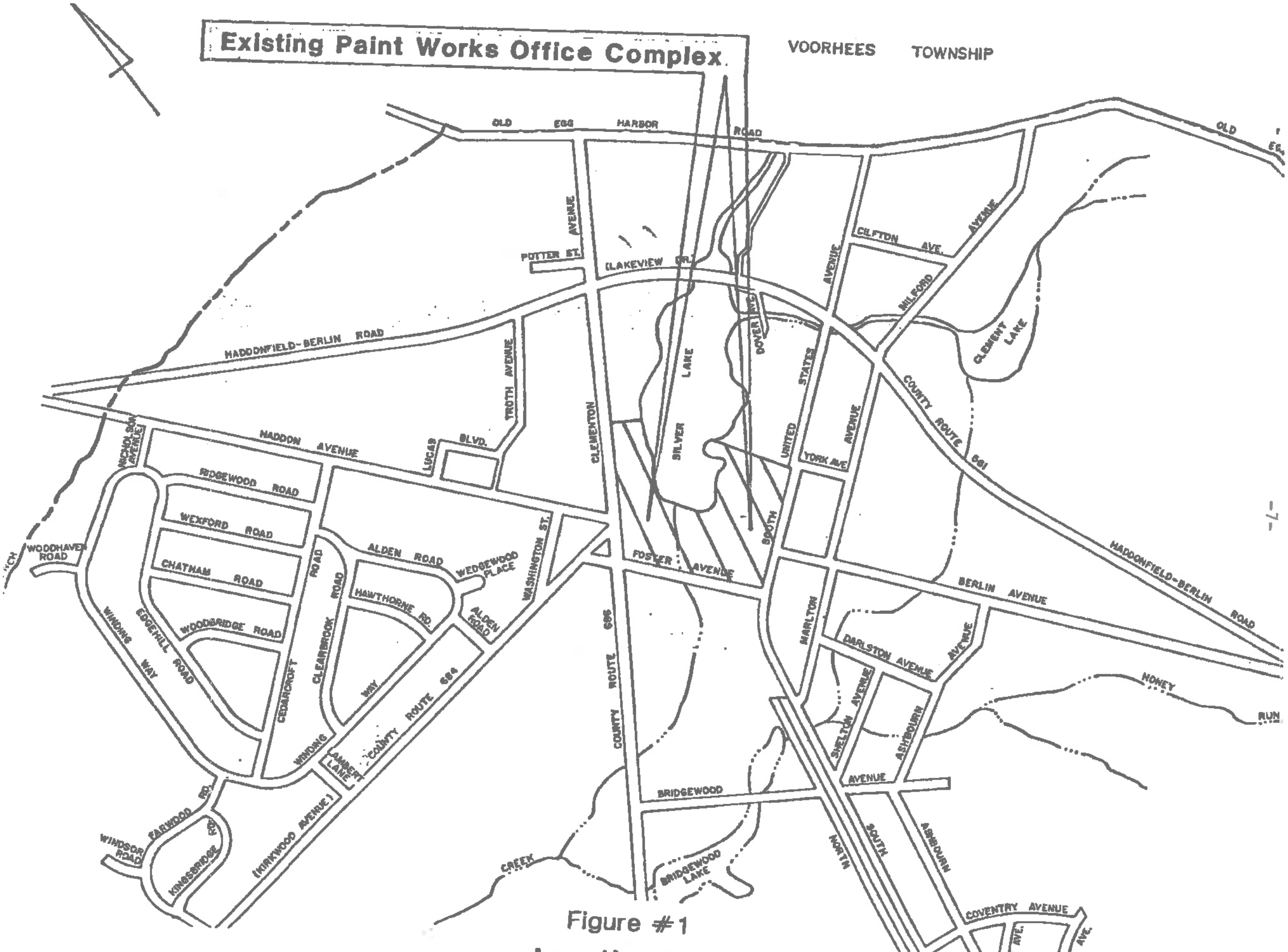


Figure #1

Location Map

3.2.1 Soil Boring and Sampling Plan

To delineate the existing conditions of the soil contamination, a Soil Boring and Sampling Plan was developed around The Paint Works Complex. A total of seven boring holes were performed at the following locations:

Boring Hole #1 - North side of South United States Avenue at the intersection of South United States Avenue and Berlin Road, near guardrail, 6 feet from the face of curb in the grass.

Boring Hole #2 - North side of South United States Avenue, 45 feet north of existing fire hydrant, 4 feet from the edge of the road in the grass.

Boring Hole #3 - North side of Marlton Avenue at the intersection of New York Avenue and Marlton Avenue, 3 feet South of the existing stop sign on New York Avenue in the grass.

Boring Hole #4 - South side of Berlin Road, 30 feet West of Utility Pole #307, 4 feet from the edge of road in poison ivy.

Boring Hole #5 - North side of Clementon Road at the intersection of Haddon Avenue directly behind existing manhole 6 feet from the face of curb in grass.

Boring Hole #6 - North side of Clementon Road directly across from Utility Pole #BT13, 7 feet from the edge of road in grass.

Boring Hole #7 - South side of Foster Avenue in front of Police Station 10 feet East of Utility Pole #3478.

Two (2) soil samples were obtained at each boring location. One (1) sample was obtained approximately 2 feet from the existing ground surface and one (1) sample was obtained within one (1) foot of the ground water table for each boring hole. The soil samples were analyzed for total petroleum hydrocarbons utilizing EPA Testing Method 418.1 and Volatile Organics Utilizing EPA Testing Methods SW 846-8010 and 8020. These testing methods were recommended to the Borough by the Southern Enforcement Element. All soil testing was performed by a certified testing laboratory.

3.2.2 Test Results

The Test Results were interpreted based on guidelines that were provided by the New Jersey Department of Environmental Protection Bureau of Hazardous Waste Identification and Classification. The following guidelines have been used for the interpretation of the test results:

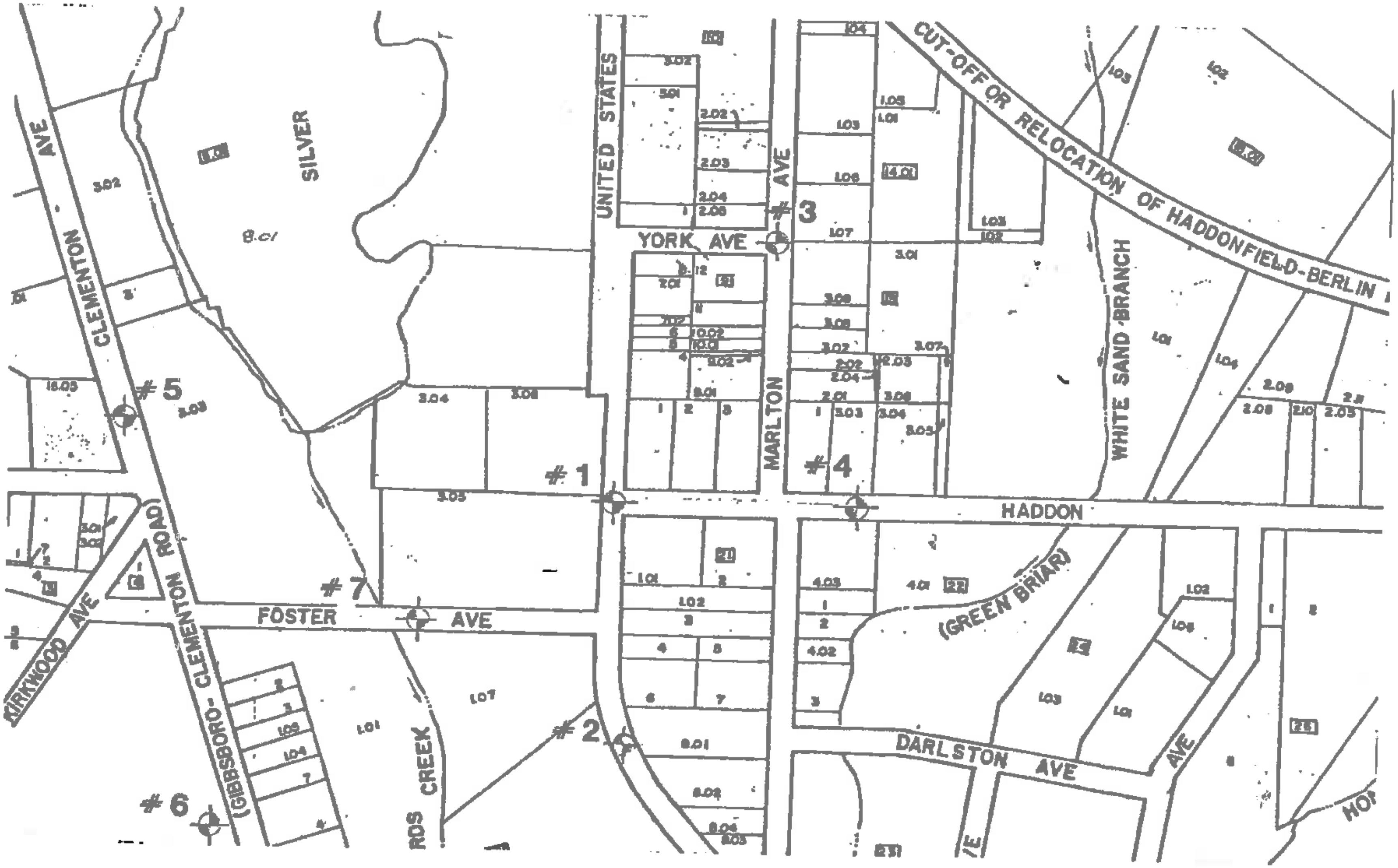


Figure #3

Soil Boring Plan

Gibbsboro Sanitary Sewer Collection System

A. If a contaminant constitutes 3% or more of the total sample, the sample represents a hazardous waste and the material must be classified and properly disposed according to the New Jersey Department of Environmental Protection Regulations.

B. If a contaminant constitutes between 1% and 3% of the total sample, the sample indicates that the material is a non-hazardous waste which can be classified as an ID27 Industrial Waste and must be disposed of properly at a landfill or incinerated.

C. In most cases, If a contaminant constitutes less than 1% of the total sample, the sample represents a non-hazardous waste and the material may or may not have to be disposed at a landfill or incinerator.

