RECORD OF DECISION

Sherwin-Williams Superfund Site
Operable Unit 3 - Groundwater

Gibbsboro, Camden County, New Jersey

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

September 2025

758114

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Sherwin-Williams/Hilliards Creek Superfund Site
Operable Unit 3 - Groundwater
Gibbsboro, Camden County, New Jersey
EPA Superfund Site Identification Number NJD980417976/0200516

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected remedy to address contaminated groundwater at the Sherwin-Williams/Hilliards Creek Superfund Site (Site) – Operable Unit 3 (OU3) – Groundwater, located in Gibbsboro, Camden County, New Jersey (Figure 1). EPA selected the remedy in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §§ 9601-9675, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedy. The administrative record for the Site, established pursuant to the NCP, 40 C.F.R. Section 300.800, contains the documents that form the basis for EPA's selection of the remedial action (see Appendix III).

The State of New Jersey Department of Environmental Protection (NJDEP) has been consulted on the proposed remedy in accordance with CERCLA Section 121(f), 42 U.S.C. §9621(f), and it concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances at or from OU3 of the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The OU3 remedial action described in this document addresses contaminated groundwater at the Site. OU3 is the third of four operable units for the Site.

The major components of the selected remedy for OU3 include the following:

- Assumption of the implementation of the OU2 remedy.
- Implementation of a Pre-Design Investigation and treatability study.
- Placement of Institutional Controls (ICs).

- Installation of injection points and performance of injections in the area surrounding the secondary source at MW-30.
- Installation of additional monitoring wells to 75 feet below the ground surface to supplement the existing monitoring well network for long-term monitoring (LTM) purposes.
- Attenuation processes, including biodegradation, dilution, dispersion, sorption, volatilization, and precipitation, as the primary mechanism for contaminant reduction for areas where active groundwater remediation is not implemented.
- LTM of shallow, intermediate, and deep groundwater.
- Five-year reviews.

The estimated present-worth cost of the selected remedy is $4,220,000.

Along with the selected OU3 remedy, the OU2 remedy is also instrumental in attainment of the groundwater goals since it includes: 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 light non-aqueous phase liquid (LNAPL), passive and active recovery, in-situ bioremediation (nutrient injections), and vapor recovery of deep LNAPL, which acts as a source of contamination to the shallow, intermediate, and deep groundwater. As such, the selected remedy for OU3, along with implementation of the remedy for OU2, will constitute a comprehensive remedy for groundwater.

DECLARATION OF STATUTORY DETERMINATIONS

Part 1: Statutory Requirements

The selected remedy meets the requirements for remedial actions set forth in Section 121 of CERCLA, 42 U.S.C. § 9621, because it meets the following requirements: 1) it is protective of human health and the environment; 2) it meets a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains the legally applicable or relevant and appropriate requirements (ARARs) under federal and state laws unless a statutory waiver is justified; 3) it is cost-effective; and 4) it utilizes permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. In addition, Section 121 of CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances as a principal element.

Part 2: Statutory Preference for Treatment

The selected remedy for OU3 is a combination of attenuation via natural processes and focused in-situ groundwater treatment. In keeping with the statutory preference for treatment as a principal element of the remedy, the remedy provides for the treatment of contaminated deep groundwater at the Site. Focused in-situ treatment for OU3 partially satisfies the statutory preference for treatment as a principal element of the remedy in that it includes treatment of the source of contamination in the deep aquifer. Additionally, the bioremediation of LNAPL that is part of the OU2 remedy will treat the shallow sources of contaminated groundwater at the Site. Together, these remedies, along with attenuation via natural processes, will address the remaining contaminated groundwater.

Part 3: Five-Year Review Requirements

Because the selected remedy will not result in hazardous substances remaining on-site above levels that allow for unlimited use or unrestricted exposure, but will take longer than five years to attain remedial action objectives (RAOs), a review of the remedial action pursuant to CERCLA Section 121(c) will be conducted five years after the completion of the remedial action (RA) to ensure that the remedy continues to provide adequate protection to human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

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

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

AUTHORIZING SIGNATURE

Pat Evangelista

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September 26, 2025

____ ________________

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

Date

RECORD OF DECISION
DECISION SUMMARY

Sherwin-Williams/Hilliards Creek Superfund Site
Operable Unit 3 - Groundwater

Gibbsboro, Camden County, New Jersey

United States Environmental Protection Agency
Region 2
New York, New York
September 2025

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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 Gibbsboro, Lindenwold, and Voorhees, Camden County, New Jersey, these Sites are the *Sherwin-Williams/Hilliard's Creek Superfund Site,* the *Route 561 Dump Site* (Dump Site) in Gibbsboro, and the *United States Avenue Burn Superfund Site* (Burn Site) in Gibbsboro. The Sites represent source areas from which contamination has migrated to downgradient areas within Gibbsboro, Voorhees, and Lindenwold.

Sherwin-Williams/Hilliards Creek Superfund Site: The Site has been divided into several OUs to remediate the contamination more efficiently. OU1 includes residential properties and was addressed under a ROD issued by EPA in September 2015. That cleanup has been completed, except for one property which EPA will address as part of OU4 because of its location within the flood plain. OU2 includes the Former Manufacturing Plant (FMP) Area which is approximately 20 acres in size and is comprised of commercial structures, undeveloped land, the southern portion of Silver Lake, and the upper portion of Hilliards Creek. The FMP Area extends from the south shore of Silver Lake in Gibbsboro and straddles the headwaters of Hilliards Creek. Hilliards Creek is formed by the outflow from Silver Lake. The outflow enters a culvert beneath a parking lot at the FMP and resurfaces on the south side of Foster Avenue, Gibbsboro. From this point, Hilliards Creek flows in a southerly direction through the FMP Area and continues downgradient through residential and undeveloped areas. OU2 is being addressed under a ROD issued in August 2020; the remedial designs and remedial actions (RD/RAs) for various areas within OU2 are in various stages of design and/or completion. OU4 (Waterbodies) includes Silver Lake, Bridgewood Lake, Kirkwood Lake, and the lower portion of Hilliards Creek, which starts at the culverted section at West Clementon Road, traveling approximately one mile before emptying into Kirkwood Lake. OU4 is being addressed under a ROD which EPA issued in September 2021. Much like OU2, various elements of OU4 are in various stages of RD and RA. OU3 addresses the Site-related contaminated groundwater at and associated with OU2, the FMP Area of the Site.

Route 561 Dump Site: The Dump Site is located approximately 700 feet to the east 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 United States Avenue Burn Site.

United States Avenue Burn Superfund Site: The Burn Site consists of a fenced area, a former landfill area, a railroad track area, and several other components. The fenced portion of the Burn Site and its associated contamination is approximately thirteen acres in size and includes the remaining 400 feet of White Sand Branch. A 500-foot portion of a small creek, Honey Run Brook, 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 West 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 developed in the early 1800s as a sawmill, and later 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. The Sherwin-Williams Company (Sherwin-Williams) purchased Lucas in the early 1930s and expanded operations at the facility. Historic features at the FMP Area included wastewater lagoons, above-ground storage tanks, a railroad line and spur, drum storage areas, and numerous production and warehouse buildings. The facility was closed in 1977 and was sold to a developer in 1981.

After plant operations ceased, NJDEP issued an administrative order on August 17, 1978, directing Sherwin-Williams to excavate and properly dispose of the waste material remaining in the lagoons. The property was sold to Robert Scarborough, a private developer, in early 1981. On May 19, 1981, NJDEP issued an administrative order to Sherwin-Williams to characterize and address groundwater contamination. In 1983, NJDEP received a report that petroleum-like seeps, 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 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").

During this time frame, NJDEP also discovered two additional source areas, the Dump Site, and the Burn Site. Contamination in both areas is attributable to historic dumping activities associated with the FMP Area. In the mid-1990s, enforcement responsibilities for the Dump Site and the Burn Site were transferred from NJDEP to EPA. EPA issued several administrative orders to Sherwin-Williams in 1995 and 1997, directing Sherwin-Williams to further characterize and delineate the extent of contamination associated with these areas and to fence them off to minimize the potential for human exposure. EPA proposed the Dump Site to the National Priorities List (NPL) in 1998. The Burn Site was added to the NPL in 1999.

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).

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 Site was placed on the NPL. Under EPA oversight, Remedial Investigation/Feasibility Study (RI/FS) activities began at the Site, pursuant to the 1999 Administrative Order on Consent (AOC). 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 RI report, FS report, and the Proposed Plan for OU3 of the Site, as well as other documents considered by EPA, to the public for comment on July 27, 2025. EPA made these documents available to the public in the administrative record file at the EPA Superfund Records Room in Region 2, 290 Broadway, New York, New York, and online at: www.epa.gov/superfund/sherwin-williams. Additionally, the documents are also available at the following local repositories: Gibbsboro Borough Hall/Library, 49 Kirkwood Road, Gibbsboro, New Jersey 08026 and the M. Alan Vogelson Region Branch Library – Voorhees, 203 Laurel Road, Voorhees, New Jersey 08043. The notice of availability for these documents was published in the Courier-Post on July 27, 2025. The thirty-day public comment period on these documents was held from July 27, 2025, to August 26, 2025.

On August 7, 2025, EPA conducted a public meeting at the Gibbsboro Senior Center, located at 772 Pole Hill Park Drive, Gibbsboro, New Jersey, to inform local officials and members of the public about the Superfund process, present the findings of the RI/FS and EPA's Proposed Plan to the community, review current and planned remedial activities at the Site, and to respond to questions from area residents and other attendees. EPA responses to the comments received at the public meeting, and in writing during the public comment period, are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

The Site has been divided into several OUs to remediate the contamination more efficiently. The first OU, OU1, includes the cleanup of soil contamination on the impacted residential properties. This remedy has been completed. The second OU, OU2, includes the soils, sediment, and LNAPL associated with the FMP Area, and the upper portion of Hilliards Creek. OU2 soil, sediment, and LNAPL are the primary sources of contamination to the groundwater and are being addressed under a ROD issued in August 2020. This remedy includes a combination of excavation and capping of soils with contamination above cleanup goals; excavation of saturated soils which act as sources to shallow groundwater; and, excavation of shallow light LNAPL, passive and active recovery, in-situ bioremediation (nutrient injections), and vapor recovery of deep LNAPL, which acts as a source of contamination to the shallow, intermediate, and deep groundwater. OU3 includes contaminated groundwater at and associated with OU2, the FMP Area of the Site. Groundwater contamination has been identified in the shallow, intermediate, and deep groundwater. This ROD addresses OU3 of the Site, which consists of contamination in the shallow, intermediate, and deep groundwater at and associated with OU2. The remedial designs and remedial actions (RDs/RAs) for various areas within OU2 are in different stages of design and/or completion. OU4 includes the contaminated soil, sediment, and surface water within the lower portion of Hilliards Creek, Silver Lake, Bridgewood Lake, and Kirkwood Lake, and is being addressed under a ROD issued in September 2021.

Both the Burn Site and the Dump Site have separate OU1, OU2, and OU3 designations that include residential properties, soil/sediment, and groundwater. The table below lists the decision documents for each of the Sites. The cleanups at the OUs that have RODs (or other decision documents) are in various stages of design and construction.

Sherwin Williams/Hilliards Creek Site

Operable Unit	Record of Decision	Status
1- Residential	2015	Complete
2- FMP Area Soils, Sediments, LNAPL	2020	In Progress
3- Groundwater at FMP	Anticipated 2025	Not Started
4- Waterbodies	2021	In Progress

United States Avenue Burn Site

Operable Unit	Record of Decision	Status
1- Residential	2015	Complete
2- Soil and Sediment	2017	Complete
3- Groundwater	TBD	TBD

Route 561 Dump Site

Operable Unit	Decision Document	Status
1- Residential	2015	Complete
2- Soil and Sediment	2016	Complete
3- Groundwater	TBD	TBD

SUMMARY OF SITE CHARACTERISTICS

Physical Setting

The FMP Area is bounded to the north by Silver Lake and Route 561, to the east by U. S. Avenue, to the west by East and West Clementon Road, and to the south by vacant land, a cemetery, and Bridgewood Lake.

The FMP Area currently comprises four buildings, the 1, 5, 7, and 10 Foster Avenue buildings, and the 2 and 4 Foster Avenue and 6 East Clementon (6EC) building slabs. The 1, 5, and 7 Foster Avenue buildings are located south of Foster Avenue, while the 10 Foster Avenue building and the 2 and 4 Foster Avenue and 6EC building slabs are located north of Foster Avenue. Most of the FMP Area is owned by Sherwin-Williams, with two lots, one at the corner of Foster Avenue and East Clementon Road, and the other immediately west of U.S. Avenue, owned by the Borough of Gibbsboro.

The topography of the FMP Area slopes from the northeast, where the elevations are highest, to the southwest. In the locations where the FMP Area is developed, surfaces such as parking lots and building locations are relatively flat and graded towards stormwater collection points. In the vicinity of Hilliards Creek and Bridgewood Lake, the topographic gradient slopes gently towards these water bodies.

There are seven subareas in total that make up the FMP Area of the Site. Six subareas identified as OU2 source areas will be used to present the groundwater contamination associated with former Site operations, as described below (Figure 2):

- **Former Main Plant (MP):** This is the northwest part of the Site. This area consists of the former 6 East Clementon Road building slab, the parking area west of the 2 and 4 Foster Avenue building slabs, the 10 Foster Avenue building, and the Silver Lake conveyance system, which is located beneath the paved parking area.
- **The Former Resin Plant (FRP) and Tank Farm A (TFA)**: This is the area immediately north of Foster Avenue and west of U.S. Avenue. The area includes the 2 and 4 Foster Avenue and 3 U.S. Avenue building slabs, and the building slab from a former structure known as the red barn.
- **The Seep Area:** This is the area south of Foster Avenue, west of U.S. Avenue, and east of Hilliards Creek. This area includes the 1 and 5 Foster Avenue buildings. The Seep Area is bordered to the west by Hilliards Creek.
- **Former Tank Farm B (TFB)/7 Foster Avenue (7FA):** This area consists of the former Tank Farm B area, including the current location of the 7 Foster Avenue building and parking area located west of Hilliards Creek. To the east is the Seep Area, and to the west are residential properties B-1 through B-8, which have been the subject of a prior remedial action.
- **The Former Lagoon Area (FLA):** This is the area where the former wastewater lagoons were located. The lagoons were closed by Sherwin-Williams, under NJDEP oversight, in 1979. The FLA is located south of the Seep Area, east of Hilliards Creek and west of U.S. Avenue. Bridgewood Lake is located south of the FLA. The southern off-property area is located to the south of the FLA and is a small section of the Cedar Grove Cemetery.
- **The Eastern Off-Property Area (EOP):** This is the area east of U.S. Avenue where the residential properties designated as Properties E-1 and E-7 through E-11, and the former service station/tavern, are located.

The FMP Area is situated within the New Jersey Coastal Plain Physiographic Province. The New Jersey Coastal Plain extends from the Fall Line in the west, to the Atlantic Ocean in the east, and from the Raritan Bay in the northeast to the Delaware Bay in the southwest.

Geology and Hydrogeology

Observations during the RI were consistent with the description of the geologic and hydrogeologic units from the published geological literature:

- The first unit encountered is the Lower Kirkwood Formation. This formation consists of sand and clay. The upper sand is typically fine- to medium-grained, massive- to thick-bedded, locally cross-bedded, light-yellow to white, locally very micaceous, and extensively stained by iron oxides in near-surface beds.
- The lower 5 to 10 feet of the Lower Kirkwood Formation grades into darker grayish brown to greenish clay or clayey sand (the Lower Kirkwood Clay), which marks the boundary with the underlying Vincentown Formation.
- Below the Lower Kirkwood Clay is the Vincentown Formation which, along with the Hornerstown Formation and the Navesink Formation, forms the composite confining unit, a lower permeability unit separating the Lower Kirkwood Formation from the Mount Laurel Formation.
- Below the composite confining unit is the Mount Laurel Formation, a regional drinking water aquifer.

Groundwater at the FMP Area has historically been categorized into three zones: 1) shallow; 2) intermediate; and 3) deep. “Shallow” wells are those installed at depths up to 20 feet below ground surface (bgs) and “intermediate” wells are installed at depths from 20 to 37 feet bgs; both are set in the Lower Kirkwood Formation. The “deep” wells are those installed from the clay portion of the Lower Kirkwood Formation (approximately 55 feet bgs) and into the Vincentown, Hornerstown, Navesink, and Mount Laurel Formations. Both the stratigraphic column and the groundwater zones can be found on Figure 3.

Results of the Remedial Investigation

Prior to the FMP Area becoming part of the Sherwin-Williams/Hilliards Creek Site in 2007, Sherwin-Williams performed interim measures, beginning in 1979, and site investigations, beginning in the 1990’s. The earliest work was performed under the oversight of NJDEP, which transferred authority to the EPA Removal Branch in 2002. Sherwin-Williams initiated the groundwater investigation of the FMP Area in 2009, as part of the RI/FS work carried out under the September 1999 AOC. The following is a summary of these early interim actions and investigations, and how they relate to the groundwater contamination addressed by OU3.

Previous Interim Measures
The first interim measure was conducted by Sherwin-Williams in 1979, under the oversight of NJDEP. This measure included the excavation and disposal of approximately 8,100 cubic yards (CY) of impacted soil from the FLA. Subsequent interim measures focused on addressing and preventing LNAPL discharges at the Seep Area. These measures started in 1994, under NJDEP oversight (1994 to 2001), and continued, as needed, under EPA oversight (2001 to present), with the most recent measure occurring in October 2024.

In addition to the interim measures taken to address discharges to Hilliards Creek, Sherwin-Williams inspected all floors in buildings located within the FMP Area footprint, identifying and sealing any penetrations or cracks that were acting as pathways for subsurface vapor transport, and installed vents in subsurface sumps to provide a path for vapor transport to the outside.

Previous Investigations
The first monitoring wells were installed in the FMP Area prior to 1991. These were shallow monitoring wells designed to monitor the effectiveness of the interim measure performed in 1979 for the FLA, and to evaluate conditions upgradient of the FMP Area. Most of these investigation activities were performed under NJDEP oversight and were conducted from 1991 through 2000. During this time frame, Sherwin-Williams conducted five phases of work that focused on the former TFA Area, Seep Area, former TFB Area, and the FLA. Beginning in 2002, Sherwin-Williams conducted three site-wide investigations under the oversight of the EPA Region 2 Removal Branch. These efforts included a geophysical investigation to identify subsurface utilities, historic features, and possible transport pathways for LNAPL, a soil screening and confirmatory sampling program to delineate the extent of LNAPL in FMP Area soil, and a site-wide water level and monitoring well sampling program.

Groundwater Remedial Investigation
Further investigations of the FMP Area were incorporated as part of the RI for the Sherwin-Williams/Hilliards Creek Site. In March 2007, EPA requested that Sherwin-Williams prepare a work plan for characterization of the FMP Area. Since that time, numerous groundwater characterization activities and investigation activities have been conducted. These activities included the following work:

- Groundwater sampling (2009–2018), including:
    - Monitoring well installation;
    - Monitoring well development and redevelopment;
    - Groundwater level measurements; and,
    - Groundwater sample collection and analysis.
- Aquifer testing (2009–2018);
- Downhole natural gamma logging (2012–2018);

- Shallow and intermediate groundwater screening (2012);
- A survey of groundwater/surface water interactions (2017);
- An evaluation of biodegradation of LNAPL constituents in groundwater (2018);
- Installation and sampling of upgradient background wells (2020);
- Installation and sampling of replacement wells on a downgradient residential property (2021);
- Additional groundwater sampling conducted following EPA's review of the Draft Groundwater Remedial Investigation (RI) Report and in response to "*EPA and NJDEP Request for Additional Groundwater Sampling*" (2021);
- Several OU2 Pre-Design Investigation (PDI) sampling events were also used to support the OU3 Groundwater RI:
    - OU2 PDI sampling event conducted in support of the source removal actions at the FLA (2020–2022);
    - OU2 PDI sampling conducted in support of the LNAPL recovery and treatment activities in the FRP/TFA Area and the EOP Area (2022);
    - Sampling conducted as part of the baseline pre-RA sampling within the Burn Site (2022);
- Resampling of monitoring well MPMW0052 (December 2023); and
- Abandonment of monitoring well MPMW0052 and installation and sampling of replacement well MPMW0052R (2024).

Through the soil investigations conducted as part of the OU2 RI and later through the OU2 pe-design investigation, and the groundwater investigations conducted as part of the OU3 RI, a detailed understanding of the nature and extent of the chemicals of concern (COCs) in groundwater, their sources, and the factors that influence their fate and transport, was developed. Figure 4 shows the location of groundwater monitoring wells used during the RI, and Table 1 provides a summary of the identified groundwater COCs and their ranges of concentrations.

Below is a summary of the groundwater investigation results:

<u>Light Non-Aqueous Phase Liquid</u>

LNAPL is present on the surface of the shallow groundwater in the former TFA Area, EOP Area and Seep Area (Figure 5). The LNAPL is comprised primarily of degraded mineral spirits with some VOCs and semi-volatile organic compounds (SVOCs), including benzene, naphthalene, and VOC/SVOC Tentatively Identified Compounds (TICs), and is the direct source of contamination to shallow and intermediate groundwater above NJDEP Ground Water Quality Standards (GWQS) and Interim Generic Ground Water Quality Criteria (IGGWQC) for synthetic organic compounds (SOCs). Dissolution of the LNAPL is the primary mechanism by which benzene and VOC/SVOC TICs come to be present in Site groundwater at concentrations greater than the GWQS and the IGGWQC. LNAPL is also an indirect source of some of the arsenic found in groundwater at concentrations greater than the GWQS. The reducing conditions created by the biodegradation of the LNAPL and dissolved-phase hydrocarbons mobilizes naturally occurring arsenic in the soil, resulting in dissolved-phase arsenic concentrations greater than the GWQS. The RI also found that on a site-wide basis the LNAPL is generally not mobile, with only a handful of wells showing signs of mobile LNAPL during periods of low groundwater levels. Recoverable LNAPL is limited to well HP-3, and recovered volumes continue to decline over time. The LNAPL discussed in this section is being addressed under the OU2 remedial action which is currently in the design phase. Since it is the primary source of the groundwater contamination discussed in this ROD, implementation of the OU2 remedy for LNAPL is expected to have a significant beneficial impact in reducing the groundwater contamination addressed under OU3.

Benzene

Benzene is a key primary constituent in shallow, intermediate, and deep groundwater at concentrations greater than the GWQS at the FMP Area. Benzene was transported horizontally in shallow groundwater through the former TFA and Seep Areas towards the FLA and EOP Area. In addition to the horizontal transport, contamination was also transported vertically from the former TFA Area into the Vincentown and Hornerstown Formations by the presence of a downward vertical gradient from the Lower Kirkwood Formation to the Vincentown Formation, where a thinning of the lower Kirkwood Clay has been observed. Based on the continued elevated benzene concentrations in MW-30 in the Lower Kirkwood Formation, it was concluded that back diffusion of benzene absorbed in the basal clay in this area acts as a secondary source of benzene in deep groundwater. The vertical extent of the benzene in deep groundwater is limited to the Vincentown and Hornerstown Formations. The Navesink Formation clay unit, identified during the RI, is an effective confining layer preventing groundwater flow into the deeper Mount Laurel Formation.

With the exception of a few locations, benzene concentrations in groundwater have declined across the Site since RI sampling was initiated in 2009. In instances where a decline was not noted, groundwater concentrations have remained stable or have increased. The increases were primarily in newer wells where only a few rounds of data were available for comparison; however, overall, many years of data show that benzene concentrations in the FMP Area groundwater have substantially declined, suggesting mass reduction of approximately 90% since 1990 (Figure 6).

Synthetic Organic Compounds (SOCs)

VOC/SVOC TICs are present in groundwater within the limits of the LNAPL plume (**Figure 5**) and in the FLA. There are no GWQS or maximum contaminant levels (MCLs) for VOC/SVOC TICs, but

NJDEP has established IGGWQCs for SOCs. SOCs are defined as any synthetic (not naturally occurring) organic chemical for which NJDEP has not established a GWQS.

In shallow groundwater, the highest total VOC/SVOC TICs are present within the inferred extent of the LNAPL plume. The VOC/SVOC TICs have been identified as primarily alkanes and methylated benzenes that have been attributed to the LNAPL. VOC/SVOC TICs are also present in the FLA at concentrations greater than the 500 micrograms per liter (µg/L) IGGWQC for total SOCs.

The VOC/SVOC TIC concentrations in the FLA are lower than those within the LNAPL plume, and the composition of the VOC/SVOC TICs is different than the composition in the LNAPL plume (alkanes and methylated benzenes vs. organic acids and phenolic compounds).

VOC/SVOC TIC concentrations within the LNAPL area in intermediate groundwater are much lower than in shallow groundwater. The extent of VOC/SVOC TICs in intermediate groundwater at concentrations greater than 500 µg/L is also less than in shallow groundwater. A similar pattern is observed in the FLA; higher VOC/SVOC TIC concentrations are present in shallow groundwater than in intermediate groundwater. As discussed above, the LNAPL, and the associated TICs, are being addressed under the OU2 remedial action. Implementation of the OU2 remedy is expected to have a significant beneficial impact in reducing the VOC/SVOC TIC contamination addressed under OU3.

The only location where VOC/SVOC TICs exceed 500 µg/L in deep groundwater is at MW-30, where a downward vertical hydraulic gradient and a thinning of the Lower Kirkwood Clay was identified. As such, like the transport of benzene, the downward transport of VOC/SVOC TICs from the Lower Kirkwood Formation to the Vincentown Formation, and horizontal transport through the Vincentown Formation, is the primary transport mechanism for the VOC/SVOC TICs.

<u>Other VOC and SVOCs</u>

In addition to the benzene and VOC/SVOC TICs discussed above, some additional VOCs and SVOCs were found at concentrations greater than the GWQS in various wells in the 2018 sampling, including 2-methylnaphthalene, naphthalene, 1,1,2,2-trichloroethane, trichloroethene, tetrachloroethene, vinyl chloride, 1,1,2-trichloroethane, and 1,2-dichloroethane.

<u>Chlorinated VOCs</u>

Chlorinated VOCs were found at concentrations greater than the GWQS in some wells. Except for one well, most exceedances are found in shallow and intermediate wells located within the Seep Area and FLA. In total, chlorinated compounds were detected in 9 wells: two in the Seep Area, two in the EOP Area, and five in the FLA. The chlorinated VOCs detected, although above GWQS, are sporadic and are located within the footprint of the OU2 source area in which both soils and LNAPL are being treated as part of the OU2 remedy, and concentrations are expected to decrease post-OU2 remediation implementation.

Naphthalene/2-Methylnaphthalene

Naphthalene was found in two wells, including a shallow well in the FRP/TFA Area and a shallow well in the EOP Area, at concentrations greater than the GWQS during the OU3 RI and the LNAPL PDI sampling performed in 2022 for the OU2 RD. The OU2 ROD specifies that biological treatment of the LNAPL will be performed in both the FRP/TFA Area and the EOP Area. Since the LNAPL is the source of the naphthalene in groundwater, it is expected that the naphthalene concentrations in the shallow groundwater will decline when the remedy for the LNAPL is implemented as part of the OU2 remedy.

The Human Health Risk Assessment (HHRA) for OU3, discussed below, identified that 2-methylnaphthalene in groundwater contributes to an individual Hazard Quotient (noncancer) greater than one. Like naphthalene, 2-methylnaphthalene has been detected at concentrations greater than the GWQS in only one well, MW-24. Like naphthalene, the LNAPL is the source of the 2-methylnaphthalene in groundwater, and it is expected that the 2-methylnaphthalene concentrations will decline when the LNAPL remedy is implemented.

Arsenic

Soil representing sources of arsenic to groundwater was identified during the RI and subsequent PDI for the 6EC and MP subareas of OU2 as identified below:

- Beneath and adjacent to the former 6EC building slab,
- In the southeast corner of the 10 Foster Avenue building on both sides of the Silver Lake conveyance,
- Beneath the parking area of the 2 and 4 Foster Avenue buildings north of Foster Avenue and east of the Silver Lake conveyance system, and
- South of Silver Lake, east of the Silver Lake conveyance system.

The depths at which arsenic is present at concentrations at or exceeding 50 milligrams per kilograms (mg/kg) in saturated soil ranged from approximately 6 ft bgs to more than 20 ft bgs.

Arsenic is found at concentrations greater than the NJDEP GWQS in shallow groundwater throughout the FMP Area, because of two primary mechanisms:

1. **Sources of arsenic present in soil** – Although not specifically addressed in OU3, arsenic sources to groundwater have been identified in the FMP Area. The OU2 ROD defines sources of arsenic as locations where saturated soil contains arsenic at concentrations of

50 mg/kg or more. These areas were fully characterized as part of the PDI for the MP, 6EC, and 7 Foster Avenue subareas of OU2. The MP and 6EC arsenic sources have already been removed as part of the OU2 remedial action that has been completed for the MP and 6EC subareas. The arsenic source areas identified in the 7 Foster Avenue subarea will be addressed in a future excavation. The excavation cut lines for this area are currently being designed and excavation of this subarea will be implemented in early 2026.

2. **Mobilization of naturally occurring arsenic –** Due to the reducing conditions caused by the biodegradation of the LNAPL and dissolved phase organic constituents in groundwater, naturally-occurring arsenic in soil has been mobilized. "Reductive dissolution" and "reductive desorption" of the aquifer formations result in releases of the naturally occurring arsenic in soil into the groundwater.

In some instances, both these mechanisms described above may be responsible for the presence of the arsenic in groundwater.

The highest concentrations of arsenic are found in two shallow groundwater wells near where the OU2 arsenic soil source areas have been identified. The highest concentrations of arsenic have been found in well MPSB0049, immediately south of the 6EC building slab and within a large arsenic source area. The other well with high concentrations is well MPMW0009, which is located in the Seep Area, downgradient of the identified soil arsenic source areas detailed above. In locations other than these two well locations, arsenic concentrations range from less than the GWQS to approximately 10 µg/L, which is the MCL.

Arsenic is generally not present at concentrations greater than the GWQS in deep groundwater. The one location where arsenic is routinely found in deep groundwater at concentrations greater than the GWQS is MW-30, which is located within the former TFA Area. As a result of the presence of the LNAPL, reducing conditions in this area extend to deep groundwater. As such, EPA attributes the presence of arsenic at concentrations greater than the GWQS to the reducing conditions at this location.

The OU3 GW RI concluded that the dissolved-phase arsenic is in a "steady-state" condition because the hydrocarbon plume that is the source of the reducing conditions is not expanding, the extent of arsenic present at concentrations greater than the GWQS is stable, and there is little transport of the arsenic beyond the influence of the reducing conditions. Beyond the zones of reducing conditions the groundwater returns to ambient geochemical conditions, returning arsenic concentrations to ambient conditions. Similar to other contaminants, it is expected that the arsenic concentrations will decline when the LNAPL remedy is implemented.

Lead

Lead is not extensively found at concentrations greater than the GWQS 5 µg/L at the FMP Area. Lead was reported at a concentration greater than the GWQS in only four locations in 2018: MW-38 (16.1 µg/L), MPMW0017 (24.1 µg/L), MPMW0030 (18.7 µg/L), and MPMW0032 (31.3 µg/L). In 2021, Sherwin-Williams implemented another groundwater sampling event. The sampling results from this event showed that lead was not present at concentrations greater the GWQS in any of the wells except for MW-38, where lead was detected at 51 µg/L and 19 µg/L in the unfiltered and filtered samples, respectively. From the information collected during the OU2 and OU3 RIs, EPA has concluded that the most likely explanation for the lead in MW-38 is the entrainment of solids rather than groundwater contamination. Lead was not detected above GWQS in any of the deep wells.

Other Metals

In addition to the compounds listed above, concentrations of aluminum, iron, manganese, sodium, beryllium, cadmium, chlorides, thallium, and zinc were also detected at concentrations greater than their respective GWQS in shallow and intermediate groundwater. A detailed account of these metals can be found in the OU3 RI report. Although these compounds were detected above their respective GWQS, concentrations were sporadic and not indicative of an anthropogenic source, or they were determined to be naturally occurring; however, due to the reducing conditions caused by the biodegradation of the LNAPL, naturally occurring iron and manganese in soil has been mobilized. “Reductive dissolution” and “reductive desorption” of the aquifer formations result in releases of the naturally occurring iron and manganese in soil into the groundwater.

Pentachlorophenol (PCP)

Soil representing sources of pentachlorophenol (PCP) to groundwater was identified during the RI and subsequent PDI sampling events for the 7 Foster Avenue/Tank Farm B (7FA/TFB) and the FLA subareas of OU2. The sources of PCP impacts to groundwater are identified for removal as part of the 7FA/TFB and FLA remedial effort as part of the OU2 remedial action currently underway. PCP has also been found in shallow groundwater at concentrations greater than the NJDEP GWQS. These exceedances in shallow groundwater have been identified primarily in the former 7FA/TFB Area and in the shallow and intermediate groundwater in the FLA. Potential PCP source areas will be addressed during the OU2 source area soil remedial action. Once the source area soils have been removed, concentrations are expected to decline. PCP is not found in deep groundwater.