The Test Results are summarized in Figure 4. The results of the soil sampling appear to be well within the acceptable limits of the guidelines established by the Bureau of Hazardous Waste Classification and Identification except for samples taking from Boring Hole #1 located at the intersection of South United States Avenue and Berlin Road and Boring Hole #7 located on Foster Avenue. Soil samples taken near the ground water level of Boring Hole #1 and Boring Hole #7 indicate a high level of contamination involving petroleum hydrocarbons and volatile organics which include Ethylbenzene, Toluene and Total Xylenes.

As proposed, the 6" P.V.C. on force main on Foster Avenue and a large portion of the 8" Gravity Main on South United States Avenue would be constructed in contaminated soils as indicated by the test results. Installing the collection system in these contaminated soils could jeopardize the integrity of the system and potentially transport the contamination to the Camden County Regional Sewerage System.

Alternatives must be investigated to correct the situation.

Parameter	B.H. #4 Berlin Road 2'-3'	B.H. #4 Berlin Road 5'-6'	B.H. #2 S. United States Ave. 2'-3'	B.H. #2 S. United States Ave. 5'-6'	B.H. #5 Haddon Avenue at Clementon Road 4'-5'	B.H. #5 Haddon Avenue at Clementon Road 10'-3'	B.H. #6 Clementon Road 4'-4'	B.H. #6 Clementon Road 6'-8'	B.H. #3 Marlton Avenue at New York Avenue 2'-3'	B.H. #3 Marlton Avenue at New York Avenue 10'-4'	B.H. #1 Berlin Road at S. United States Avenue 3'-3'	B.H. #1 Berlin Road at S. United States Avenue 13'-13'	B.H. #7 Foster Avenue 2'-3'	B.H. #7 Foster Avenue 2'-3'
	#3552	#3553	#3554	#3555	#3556	#3557	#3558	#3559	#3560	#3561	#3562	#3563	#3564	#3565
		(results in mg/kg)												
Total Petroleum Hydrocarbons EPA Method 418.1	<5	<5	<5	<5	<5	<5	<5	<5	<5	18	27	2600	740	680

Parameter	#3552	#3553	#3554	#3555	#3556	#3557	#3558	#3559	#3560	#3561	#3562	#3563	#3564	#3565
Volatile Organics SW-846, 88010, mg/kg:														
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Tetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	1.8	1.4	<1	1.4	<1	<1	<1	<1	<1	<1	<1	1.5	<1	<1
Chlorodibromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Chloroethylvinylether	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	6.3	7.2	8.9	33	<1	<1*	<1*	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	<1	<1	<1	10	19	15	7.9	14	9.7	14	16	9.8	100	44
1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methylene chloride	24	25	28	1.4	31	27	6.3	<1	<1	<1	<1	<1	<1	7.8
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethylene	3.7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	<1	<1*	<1*	<1*	<1*	<1	<1	<1	<1	<1	<1*	<1*	<1	<1*
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethylene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

SW-846 88020, mg/kg:	#3552	#3553	#3554	#3555	#3556	#3557	#3558	#3559	#3560	#3561	#3562	#3563	#3564	#3565
Benzene	<1*	1.4	1.2	2.4	1.6	1.4	<1*	7.8	<1	<1	1.4	54	3	11
Chlorobenzene	1.5	<1*	<1*	<1*	<1*	<1*	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	1.4	<1	<1	<1	<1*	<1	<1	<1	<1	<1	<1*	1,800	<1	3.5
Toluene	<1	8.6	13	16	23	12	5.7	2.1	3.8	5.5	9.1	630	7.4	80
Total Xylenes	9.3	<1	<1	3.3	<1	<1	<1	28	1.1	1.1	7.3	6,000	73	130

Summary Of Laboratory Results
Of Soil Samples Taken From The Area Of The Paint Works Office Complex
Gibbsboro Sanitary Sewerage Collection System

Figure #4

4.0 ALTERNATIVES

4.1 Investigation Of Alternatives To The Proposed Gibbsboro Sanitary Collection System In The Vicinity Of The Paint Works Office Complex.

A number of alternatives to the proposed collection system in the area of the Paint Works Facility have been investigated to determine the most practical cost effective solution to convey the sanitary sewerage generated from the Stumptown section of Gibbsboro over to the Kirkwood Road Interceptor which connects the Gibbsboro System to the Camden County Regional Sewerage System. The alternatives have been evaluated using monetary, environmental, and time considerations along with guidelines provided by the New Jersey Department Of Environmental Protection Southern Bureau Of Regional Enforcement.

Because of the concern of contaminated soils along Foster Avenue and South United States Avenue the proposed collection system will be raised approximately 7 feet along Berlin Road between manhole B6 and B10 regardless of the alternative that is chosen. This will reduce or possibly eliminate any ground water dewatering that would be required to install the system in this area and therefore eliminate the potential for ground water movement via pumping in the area of the contaminated soils.

The following is a listing of the alternative methods or combinations thereof that have been considered:

1. Construct the system as proposed and deal with the contaminated soils following all State and Federal regulations regarding the delineation, identification, classification, and disposal of any wastes that are generated.

2. Eliminate the proposed force main on Foster Avenue and lift the proposed sewerage collected at the Berlin Road Pump Station via an 8" force main up Marlton Avenue and along Haddonfield-Berlin Road (County Route #561) to Manhole C18 located on Clementon Avenue.

3. Eliminate the proposed force main on Foster Avenue and eliminate the proposed 8" Gravity Main along South United States Avenue and lift the proposed sewerage collected at the Berlin Road Pump Station via an 8" force main up Marlton Avenue and along Haddonfield-Berlin Road (County Route #561) to Manhole C18 located on Clementon Avenue.

4.2 Description Of The Proposed Alternatives

1. Construct The System As Proposed And Deal With The Soil Contamination:

The preliminary soil test which have been performed by the Borough clearly indicate that soil contaminated with petroleum hydrocarbons and volatile organics is present along Foster Avenue and South United States Avenue. The results further indicate that the soil contamination on Foster Avenue in front of the Police Station on the south side of the creek (Boring Hole #7) is present in above normal levels from the ground surface to the ground water table. Also, the results indicate that the soils from boring hole #1 (intersection of Berlin Road and South United States Avenue) near the location of the ground water table contain high levels of volatile organics and petroleum hydrocarbons.

The material type that is proposed for the 6" force main on Foster Avenue and the 8" gravity main on South United States Avenue is polyvinyl chloride (P.V.C.). P.V.C. will not withstand soils or ground water that is contaminated with high concentrations of petroleum hydrocarbons or volatile organics like those that have been found in the soils at Foster and South United States Avenues. Ductile iron pipe would have to replace the P.V.C. material in order to prevent any contamination from entering the system and to prevent the pipe from prematurely degrading and failing as a concealed flowing system. Also, typical rubber gaskets cannot be used in soils that are contaminated with petroleum hydrocarbons and volatile organics. Therefore, special "VITON" gaskets must be used to join the ductile iron pipe at each connection to prevent migration of the contamination into the system via the joint connections.

Ductile iron pipe with "VITON" gaskets would replace the 6" P.V.C. force main pipe along Foster Avenue From 200 feet south of Manhole K1 located on Kirkwood Road to United States Avenue, United States Avenue to Berlin Road, and on Berlin Road to the Marlton Road intersection. Ductile iron pipe would also replace the 8" P.V.C. gravity main on South United States Avenue From New York Avenue to approximately 100 feet west of Foster Avenue and the 8" gravity main from Manhole B10 to Manhole B9.

In order to raise the collection system out of the location of the ground water table and to reduce the amount of contaminated soils that would have to be excavated to install the system, 300 feet of 8" gravity main between Manhole US1 and US2 would be eliminated. As a result, the main would be raised out of the ground water table approximately 3 feet.

To reduce the amount of contaminated soil that would have to be disposed of, the trench for the 6" force main would be reduced in size to 2.5 feet in width X 3 feet deep along the entire alignment of the force main from 200 feet south of Manhole K1 located on Kirkwood Road to the intersection at Berlin Road and Marlton Avenue.

To delineate the actual boundaries of the soil contamination the New Jersey Department Of Environmental Protection Southern Bureau Of Regional Enforcement has indicated that soil sampling must be performed every 15 feet along the alignment at every 1 foot of depth encountered to 1 foot below the proposed depth of the main. All wastes that are found must be identified, classified, and properly disposed of in accordance with all State and Federal regulations.

Soil wastes that are found to be hazardous (if a contaminant constitutes 3% of or more of total sample) will be handled and disposed of in accordance with all State and Federal environmental regulations. If a soil waste is classified as ID-27 Industrial waste (if a contaminant constitutes between 1% and 3% of the total sample) the soil waste will be hauled and disposed of following all rules and regulations at a certified land fill outside of the State of New Jersey. If a soil contains a contaminant that is less than 1% of the total sample the Borough would like to stock pile this material and use the material for other purposes such as fill or embankment depending on approval from the New Jersey Department Of Environmental Protection.

Select fill would be used to replace the contaminated soil in the pipe trench.

To insure proper health and safety regulations are employed and monitored an environmental health and safety engineer would be present during all testing, excavating, and installing procedures. Only personnel experienced with working in contaminated soils would be used for the installation.

2. Eliminate The Proposed Force Main On Foster Avenue And Install An 8" Force Main Up Marlton Avenue And Along Haddonfield-Berlin Road (County Route #561) To Manhole C18 Located On Clementon Avenue.

To eliminate the force main on Foster Avenue an 8" P.V.C. force main 3255 feet long would have to be constructed from the Berlin Road pump station up Marlton Avenue and along Haddonfield-Berlin Road (County Route #561) to Manhole C18 located on Clementon Avenue.

The proposed 4" diameter, 7.5 horsepower pumps in the pump station would have to upgraded to 6" diameter, 25 horsepower pumps which would have to be capable of pumping against a TDH of 73 feet. The pump station wet well would have to be increased in size to a minimum of 7 feet in diameter. The new pumping rate would be approximately 600 GPM.

The proposed 8" gravity main on Clementon Avenue would have to be increased to a 10" gravity main from Manhole C18 to the Gibbsboro Road Pump Station to handle the additional flow do to the increase in the new pumping rate. Also, the slope of the 10" main would have to be increased to 0.005 1/1 between

Manhole HA9 and C14, and 0.007 1/1 between Manhole C11 and the pump station.

The pumps in the Gibbsboro Road pump station would have to be upgraded to 8" diameter, 50 horsepower pumps capable of pumping against a TDH approximately equal to 82 feet. The new pumping rate would be 1050 GPM.

The 6" P.V.C. force main along Clementon Avenue would have to be increased to an 8" diameter P.V.C. force main.