Perfluorooctanoic acid and Perfluorooctanesulfonic acid (PFOA and PFOS)

Limited sampling for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) was performed during the OU3 RI. The NJDEP GWQS for PFOA (14 nanograms per liter [ng/L]) was exceeded in two locations, MW-30 (18.6 ng/L) and MPMW0046 (18.8 ng/L). In addition to MW-30 and MPMW0046, PFOA was also present at concentrations greater than the federal MCL of 4 ng/L in MW-11 (4.59 ng/L) and MPMW0009 (13.7 ng/L). The federal MCL for PFOA was also exceeded in upgradient shallow well MW-28 (5.55 ng/L). The NJDEP GWQS for PFOS (13 ng/L) was exceeded in only MPMW0046 (33 ng/L). The federal MCL for PFOS (4 ng/L) was also exceeded in MW-11 (7.43 ng/L) and MPMW0009 (12.7 ng/L). Both PFOA and PFOS were found in upgradient deep wells MPMW0060 and MPMW0061 at concentrations below the GWQS and the federal MCL. Concentrations of both PFOA and PFOS are below the GWQS and MCL in the most downgradient sampling location (MW-41).

EPA is not aware of any history of use of PFOA/PFOS at the FMP Area during historic operations. Further, soil source area removals during the OU2 remedial actions will be performed in the locations where the highest concentrations of PFOA/PFOS were found in the groundwater. Given the relatively low concentrations of PFOA/PFOS, once the OU2 source removal activities are conducted, EPA expects that PFOA/PFOS concentrations will decline to background levels. Additional sampling for PFOA and PFOS will be performed following implementation of the OU2 remedy as part of the long-term monitoring program for the Sites.

1,4-Dioxane

1,4-dioxane was reported at concentrations greater than the NJDEP GWQS of 0.4 µg/L in several intermediate monitoring wells throughout the FMP Area in the 2018 sampling. Sampling conducted in 2017 and 2018 for the existing wells, and 2021 for the newly installed upgradient wells, are the only events in which 1,4-dioxane was included as an analyte. Where reported, the 1,4-dioxane concentrations in intermediate groundwater ranged from approximately 1 µg/L to 3 µg/L. The highest concentrations (approximately 3 µg/L) were found in MW-20, located in the parking area west of the 2 Foster Avenue building, and MPMW0035, located south of the FLA. In the wells sampled between these two wells, 1,4-dioxane concentrations were approximately 1 µg/L to 1.5 µg/L. EPA has not identified the source(s) of the 1,4-dioxane. EPA is not aware of any documentation of the use of chlorinated solvents, particularly 1,1,1-trichloroethane, at the FMP Area and there is no indication of a source of chlorinated solvents at the FMP Area that are common co-contaminants associated with 1,4-dioxane usage. The relatively low concentrations of 1,4-dioxane present in intermediate groundwater also suggest that there was no significant or centralized release of 1,4-dioxane at the FMP during historic operations. Additionally, there are no public sewers in the vicinity of the FMP Area. The 1,4-dioxane may be present in septic systems because of its use as a component of consumer products, such as laundry detergents or shampoos, or because it was a component of a septic tank degreasing agent.

Summary of RI Results

As discussed above, groundwater is characterized into three zones – shallow, intermediate, and deep. Shallow and intermediate groundwater is contaminated with arsenic, PCP, and LNAPL constituents (SOC, naphthalene, 2-methylnaphthalene, and benzene). The source areas for contamination in the shallow and intermediate zones will be addressed by the OU2 remedial actions. Contaminants from the shallow and intermediate zones have migrated to the deep groundwater through a preferential pathway caused by a downward gradient in the vicinity of MW-30. While several contaminants are present in the deep groundwater, the primary one is benzene, with the highest concentrations observed at MW-30. Elsewhere in the deep groundwater, contamination is more heterogenous and diffuse. Monitoring data collected since 2009 show rapid degradation in downgradient wells, and the size of the benzene plume has decreased significantly.

Lines of Evidence to Support Attenuation via Natural Processes

An evaluation of natural attenuation conditions was conducted as part of the RI and further evaluated during the FS. Overall, the analyses indicated that some level of natural attenuation of Site-related contaminants is occurring. Lines of evidence (LOE) for the use of attenuation via natural processes at the FMP Area have been developed in several different studies and are summarized in the technical memorandum, "Lines of Evidence Supporting Attenuation via Natural Processes" which is Attachment 1 to the FS. The primary natural processes at work are biodegradation, dispersion, dilution, sorption, volatilization, and precipitation. A more detailed summary of these LOE is presented below:

- Direct evidence in the form of reduction in concentration and mass for benzene and other COCs over time shows that attenuation via natural processes is occurring.
- Assessment of post-source removal groundwater data for the adjacent Dump Site shows direct evidence of the reduction in arsenic concentrations following the source removal. Conditions at the Dump Site are similar to the Sherwin Williams/Hilliards Creek Site, therefore similar results can be expected at the FMP Area following the arsenic source removal.
- Hydrogeologic (field indicator parameters, site specific seepage velocity) and geochemical (biogenic heat signatures showing biological activity, electron donors and acceptors, dissolved gasses, arsenic speciation data, and organic carbon content) data support the conclusion that following source removal and treatment, attenuation via natural processes will be an effective remedial approach for the LNAPL-related COCs, arsenic, and pentachlorophenol.
- Microbial studies performed as part of the OU2 LNAPL PDI document the ongoing biodegradation of LNAPL and dissolved hydrocarbons in groundwater at the FMP Area.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Land Uses

The FMP Area is a large parcel of land that is currently in use with a variety of land uses, including commercial, residential, and undeveloped land. North of Foster Avenue is zoned as Office/Technical Park. This area is currently used as an office and industrial park, although many of the buildings are vacant, and the likely future use will be for commercial/industrial purposes. EPA's understanding of the future use of the FMP Area is based on its long experience at the Site, including consultation with local officials and community outreach.

South of Foster Avenue and west of U.S. Avenue, the land use is commercial through the developed portions of the 7 Foster Avenue and the 1 and 5 Foster Avenue building areas. South of these developed areas, the Upper Hilliards Creek flood plain and the FLA are mostly undeveloped, with a portion being used for a cemetery. The off-property area to the southwest of the FMP Area is zoned as Office/Residential; thus, it could potentially be developed for either commercial office or residential use, but based on the current use, the likely future use is as a cemetery and undeveloped land.

The EOP Area located east of U.S. Avenue is primarily residential, except for one commercial property which is the former location of a service station/tavern. The former building has been razed, and the property is currently vacant and undeveloped. Future use of this area is likely to remain residential.

Groundwater and Surface Water Use

Site groundwater, although classified by NJDEP as Class IIA Groundwater for Potable Water Supply, which is consistent with the federal groundwater classification, is not currently used as a drinking water source. Properties located in the vicinity of the Site are connected to the municipal water supply and it is not likely that groundwater will be used as a drinking water source in the foreseeable future.

SUMMARY OF SITE RISKS

As part of the OU3 RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land and groundwater uses. The baseline risk assessment typically includes a human health risk assessment (HHRA) and a screening level ecological risk assessment (SLERA). It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline HHRA for OU3 of the Site. As discussed below in more detail, a SLERA was not performed for OU3.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure (RME) scenario:

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

Hazard Identification

In this step, the contaminants of potential concern (COPCs) in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. Analytical information that was collected to determine the nature and extent of contamination was evaluated to determine the presence of contaminants exceeding concentrations of potential concern. Based on this information, the risk assessment focused on Site groundwater, and contaminants which may pose significant risk to human health.

The COPCs identified in OU3 groundwater include: 14 metals, cyanide, 4 pesticides, 11 SVOCs, 12 VOCs, and 6 TICs. Not all contaminants were retained as COPCs in every depth evaluated. A comprehensive list of COPCs can be found in the OU3 HHRA in the administrative record for the Site. Only the COCs, or those chemicals requiring remediation at the Site, are listed in Table 2.

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 and no institutional controls are in place 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 FMP Area is currently in use with a variety of uses, including commercial, residential, and undeveloped land. North of Foster Avenue is zoned as Office/Technical Park. This area is currently used as an office and industrial park, although many of the buildings are vacant, and the likely future use will be for commercial/industrial purposes.

South of Foster Avenue and west of U.S, Avenue, the land use is commercial through the developed portion of the 7 Foster Avenue and the 1 and 5 Foster Avenue building areas. South of these developed areas, the upper Hilliards Creek Flood Plain and the FLA are mostly undeveloped, with a portion being used for a cemetery. The off-property area to the southwest of the FMP Area is zoned as Office/Residential; thus, it could potentially be developed for either commercial office or residential use, but based on the current uses, the likely future uses are as a cemetery and undeveloped land.

The EOP Area located east US Avenue is primarily residential, except for one commercial property which is the former location of a service station/tavern. The former building has been razed, and the property is currently vacant and undeveloped. Future use of this area is likely to remain residential.

The HHRA evaluated potential risks to populations associated with both current and potential future land uses.

As discussed above, although the groundwater is classified for a potable water supply it is not currently used as a drinking water source. Properties located in the vicinity of the Site are connected to the municipal water supply, and it is not likely that groundwater will be used as a drinking water source in the foreseeable future.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for the groundwater. Due to subsurface groundwater conditions below the FMP Area, shallow, shallow/intermediate, and deep groundwater were screened and evaluated separately in the HHRA. COCs were determined for each depth zone by comparing detected concentrations to conservative screening criteria as described in the HHRA for OU3**.** A summary of the exposure pathways included in the HHRA can be found in Table 3. 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. A summary of the EPCs for the COCs in groundwater can be found in Table 1, while a comprehensive list of the EPCs for all COPCs can be found in the 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 was identified as an appropriate reference for toxicity values. This information is presented in Table 4 (noncancer toxicity data summary) and Table 5 (cancer toxicity data summary). Additional toxicity information for all COPCs is presented in the baseline HHRA.

Risk Characterization

This step summarized and combined outputs of the exposure and toxicity assessments to provide a quantitative assessment of OU3 risks. Risks and hazard were evaluated based on the potential risk of developing cancer and potential for noncancer health hazards under current/future exposure to groundwater beneath the FMP Area by a utility worker, construction worker, and a child and adult resident. Even though current exposure was quantitatively evaluated in the HHRA, it should be noted that no one is currently drinking contaminated Site groundwater beneath the FMP Area. However, consistent with the NCP, future potable use of groundwater was evaluated in the absence of any actions or controls to mitigate such releases under current and future groundwater uses.

Noncancer risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) 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).

The HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. The noncancer HI is a “threshold level”, set at an HI of less than 1, below which noncancer health effects are not expected to occur. An HI greater than 1 indicates that the potential exists for noncarcinogenic health effects to occur due to 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 6.

It can be seen in Table 6 that when considering risk from all COPCs, the HIs for noncancer effects exceeded EPA's threshold of 1 for the construction worker exposed to shallow groundwater (12), child resident exposed to shallow/intermediate groundwater (561), child resident exposed to deep groundwater (237), adult resident exposed to shallow/intermediate groundwater (878), and adult resident exposed to deep groundwater (395). Table 5 also shows total HI estimates per receptor based on exposure to the COCs only; although lower in comparison to the total hazard estimates from all COPCs, the conclusion that the noncancer threshold of 1 is exceeded remains unchanged. Noncarcinogenic risks may occur from the exposure routes evaluated in the risk assessment. The noncarcinogenic risks for both populations was attributable primarily to arsenic, cadmium, cobalt, cyanide, iron, manganese, thallium, vanadium, hexavalent chromium, 1,1-biphenyl, 2-methylnapthalene, benzo(a)pyrene, naphthalene, pentachlorophenol, 1,2-dichloroethane, benzene, ethylbenzene, trichloroethylene, o-xylene, and m & p-xylenes. The following TICs also exceeded noncancer risk thresholds: 1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and amylene hydrate. The compounds that contribute most to hazard, by percentage, and are widespread in OU3 groundwater, include pentachlorophenol in shallow groundwater; naphthalene and pentachlorophenol in shallow/intermediate groundwater; and benzene in deep groundwater. Additionally, arsenic, iron and manganese are present in groundwater as a result of the reducing conditions created by the LNAPL.

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, 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 ($1x10^{-6}$) 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 $1x10^{-4}$). An excess lifetime cancer risk of $1x10^{-4}$ 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 assessment. Again, as stated in the NCP, the acceptable risk range for site-related exposure is $1x10^{-6}$ to 10^{-4}.

The results of the HHRA presented in Table 7 indicate that cancer risks estimates for all receptors evaluated exceeded EPA's threshold range of $1x10^{-6}$ to $1x10^{-4}$ with risk estimates ranging from $3x10^{-4}$ to $8x10^{-2}$. The greatest contributor to groundwater risks varied by receptor, cancer endpoint, and groundwater depth, but those chemicals that caused the cancer risk to exceed 10^{-4} were: arsenic, hexavalent chromium, benzo(a)pyrene, naphthalene, pentachlorophenol, 1,2-dichlorothane, benzene, ethylbenzene, and vinyl chloride. The compounds that contribute most to cancer risk, by percentage and are widespread in OU3 groundwater, include arsenic and pentachlorophenol in shallow groundwater; naphthalene and pentachlorophenol in shallow/intermediate groundwater; and benzene in deep groundwater.

Risk from exposure to lead in groundwater was evaluated separately for the child resident using the Integrated Exposure and Uptake Biokinetic (IEUBK) model. Lead was evaluated using the IEUBK model for the child resident exposed to shallow/intermediate groundwater only, because lead was not retained as a COPC in deep groundwater. Results of the IEUBK model are shown in Table 8. Model results were compared to EPA's risk reduction goal, which is to limit the probability of having a Blood Lead level (BLL) greater than 5 µg/dL to 5% or less. In the baseline IEUBK run, the predicted geometric mean (GM) BLL for the child resident, with a default concentration of 4 µg/L in drinking water, is 2.9 µg/L, and the probability of exceeding 5 µg/dL was 12%. The predicted GM BLL for the child resident exposed to shallow/intermediate groundwater (with an EPC of 13 µg/L) was 3.6 µg/dL, and the probability of the BLL exceeding 5 µg/dL was 25%. As such, lead was retained as a COC in the shallow/intermediate groundwater zone.

Due to the presence of VOCs in groundwater (OU3) and soil at OU2, several investigations have been conducted to date to evaluate the potential for subsurface vapor intrusion (VI) into indoor air of overlying structures. As discussed in the HHRAs for OU2 and OU3, results from residential property sampling were evaluated and discussed separately from the commercial property sampling at properties in the FMP Area. Results of the VI sampling in all nearby residential structures showed sub-slab results below EPA' s Vapor Intrusion Screening Levels (VISLs) and the NJDEP Residential Soil Gas Screening Levels, indicating the potential for subsurface VI is unlikely. However, sampling conducted in the sub-slab and indoor air properties at the FMP Area showed exceedances of non-residential state and EPA VISLs in the sub-slab and indoor air sampling results. The OU2 and OU3 HHRAs identified benzene and ethylbenzene as the only analytes with exceedances in both sub-slab and indoor air and concluded that the potential for subsurface VI exists for commercial workers. Further, the OU2 and OU3 HHRAs concluded that if the commercial properties in the FMP Area were to be redeveloped into residential use, there could be potential risk to the future resident. There are currently no commercial operations at the FMP Area, and redevelopment into residential uses is unlikely.

In summary, direct contact exposure to groundwater by all potential human health receptors evaluated showed unacceptable risk and or hazard stemming from exposure to the COCs arsenic, iron, manganese, lead, benzene, pentachlorophenol, 2-methylnaphthalene, naphthalene, and VOC/SVOC TICs as detailed above.

Ecological Risk Assessment

An ecological risk assessment is generally completed to evaluate the potential for adverse ecological effects. The ecological assessment process begins with an evaluation of completed exposure pathways to determine which media, contaminants and ecological receptors to evaluate within the SLERA. As part of this process, it was identified that the groundwater does not discharge to the surface water, therefore there are no completed ecological pathways. Because of this, a SLERA was not conducted and EPA concluded that there were no unacceptable ecological risks associated with the groundwater as part of the OU3 investigation.

Uncertainties

The procedures and inputs used to assess risks in these evaluations, 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.*

A site-specific area of uncertainty in the HHRA for OU3 is that a total of 535 TICs were reported in groundwater samples; however, only 21 of them have published toxicity factors. Eight of these TICs were retained after the COPC screening process and the remaining TICs were not quantitatively evaluated in the HHRA due to a lack of published toxicity factors. If the unevaluated TICs contribute to risk, then the risks presented in the HHRA could be underestimated.

Additionally, analytical methods are not designed to accurately quantify TICs, especially at low levels, as they do not have detection limits established by the methods. For this reason, the EPCs for TICs are likely to be biased high and may overestimate risk.

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 OU3 HHRA report.

Basis for Taking Action

Actual or threatened releases of hazardous substances from OU3, if not addressed by implementing the response action selected in the ROD, may present an imminent and substantial endangerment to the public health, welfare, or the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific media-specific goals to protect human health and the environment; they specify the COCs, the exposure routes, receptors, and acceptable contaminant levels for each exposure route. These objectives are based on available information and standards such as ARARs, to-be-considered (TBC) advisories, criteria and guidance, and site-specific risk-based levels and background (i.e., reference area) concentrations.

The following RAOs have been established for OU3:

1. Restore groundwater to the most beneficial use as a source of drinking water by reducing Site-related contaminant levels to the more stringent of the state and federal MCLs or NJDEP GWQS.
2. Prevent potential current and future unacceptable risks to human receptors resulting from ingestion, inhalation or dermal contact with groundwater containing Site-related contaminants above levels of concern.
3. Prevent further migration of Site-related contaminants in groundwater above levels of concern.
4. Prevent potential vapor intrusion of Site-related VOCs and SVOCs in groundwater to indoor air at concentrations above levels of concern.

EPA expects that the OU2 remedy will primarily address the vertical migration of contamination from the shallow and intermediate aquifers. Horizontal migration of the deep benzene plume will be the focus of the OU3 remedy.

Remediation Goals

Achieving the RAOs relies on the remedial alternatives' ability to meet final remediation goals (also referred to as cleanup levels) derived from preliminary remediation goals (PRGs), which are generally chemical-specific goals for each medium and/or exposure route that are established to protect human health and the environment. They can be based on such factors as ARARs, risk, and from comparison to background levels of contaminants in the environment that occur naturally or are from other industrial sources. In the Proposed Plan, the PRGs identified for the COCs are based on achieving NJDEP GWQS. Due to the nature of the LNAPL at the Site (i.e., high concentrations of VOC and SVOC compounds without specific standards), the PRGs for the constituents of the LNAPL, which are primarily TICs, are based on NJDEP's IGGWQS for SOCs in groundwater. No occupied buildings currently exist in the FMP Area. Any VI data collected as part of sampling efforts related to future development would be compared to the applicable EPA and New Jersey VISLs and Indoor Air Remediation Standards. PRGs become final remediation goals (RGs) when EPA selects a remedy after taking into consideration all public comments. A complete list of ARARs can be found in Appendix II (Tables 09 to Table 12) and the final RGs for OU3 can be found in Appendix II (Tables 13a and 13b).

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA Section 121(b)(1) requires that a remedial action 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, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. §9621(d)(4).

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

This ROD evaluates in detail four remedial alternatives for addressing the groundwater contamination associated with the Site. The time to implement a remedial alternative reflects only the time required to construct or implement the remedy and does not include the time required to negotiate with any responsible parties, design the remedy, procure contracts for design and construction, or conduct operation and maintenance at the Site. Detailed information regarding the alternatives can be found in the FS Report.

Description of Common Elements of All Alternatives

With the exception of the No Action alternative (Alternative 1), all of the alternatives include the following common components:

1. Assumption that implementation of the OU2 remedy will be completed and will remove the source to the shallow, intermediate, and deep groundwater. As stated in the 2020 OU2 ROD, "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." Attenuation via natural processes following completion of the OU2 source control activities is expected to occur in the shallow and intermediate groundwater. Additionally, in accordance with the OU2 ROD, the OU2 remedy includes that engineering controls (ECs) and ICs will be established for any new structure built within the commercial property of the FMP Area.
2. Pre-Design Investigation (PDI) - The objective of a PDI would be to fill data gaps and obtain design parameters for the completion of the remedial design. A PDI could include groundwater screening, well installation and sampling, and hydraulic testing to further delineate the vertical and lateral extent of the treatment zones in the overburden aquifers. Models could be developed using the OU3 RI and PDI results to visualize contaminant distribution and evaluate the aquifer characteristics to assist in the remedial design.
3. Institutional Controls - ICs such as a groundwater Classification Exception Area (CEA) and Well Restriction Area (WRA), which provide notice of groundwater contamination exceeding standards and well drilling restrictions, would be implemented to eliminate the exposure pathways of contaminated groundwater to receptors. ICs would be implemented during and after the remedial action until the groundwater quality meets the NJDEP GWQS. EPA will finalize the CEA/WRA based on the results of the PDI and post-OU2 RA sampling.
4. Long-term Monitoring – A long-term monitoring (LTM) program would be established for shallow, intermediate, and deep groundwater to evaluate the concentration changes and ensure contamination is not migrating.

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. Pursuant to CERCLA Section 121(c), 42 U.S.C. §9621(c), a review of the RA will be conducted five years after the completion of the RA to ensure that the remedy continues to provide adequate protection to human health and the environment because this remedy will result in hazardous substances remaining on-site above health-based levels that allow for unlimited use and unrestricted exposure.

Description of Remedial Alternatives

Alternative 1 - No Action

Alternative 1, the “No Action” alternative, is required by the NCP to provide an environmental baseline against which impacts of the other remedial alternatives can be compared. No action would be initiated to remediate contaminated groundwater or otherwise mitigate the migration of contamination that poses unacceptable risks to human health and the environment. This alternative also does not include monitoring or institutional controls.

Capital Cost:	$0
Annual O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable
Estimated time to reach RAOs:	Not Applicable

Alternative 2 – Attenuation via Natural processes with ICs and LTM

Capital Cost:	$540,000
Total O&M Cost:	$773,000
Present-Worth Cost:	$1,310,000
Construction Time:	0 years
Estimated time to reach RAOs:	20 years

This alternative relies on natural processes, including physical, chemical, or biological processes, to reduce mass, toxicity, mobility, volume, or concentrations of contaminants in groundwater without human intervention. As described above, these processes include biodegradation, dispersion, dilution, sorption, volatilization, and precipitation.

This alternative would consist of the installation of new monitoring wells to supplement the existing monitoring well network. For cost estimating purposes, it is assumed that monitoring to evaluate contaminant levels in Site groundwater would be conducted for a period of 20 years. This is based on regression analyses documenting the linear decline of benzene from the later 1990s to 2018, as detailed in Attachment 1 of the FS, assuming OU2 source areas are addressed. Because benzene is the most widespread and prevalent groundwater contaminant and extends beyond the influence of the OU2 remedy, its attenuation is expected to be representative of other Site-related contaminants.

Alternative 3 – Focused In-Situ Treatment with Attenuation via Natural Process, ICs and LTM

Capital Cost:	$3,402,312
Total O&M Cost:	$841,183
Present-Worth Cost:	$4,220,000
Construction Time:	2 years
Estimated time to reach RAOs:	10 years

Under this alternative, the residual mass of VOCs, SVOCs, and associated TICs in the MW-30 area would be treated with in-situ treatment technologies. Three technologies were evaluated during the OU3 FS: in-situ chemical oxidation (ISCO), in-situ chemical reduction (ISCR) with bioremediation, and sequestration and enhanced bioremediation. All were found to be effective at reducing residual concentrations of COCs within the MW-30 secondary source area. The effectiveness of the in-situ treatment technology depends on the amendment/reagent type and dosage rates, delivery and distribution in the treatment area, and the ability of the amendments/reagents to degrade COCs. Based on the evaluation of the three in-situ treatment technologies, sequestration and enhanced bioremediation was the most promising given existing site conditions, and for its use of non-hazardous amendments that would effectively and quickly treat benzene.

A PDI would be required to fully understand the extent of the MW-30 secondary source area and subsurface heterogeneities. Additionally, bench-scale testing would be needed for the selection of dosage rates, and pilot testing would be required to optimize amendment/reagent delivery into the subsurface. If the PDI phase yielded evidence of less-than-optimal results using sequestration and enhanced bioremediation, testing ISCO and ISCR with bioremediation alternative would be evaluated.

During and following implementation of active source treatment technologies, monitoring would be used to evaluate source area treatment, its effectiveness and duration, and attenuation via natural processes, to ensure the RAOs are attained both inside and outside the treatment area. The integration of in-situ treatment and attenuation via natural processes would enhance the effectiveness of the overall cleanup efforts for OU3.

This alternative would require:

- Re-installation of additional groundwater monitoring wells removed during the OU2 RA.
- Installation of injection points and performance of injections in the area surrounding the secondary source at MW-30. The treatment area is estimated to be approximately 25,000 square feet, at depths ranging from elevation 45 ft to 65 ft above mean sea level (approximately 55 to 75 feet bgs). For cost estimating purposes, it was assumed 20 days of drilling would be needed for the placement of the amendment and 2 injection events would be needed.
- Installation of additional wells to supplement the existing monitoring well network.

As presented in Attachment 1 of the FS (and Figure 6), the decline in benzene concentrations in wells beyond the influence of the secondary source has been rapid. In some wells, the GWQS for benzene has been achieved in a time frame of approximately 10 years. Therefore, it is assumed that the LTM following the in-situ injections would be conducted for 10 years. Because benzene is the most widespread and prevalent groundwater contaminant and extends beyond the influence of the OU2 remedy, its attenuation is expected to be representative of other Site-related contaminants.

For cost estimating purposes, it is assumed that planning, reporting and PDI would take three years to complete, and construction and implementation of the source control measure (two injections) would take two years. Based on data presented in Attachment 1 of the FS, it is estimated that it would take approximately 10 years to reach RGs following the second injection.

Alternative 4 – Groundwater Extraction and Treatment, ICs and LTM

Capital Cost:	$12,236,936
Total O&M Cost:	$11,525,200
Present-Worth Cost:	$ 23,760,000
Construction Time:	2 years
Estimated time to reach RAOs:	13 years

This alternative, groundwater extraction and treatment, ICs, and LTM, would consists of extraction wells pumping contaminated deep groundwater to the surface for treatment. Extraction and treatment is a well-established technology with known design standards and performance criteria, and the extraction system design for this alternative would need to be supported using groundwater modeling and field-testing to determine extraction well positioning and flow rates, as well as bench and pilot-scale testing for water treatment before discharge or disposal of the treated water.

In addition to the modeling and bench and pilot testing, a PDI would be needed to support the number and location of wells, to determine soil properties, well design, capture zones from field pumping tests, groundwater/surface water interaction, and treatability testing to determine the appropriate methods and treatment efficiency.

For cost-estimating purposes, a conceptual groundwater extraction and treatment design would include:

- Construction of a groundwater extraction and treatment system, including obtaining access from landowners for extraction and monitoring well installation, installation of conveyance piping, and LTM of the extraction and treatment system. This could include:
    - 20 extraction wells, with up to 20-foot screens, installed at depths greater than 100 feet bgs.
    - Pumping rates for the wells are assumed to be 3 gallon per minute (gpm) across OU3, for total treatment system capacity of 60 gpm.
    - Centralized treatment plant would be constructed at 1 Foster Avenue and would include two lift stations and approximately 2,500 linear feet of trenching and conveyance piping.
    - Filtered groundwater would be treated using chemical oxidation, ion exchange, chemical reduction/precipitation, or a combination thereof. A filter press would reduce liquids and produce a solid for off-site disposal. Treated groundwater would be transferred into an air stripper, granular activated carbon (GAC), and/or membrane filtration system for VOC and SVOC treatment as a polishing step prior to a metered surface water discharge.
    - O&M would consist of monitoring influent/effluent flows and concentrations, air discharges, and groundwater conditions in the LTM network.

Figure 7 provides the conceptual layout of the extraction well system as developed for Alternative 4. Given the low hydraulic conductivity in the MW-30 area, the extraction and treatment system would need to be designed to cover a larger area to effectively treat the dissolved phase contaminants from the secondary source area.

The planning, reporting, and pre-design investigation would take five years to complete. Given the complexity of the system to build, it is estimated that that it would take two years to construct. Based on data presented in Attachment 1 of the FS, it is estimated that it would take approximately 13 years to reach RGs.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

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

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

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable (legally enforceable), or relevant and appropriate (requirements that pertain to situations sufficiently similar to those encountered at a Superfund site such that their use is well suited to the site) requirements of federal and state environmental statutes and requirements or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance may be identified by EPA as "to be considered", or "TBCs". While TBCs are not required to be adhered to under the NCP, they may be useful in determining what is protective or how to carry out certain actions or requirements.

The following "primary balancing" criteria are used to make comparisons and to identify the major trade-offs between alternatives:

3. *Long-term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude, effectiveness and reliability of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume via treatment* refers to a remedial technology's expected ability to reduce the toxicity, mobility, or volume of hazardous substances, pollutants or contaminants at the site through treatment.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed to workers, the community and the environment during the construction and implementation periods until cleanup goals are achieved.

6. *Implementability* refers to the technical and administrative feasibility of a remedy, from design through construction and operation, including the availability of materials and services needed, administrative feasibility, and coordination with other governmental entities.

7. *Cost* includes estimated capital and operation and maintenance costs, and the net present-worth costs calculated using a 7% discount rate [per current guidance].

The following "modifying" criteria are considered fully after the formal public comment period on the Proposed Plan is complete:

8. *State acceptance* indicates whether, based on its review of the RI/FS and the Proposed Plan, the State supports, opposes, and/or has identified any reservations with the preferred alternative.

9. *Community acceptance* refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

A comparative analysis of the remedial alternatives based upon the evaluation criteria noted above follows.

· Overall Protection of Human Health and the Environment

Alternative 1, No Action, would not be protective of human health and the environment since it does not include measures to prevent exposure to groundwater containing COCs at concentrations greater than the RGs. Further, there would be no LTM of deep groundwater to document when the RGs are achieved.

Alternatives 2, 3, and 4 would be protective of public health and the environment under current conditions, assuming that the OU2 soil remedy has been implemented. Attenuation via Natural Processes with ICs and LTM (Alternative 2) would be protective because the CEA/WRA would prevent use of the groundwater containing COCs at concentrations greater than the RGs, and LTM would be performed to document when the RGs are achieved. However, without treatment of the source at MW-30, achieving the RGs would require an extended time frame.

The two remaining alternatives, Focused In-Situ Treatment with Attenuation via Natural Processes and ICs (Alternative 3), and Groundwater Extraction and Treatment (Alternative 4), would be protective of public health and the environment and would include the same IC as Alternative 2, a CEA/WRA to prevent use of groundwater until the RGs are achieved, which would occur in a less extended time frame. They would also include LTM to document the progress towards and achievement of the RGs.

· <u>Compliance with ARARs</u>

Although the RGs may eventually be achieved under Alternative 1 (No Action), because deep groundwater would not be monitored, EPA could not assess progress towards RGs. Therefore, this alternative would not comply with the chemical-specific ARARs, consisting of the NJDEP GWQS or the state and federal MCLs. Because no action would be taken, no action-specific or location-specific ARARs would apply. Because Alternative 1 does not meet the threshold criterion of compliance with ARARs, it is not further evaluated.

Attenuation via Natural Processes with ICs and LTM (Alternative 2) would achieve the RGs and eventually comply with chemical-specific ARARs and meet the RAOs. The ICs would aid in preventing use of the groundwater containing COCs at concentrations greater than the GWQS. Attenuation via Natural Processes with ICs and LTM is expected to require 20 years to achieve the GWQS for benzene in deep groundwater.

In-Situ Treatment with Attenuation via Natural Processes, ICs and LTM (Alternative 3) would comply with chemical-specific ARARs (NJDEP GWQS or state and federal MCLs) and action-specific ARARs and meet RAOs. Alternative 3 would include all of the components of Alternative 2 but would add a focused in-situ treatment for the secondary source of benzene in deep groundwater (area around MW-30). This treatment would minimize the migration of COCs. The time to achieve the RGs would be reduced compared to Alternative 2 (10 years compared to 20 years). LTM of deep groundwater would be performed to track progress of the remedy as required by NJDEP regulation.

Alternative 4 would meet chemical-specific ARARs (NJDEP GWQS or state and federal MCLs). Following the OU2 source area actions, groundwater extraction and treatment would achieve the NJDEP GWQS for benzene in deep groundwater in a time frame similar to that for attenuation alone, approximately 13 years. ICs in the form of a CEA/WRA would be established to aid in preventing the use of groundwater until the RGs are achieved, and LTM would be performed to document progress toward achieving the standards.

· Long-Term Effectiveness and Permanence

Alternative 2 would provide long-term effectiveness and permanence, though in a longer time frame than Alternatives 3 and 4. The concentrations of groundwater COCs in shallow and intermediate groundwater would decline to the GWQS following completion of the OU2 source control actions and benzene concentrations in deep groundwater would decline to the GWQS in approximately 20 years. Once the GWQS for groundwater COCs were achieved, there would be no potential for exposure.