The slope of the proposed 10" gravity main on Kirkwood Road would have to be increased to a minimum 0.0073 1/1 for the entire length of the main.

Ductile iron pipe with "VITON" gaskets would replace the 8" P.V.C. gravity main on South United States Avenue From New York Avenue to approximately 100 feet west of Foster Avenue and the 8" gravity main from Manhole B10 to Manhole B9.

In order to raise the collection system out of the location of the ground water table and to reduce the amount of contaminated soils that would have to be excavated to install the system, 300 feet of 8" gravity main between Manhole US1 and US2 would be eliminated. As a result, the main would be raised out of the ground water table approximately 3 feet.

To delineate the actual boundaries of the soil contamination the New Jersey Department Of Environmental Protection Southern Bureau Of Regional Enforcement has indicated that soil sampling must be performed every 15 feet along the alignment at every 1 foot of depth encountered to 1 foot below the proposed depth of the main. All wastes that are found must be identified, classified, and properly disposed of in accordance with all State and Federal regulations.

Soil wastes that are found to be hazardous (if a contaminant constitutes 3% of or more of total sample) the soil waste will be handled and disposed of in accordance with all State and Federal environmental regulations. If a soil waste is classified as ID-27 Industrial waste (if a contaminant constitutes between 1% and 3% of the total sample) the soil waste will be hauled and disposed of following all rules and regulations at a certified land fill outside of the State of New Jersey. If a soil contains a contaminant that is lessthan 1% of the total sample the Borough would like to stock pile this material and use the material for other purposes such as fill or embankment depending on approval from the New Jersey Department Of Environmental Protection.

Select fill would be used to replace the contaminated soil in the pipe trench.

To insure proper health and safety regulations are employed and monitored an environmental health and safety engineer would be present during all testing, excavating, and installing procedures. Only personnel experienced with working in contaminated soils would be used for the installation.

3. Eliminate the proposed force main on Foster Avenue and the proposed 8" Gravity Main on South United States Avenue and Berlin Road between Manhole B10 And B9 And Install An 8" force main up Marlton Avenue And Along Haddonfield-Berlin Road (County Route #561) To Manhole C18 located on Clementon Avenue.

This alternative would be identical to Alternative #2 except that soil contamination would not be a factor in the installation of the pipe and therefore soil testing, ductile iron pipe, and dealing with contaminated soils would not be a consideration for the collection system construction.

The main on South United States would not be considered for installation until the soil contamination around the Paint Works Office Complex, particularly in the area of Foster Avenue And South United States Avenue Between Foster Avenue and Berlin Road, as cleaned up by the New Jersey Department Of Environmental Protection or by others.

4.3 Evaluation Of Alternatives

The three alternatives have been evaluated based on Cost Comparison Analysis and the Environmental Aspects related to the area under investigation.

The "No Action" Alternative is not acceptable due to the hazardous public problem with failing septic systems that exist throughout the Borough of Gibbsboro.

Alternative #1, which involves constructing the system as proposed, is the most logical alternative because the collection system is already designed and approved for construction. Soil sampling test requirements established by The New Jersey Department of Environmental Protection and the problem of dealing with waste disposal make this alternative undesirable and economically not feasible.

Alternative #2, proposes to eliminate the force main along Foster Avenue and re-route the flow up Marlton Avenue and along Haddonfield-Berlin Road (County Route #561) to the gravity Manhole C18 located on Clementon Avenue.

This Alternative requires up grading the Berlin Road Pump Stations, the down stream gravity system located on Clementon Road, and the Gibbsboro Road Pump Station along with the corresponding force main leading to the Kirkwood Road Interceptor. This Alternative becomes a more economical solution, but potential soil contamination at the intersection of Berlin Road and South United States Avenue will require further soil testing and waste disposal. As explained before, The soil testing and disposal requirements established by The New Jersey Department of Environmental Protection will also make Alternative # 2 undesirable and economically not feasible.

Cost Analysis Of The Alternatives

COST ANALYSIS

ALTERNATIVE NUMBER 1

Construct 6" force main on Foster Avenue and 8" gravity main on South United States Avenue as proposed and deal with contaminated soil following all state and federal environmental regulations.

1.	Upgrade 6" P.V.C. Force Main to 6" Ductile Iron Pipe	1,380 L.F.	@ $ 5.50	=	$ 7,590.00
2.	Install 6" Viton Gasket	80 Unit	@ 32.00	=	2,560.00
3.	Upgrade 8" P.V.C. Force Main to 8" Ductile Iron Pipe	1,176 L.F.	@ 7.00	=	8,232.00
4.	Install 8" Viton Gasket	70 Unit	@ 46.50	=	3,255.00
5.	Soil Testing for Further Waste Delineation	540 Sam.	@ 230.00	=	124,200.00
6.	Health and Safety Engineer	Lump Sum	@ 5000.00	=	5,000.00
7.	Contaminated Soil Classified as ID 27 to be Hauled Away and Disposed of Properly	1,127 C.Y.	@ 130.00	=	146,510.00
8.	Select Fill for Pipe Trench Backfill	2,217 C.Y.	@ 6.00	=	13,302.00
9.	Health and Safety Engineer	Lump Sum	@ 5000.00	=	5,000.00
10.	Additional Equipment to Excavate Contaminated Soils	Lump Sum	@ 5600.00	=	5,600.00
Total					$321,249.00

COST ANALYSIS

ALTERNATIVE NUMBER 2

Install 8" force main from Berlin Road pump station to Manhole C-18 on Clementon Road and upgrade 8" gravity main on South United States Avenue.

1.	Install 8" Force Main	3,255 L.F. @	$ 30.00	=	$ 97,650.00
2.	Remove Existing Paving Cross Section, Install 2" FABC-1, Mix I-5 over 6" Bituminous Stabilized Base Course, Mix I-2, over 4" Dense Graded Aggregate	100 S.Y. @	16.00	=	1,600.00
3.	Remove Existing Concrete and Bituminous Roadway and Construct 2" FABC-1, Mix I-5 over 8" Concrete Roadway	200 S.Y. @	30.00	=	6,000.00
4.	Remove Existing Bituminous Sidewalk and Install 4' Wide, 2" Thick Bituminous Walk	312 S.Y. @	8.00	=	2,496.00
5.	Install 4" Thick Topsoil and Seeding	723 S.Y. @	3.60	=	2,603.00
6.	Remove and Replace Loop Detectors	Lump Sum @	500.00	=	500.00
7.	Upgrade Pumps in Berlin Road Pump Station	Lump Sum @	6000.00	=	6,000.00
8.	Increase Pipe Size on Clementon Road to 10" Dia. (0' - 8' Deep)	595 L.F. @	9.00	=	5,355.00
9.	Increase Pipe Size on Clementon Road to 10" Dia. (8' - 12' Deep)	1,949 L.F. @	9.00	=	17,541.00
10.	Increase Pipe Size on Clementon Road to 10" Dia. (12' - 16' Deep)	526 L.F. @	9.00	=	4,734.00
11.	Increase to 10" x 4" Wyes	25 Unit @	25.00	=	625.00
12.	Increase to 10" x 6" Wyes	2 Unit @	25.00	=	50.00
13.	Upgrade Gibbsboro Road Pump Station	Lump Sum @	15000.00	=	15,000.00

14.	Upgrade 6" Force Main on Clementon Road to 8" Force Main	1,740 L.F. @	$ 2.00	=	$	3,480.00
15.	Soil Testing for Further Waste Delineation	367 Sam. @	230.00	=		84,410.00
16.	Contaminated Soil Classified as ID-27 to be Hauled Away and Disposed of Properly	891 C.Y. @	130.00	=		115,700.00
17.	Health and Safety Engineer	Lump Sum @	3000.00	=		3,000.00
18.	Additional Equipment to Excavate Contaminated Soils	Lump Sum @	4000.00	=		4,000.00
19.	Upgrade 8" P.V.C. on South United States Avenue and Berlin Road between Manhole B10 and B9 to 8" Ductile Iron Pipe	1,176 L.F. @	7.00	=		8,232.00
20.	Install Viton Gaskets	66 Unit @	46.50	=		3,069.00
21.	Select Fill for Pipe Trench Backfill	1,781 C.Y. @	6.00	=		10,696.00
Total						$392,731.00

COST ANALYSIS

ALTERNATIVE NUMBER 3

Install 8" force main from Berlin Road pump station to Manhole C-18 on Clementon Road and eliminate 8" gravity main on South United States Avenue and 6" force main on Foster Avenue.

1.	Install 8" Force Main	3,255 L.F. @	$ 30.00	=	$ 97,650.00
2.	Remove Existing Paving Cross Section, Install 2" FABC-1, Mix I-5 over 6" Bituminous Stabilized Base Course, Mix I-2, over 4" Dense Graded Aggregate	100 S.Y. @	16.00	=	1,600.00
3.	Remove Existing Concrete and Bituminous Roadway and Construct 2" FABC-1, Mix I-5 over 8" Concrete Roadway	200 S.Y. @	30.00	=	6,000.00
4.	Remove Existing Bituminous Sidewalk and Install 4' Wide, 2" Thick Bituminous Walk	312 S.Y. @	8.00	=	2,496.00
5.	Install 4" Thick Topsoil and Seeding	723 S.Y. @	3.60	=	2,603.00
6.	Remove and Replace Loop Detectors	Lump Sum @	500.00	=	500.00
7.	Upgrade Pumps in Berlin Road Pump Station	Lump Sum @	6000.00	=	6,000.00
8.	Increase Pipe Size on Clementon Road to 10" Dia. (0' - 8' Deep)	595 L.F. @	9.00	=	5,355.00
9.	Increase Pipe Size on Clementon Road to 10" Dia. (8' - 12' Deep)	1,949 L.F. @	9.00	=	17,541.00
10.	Increase Pipe Size on Clementon Road to 10" Dia. (12' - 16' Deep)	526 L.F. @	9.00	=	4,734.00
11.	Increase to 10" x 4" Wyes	25 Unit @	25.00	=	625.00
12.	Increase to 10" x 6" Wyes	2 Unit @	25.00	=	50.00
13.	Upgrade Gibbsboro Road Pump Station	Lump Sum @	15000.00	=	15,000.00

14. Upgrade 6" Force Main on Clementon Road to 8" Force Main	1,740 L.F. @ $ 2.00	=	$ 3,480.00
TOTAL			$163,634.00

5.0 THE SELECTED PLAN

5.1 Description Of The Selected Plan

The recommended Alternative to manage with the Soil Contamination around the Paint Works Office Complex is to eliminate the proposed 6" Force Main on Foster Avenue and the 8" Gravity Main located on South United States Avenue and therefore eliminate excavating any soil contamination that may be present along the alignment of the proposed system. The recommended Alternative will pump the sewerage generated from the Berlin Road Pump Station up Marlton Avenue and along Haddonfield-Berlin Road to Manhole C18 located on Clementon Road.

The Alternative has been recommended for the following reasons:

1. The Alternative eliminates working with potential soil contamination around the Paint Works Complex.

2. The Alternative is the most cost effective solution of the possible alternatives.

3. The Alternative requires no additional New Jersey Department of Environmental Protection and will not create any adverse impact on environmentally sensitive areas.

4. When the soil contamination at Paint Works Site is remediated, the main on South United States Avenue can be installed and connected to the proposed system as originally planned.

The selected alternative will require a single new alignment on Haddonfield-Berlin Road (County Route #561) between Marlton Avenue and Clementon Road. The new Force Main will be constructed along the existing edge of road in the paving area for approximately 500 feet along Haddonfield-Berlin Road and then the force main will traverse into the grass median and under an existing asphalt bike path for the remainder of the distance to Manhole C18. The new force main will be installed along with the 8" Gravity Main on Marlton Avenue within the same pipe trench excavation. The new force main will be P.V.C. in type.

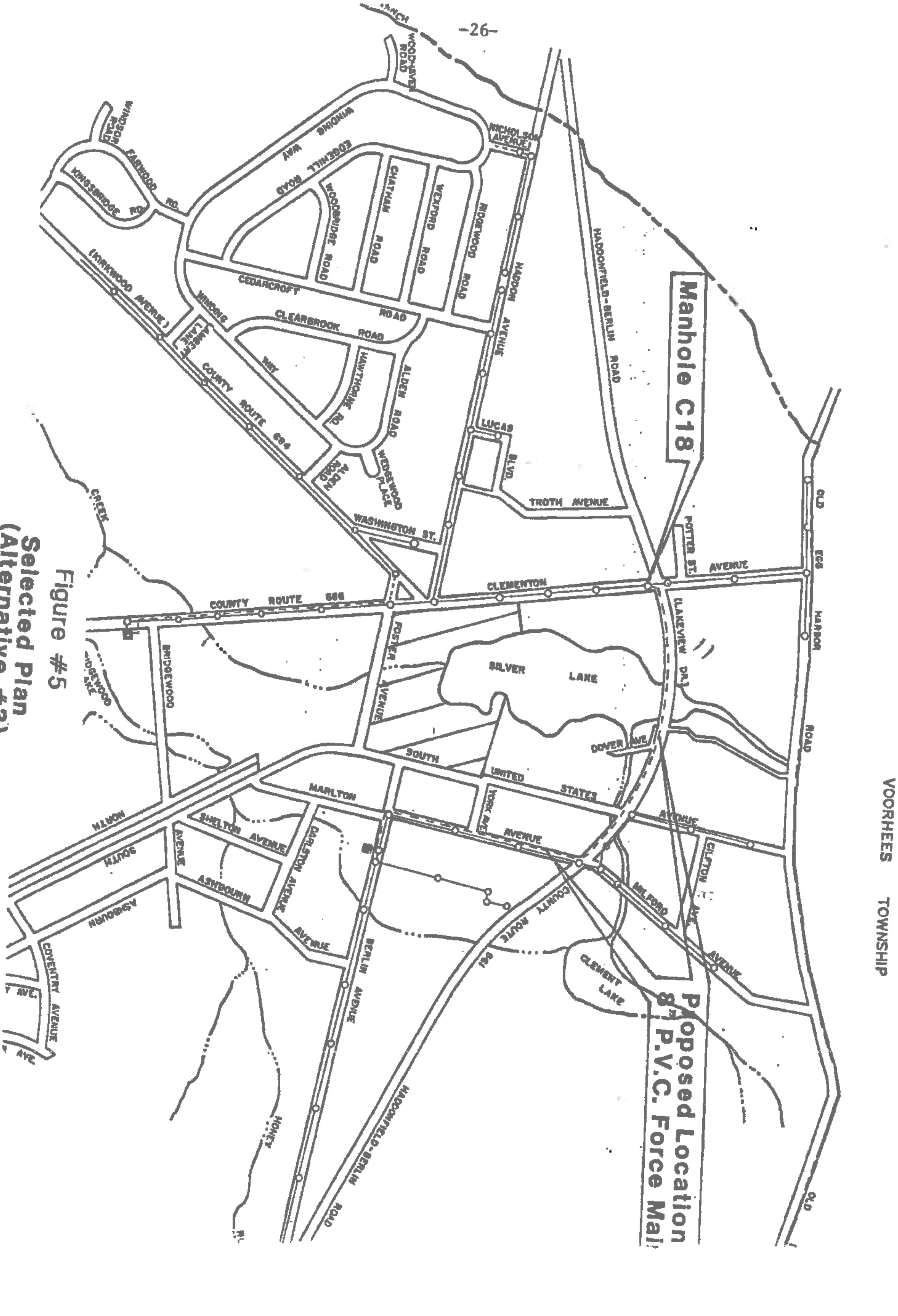


Figure #5
Selected Plan
(Alternative #3)

Appendix

Soil Boring Logs

Borings For Gibbsboro Sanitary Sewer Project
Soil Testing Log
Thursday, August 3, 1989

Greg Fusco, P.E., P.P.
Greg Evans, Performed Borings
Weather: Sunny, Hot

Boring Hole Number 4

Time: 9:00 a.m. Temp: 80
Location: Berlin Road 30 feet West of UP#307 (in poison Ivy)
4' O Edge of road

Obtain samples @ 2'-7" @ 9:15 a.m.
Obtain samples @ 5'0" @ 10;00 a.m.

Boring Hole Number 2

Time: 10:32 a.m. Temp: 80
Location: South United States Avenue 45 feet North of F.H. across
from drive 4'O edge of road

Obtain samples @ 2'-6" @ 10:49 a.m.
Obtain samples @ 9'-0" @ 11:12 a.m.

Boring Hole Number 5

Time: 11:30 a.m. Temp: 83
Location: 6' O curb on Clementon Road right behind M.H. near
intersection of Haddon Avenue

Obtain samples @ 2'-6" @ 10:49 a.m.
Obtain samples @ 9'-0" @ 11:12 a.m.

Boring Hole Number 6

Time: 12:41 p.m. Temp: 86
Location: Clementon Road directly across from UP#BT#13
O 7' edge of road in grass

Obtain samples @ 4'-4" Depth @ 1:04 p.m.
Obtain samples @ 6'-8" Depth @ 1:20 p.m.

Page 2

Boring Hole Number 3

Time: 1:37 p.m. Temp: 86
Location: North Side of Marlton Avenue at Intersection of New York Avenue next to stop sign, 3' O stop sign.

Obtain samples @ 2'-5" @ Time: 1:53 p.m.
Obtain samples @ 10'-4" @ Time: 2:20

Boring Hole Number 1

Time: 2:35 p.m. Temp: 87
Location: Intersection of Berlin Road and S. U.S. Avenue behind guard rail, 6' O F.C.

Obtain samples @ 3'-7" Time: 3:00 p.m.
Obtain samples @ 15'-3" Time: 3:38 p.m.

Boring Hole Number 7

Time: 3:50 p.m. Temp: 88
Location: 4' O F.C. on Foster Avenue near police station 10' East of pole# 3478

Obtain samples @ 2'-9" Time: 4:07 p.m.
Obtain samples @ 4'-11" Time: 4:28 p.m.

Samples were placed in a cooler with ice at approximately 6:00 p.m. same evening and samples were delivered to lab Friday morning at 7:30 a.m.

KEY ENGINEERS, INC.
80 South White Horse Pike
Berlin, New Jersey 08009

SOIL BORING FIELD REPORT

Client Gibbsboro Sewer Correction System (KEI#16GB1857)

Date Ordered ____________ Date Required ____________

Street Berlin Road 30 feet West of UP#307 (in poison ivy) 4' @ edge of road Municipality Gibbsboro

Block No. ________ Lot No. ________ Page 1 of 7

Weather Sunny, Hot, 80° 9:00a.m. Job No. (KEI#16GB1857)

Test Performed by Greg Evans and Greg Fusco, P.E., P.P. Date August 3, 1989

Test Checked by Greg Fusco, P.E., P.P. Date August 3, 1989

Depth Soil Boring Number 4

0"-9" 10yr. 4/4 Dark yellowish brown fine loamy sand

9"-1" 10yr. 5/6 Yellowish brown medium sand and fine gravel

1'-1'3" 10yr. 6/6 Yellow fine to medium loamy sand and some small stones

1'3"-1'4" Asphalt from road x-section(broken up) coarse

1'4"-1'10" 10yr. 3/1 Very dark gray medium loamy sand

1'10"-2'2" 10yr. 5/6 Yellowish brown coarse sand w/ clump of clay and fine gravel

2'2"-3'2" 10yr. 5/4 Yellowish brown fine sandy loam w/ trace of clay (damp)

3'2"-3'7" 10yr. 5/4 Yellowish brown fine sand loam w/ 10 yr. 7/3 very pale brown few mottles

3'7"-4'6" 10yr. 6/6 Brownish yellow fine sandy clay w/ 10yr. 6/2 light brownish gray common distinct mottles

4'6"-5'5" 10yr. 5/2 Grayish brown fine sandy loam w/ 10yr. 6/6 brownish yellow

5'5"-5'9" 12.5 yr. 5/4 Large olive brown fine silty loam

5'9"-6'4" 25yr. 5/4 Olive brown fine silt w/ small stones and 10yr. 7/2 light gray mottles

6'4"-7'1" 10yr. 6/2 Large brownish gray fine silt w/ 10yr. 6/4 large yellowish brown mottles

7'1"-7'10" 10yr. 6/1 Gray fine silt w/ 2.5 6/6 olive yellow mottles

7'10"-8'9" 10yr. 7/1 Large gray fine silt

8'9"- 2.5/6/6 Olive yellow fine silt

8'11" H_2O

KEY ENGINEERS, INC.
80 South White Horse Pike
Berlin, New Jersey 08009

SOIL BORING FIELD REPORT

Client Gibbsboro Sewer Correction System (KEI#16GB1857)

Date Ordered ______ Date Required ______

Street South United States Avenue 45 feet North of F.H. across from drive 4'0 edge of road. Municipality Gibbsboro