For Alternative 3, EPA evaluated three in-situ treatment alternatives, all of which would provide long-term effectiveness and permanence. Each would reduce the concentrations in MW-30, providing for attenuation via natural processes to be effective for dissolved-phase benzene in deep groundwater. Based on the evaluation of the three in-situ treatment technologies, sequestration and enhanced bioremediation was the most promising given existing site conditions, and for its use of non-hazardous amendments that would effectively and quickly treat benzene. In combination with the OU2 remedy, all sources will be removed, preventing additional contributions to the groundwater. Of the three treatment technologies, ISCO would require the most controls and injection events to be effective given the site conditions. ISCR would maintain the existing anaerobic/reducing conditions that have been successful to date from a natural source zone depletion (natural attenuation) perspective and add amendments to facilitate mass removal. Sequestration would adsorb and concentrate benzene within PAC or CAC and allow biological activity to increase within the treatment zone.

Alternative 4, Groundwater Extraction and Treatment, would also provide long-term effectiveness and permanence, although the time needed to achieve the GWQS would be slightly longer than Alternative 3. However, if treatment was terminated prior to the source of benzene being depleted, rebound might occur.

· Reduction in Toxicity, Mobility, or Volume via Treatment

Under Alternative 2, natural processes would result in reduction of the toxicity, mobility, and volume of COCs through dispersion, dissolution, precipitation, sorption, and biodegradation in groundwater. However, these natural attenuation processes associated with Alternative 2 are not treatment, and it is projected that 20 years or longer would be required for groundwater concentrations to achieve the RGs in the MW-30 area.

The in-situ treatment technologies associated with Alternative 3 would reduce toxicity, mobility, and volume of COCs through treatment. One would oxidize the benzene in the MW-30 area. The other two technologies would enhance anaerobic biodegradation of the benzene.

Alternative 4, Groundwater Extraction and Treatment, would reduce the mobility and volume over an extended period of time. The reduction in toxicity in groundwater would occur; however, the COCs would not be destroyed or degraded, only transferred/aerated, and concentrated on filter media, which would not reduce the toxicity to the environment as the media would require disposal or incineration.

· Short-term Effectiveness

Alternative 2 would have the least amount of impact on the public and the environment during implementation.

The In-Situ Treatment and Attenuation via Natural Processes alternative (Alternative 3) would have moderate impacts on the environment and public during implementation. Impacts could be from pressure build-up, which could lead to chemical releases. Additionally, daylighting or breakout of the injected amendment could also be released into sensitive areas (catch basins, drainage culverts, etc.) outside the treatment area. The balance of lower injection pressures and monitoring of the area surrounding the injection is an effective way to mitigate these issues. Additionally, transportation and storage of the amendments at the FMP Area during treatment activities could have short term impacts on the surrounding area. Spills and other incidents could have an effect on workers or the environment. If phased injection events were necessary as part of Alternative 3, this would cause added impacts on the community. Consideration of both worker and passers-by safety would occur during remedy implementation and be addressed in the health and safety plan.

Groundwater Extraction and Treatment (Alternative 4) would have the greatest impacts on the community, construction workers, and the environment. Construction of the extraction and treatment system would consist of well installation, installation of conveyance piping and trenching, pump station construction, and installation of access roads for well and piping installation. Utilities, including electricity and water, would need to be provided to the system. Water treatment chemicals would be transported to the Site, and sludge would be transported away from the Site for off-Site disposal. Noise and nuisance dust would also be a concern for the community during the time it takes to construct the extraction and treatment system. Discharges from the treatment system may have difficulty achieving discharge limits for metals that are present in groundwater. Operation of the treatment system would also have adverse impacts. There is the potential for spills of water treatment chemicals and breaks in conveyance lines.

· Implementability

Because EPA expects that the OU3 groundwater RA would be implemented at the same time and in the same area that the OU2 LNAPL treatment remedy is being performed, coordination between these activities would be required.

Alternative 2 (ICs with LTM) would be simple to implement, as it includes no construction activities. There is a moderate difficulty in establishing the CEA/WRA, but that is a well understood administrative process in New Jersey.

The in-situ treatment, Alternative 3, has an overall moderate degree of difficulty to implement. However, in-situ treatment technologies are known to be available and successful at achieving project goals. Engineering/construction services, materials, and supplies are readily available. Regulatory agency knowledge of these technologies has grown, and this technology is widely accepted such that agency approvals are generally routine once the appropriate documentation is provided.

Once the PDI and bench-scale study has identified the best in-situ treatment technology, the remedial design would be completed. Monitoring of site conditions after injection events would be necessary to evaluate potential contaminant mobilization and/or migration. Phased injection events may be necessary.

The Groundwater Extraction and Treatment alternative, Alternative 4, would be the most difficult to implement due to the areal extent of COCs requiring capture, the need for multiple road crossings to bring infrastructure to a centralized spot, the low-flow extraction rates necessary to prevent dewatering of extraction wells, and the technologies needed to treat COCs. The presence of high concentrations of metals has the potential to foul all components of the treatment system, including the pumps, conveyance lines and treatment system components. Long-term operation of the system would require ongoing maintenance and repairs. Although the extraction and treatment technology has been used over decades to remediate groundwater at numerous contaminated sites, under certain conditions, it has been found that, as a result of factors such as back diffusion, once a system has been turned off, achieving goals may take longer than originally predicted and therefore, be less effective at targeting areas of matrix diffusion.

· <u>Cost</u>

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

The estimated capital, operation and maintenance costs, and present worth costs assuming a 7% discount rate over a period of 30 years are discussed in detail in the FS Report. The cost estimates are based on the best available information. Detailed estimates for each of the alternatives can be found in Appendix II Table 14 to Table 17.

Alternative	Capital Cost	Total O&M Cost	Total Present-Worth Cost
1	$0	$0	$0
2	$540,000	$773,000	$1,310,000
3	$3,402,313	$841,183	$4,220,000
4	$12,236,936	$11,525,200	$23,760,000

· <u>State Acceptance</u>

The State of New Jersey concurs with the selected alternative for Site groundwater.

· <u>Community Acceptance</u>

EPA solicited input from the community on the remedial alternatives proposed for OU3, Site groundwater. EPA received written and oral comments from residents as well as elected officials. Comments from the community members generally indicated support of groundwater Alternative 3. Comments received during the public comment period and EPA responses are in the attached Responsiveness Summary, Appendix V.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed by a site whenever 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 reliably contained or would present a significant risk to human health or the environment in the event that exposure should 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 that the remedy employs treatment as a principal element. There are no principal threat wastes associated with OU3.

SELECTED REMEDY

Based upon considerations of the results of the RI/FS, the requirements of CERCLA, the detailed analyses of the response measures and public comments, EPA has determined that Alternative 3 – Focused In-Situ Treatment with Attenuation via Natural Processes, ICs and LTM is the appropriate remedy for OU3, because it best satisfies the requirements of CERCLA Section 121, 42 U.S.C. § 9621, and the NCP's nine evaluation criteria for remedial alternatives, 40 C.F.R. § 300.430(e)(9).

Description of the Selected Remedy

The major components of the selected remedy are as follows:

- Assumption of implementation of the OU2 remedy;
- Implementation of a PDI and treatability study;
- Placement of ICs;
- Installation of injection points and performance of injections in the area surrounding the secondary source at MW-30.
- Installation of additional monitoring wells to 75 feet below the ground surface to supplement the existing monitoring well network for LTM purposes;
- Attenuation processes, including biodegradation, dilution, dispersion, sorption, volatilization, and precipitation, as the primary mechanism for contaminant reduction for areas where active groundwater remediation is not implemented.
- LTM of shallow, intermediate, and deep groundwater;
- Five-year reviews.

The total estimated present-worth cost for the selected remedy is $4,220,000, based on the assumption that sequestration with enhanced bioremediation is the most effective technology given existing site conditions, and therefore would be the technology used for in-situ treatment. A PDI will be required to fully understand the extent of the MW- 30 source area and subsurface heterogeneities. Additionally, bench-scale testing will be needed for the selection of dosage rates, and pilot testing will be required to optimize amendment/reagent delivery into the subsurface. If during the PDI phase this study yields less than optimal results, EPA may evaluate other technologies, i.e., ISCO and ISCR with bioremediation. It is EPA's expectation that the OU2 source remedy will have a significant and beneficial impact on the OU3 groundwater. As such, the selected remedy for OU3, along with implementation of the remedy for OU2, constitute a comprehensive remedy for groundwater and will ensure that the RAOs are attained.

Implementation of a long-term groundwater monitoring program for both the shallow/intermediate and deep groundwater will track and monitor changes in the groundwater contamination to ensure the RAOs are attained both inside and outside the treatment area. The sampling program will also monitor groundwater quality including geochemical conditions and degradation byproducts generated by the treatment processes. The results from the long-term monitoring program will be used to evaluate the migration and changes in contaminants over time outside the treatment area.

Summary of the Rationale for the Selected Remedy

Site-related COCs are present in shallow, intermediate, and deep groundwater. The source areas are being addressed through a combination of the OU2 remedial action source control activities and LTM under the OU2 ROD. These source control activities include excavation of soils to expedite attainment of groundwater clean-up levels, and the removal and treatment of LNAPL. Attenuation via natural processes following completion of the OU2 source control activities is expected to occur in the shallow and intermediate groundwater. Once source area removal for OU2 has been completed, an IC in the form of a CEA/WRA will be established.

Three in-situ treatment technologies have been evaluated to attain RGs in deep groundwater: 1) in-situ chemical oxidation (ISCO), 2) chemical reduction/biological treatment, and 3) sequestration and biological degradation. Each of these three approaches has advantages and potential shortcomings. The selected remedy includes a PDI and treatability studies, which will be used to confirm the use of sequestration and enhanced bioremediation as the optimal in-situ technology.

The in-situ treatment technology will be capable of reducing dissolved-phase benzene concentrations and treating any residual source material that may be present. Once EPA determines that the in-situ treatment technology is no longer necessary based on post-injection monitoring, it will be followed by attenuation via natural processes for benzene in deep groundwater and accompanied by an IC in the form of a CEA/WRA with LTM, until such time as RGs are achieved. Because benzene is the most widespread and prevalent groundwater contaminant and extends beyond the influence of the OU2 remedy, its attenuation is expected to be representative of other Site-related contaminants.

Alternative 3 will be protective of human health and the environment and will comply with ARARs. The time period for the RG for benzene to be achieved is less than the time period under the other alternatives considered, and the CEA/WRA with LTM will prevent groundwater use until such time as drinking water standards are achieved. The focused treatment will meet the RAO of minimizing migration of contamination.

Alternative 3 will provide permanence and long-term protectiveness. With the sources removed or treated as part of the OU2 and OU3 remedies, there will be no ongoing contribution to groundwater contamination, so once the cleanup goals are achieved, there is little risk of groundwater concentrations increasing in the future.

The in-situ treatment technology will also provide a reduction of toxicity, mobility, and volume through treatment. The treatment in the secondary source area will reduce both the benzene and VOC/SVOC TIC concentrations in the treatment area, as well as downgradient benzene concentrations. Lower benzene concentrations equate to a smaller volume of benzene, and the lower concentrations will limit the transport of benzene at concentrations greater than the RGs.

The in-situ technologies have a moderate degree of short-term impacts. These risks are primarily associated with transportation of the treatment chemicals. However, any risks to community members, workers and environment from the in-situ technologies will be addressed by having a robust health and safety plan. Finally, the in-situ technologies are implementable. The equipment and reagents are readily available.

Based upon the information currently available, EPA, in conjunction with NJDEP, believes that the selected remedy meets the threshold criteria and provides the best balance of tradeoffs compared to the other alternatives with respect to the balancing criteria. EPA expects the remedy to satisfy the following statutory requirements of Section 121(b) of CERCLA: 1) it is protective of human health and the environment; 2) it complies with ARARs; 3) it is cost effective; 4) it utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) it partially satisfies the preference for treatment as a principal element. The selected remedy will be readily implementable using technologies proven to be effective at this Site. The short-term effects of the remedy include potential impacts to workers and the nearby community, but these will be mitigated using the appropriate health and safety measures. With respect to the two modifying criteria, state acceptance and community acceptance, NJDEP concurs with the selected remedy, and comments received from community members indicated support of the selected remedy.

Expected Outcomes of the Selected Remedy

The selected remedy will reduce the back diffusion of VOC mass from the deep clay source area which continues to serve as a source of deep groundwater contamination. Therefore, EPA expects that implementation of this remedy will facilitate achievement of the OU3 groundwater RAOs and restore the shallow, intermediate, and deep groundwater quality to the NJDEP GWQS, within a reasonable time frame.

STATUTORY DETERMINATIONS

As previously noted, CERCLA Section 121(b)(1), 42 U.S.C. § 9621(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 Section 121(d), 42 U.S.C. § 9621(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 Section 121(d)(4), 42 U.S.C. § 9621(d)(4).

For the reasons discussed below, EPA has determined that the selected remedy meets the requirements of CERCLA Section 121, 42 U.S.C. §9621.

Protection of Human Health and the Environment

The selected groundwater remedy will be protective of human health and the environment by utilizing Focused In-Situ Treatment, Attenuation via Natural Processes, ICs and LTM to treat the groundwater. ICs in the form of CEA/WRA will be established to prevent use of contaminated groundwater until the NJDEP GWQS are achieved. LTM will be used to document the progress towards and achievement of the RGs.

Although the selected remedy could have moderate unacceptable short-term risks on the environment and public during implementation, these impacts will be mitigated by the implementation of a health and safety plan, and therefore it will be protective of human health and the environment.

Compliance with ARARs

EPA expects that the selected remedy for groundwater will comply with federal and New Jersey ARARs. A complete list of ARARs and TBCs can be found in Appendix II-B, Tables 09 – 12.

Location-specific ARARs (Appendix II-B, Table 9) apply to work being conducted in areas regulated by NJDEP Division of Land Resource Preservation, such of flood hazards and wetlands. 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 10) for the Site groundwater include the federal Resource Conservation and Recovery Act.

Chemical-specific ARARs (Appendix II-B, Table 11) for site-related COCs in groundwater include the New Jersey Ground Water Quality Standards, and Federal Safe Drinking Water Act Maximum Contaminant Levels.

Cost-Effectiveness

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

Each of the alternatives underwent a detailed cost analysis. In that analysis, capital and operation and maintenance costs were estimated and used to develop present-worth costs. In the present-worth cost analysis, operation and maintenance costs were calculated for the estimated life of each alternative. The total estimated present worth cost for implementing the selected remedy is $4,220,000.

Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost effective (40 C.F.R. § 300.430(f)(1)(ii)(D)) in that it represents reasonable value for the money to be spent. A 15-year timeframe was used for planning and estimating purposes to remediate groundwater, although remediation timeframes could exceed this estimate.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable. The selected remedy provides the best balance of trade-offs among the alternatives with respect to the balancing criteria set forth in Section 300.430(f)(1)(i)(B) of the NCP and represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at OU3 of the Site. The selected remedy satisfies the criteria for long-term effectiveness and permanence by effectively removing the sources to the shallow and intermediate groundwater and effectively reducing the mass of the deep groundwater source area, thereby reducing the toxicity, mobility, and volume of contamination.

Preference for Treatment as a Principal Element

CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances as a principal element. Focused in-situ treatment for OU3 partially satisfies the statutory preference for treatment as a principal element of the remedy in that it includes treatment of the source of contamination in the deep aquifer. Additionally, the bioremediation of LNAPL that is part of the OU2 remedy will treat the shallow sources of contaminated groundwater at the Site. Together, these remedies, along with attenuation via natural processes, will address the remaining contaminated groundwater.

Five-Year Review Requirements

Because the selected remedy will not result in hazardous substances remaining on-site above levels that allow for unlimited use or unrestricted exposure, but will take longer than five year to attain RAOs, a review of the remedial action pursuant to CERCLA Section 121(c) will be conducted five years after the completion of the remedial action to ensure that the remedy continues to provide adequate protection to human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU3 of the Site was released for public comment on July 27, 2025. The comment period closed on August 26, 2025. The Proposed Plan identified Alternative 3 as the preferred alternative to address groundwater contamination. 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.

However, errors were noted on page 20 and page 24 of the Proposed Plan. On page 20, the construction time for Alternative 2 was shown as 2 years in the Proposed Plan, but no construction would be needed for this alternative. In the text above, the construction time is correctly shown as 0 years. Additionally, on page 20, the estimated time to reach RAOs for Alternative 3 was shown incorrectly as 12 years. This time frame included the time required to construct and implement the alternative. The estimated time frame to reach RAOs has been corrected in the text above to reflect 10 years. Time frames throughout the document have been updated accordingly. Since the relative time to reach RAOs remains the same as what was presented in the Proposed Plan, EPA's comparison of alternatives is unchanged by this correction.