Block No. ______ Lot No. ______ Page 2 of 7

Weather Sunny, hot 80° 10:32 a.m. Job No. (KEI#16GB1857)

Test Performed by Greg Evans, and Greg Fusco, P.E., P.P. Date August 3, 1989

Test Checked by Greg Fusco, P.E., P.P. Date August 3, 1989

Depth Soil Boring Number 2

0"-6" 10yr. 5/6 Yellowish brown fine sandy loam

6"-1'6" 10yr. 6/8 Brownish yellow fine silty sandy loam w/ 10yr. 7/4 very pale brown mottles

1'6"-2'0" 10yr 6/8 Brownish yellow medium silty sandy loam w/ fine gravel and 10yr. 7/2 light gray common distinct mottles

2'0"-3'8" 10yr. 6/8 Brownish yellow fine silt loam w/ 10yr. 7/4 very pale brown mottles

3'8"-6'0" 10yr. 6/8 Brownish yellow fine silty sand w/ 10yr. 7/2 light gray mottles

6'0"-6'7" 10yr. 6/8 Brownish yellow fine silty loam w/ 10yr. 7/2 light gray mottles (damp)

6'7"-9'0" 10yr. 6/8 Brownish yellow fine silty loam w/ 10yr. 7/1 light gray mottles

9'0"-9'4" 10yr. 6/8 Brownish yellow fine loam trace of silt

9'4" 10yr. 6/8 Brownish yellow fine loam trace of silt w/ 10yr. 7/1 light gray mottles

H_2O @ 8'0"

KEY ENGINEERS, INC.
80 South White Horse Pike
Berlin, New Jersey 08009

SOIL BORING FIELD REPORT

Client Gibbsboro Sewer Correction System (KEI#16GB1857)

Date Ordered ______ Date Required ______

Street 6' @ curb on Clementon Road right behind M.H. near intersection of Maddon Avenue Municipality Gibbsboro

Block No. ______ Lot No. ______ Page 3 of 7

Weather Sunny, hot 83° 11:30 a.m. Job No. (KEI#16GB1857)

Test Performed by Greg Evans and Greg Fusco, P.E., P.P. Date August 3, 1989

Test Checked by Greg Fusco, P.E., P.P. Date August 3, 1989

Depth Soil Boring Number 5

0"-10" 10yr. 4/3 Brown fine to medium sandy loam

10"-1'2" 10yr. 5/4 Yellowish brown fine sandy loam

1'2"-4'4" 10yr. 6/6 Brownish yellow fine loamy sand w/ some fine gravel

4'4"-5'2" 10yr. 6/6 Brownish yellow fine loam w/ 10yr. 2/1 black mottles

5'2"-5'9" 10yr. 8/4 Very pale brown fine sandy laom w/ 10yr. 5/8 yellowish brown mottles

5'9"-6'0" 10yr. 8/4 Very pale brown medium to coarse loamy sand w/ 10yr. 5/8 yellowish brown mottles

6'0"-7'6" 10yr. 8/4 Very pale brown fine silt w/ 10yr. 5/8 yellowish brown mottles

7'6"-8'1" 10yr. 8/4 Very pale brown fine silty loam w/ few 10yr. 5/8 brown mottles (damp)

8'1"-9'3" 10yr. 6/6 Brownish yellow fine silt w/ 7.5 yr. 6/6 reddish yellow few mottles

9'3"-9'6" 7.5yr. 5/8 Strong brown fine silt loam

9'6"- 10yr. 6/8 Brownish yellow fine silt loam

9'0" H_2O

KEY ENGINEERS, INC.
80 South White Horse Pike
Berlin, New Jersey 08009

SOIL BORING FIELD REPORT

Client Gibbsboro Sewer Correction System (KEI#16GB1857)

Date Ordered ______ Date Required ______

Street Clementon Road directly across from UP#BT#13 @ 7' edge of road in grass Municipality Gibbsboro

Block No. ______ Lot No. ______ Page 4 of 7

Weather Sunny, hot 86° 12:41 p.m. Job No. (KEI#16GB1857)

Test Performed by Greg Evans and Greg Fusco, P.E., P.P. Date August 3, 1989

Test Checked by Greg Fusco, P.E., P.P. Date August 3, 1989

Depth Soil Boring Number 6

0"-6" 10yr. 3/2 Very dark grayish brown fine sandy loam

6"-1'2" 10yr. 6/3 Pale brown fine loamy sand

1'2"-2'2" 10yr. 5/8 Yellowish brown fine loamy sand

2'2"-3'9" 10yr. 6/8 Brownish yellow fine loamy sand w/ 10yr. 5/8 yellowish brown mottles few

3'9"-4'7" 10yr. 6/8 Brownish yellow medium sandy loam w/ 10yr. 4/2 dark grayish brown mottles and ~~fine gravel~~

4'7"-6'2" 10yr.6/4 Light yellowish brown fine tomed sandy loam w/ 7.5 yr. 5/8 strong brown mottles few

6'2"-7'8" 10yr. 6/4 Light yellowish brown fine silty sand w/ 10yr. 7/4 very pale brown few mottles and fine gravel (damp)

7'8"-8'3" 10yr. 6/4 Light yellowish brown medium silty sand w/ fine gravel

8'3" Light gray medium silty sand w/ fine gravel

7'4" H_2O

KEY ENGINEERS, INC.
80 South White Horse Pike
Berlin, New Jersey 08009

SOIL BORING FIELD REPORT

Client GIbbsboro Sewer Correction System (KEI#16GB1857)

Date Ordered ______ Date Required ______

Street North side of Marlton Avenue at Intersection of New York Avenue next to stop sign, 3' @ stop sign Municipality Gibbsboro

Block No. ______ Lot No. ______ Page 5 of 7

Weather Sunny, hot, 86° 1:57 p.m. Job No. (KEI#16GB1857)

Test Performed by Greg Evans and Greg Fusco, P.E.,P.P. Date August 3, 1989

Test Checked by Greg Fusco, P.E.,P.P. Date August 3, 1989

Depth Soil Boring Number 3

0"-1'3" 10yr. 2/1 Black fine sandy loam

1'3"-2'0" 10yr. 4/2 Dark grayish brown fine loamy sand

2'0"-3'8" 10yr. 5/2 Grayish brown medium sand and fine gravel

3'8"-4'1" 7.5yr. 5/8 Strong brown coarse clayey sand and gravel w/ sandstone fragments

4'1"-5'2" 10yr. 6/6 Brownish yellow fine loamy sand w/ 10yr. 5/6 yellowish brown few mottles

5'2"-5'11" 10yr. 6/6 Brownish yellow fine loamy sand w/ 10yr. 7/3 very pale brown few mottles

5'11"-7'0" 10yr. 6/8 Brownish yellow fine loamy sand

7'0"-8'4" 10yr. 6/8 Brownish yellow fine silt w/ 10yr. 7/2 light gray c d. mottles (damp)

8'4"-9'0" 10yr. 6/8 Brownish yellow fine silty loam

9'0" 7.5yr. 6/8 Redish yellow fine silty loam w/ 10yr. 7/4 very pale brown mottles

10'6" H_2O

KEY ENGINEERS, INC.
80 South White Horse Pike
Berlin, New Jersey 08009

SOIL BORING FIELD REPORT

Client: Gibbsboro Sewer Correction System (KEI#16GB1857)

Date Ordered: ____ Date Required: ____

Street: Intersection of Berlin Road and South U.S. Avenue behind guard rail 6' ⊕ F.C. Municipality: Gibbsboro

Block No. ____ Lot No. ____ Page 6 of 7

Weather: Sunny, hot 87° 2:35 p.m. Job No. (KEI#16GB1857)

Test Performed by: Greg Evans and Greg Fusco, P.E., P.P. Date: August 3, 1989

Test Checked by: Greg Fusco, P.E., P.P. Date: August 3, 1989

Depth — Soil Boring Number 1

0"-8" 10yr. 4/2 Dark grayish brown fine sandy loam

8"-10" 10yr. 5/2 Grayish brown medium loamy sand and fine gravel

10"-2'0" Black sand, asphalt and gravel

2'0"-3'7" 10yr. 6/2 Light brownish gray course sand and fine gravel

3'7"-5'11" 10yr. 5/3 Brown coarse clayey sand and fine gravel (damp)

5'11"-6'7" 10yr. 6/8 Brownish yellow medium sand and fine gravel

6'7"-7'4" 2.5yr. 5/4 Light olive yellow medium sand and fine gravel

7'4"-10'5" 10yr. 7/1 Light gray fine silty loam w/ 10yr. 7/8 yellow mottles

10'5"-11'10" 10yr. 6/8 Brownish yellow fine silt w/ 10yr. 7/3 very pale brown mottles

11'10"-13'4" 10yr. 3/1 Very dark gray silt w/ 10yr. 6/8 brownish yellow and 10yr. 7/1 light gray (odor)

13'4"-14'5" 10yr. 7/1 Light gray silt w/ 10yr. 6/8 brownish yellow

14'5" 10yr. 5/1 Gray silt w/ 10yr. 7/6 yellow mottles

15'3" H_2O

KEY ENGINEERS, INC.
80 South White Horse Pike
Berlin, New Jersey 08009

SOIL BORING FIELD REPORT

Client Gibbsboro Sewer Correction System (KEI#16GB1857)

Date Ordered ______ Date Required ______

Street 4' @ F.C. on Foster Avenue near police station 10' East of Pole #3478 Municipality Gibbsboro

Block No. ______ Lot No. ______ Page 7 of 7

Weather Sunny, hot 88° 3:50 p.m. Job No. (KEI#16Gb1857)

Test Performed by Greg Evans and Greg Fusco, P.E., P.P Date August 3, 1989

Test Checked by Greg Fusco, P.E., P.P. Date August 3, 1989

Depth Soil Boring Number 7

0"-9" 10yr. 3/2 Very dark grayish brown fine sandy loam and pieces of asphalt

9"-1'0" 10yr. 3/1 Very dark gray fine sandy loam

1'0"-4'3" Black fine sandy loam w/ asphalt and few 10yr. 5/3 brown mottle

4'3"- 10yr. 4/6 Dark yellowish brown silt loam w/ 10yr. 3/1 very dark gray mottles

3'2" H_2O

Soil Analysis

Environmental Testing & Technologies Inc.
of South Jersey
3 Cooper Street, Westmont, New Jersey 08108 609-858-9573

Key Engineers
80 S. White Horse Pike
Berlin, New Jersey 08009

Sample ID: Soils
Lab ID: 3552 - 3565
Received: 8-4-89
Reported: 8-22-89

Attn.: Gregory Fusco

Sample Designation: Gibbsboro Sanitary Severage Collection System

3552 - Boring Hole #4, 2'7"
3553 - Boring Hole #4, 5'0"
3554 - Boring Hole #2, 2'6"
3555 - Boring Hole #2, 9'0"
3556 - Boring Hole #5, 4'9"
3557 - Boring Hole #5, 10'3"
3558 - Boring Hole #6, 4'4"
3559 - Boring Hole #6, 6'8"
3560 - Boring Hole #3, 2'5"
3561 - Boring Hole #3, 10'4"
3562 - Boring Hole #1, 3'7"
3563 - Boring Hole #1, 15'3"
3564 - Boring Hole #7, 2'9"
3565 - Boring Hole #7, 4"11"

(results in mg/kg)

Parameter	#3552	#3553	#3554	#3555
Total Petroleum Hydrocarbons EPA Method 418.1	<5	<5	<5	<5

	#3556	#3557	#3558	#3559
Total Petroleum Hydrocarbons EPA Method 418.1	<5	<5	<5	<5

	#3560	#3561	#3562	#3563
Total Petroleum Hydrocarbons EPA Method 418.1	<5	18	27	2600

	#3564	#3565
Total Petroleum Hydrocarbons EPA Method 418.1	740	680

Key Engineers

Attn.: Gregory Fusco

Sample ID: Soils
Lab ID: 3552 - 3565

Parameter Volatile Organics SW-846, #8010, mg/kg:	#3552	#3553	#3554	#3555
Bromodichloromethane	<1	<1	<1	<1
Bromoform	<1	<1	<1	<1
Bromomethane	<1	<1	<1	<1
Carbon Tetrachloride	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1
Chlorodibromomethane	1.8	1.4	<1	1.4
Chloroethane	<1	<1	<1	<1
2-Chloroethylvinylether	<1	<1	<1	<1
Chloroform	<1	<1	<1	<1
Chloromethane	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1
Dichlorodifluoromethane	<1	<1	<1	<1
1,1-Dichloroethane	<1	<1	<1	<1
1,2-Dichloroethane	6.3	7.2	8.9	33
1,1-Dichloroethene	<1	<1	<1	10
trans1,2-Dichloroethene	<1	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1	<1
cis1,3-Dichloropropene	<1	<1	<1	<1
trans1,3-Dichloropropene	<1	<1	<1	<1
Methylene chloride	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	24	25	28	1.4
Tetrachloroethylene	<1	<1	<1	<1
1,1,1-Trichloroethane	3.7	<1	<1	<1
1,1,2-Trichloroethane	<1	<1*	<1*	<1*
Trichloroethylene	<1	<1	<1	<1
Trichlorofluoromethane	<1	<1	<1	<1
Vinyl Chloride	<1	<1	<1	<1

SW-846, #8010, mg/kg:	#3556	#3557	#3558	#3559
Bromodichloromethane	<1	<1	<1	<1
Bromoform	<1	<1	<1	<1
Bromomethane	<1	<1	<1	<1
Carbon Tetrachloride	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1
Chlorodibromomethane	<1	<1	<1	<1
Chloroethane	<1	<1	<1	<1

Key Engineers

Attn.: Gregory Fusco

Sample ID: Soils
Lab ID: 3552 - 3565

Parameter SW-846, #8010, mg/kg: (cont.)	#3556	#3557	#3558	#3559
2-Chloroethylvinylether	<1	<1	<1	<1
Chloroform	<1	<1	<1	<1
Chloromethane	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1
Dichlorodifluoromethane	<1	<1	<1	<1
1,1-Dichloroethane	<1	<1*	<1	<1
1,2-Dichloroethane	19	15	<1*	<1
1,1-Dichloroethene	<1	<1	7.9	14
trans1,2-Dichloroethene	<1	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1	<1
cis1,3-Dichloropropene	<1	<1	<1	<1
trans1,3-Dichloropropene	<1	<1	<1	<1
Methylene chloride	31	27	<1	<1
1,1,2,2-Tetrachloroethane	<1	<1	4.3	<1
Tetrachloroethylene	<1	<1	<1	<1
1,1,1-Trichloroethane	<1*	<1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1	<1
Trichloroethylene	<1	<1	<1	<1
Trichlorofluoromethane	<1	<1	<1	<1
Vinyl Chloride	<1	<1	<1	<1

SW-846, #8010, mg/kg:	#3560	#3561	#3562	#3563
Bromodichloromethane	<1	<1	<1	<1
Bromoform	<1	<1	<1	<1
Bromomethane	<1	<1	<1	<1
Carbon Tetrachloride	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1
Chlorodibromomethane	<1	<1	<1	1.5
Chloroethane	<1	<1	<1	<1
2-Chloroethylvinylether	<1	<1	<1	<1
Chloroform	<1	<1	<1	<1
Chloromethane	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1
Dichlorodifluoromethane	<1	<1	<1	<1

Key Engineers

Attn.: Gregory Fusco

Sample ID: Soils
Lab ID: 3552 - 3565

Parameter SW-846, #8010, mg/kg: (cont.)	#3560	#3561	#3562	#3563
1,1-Dichloroethane	<1	<1	<1	<1
1,2-Dichloroethane	9.7	14	16	9.8
1,1-Dichloroethene	<1	<1	<1	<1
trans1,2-Dichloroethene	<1	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1	<1
cis1,3-Dichloropropene	<1	<1	<1	<1
trans1,3-Dichloropropene	<1	<1	<1	<1
Methylene chloride	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1
Tetrachloroethylene	<1	<1	<1	<1
1,1,1-Trichloroethane	<1	<1	<1*	<1*
1,1,2-Trichloroethane	<1	<1	<1	<1
Trichloroethylene	<1	<1	<1	<1
Trichlorofluoromethane	<1	<1	<1	<1
Vinyl Chloride	<1	<1	<1	<1

SW-846, #8010, mg/kg:	#3564	#3565
Bromodichloromethane	<1	<1
Bromoform	<1	<1
Bromomethane	<1	<1
Carbon Tetrachloride	<1	<1
Chlorobenzene	<1	<1
Chlorodibromomethane	<1	<1
Chloroethane	<1	<1
2-Chloroethylvinylether	<1	<1
Chloroform	<1	<1
Chloromethane	<1	<1
1,2-Dichlorobenzene	<1	<1
1,3-Dichlorobenzene	<1	<1
1,4-Dichlorobenzene	<1	<1
Dichlorodifluoromethane	<1	<1
1,1-Dichloroethane	<1	<1
1,2-Dichloroethane	100	44
1,1-Dichloroethene	<1	<1
trans1,2-Dichloroethene	<1	<1
1,2-Dichloropropane	<1	<1
cis1,3-Dichloropropene	<1	<1
trans1,3-Dichloropropene	<1	<1

Key Engineers

Attn.: Gregory Fusco

Sample ID: Soils
Lab ID: 3552 - 3565

Parameter SW-846, #8010, mg/kg: (cont.)	#3564	#3565
Methylene chloride	<1	7.8
1,1,2,2-Tetrachloroethane	<1	<1
Tetrachloroethylene	<1	<1
1,1,1-Trichloroethane	<1	<1
1,1,2-Trichloroethane	<1	<1*
Trichloroethylene	<1	<1
Trichlorofluoromethane	<1	<1
Vinyl Chloride	<1	<1

Note: T - Detected in Trace

SW-846 #8020, mg/kg:	#3552	#3553	#3554	#3555
Benzene	<1*	1.4	1.2	2.4
Chlorobenzene	1.5	<1*	<1*	<1*
1,2-Dichlorobenzene	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1
Ethylbenzene	1.4	<1	<1	<1
Toluene	<1	8.6	13	16
Total Xylenes	9.3	<1	<1	3.3

SW-846 #8020, mg/kg:	#3556	#3557	#3558	#3559
Benzene	1.6	1.4	<1*	7.5
Chlorobenzene	<1*	<1*	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1
Ethylbenzene	<1*	<1	<1	<1
Toluene	13	12	5.7	2.1
Total Xylenes	<1	<1	<1	18

SW-846 #8020, mg/kg:	#3560	#3561	#3562	#3563
Benzene	<1	<1	1.4	54
Chlorobenzene	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1*	1,500
Toluene	3.8	5.5	9.1	630
Total Xylenes	1.1	1.1	7.3	6,000

Key Engineers

Attn.: Gregory Fusco

Sample ID: Soils
Lab ID: 3552 - 3565

Parameter SW-846 #8020, mg/kg:	#3564	#3565
Benzene	3	11
Chlorobenzene	<1	<1
1,2-Dichlorobenzene	<1	<1
1,3-Dichlorobenzene	<1	<1
1,4-Dichlorobenzene	<1	<1
Ethylbenzene	<1	3.5
Toluene	7.4	80
Total Xylenes	73	130

*Note: Detected in Trace

Reviewed and approved by

Sherree A. Baker

Sherree A. Baker
Laboratory Manager

ting & Technologies Inc.

CHAIN OF CUSTODY RECORD

Client: KEY ENGINEERS, INC - GIBBSBORO SANITARY SEWERAGE COLLECTION SYSTEM

Site Location: BERLIN ROAD, MALLTON ROAD, U.S. AVE, FOSTER AVE, CLEMENTON ROAD

Project No.: 16 GB 1857

Please Print - Sampler's Name: GREG FUSCO, PE; CARA EVANS

Company: KEY ENGINEERS, INC

Signature: Gregory B Fusco

Collectors Sample No.	Station No.	Sample Description (ie. Name, Location, etc.)	Samples Collected Date	Samples Collected Time	Sample Type Comp.	Sample Type Grab	Sample Type Other (Specify)	Preservative	No. of Containers	Lab ID No.(s)	Analyses Required: Total Petro. Hydrocarbons (EPA 418.1)	Analyses Required: Volatile Organics EPA SW 846-8010 & 8020	Remarks
#1		BORING HOLE #4 DEPTH OF 2'-7"	8/3	0915		✓			1		X		SOIL
#2		BORING HOLE #4 DEPTH OF 2'-7"	8/3	0915		✓			2			X	SOIL
#3		BORING HOLE #4 DEPTH OF 5'-0"	8/3	1000		✓			1		X		SOIL
#4		BORING HOLE #4 DEPTH OF 5'-0"	8/3	1000		✓			2			X	SOIL
5		BORING HOLE #2 DEPTH OF 2'-6"	8/3	1049		✓			1		X		SOIL
6		BORING HOLE #2 DEPTH OF 2'-6"	8/3	1049		✓			2			X	SOIL
7		BORING HOLE #2 DEPTH OF 9'-0"	8/3	1112		✓			1		X		SOIL
8		BORING HOLE #2 DEPTH OF 9'-0"	8/3	1112		✓			2			X	SOIL

Additional Field Comments:

Relinquished by:		Received by:		Date	Time
Print Name: GREGORY B. FUSCO, P.E. Signature: Gregory B. Fusco	Company: KEY ENGINEERS, INC	Print Name: Sherree Baker Signature: Sherree Baker	Company: ET+T	8/4/89	8 AM
Print Name: Signature:	Company:	Print Name: Signature:	Company:		
Print Name: Signature:	Company:	Print Name: Signature:	Company:		
COMMENTS:		Received for laboratory by: Print Name: Signature:			

Environmental Testing & Technologies Inc.