Also, while the Proposed Plan Section "Basis for the Remedy Preference" discussed the long-term effectiveness and permanence of Alternative 3, the comparative analysis of the alternatives omitted a comparison of Alternatives 2, 3, and 4 in terms of this NCP balancing criterion. A full discussion of the long-term effectiveness and permanence criterion, showing that Alternative 3 is somewhat superior to Alternatives 2 and 4, is in the ROD text above, and was also available to the public in the FS Report, as indicated in the Proposed Plan.

APPENDIX I

FIGURES

Figure 1: Site Location Map

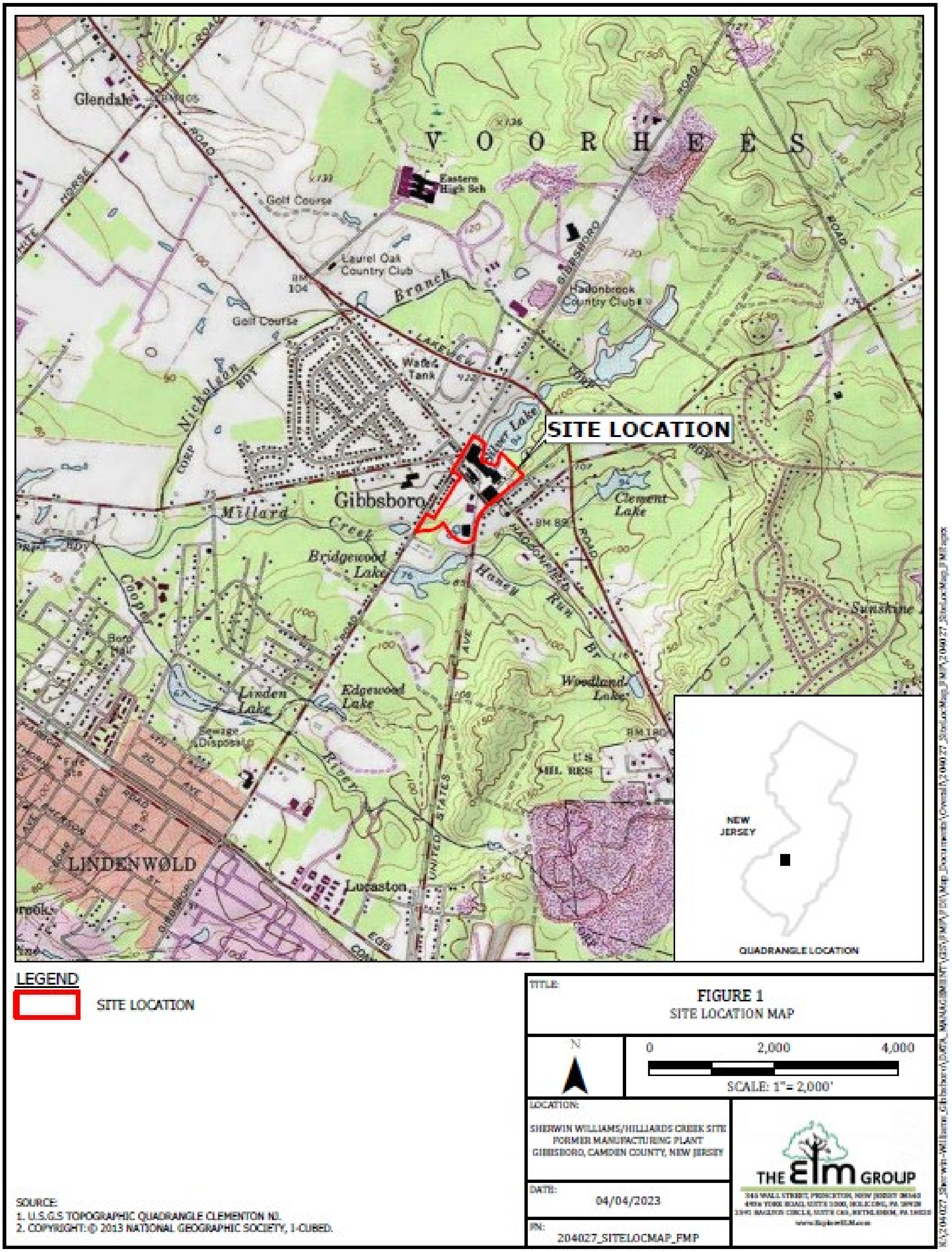


Figure 2: Sub-Area Location Map

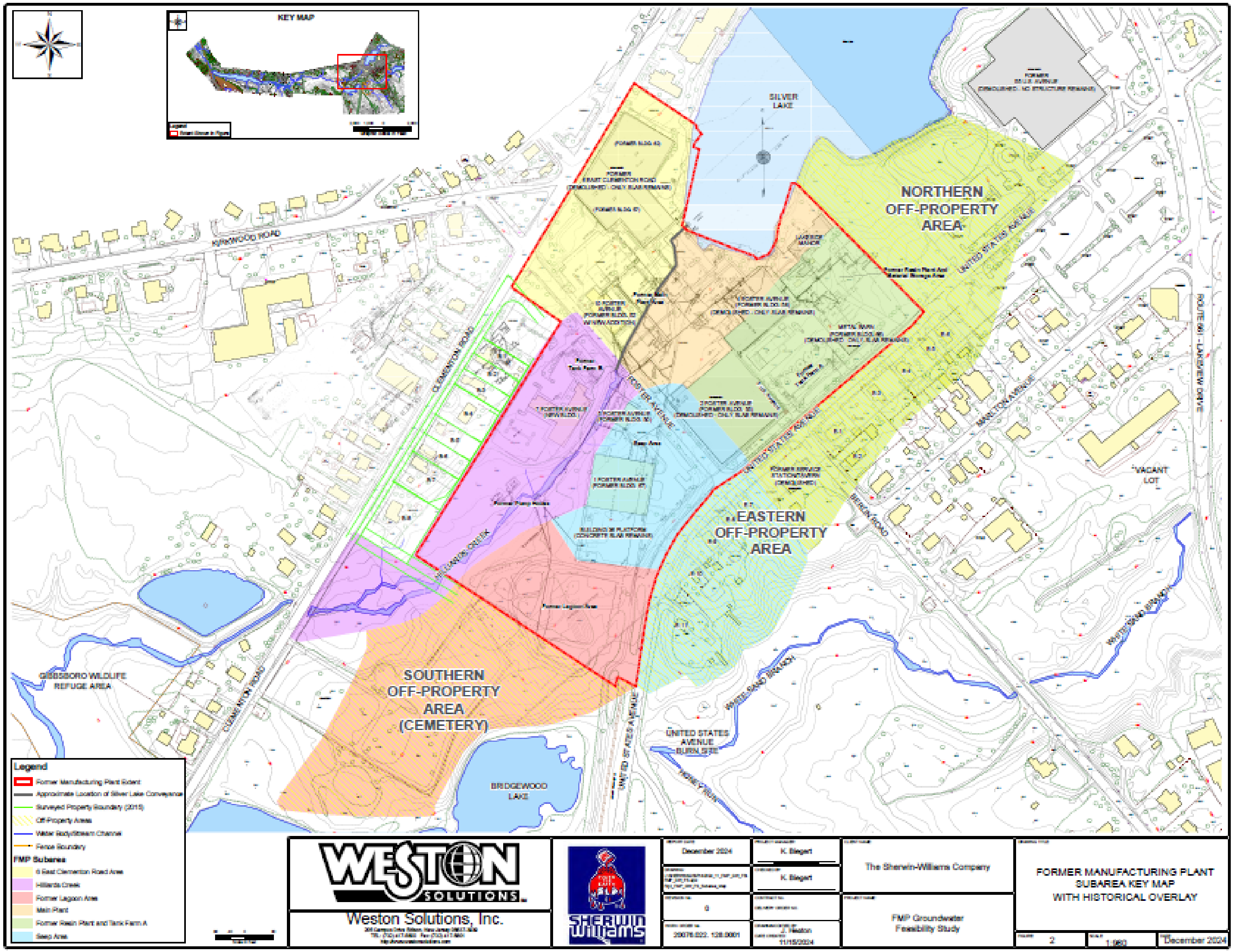


Figure 3: Groundwater Zones

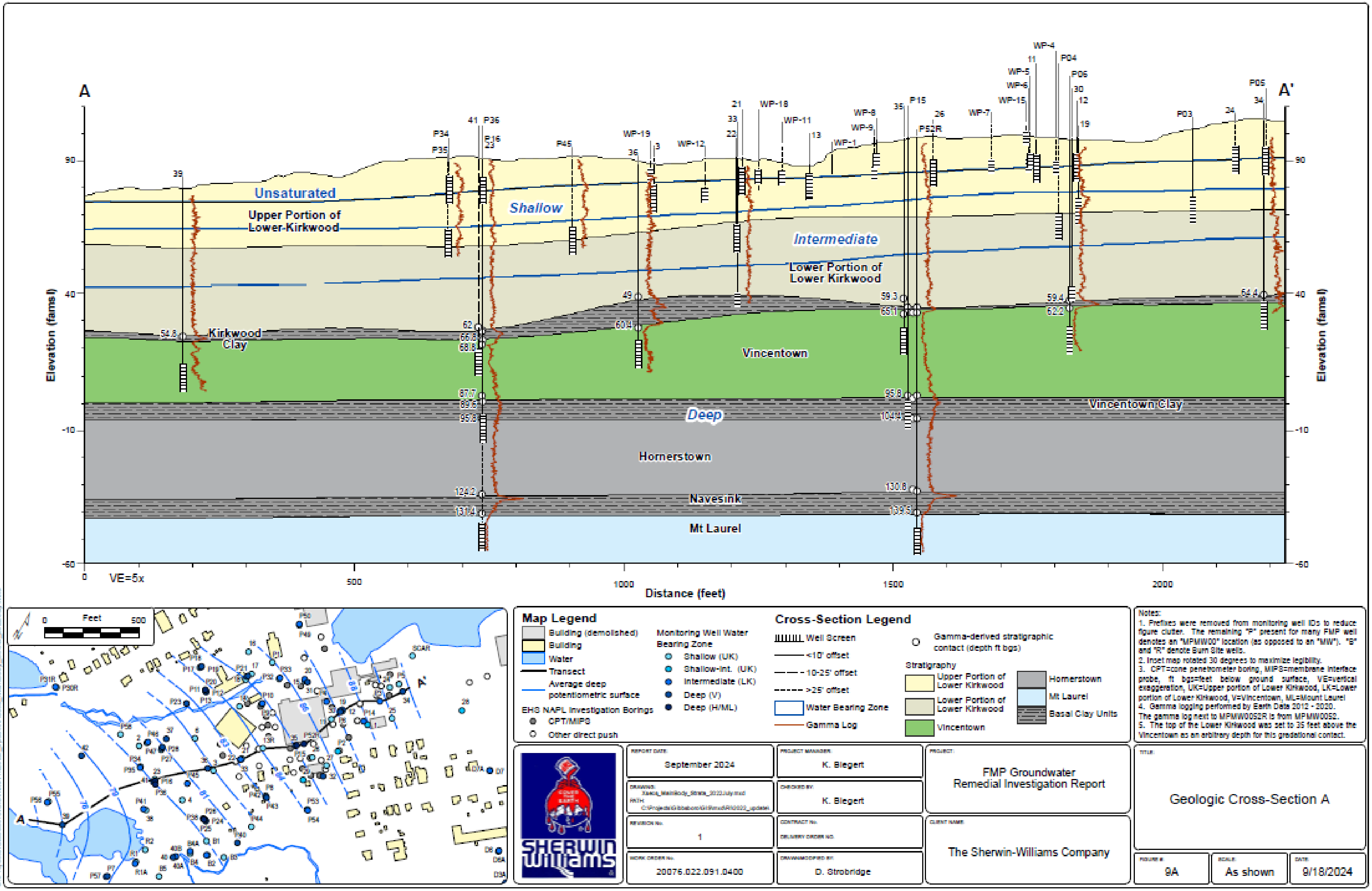


Figure 4: Monitoring well and Stream Gauge Location Map

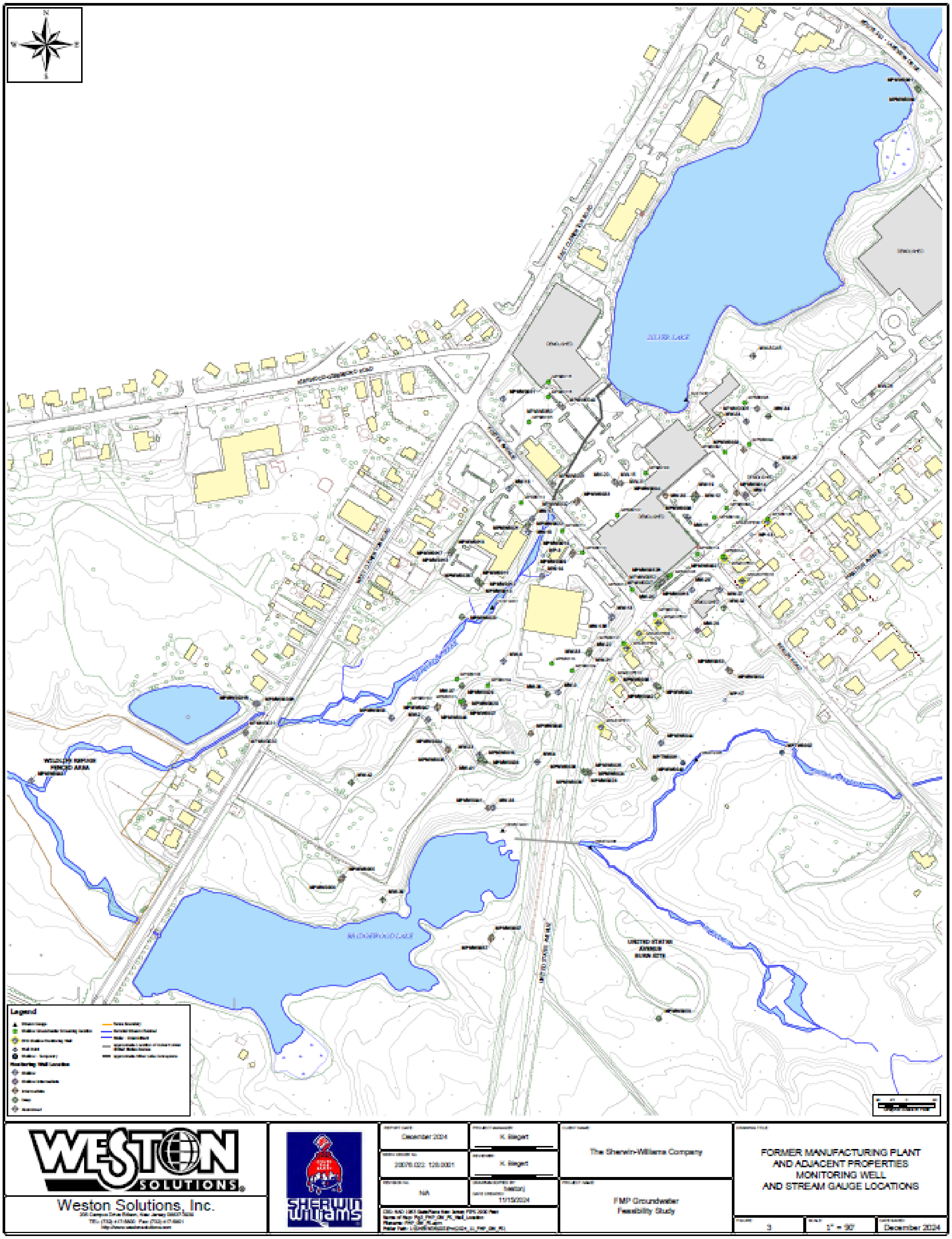


Figure 5: Extent of LNAPL

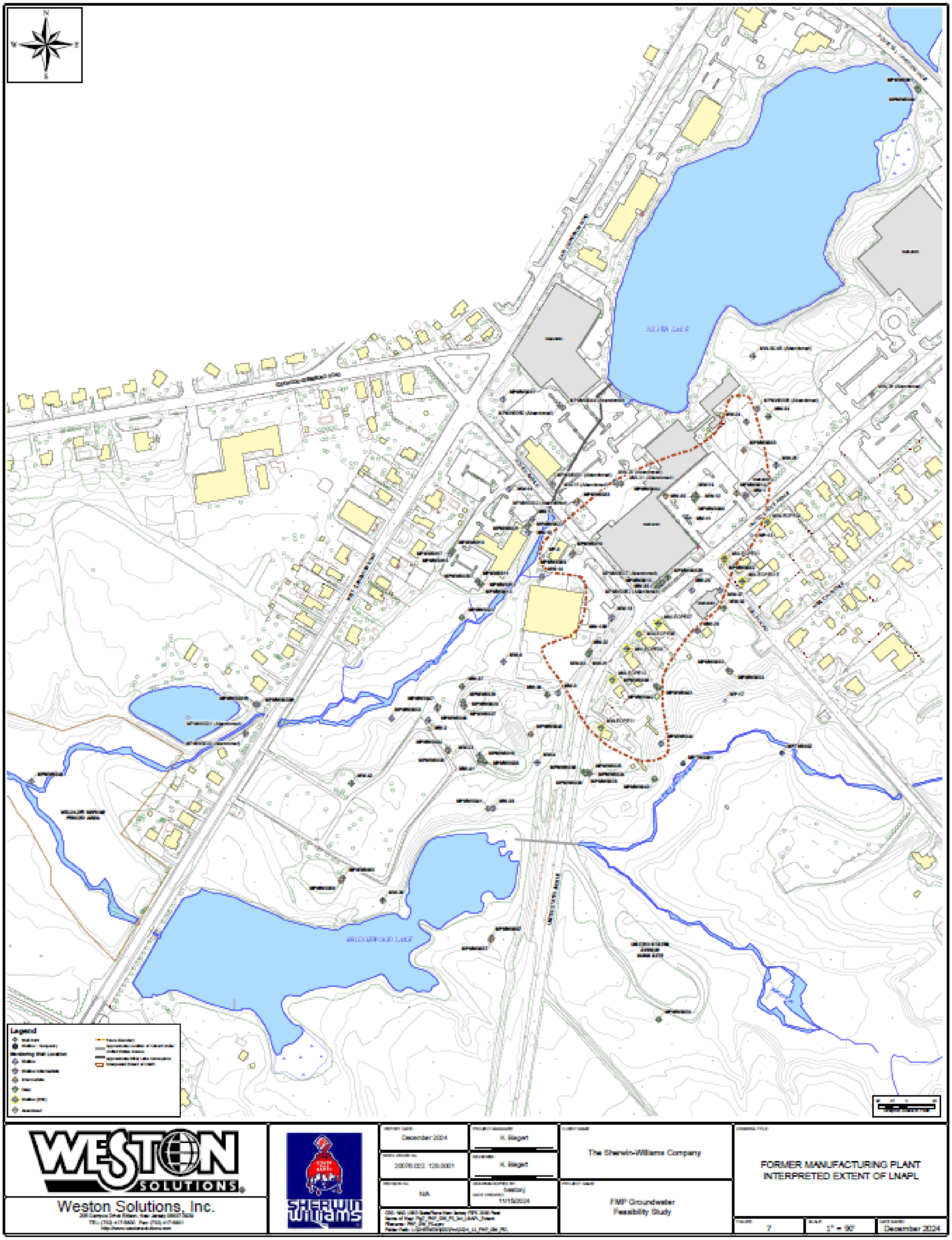
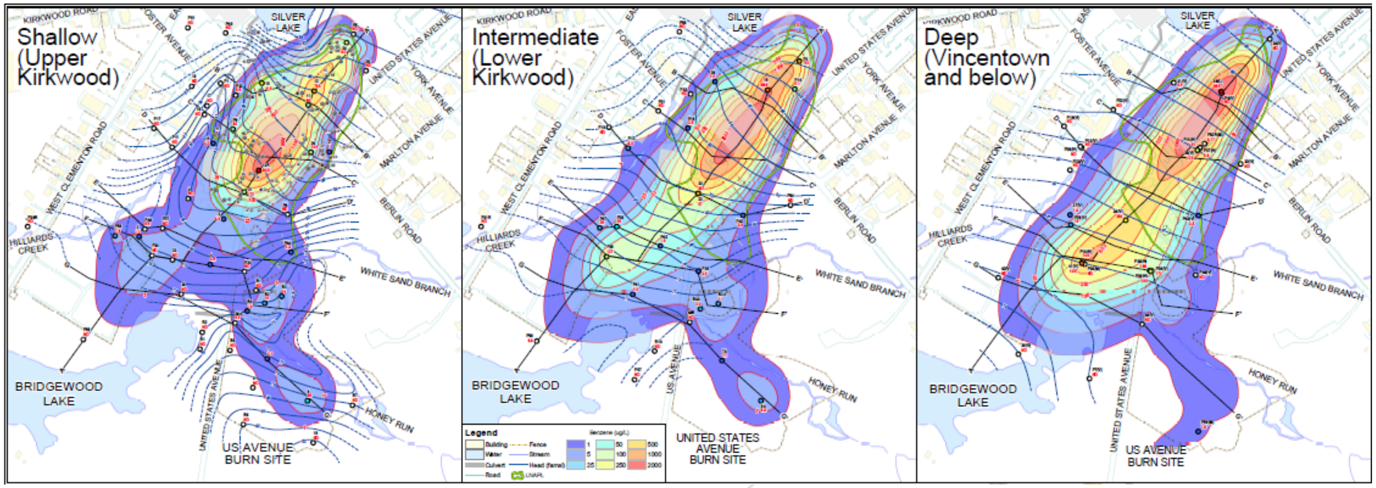


Figure 6: Extent of Benzene Plume 1990 vs. 2020

Year: 1990



Year 2020:

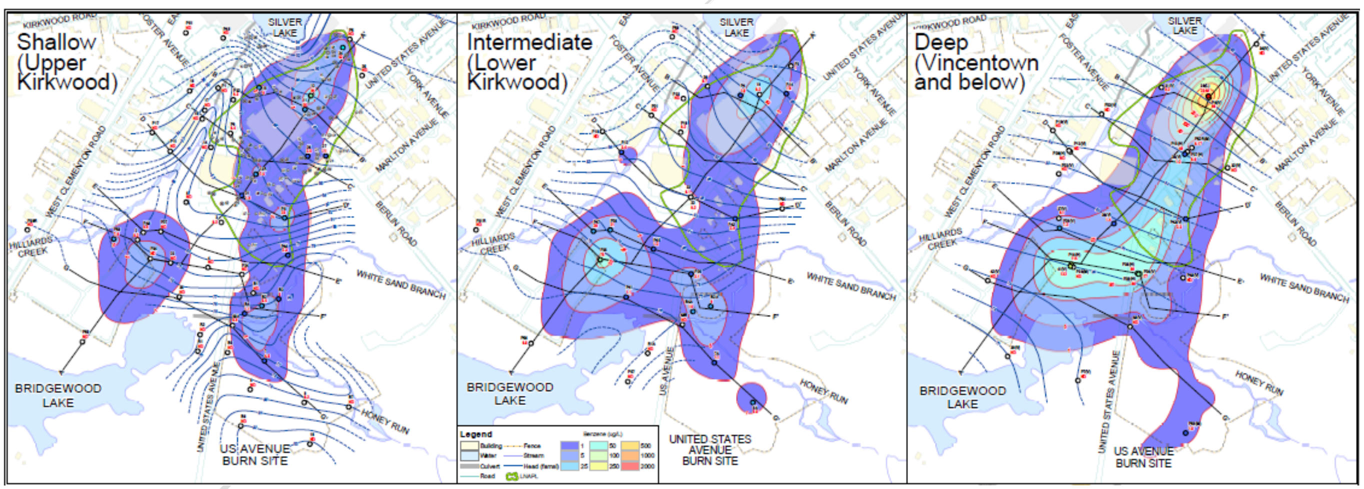
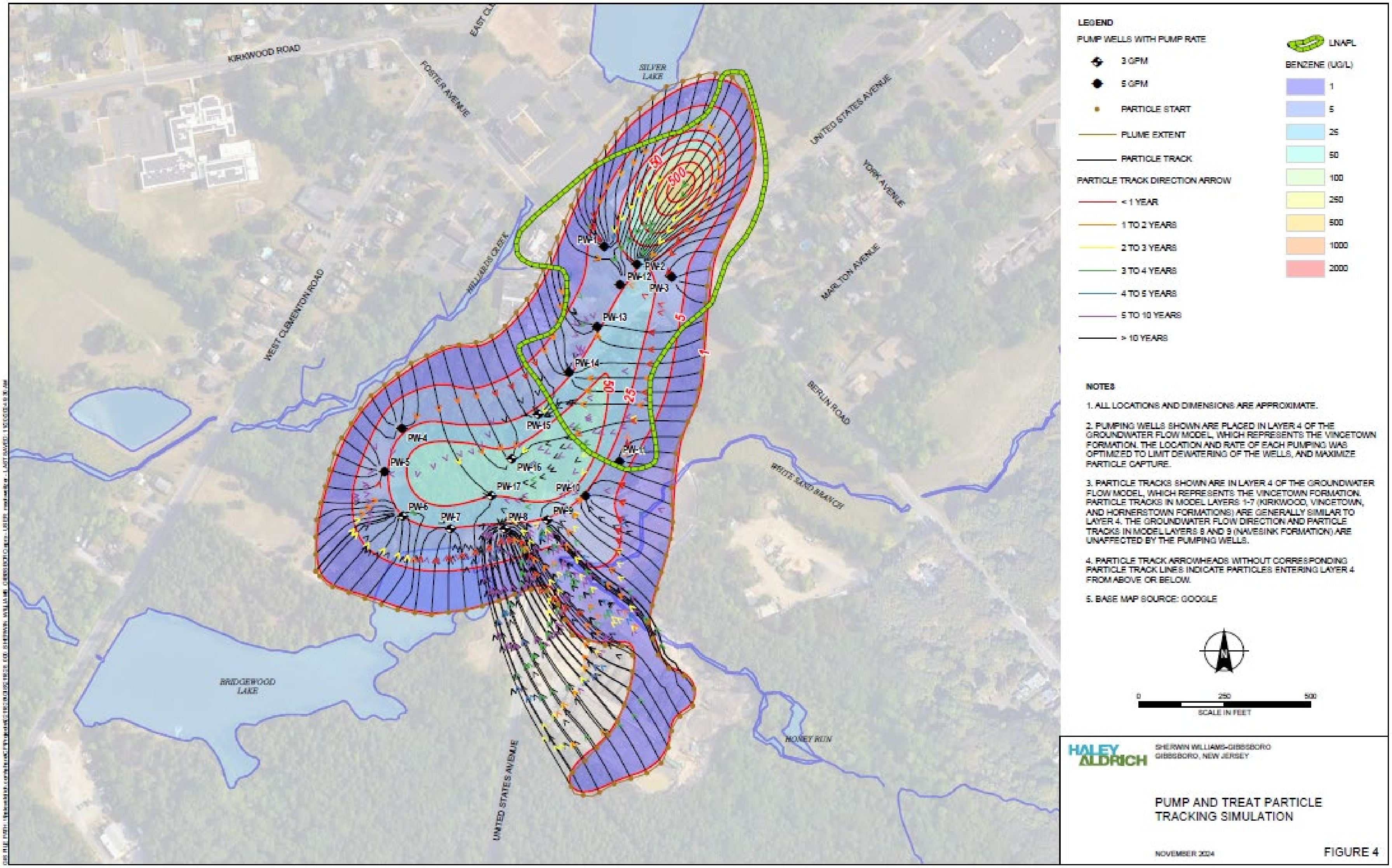


Figure 7: Groundwater Extraction and Treatment



APPENDIX II

TABLES

Required Tables:

- **Data that supports "Results of RI" discussion**
    - Table 1 Summary of GW COC Concentrations Ranges
- **Risk Tables (Human Health)**
    - Table 2 Specific Exposure Point Concentrations
    - Table 3 Exposure Pathway from HHRA
    - Table 4 Non-Cancer toxicity Summary Data
    - Table 5 Cancer Toxicity data summary
    - Table 6 Summary of Noncarcinogenic risk for each exposure pathway
    - Table 7 Results of the HHRA
    - Table 8 Results of Lead Model
- **ARARs/TBCs**
    - Table 9 Location Specific ARARs
    - Table 10 Action Specific ARARS
    - Table 11 Chemical Specific Arars
    - Table 12 TBC
- **Remedial Goals**
    - Table 13a MCL GWQS RG
    - Table 13b SOC RG
- **Cost Estimate for Selected Remedy**
    - Table 14 Alternative 1
    - Table 15 Alternative 2
    - Table 16a Alternative 3a
    - Table 16b Alternative 3b
    - Table 16c Alternative 3c
    - Table 17 Alternative 4

Table1

Summary of Groundwater COC Concentrations

Groundwater COC	Concentration Range (µg/L)[1]	GWQS (µg/L)[2]	MCL (µg/L)[3]
Arsenic	ND - 736	3	10
Benzene	ND – 2,100	0.45	5
Iron	ND – 133,000	300	NA
Lead	ND - 51	5	10
Manganese	1.5 - 710	50	NA
2-methylnaphthalene	ND - 150	30	NA
Naphthalene	ND - 870	300	NA
Pentachlorophenol	ND – 2,800	0.1	1
Synthetic Organic Chemicals (SOCs)	ND - 11,658[6]	500[7]	NA

1. Presented in the October 2024 Groundwater RIR.
2. NJDEP Class II-A Groundwater Quality Standards, February 2025.