CHAIN OF CUSTODY RECORD

Client: KEY ENGINEERS, INC - GIBBSBORO SANITARY SEWERAGE COLLECTION SYSTEM

Site Location: BERLIN ROAD, MARLTON AVE, U.S. AVE, FOSTER AVE, CLEMENTON ROAD

Project No.: 16 GB 1857

Please Print - Sampler's Name: GREGORY B. FUSCO, GREG EVANS

Company: KEY ENGINEERS, INC

Signature: Gregory B. Fusco

Collectors Sample No.	Station No.	Sample Description (ie. Name, Location, etc.)	Samples Collected Date	Samples Collected Time	Sample Type Comp.	Sample Type Grab	Sample Type Other (Specify)	Preservative	No. of Containers	Lab ID No.(s)	Analyses Required: TOTAL PETROLEUM HYDROCARBONS EPA 418.1		Analyses Required: [illegible] ORGANICS EPA SW 846 - 8[illegible] & 8020		Remarks
#9		BORING HOLE #5 DEPTH OF 4'-5"	8/3	1152		✓			1		X				SOIL
✓ #10		BORING HOLE #5 DEPTH OF 4'-5"	8/3	1152		✓			2				X		SOIL
✓ #11		BORING HOLE #5 DEPTH OF 10'-3"	8/3	1218		✓			1		X				SOIL
✓ #12		BORING HOLE #5 DEPTH OF 10'-3"	8/3	1218		✓			2				X		SOIL
✓ #13		BORING HOLE #6 DEPTH 4'-4"	8/3	1304		✓			1		X				SOIL
✓ #14		BORING HOLE #6 DEPTH OF 4'-4"	8/3	1304		✓			2				X		SOIL
✓ #15		BORING HOLE #6 DEPTH OF 6'-8"	8/3	1320		✓			1		X				SOIL
✓ #16		BORING HOLE #6 DEPTH OF 6'-8"	8/3	1320		✓			2				X		SOIL

Additional Field Comments:

Relinquished by:		Received by:		Date	Time
Print Name: GREGORY B. FUSCO, P.E. Signature: Gregory B. Fusco	Company: KEY ENGINEERS, INC	Print Name: Sherree Baker Signature: Sherree Baker	Company: ET+T	8/4/89	8 Pm
Print Name: Signature:	Company:	Print Name: Signature:	Company:		
Print Name: Signature:	Company:	Print Name: Signature:	Company:		
		Received for laboratory by: Print Name: Signature:			

COMMENTS:

Environmental Testing & Technologies Inc.

CHAIN OF CUSTODY RECORD

Client: KET ENGINEERS, INC - GIBBSBORO SANITARY SEWERAGE COLLECTION SYSTEM

Site Location: BERLIN ROAD, MARLTON AVE, U.S. AVE, FOSTER AVE, CLEMENTON ROAD

Project No.: 16 GB 1857

Please Print - Sampler's Name: GREG FUSCO, PE. GREG EVANS

Company: KEY ENGINEERS, INC

Signature: Gregory B. Fusco

Collectors Sample No.	Station No.	Sample Description (ie. Name, Location, etc.)	Samples Collected Date	Time	Sample Type Comp.	Grab	Other (Specify)	Preser-vative	No. of Containers	Lab ID No.(s)	TOTAL PETRO HYDROCARBONS EPA 418.1	VOLATILE ORGANICS EPA SW 846 - 8240/8010	Remarks
#17		BORING HOLE # 3 DEPTH OF 2'-5"	8/3	1353		X			1		X		SOIL
#18		BORING HOLE # 3 DEPTH OF 2'-5"	8/3	1353		X			2			X	SOIL
#19		BORING HOLE # 3 DEPTH OF 10'-4"	8/3	1420		X			1		X		SOIL
#20		BORING HOLE # 3 DEPTH OF 10'-4"	8/3	1420		X			2			X	SOIL
#21		BORING HOLE # 1 DEPTH OF 3'-7"	8/3	1500		X			1		X		SOIL
#22		BORING HOLE # 1 DEPTH OF 3'-7"	8/3	1500		X			2			X	SOIL
#23		BORING HOLE # 1 DEPTH OF 15'-3"	8/3	1538		X			1		X		SOIL
#24		BORING HOLE # 1 DEPTH OF 15'-3"	8/3	1538		X			2			X	SOIL

Additional Field Comments:

Relinquished by:

Print Name: GREGORY B. FUSCO, PE. Company: KEY ENGINEERS, INC.
Signature: Gregory B. Fusco
Print Name: Company:
Signature:
Print Name: Company:
Signature:

COMMENTS:

Received by:	Company	Date	Time
Print Name: Sherree Baker Signature: Sherree Baker	ET+T	8/4/89	8Am
Print Name: Signature:			
Print Name: Signature:			
Received for laboratory by: Print Name: Signature:			

Testing & Technologies Inc.

CUSTODY RECORD

Client: KEY ENGINEERS, INC - GIBBSBORO SANITARY SEWERAGE COLLECTION SYSTEM

Site Location: BERLIN ROAD, MARLTON AVE, U.S. AVE FOSTON AVE, CLEMENTON ROAD

Project No.: 16 GB 1857

Please Print - Sampler's Name: GREG FUSCO, P.E. GREG EVANS

Company: KEY ENGINEERS, INC

Signature: Gregory B. Fusco

Collectors Sample No.	Station No.	Sample Description (ie. Name, Location, etc.)	Samples Collected: Date	Samples Collected: Time	Sample Type: Comp.	Sample Type: Grab	Sample Type: Other (Specify)	Preservative	No. of Containers	Lab ID No.(s)	Analyses Required	Total Petroleum Hydrocarbons EPA 418.1		Volatile Organics EPA [illegible] 8020		Remarks
#25		BORING HOLE #7 DEPTH OF 2'-9"	8/3	1607		X			1			X				SOIL
✓ #26		BORING HOLE #7 DEPTH OF 2'-9"	8/3	1607		X			2					X		SOIL
#27		BORING HOLE #7 DEPTH OF 4'-11"	8/3	1628		X			1			X				SOIL
✓ #28		BORING HOLE #7 DEPTH OF 4'-11"	8/3	1628		X			2					X		SOIL

Additional Field Comments:

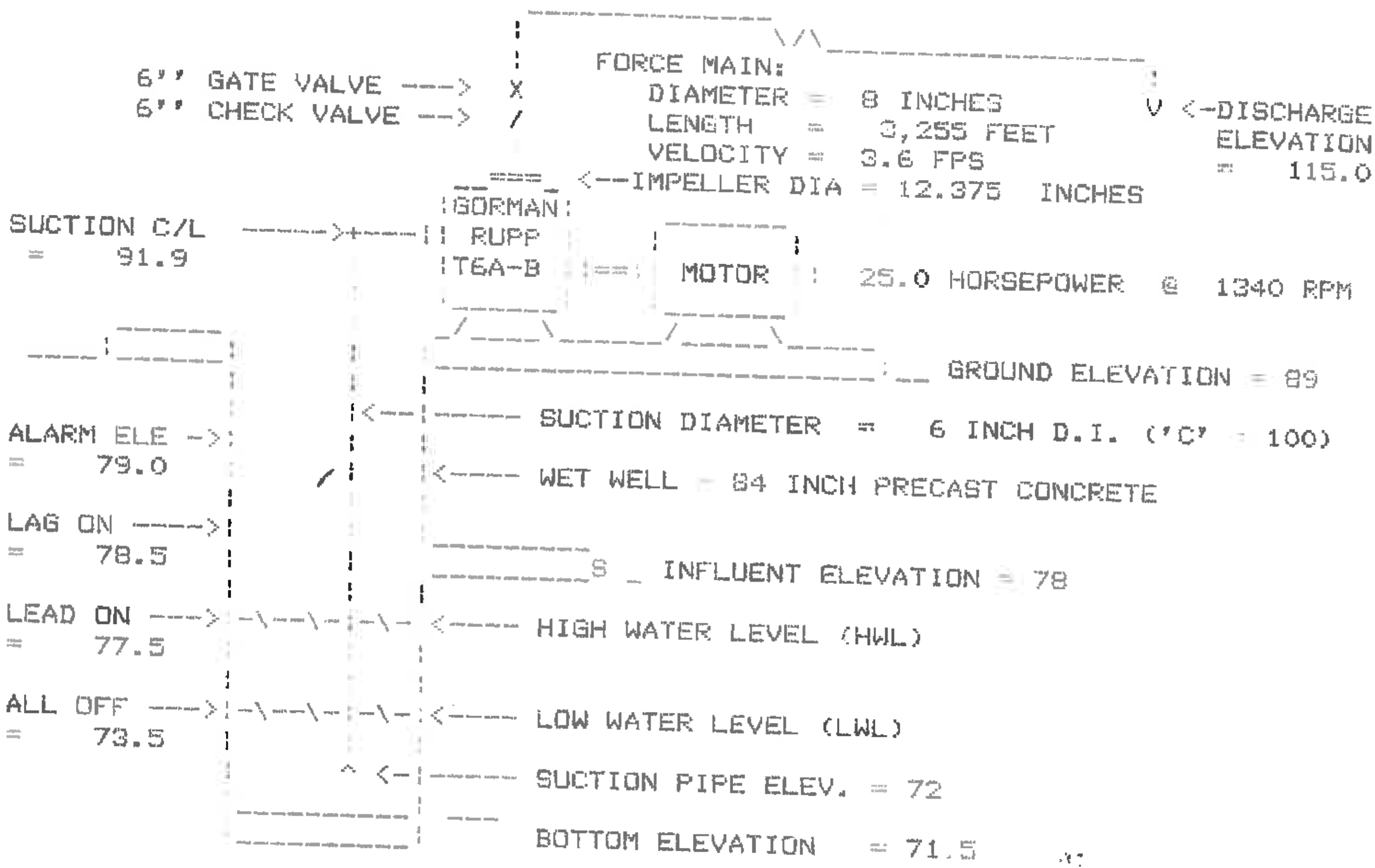
Relinquished by:		Received by:		Date	Time
Print Name: GREGORY B. FUSCO, P.E. Signature: Gregory B. Fusco	Company: KEY ENGINEERS, INC	Print Name: Sherree Baker Signature: Sherree Baker	Company: ET+T	8/4/89	8Am
Print Name: Signature:	Company:	Print Name: Signature:	Company:		
Print Name: Signature:	Company:	Print Name: Signature:	Company:		
COMMENTS:		Received for laboratory by: Print Name: Signature:			

Calculations

SPECIFICATIONS: (* GIVEN)

* FORCE MAIN LENGTH	(FEET) :	3255
* FORCE MAIN 'C' COEFF.	:	120
* DISCHARGE ELEVATION	:	115
* GROUND ELEVATION	:	89
* INFLUENT ELEVATION	:	78
GALLONS PER DAY	:	345,600
AVERAGE INFLUENT	(GPM) :	240
PUMP DOWN DEPTH	(FEET) :	4
MINIMUM PUMP DOWN TIME	(MINUTES) :	3.8

DESIGN:



OPERATING CONDITIONS:

Q MIN = 600 @ 73 TDH & 55 % EFF, VELOCITY: 3.6 FPS
Q MAX = 638 @ 72 TDH & 56 % EFF, VELOCITY: 3.9 FPS
STATIC PRIMING LIFT = 14.4 FEET ; TOTAL SUCTION HEAD = 20.4 FEET
NPSH REQUIRED = 6 FEET & NPSH EXCESS = 5.1 FEET
STANDARD PRESSURE USED = 31.5 FEET WATER; (27.8 INCHES Hg)

Preliminary Calculations
Berlin Road Pump Station Up Grade

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SPECIFICATIONS:   (* GIVEN)
    FORCE MAIN LENGTH                  (FEET)    1740
  * FORCE MAIN 'C' COEFF                         120
  * DISCHARGE ELEVATION                          95.09
  * GROUND ELEVATION                          :  79
  * INFLUENT ELEVATION                        :  64.25
    GALLONS PER DAY                           :    763,200
    AVERAGE INFLUENT                   (GPM)  :  530
    PUMP DOWN DEPTH                   (FEET)  :  5
    MINIMUM PUMP DOWN TIME (MINUTES)          :  4.5

DESIGN:
                                  _______________
                                 |               \/\__________________
                                 |    FORCE MAIN:                     |
        8'' GATE VALVE --->      X       DIAMETER =  8 INCHES         V <-DISCHARGE
        8'' CHECK VALVE -->      /       LENGTH   =   1,740 FEET          ELEVATION
                                 |       VELOCITY =  6.4 FPS              =    95.1
                              __===_ <--IMPELLER DIA = 14.75  INCHES
                             |GORMAN|
 SUCTION C/L   ------>+----|| RUPP  |   _______
  =    82.8           |     |T8A-B  ||==|| MOTOR ||   50.0 HORSEPOWER  @  1240 RPM
                      |     |_______|   |_______|
       ______              _/____\_____/_____\_____
  ____|______|            |_________________________|__ GROUND ELEVATION = 79

                      |<--.----- SUCTION DIAMETER   =   8 INCH D.I. ('C' = 100)
 ALARM ELE ->|             |
 =    65.3   |        |    |<---- WET WELL - 108 INCH PRECAST CONCRETE
             |        |    |
 LAG ON ---->|        |    |_________
 =    64.8   |        |    _________S _ INFLUENT ELEVATION = 64.25
             |             |
 LEAD ON ---> -\--\- |-\-|<---- HIGH WATER LEVEL (HWL)
 =    63.8
                      |
 ALL OFF --->|-\--\-|-\-|<---- LOW WATER LEVEL (LWL)
 =    58.8   |
             |       ^ <-|----- SUCTION PIPE ELEV. = 57.25
             |__________|  ___
             |__________|        BOTTOM ELEVATION   = 56.75

OPERATING CONDITIONS:
    Q MIN =  1050  @  82 TDH  &  54 % EFF, VELOCITY: 6.4 FPS
    Q MAX =  1106  @  81 TDH  &  56 % EFF, VELOCITY: 6.7 FPS
    STATIC PRIMING LIFT = 19.1 FEET : TOTAL SUCTION HEAD = 26.2 FEET
    NPSH REQUIRED = 5 FEET & NPSH EXCESS = .3 FEET
    STANDARD PRESSURE USED = 31.6 FEET WATER; ( 27.9 INCHES Hg)
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Preliminary Calculations

Gibbsboro Road Pump Station Up Grade

8.0 REFERENCES

1. Stage 1A Cultural Resource Survey - Gibbsboro Sanitary Sewerage Collection System, Dr. Edward Larabee, Historic Sites Research.

Dear Mr Klimcsak,

I have three different comments on this plan.

1) Characterization of Recontamination Risks and Remediation Timeline. The representatives for the Environmental Protection Agency (EPA) and Sherwin Williams (S-W) both insist that flood waters do not present a risk to public health or re-contamination. They have made these statements in both public meetings and in private meetings. This is NOT true and it is EXTREMELY frustrating to sit in meetings and listen to the project managers (especially EPA's project managers) disingenuously characterize these risks. It is believed that many portions of the Hilliard's Creek site were contaminated via hydraulic deposition of eroded soils that were contaminated. Any hydraulic erosion event (e.g. an accident during remediation or a natural flood) COULD redistribute contaminated soil. EPA and S-W routinely either deny that this is true and/or obfuscate any discussion on the matter by an irrational and unrelated insistence that the water itself is not contaminated. It is because of this recontamination risk, and because the EPA (in conjunction with S-W) has already initiated remediation in close proximity to Hilliard's Creek, that time is now of utmost importance. The remediation activities, whatever they are, need to be completed as quickly as possible to avoid re-contamination of already-remediated sites. We were given an estimate of eight years-to-completion at the public meeting in the Gibbsboro Senior center on 5 December 2019. Remediation of surface soils began in 2016 (I think). Eleven years of accumulated recontamination risk (>15 years if we consider accumulated risk from time-of-sampling) is likely significant and should not be so flippantly and disrespectfully dismissed by project managers. The hubris displayed in how the project managers treat the recontamination issue is infuriating and makes me wonder whether S-W has too much influence in how the project is being conducted and/or explained to the public. Alternatively, maybe the EPA project managers are incompetent or otherwise biased. Whatever the reason, the continued mischaracterization of recontamination risks is not acceptable moving forward and must stop.

2) Silver Lake and Recontamination Risk. Silver Lake was initially not included as part of the remediation efforts at this site. In my last public comment to EPA I brought up Silver Lake and strongly advised that sediment in the lake be assessed for contamination due to proximity to the manufacturing plant site. Since that time (and to EPA's credit) Silver Lake's sediment was sampled, contaminated sediment was found, and my understanding is that remediation plans for that sediment are currently being drawn up. Until such time as the sediment in Silver Lake is remediated, all downstream portions of the Hilliard's Creek site are at risk of recontamination via hydraulic erosion. The sediments in Silver Lake must be remediated before downstream sites within the Hilliard's Creek floodplain, and especially within the channel, are remediated. Silver Lake also presents a recontamination risk via catastrophic failure and/or removal. In the case of dam-failure, high-energy flood waters are likely to cause significant scouring and redistribution of surface sediments, which would redistribute contaminated soils and could even reconfigure the hydrology of the watershed such that vectors of contamination change. That said, the existence of a well-maintained dam upstream of the former manufacturing plant could be beneficial because the reservoir/dam has a moderating and attenuating influence on flood waters that would reduce the likelihood of redistribution of contaminated sediment downstream. Whether or not it makes sense for Silver Lake to be maintained as an artificial lake or drained and restored to a stream habitat with riparian buffer should be considered relative to the broader remediation plan and risks of recontamination downstream. In the meeting at the Gibbsboro Senior Center on 5 December 2019 EPA's representative (Ray) stated that the dam and lake had not been considered in this way. In the case that the dam (and Silver Lake) continues to remain in place, S-W should place funds in trust that can be used to maintain 1) the integrity of the Silver Lake dam and 2) the flood-attenuating characteristics of the reservoir to include its bathymetry and shoreline integrity. These funds should be enough to ensure the safe operation of the dam into the future (i.e. an endowment where interest funds maintenance) rather than merely enough for a specific number of years to avoid transferring the costs of maintenance to local taxpayers. The trust should be structured such that the monies cannot be used for any activity other than dam/reservoir maintenance. Consideration should also be given to future ecosystem services that a lake vs. stream (with riparian buffer) provide in buffering/capturing pollution/toxins that may emanate from the upstream Buzby Landfill superfund site.

3) Incorporation of Property Value Adjustment into Remediation Plan and Choice of Remediation Plan. The decision about which remediation plan to choose is currently being based on a variety of factors that include technical factors such as the type and amount of contamination present, hydrology of the site, and engineering considerations as well as monetary considerations related to the clean-up of the site. The current preferred option (#4) is likely to result in above-ground infrastructure that will cause property values to decline throughout Gibbsboro, more-so for properties near the former manufacturing plant, and especially so for properties from which the remediation infrastructure is visible. The reduction in property values is true for properties that are being remediated as well as nearby properties in both Gibbsboro and Voorhees. Both townships, but especially Gibbsboro, could experience a reduction in property values (and therefore tax-income) following remediation via option #4 due to the continuing and above-ground nature of the proposed remediation. These costs to the local community are not included in the cost estimations for option #4 and should be. It appears that these costs ARE incorporated into option #5 (this option does not have any above ground infrastructure), which might explain why the difference in estimated costs is so different (~70 million dollars) between the two plans. If option #4 is adopted, it must include fair compensation to individual property owners and to the local townships. The addition of fair compensation for decreased property values would likely bring option #4 and #5 much closer together in terms of overall cost and therefore change the calculus on EPA's preferred remediation plan. Option #5, to my understanding, in large part eliminates the property value issue and would therefore be much less complex to administer.

Sincerely,

N Ruhl

35 Clementon Rd W