3. Federal Maximum Contaminant Level (National Primary Drinking Water Regulations | US EPA)
4. NJDEP Freshwater (FW2) Surface Water Quality Standards for Chronic Aquatic Life Protection, December 2023.
5. Calculated from the formula:
   $SWQS_{chronic} = e^{(1.005[pH]-5.134)}$
6. Total volatile organic compound and semivolatile organic compound tentatively identified compounds (VOC/SVOC TICs).
7. Total SOCs.

Table 2
Summary of Contaminants of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater

Exposure Point	Contaminant of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Site-wide	Arsenic	0.00066 J	0.74	mg/L	53/65	0.16	mg/L	95% KM (Chebyshev) UCL
Site-wide	Iron	0.0785 J	93	mg/L	57/65	49	mg/L	95% Student's-t UCL
Site-wide	Lead	0.000058 J	0.0313	mg/L	35/65	0.013	mg/L	Arithmetic mean
Site-wide	Manganese	0.0015 J	1.3	mg/L	62/65	0.72	mg/L	95% Student's-t UCL
Site-wide	2-Methylnaphthalene	0.0000033 J	0.33	mg/L	30/69	0.33	mg/L	Maximum concentration
Site-wide	Naphthalene	0.0000044 J	2.2	mg/L	33/69	2.2	mg/L	Maximum concentration
Site-wide	Pentachlorophenol	0.0000065 J	2.8	mg/L	31/69	2.8	mg/L	Maximum concentration
Site-wide	Benzene	0.00004 J	0.16	mg/L	28/69	0.12	mg/L	95% Student's-t UCL
Site-wide	(Tic) 1,2,3-Trimethylbenzene	NA	1.9	mg/L	NA	1.3	mg/L	95% Student's-t UCL
Site-wide	(Tic) 1,2,4-Trimethylbenzene	NA	0.7	mg/L	NA	0.51	mg/L	95% Student's-t UCL
Site-wide	(Tic) 1,3,5-Trimethylbenzene	NA	1.8	mg/L	NA	1.14	mg/L	95% Student's-t UCL

Scenario Timeframe: Current/Future
Medium: Shallow/Intermediate Groundwater
Exposure Medium: Groundwater

Exposure Point	Contaminant of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
Site-wide	Arsenic	0.00041 J	0.74	mg/L	101/116	0.1	mg/L	95% KM (Chebyshev) UCL
Site-wide	Iron	0.0785 J	118	mg/L	108/116	53	mg/L	95% Student's-t UCL
Site-wide	Lead	0.000058 J	0.0313	mg/L	65/116	0.013	mg/L	Arithmetic mean
Site-wide	Manganese	0.0015 J	1.3	mg/L	110/116	0.8	mg/L	95% Student's-t UCL
Site-wide	2-Methylnaphthalene	0.0000033 J	0.33	mg/L	60/127	0.08	mg/L	95% KM (Chebyshev) UCL
Site-wide	Naphthalene	0.0000044 J	2.2	mg/L	61/127	0.44	mg/L	95% Adjusted Gamma UCL
Site-wide	Pentachlorophenol	0.0000065 J	2.8	mg/L	50/127	2.8	mg/L	95% Hall's Bootstrap UCL
Site-wide	Benzene	0.00004 J	0.16	mg/L	63/127	0.052	mg/L	Gamma Adjusted KM-UCL
Site-wide	(Tic) 1,2,3-Trimethylbenzene	NA	1.9	mg/L	NA	0.88	mg/L	95% Student's-t UCL
Site-wide	(Tic) 1,2,4-Trimethylbenzene	NA	1.4	mg/L	NA	0.72	mg/L	95% Adjusted Gamma UCL
Site-wide	(Tic) 1,3,5-Trimethylbenzene	NA	1.8	mg/L	NA	0.79	mg/L	95% Student's-t UCL
Site-wide	(Tic) Amylene Hydrate	NA	0.036	mg/L	NA	0.017	mg/L	95% Student's-t UCL

Table 2
Summary of Contaminants of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Deep Groundwater

Exposure Point	Contaminant of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
	Iron	0.0169 J	42	mg/L	56/59	28	mg/L	95% Student's-t UCL
	Naphthalene	0.0000069 J	0.039	mg/L	14/62	0.039	mg/L	Maximum concentration
	Benzene	0.000063 J	3.5	mg/L	31/62	3.5	mg/L	Maximum concentration
	(Tic) 1,2,3-Trimethylbenzene	NA	0.44	mg/L	NA	0.44	mg/L	Maximum concentration
	(Tic) 1,2,4-Trimethylbenzene	NA	0.26	mg/L	NA	0.26	mg/L	Maximum concentration
	(Tic) 1,3,5-Trimethylbenzene	NA	0.42	mg/L	NA	0.42	mg/L	Maximum concentration
	(Tic) Amylene Hydrate	NA	0.028	mg/L	NA	0.016	mg/L	95% Student's-t UCL

Definitions:

NA= Not available

J= qualifier, the analyte was postively identified; the associated numerical value is the approximate concentration of the analyte in the sample

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

This table presents the contaminants 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 3
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	Groundwater	Shallow Groundwater (≤20 ft bgs)	Site-wide	Construction Worker	Adult	Ingestion	Not evaluated	Incidental ingestion of groundwater during construction activities is unlikely
						Dermal	Quantitative	Exposure to groundwater during future construction activities
						Inhalation	Qualitative	Exposure to volatilized compounds in air during future construction activities is qualitatively discussed
				Utility Worker	Adult	Ingestion	Not evaluated	Incidental ingestion of groundwater during construction activities is unlikely
						Dermal	Quantitative	Exposure to groundwater during work
						Inhalation	Qualitative	Exposure to volatilized compounds in air during utility work activities is qualitatively discussed
Current/Future	Groundwater	Shallow/Intermediate Groundwater	Site-wide	Resident	Adult	Ingestion Dermal Inhalation	Quantitative	Exposure to groundwater at residence
					Child	Ingestion Dermal Inhalation	Quantitative	Exposure to groundwater at residence
Current/Future	Groundwater	Deep Groundwater	Site-wide	Resident	Adult	Ingestion Dermal Inhalation	Quantitative	Exposure to groundwater at residence
					Child	Ingestion Dermal Inhalation	Quantitative	Exposure to groundwater at residence

Summary of Selection of Exposure Pathways

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

Table 4
Non-Cancer Toxicity Data Summary

Pathway: Ingestion/Dermal

Contaminant of Concern		Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD Target Organ	Dates of RfD
Arsenic	Chronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	Skin	3	IRIS	9/1/1991
Iron	Chronic	7.00E-01	mg/kg-day	1	7.00E-01	mg/kg-day	Gastrointestinal	2	PPRTV	NA
Lead [1]	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	2.40E-02	mg/kg-day	0.04	9.60E-04	mg/kg-day	Nervous system	1	US EPA RSL (2)	5/1/1996
2-Methylnaphthalene	Chronic	4.00E-03	mg/kg-day	1	4.00E-03	mg/kg-day	Respiratory	1,000	IRIS	12/22/2003
Naphthalene	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	Systemic	3,000	IRIS	9/17/1998
Pentachlorophenol	Chronic	5.00E-03	mg/kg-day	1	5.00E-03	mg/kg-day	Hepatic	300	IRIS	9/30/2010
Benzene	Chronic	4.00E-03	mg/kg-day	1	4.00E-03	mg/kg-day	Immunological	300	IRIS	4/17/2003
(Tic) Amylene Hydrate	Chronic	NA	NA	1	NA	NA	NA	NA	NA	NA
(Tic) 1,2,3-Trimethylbenzene	Chronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	Nervous System	300	IRIS	9/9/2016
(Tic) 1,2,4-Trimethylbenzene	Chronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	Nervous System	300	IRIS	9/9/2016
(Tic) 1,3,5-Trimethylbenzene	Chronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	Nervous System	300	IRIS	9/9/2016

Definitions:
NA = Not Available
IRIS = Integrated Risk Information System
HEAST = Health Effect Assessment Summary Tables
PPRTV = Provisional Peer-reviewed Toxicity Values
Footnote:
(1) Lead does not have toxicity factors; lead risk will be evaluated with a blood lead model.
(2) The RfD for manganese based on non-diet is recommended in the EPA RSL User Guide, which subtracts the manganese contribution from the diet and uses a modifying factor of 3 (US EPA, 2018c).

Pathway: Inhalation

Contaminant of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD Target Organ	Dates of RfC
(Tic) N-Propylbenzene	Chronic	1.00E+00	mg/m^3	Hepatic	1000	PPRTV (Appendix)	2/4/2009
Lead [1]	Chronic	NA	NA	NA	NA	NA	NA

Definitions:
NA = Not Available
IRIS = Integrated Risk Information System
HEAST = Health Effect Assessment Summary Tables
PPRTV = Provisional Peer-reviewed Toxicity Values
Footnote:
(1) Lead does not have toxicity factors; lead risk will be evaluated with a blood lead model.

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 5
Cancer Toxicity Data Summary

Pathway: Ingestion/ Dermal

Contaminant of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline	Source	Date
Arsenic	1.50E+00	$(mg/kg\text{-}day)^{-1}$	1.50E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	4/10/1998
Naphthalene	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA	NA	NA	NA
Pentachlorophenol	4.00E-01	$(mg/kg\text{-}day)^{-1}$	4.00E-01	$(mg/kg\text{-}day)^{-1}$	Likely to be carcinogenic to humans	IRIS	9/30/2010
Benzene	5.50E-02	$(mg/kg\text{-}day)^{-1}$	5.50E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	1/19/2000

Definitions:
NA = Not Available
IRIS = Integrated Risk Information System
HEAST = Health Effect Assessment Summary Tables
PPRTV = Provisional Peer-reviewed Toxicity Values
CalEPA = California Environmental Protection Agency

Weight of Evidence for Cancer Classifications:
A: Human carcinogen
B2: Probable human carcinogen - based on sufficient evidence of carcinogenicity in animals
D: Not classifiable as to human carcinogenicity
LI: Likely to be carcinogenic to humans by inhalation route

Pathway: Inhalation

Contaminant of Concern	Unit Risk	Units	Inhalation Cancer Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline	Source	Date
Arsenic	4.30E-03	$(\mu g/m^3)^{-1}$	NA	NA	A	IRIS	4/10/1998
Naphthalene	3.40E-05	$(\mu g/m^3)^{-1}$	NA	NA	B2	CalEPA	1/20/2011
Pentachlorophenol	5.10E-06	$(\mu g/m^3)^{-1}$	NA	NA	B2	CalEPA	1/20/2011
Benzene	7.80E-06	$(\mu g/m^3)^{-1}$	NA	NA	A	IRIS	1/19/2000

Definitions:
NA= Not Available
IRIS = Integrated Risk Information System
PPRTV = Provisional Peer-Reviewed Toxicity Values
CalEPA = California Environmental Protection Agency

Weight of Evidence for Cancer Classifications:
A: Human carcinogen
B2: Probable human carcinogen - based on sufficient evidence of carcinogenicity in animals
D: Not classifiable as to human carcinogenicity
LI: Likely to be carcinogenic to humans by inhalation route

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 6

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Non-Carcinogenic Hazard Quotient				Target Organ	
				Ingestion	Inhalation	Dermal	Exposure Routes Total	RfD	RfC
Groundwater	Shallow/Intermediate	Site-wide	Arsenic	17	NA	0.075	17	Skin	Respiratory
			Iron	3.8	NA	0.017	3.8	Gastrointestinal	NA
			Manganese	1.7	NA	0.18	1.8	Nervous system	Nervous System
			2-Methylnaphthalene	1	NA	1.2	2.2	Respiratory	NA
			Naphthalene	1.1	100	0.64	100	Systemic	Respiratory
			Pentachlorophenol	28	NA	95	120	Hepatic	NA
			Benzene	0.64	1.5	0.086	2.2	Immunological	Immunological
			(Tic) 1,2,3-Trimethylbenzene	4.4	9	4.6	18	Nervous System	Nervous System
			(Tic) 1,2,4-Trimethylbenzene	3.6	5.5	3.6	13	Nervous System	Nervous System
			(Tic) 1,3,5-Trimethylbenzene	3.9	8.7	2.9	16	Nervous System	Nervous System
			(Tic) Amylene Hydrate	NA	1.6	NA	1.6	NA	Hepatic
Total - Shallow/Intermediate Groundwater (All COPCs considered[1])				**100**	**350**	**110**	**561**		
Total - Shallow/Intermediate Groundwater (Only COCs considered[2])				**65**	**126**	**108**	**296**		

Total Organ HI[3] (Shallow/Intermediate)	Child
Developmental	**6.00E+00**
Endocrine	**8.00E+01**
Gastrointestinal	**4.00E+00**
Hematological	8E-01
Hepatic	**3.00E+02**
Immunological	**2.00E+00**
Nervous System	**6.00E+01**
None Observed	7E-03
Renal	**1.00E+01**
Reproductive	**4.00E+00**
Respiratory	**1.00E+02**
Skin	**4.00E+01**
Systemic	**3.00E+00**

Table 6

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Residential
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Non-Carcinogenic Hazard Quotient				Target Organ	
				Ingestion	Inhalation	Dermal	Exposure Routes Total	RfD	RfC
Groundwater	Shallow/Intermediate	Site-wide	Arsenic	10	NA	0.057	10	Skin	Respiratory
			Iron	2.3	NA	0.013	2.3	Gastrointestinal	NA
			Manganese	0.99	NA	0.14	1.1	Nervous system	Nervous System
			2-Methylnaphthalene	0.6	NA	0.82	1.4	Respiratory	NA
			Naphthalene	0.66	220	0.42	220	Systemic	Respiratory
			Pentachlorophenol	17	NA	63	80	Hepatic	NA
			Benzene	0.39	3.2	0.058	3.6	Immunological	Immunological
			(Tic) 1,2,3-Trimethylbenzene	2.6	19	3.1	25	Nervous System	Nervous System
			(Tic) 1,2,4-Trimethylbenzene	2.2	12	2.4	16	Nervous System	Nervous System
			(Tic) 1,3,5-Trimethylbenzene	2.4	19	1.9	23	Nervous System	Nervous System
			(Tic) Amylene Hydrate	NA	3.5	NA	3.5	NA	Hepatic
Total - Shallow/Intermediate Groundwater (All COPCs considered[1])				**62**	**740**	**74**	**878**		
Total - Shallow/Intermediate Groundwater (Only COCs considered[2])				**40**	**277**	**72**	**386**		
				Total Organ HI [3] (Shallow/Intermediate)			**Adult**		
				Developmental			**1.00E+01**		
				Endocrine			**2.00E+02**		
				Gastrointestinal			**2.00E+00**		
				Hematological			5E-01		
				Hepatic			**4.00E+02**		
				Immunological			**4.00E+00**		
				Nervous System			**9.00E+01**		
				None Observed			5E-03		
				Renal			**1.00E+01**		
				Reproductive			**2.00E+00**		
				Respiratory			**2.00E+02**		
				Skin			**2.00E+01**		
				Systemic			**2.00E+00**		

Table 6

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Non-Carcinogenic Hazard Quotient				Target Organ	
				Ingestion	Inhalation	Dermal	Exposure Routes Total	RfD	RfC
Groundwater	Deep Groundwater		Iron	2	NA	0.0086	2	Gastrointestinal	NA
			Naphthalene	0.097	9.2	0.056	9.4	Systemic	Respiratory
			Benzene	44	100	5.8	150	Immunological	Immunological
			(Tic) 1,2,3-Trimethylbenzene	2.2	5.3	2.3	9.8	Nervous System	Nervous System
			(Tic) 1,2,4-Trimethylbenzene	1.3	3.1	1.3	5.7	Nervous System	Nervous System
			(Tic) 1,3,5-Trimethylbenzene	2.1	5	1.5	8.6	Nervous System	Nervous System
			(Tic) Amylene Hydrate	NA	1.5	NA	1.5	NA	Hepatic
Total - Deep Groundwater (All COPCs considered[1])				**61**	**160**	**13**	**237**		
Total - Deep Groundwater (Only COCs considered[2])				**52**	**124**	**11**	**187**		

Total Organ HI 3 (Deep Groundwater)	Child
Developmental	**3.00E+00**
Endocrine	**4.00E+01**
Gastrointestinal	**2.00E+00**
Hepatic	**2.00E+00**
Immunological	**1.00E+02**
Nervous System	**3.00E+01**
None Observed	8E-02
Renal	**2.00E+00**
Reproductive	**2.00E+00**
Respiratory	**9.00E+00**
Skin	3E-01
Systemic	**5.00E+00**

Table 6

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Residential
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Non-Carcinogenic Hazard Quotient				Target Organ	
				Ingestion	Inhalation	Dermal	Exposure Routes Total	RfD	RfC
Groundwater	Deep Groundwater	Site-wide	Iron	1.2	NA	0.01	1.2	Gastrointestinal	NA
			Naphthalene	0.06	20	0.04	20	Systemic	Respiratory
			Benzene	26	210	4	240	Immunological	Immunological
			(Tic) 1,2,3-Trimethylbenzene	1.3	11	1.5	14	Nervous System	Nervous System
			(Tic) 1,2,4-Trimethylbenzene	0.78	6.7	0.87	8.3	Nervous System	Nervous System
			(Tic) 1,3,5-Trimethylbenzene	1.3	11	1	13	Nervous System	Nervous System
			(Tic) Amylene Hydrate	NA	3.3	NA	3.3	NA	Hepatic
Total - Deep Groundwater (All COPCs considered[1])				**36**	**350**	**8.9**	**395**		
Total - Deep Groundwater (Only COCs considered[2])				**31**	**262**	**7**	**300**		
				Total Organ HI [3] (Deep Groundwater)			**Adult**		
				Developmental			**4.00E+00**		
				Endocrine			**7.00E+01**		
				Gastrointestinal			1.00E+00		
				Hepatic			**3.00E+00**		
				Immunological			**2.00E+02**		
				Nervous System			**4.00E+01**		
				None Observed			5E-02		
				Renal			1.00E+00		
				Reproductive			1.00E+00		
				Respiratory			**2.00E+01**		
				Skin			2E-01		
				Systemic			**3.00E+00**		

Table 6

Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Non-Carcinogenic Hazard Quotient				Target Organ	
				Ingestion	Inhalation	Dermal	Exposure Routes Total	RfD	RfC
GW	Shallow Groundwater	Site-wide	Pentachlorophenol	NA	NA	9.7	9.7	Hepatic	NA
Total - Shallow Groundwater (All COPCs considered[1])				NA	NA	12	**12**		
Total - Shallow Groundwater (Only COCs considered[2])				NA	NA	10	**10**		
				Total Organ HI [3] (Shallow Groundwater)			**Adult**		
				Developmental			1E-01		
				Endocrine			6E-04		
				Gastrointestinal			2E-03		
				Hematological			3E-04		
				Hepatic			**1.00E+01**		
				Immunological			2E-02		
				Nervous System			1.00E+00		
				None Observed			4E-04		
				Renal			1E-01		
				Reproductive			3E-03		
				Respiratory			5E-01		
				Skin			3E-02		
				Systemic			3E-01		

Definitions & Footnotes:

COC- contaminant of concern

COPC- contaminant of potential concern

NA- not applicable

NE- not evaluated

[1] Noncancer hazard index has been summed for all COPCs that screened in for the receptor in RAGS D tables 2s.

[2] Noncancer hazard index has been summed for the COCs only.

[3] Total Noncancer Organ HI has been separated by each target organ for all COPCs that screened in for the receptors in RAGS D tables 2s.

Table 7

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total[1]
Groundwater	Shallow Groundwater	Site-wide	Pentachlorophenol	NE	NE	2.8E-04	2.8E-04
Total - Shallow Groundwater (Only COCs considered[2])				NA	NA	**2.8E-04**	**3E-04**

Scenario Timeframe: Current/Future

Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total[1]
Groundwater	Shallow Groundwater	Site-wide	Pentachlorophenol	NE	NE	2.8E-04	2.8E-04
Total - Shallow Groundwater (Only COCs considered[2])				NA	NA	**2.8E-04**	**3E-04**

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total[1]
Groundwater	Shallow/Intermediate Gr	Site-wide	Arsenic	2.00E-03	NA	1.00E-05	2.0E-03
			Naphthalene	NA	7.40E-03	NA	7.4E-03
			Pentachlorophenol	1.40E-02	4.20E-06	5.30E-02	6.7E-02
			Benzene	3.6E-05	2.4E-04	5.3E-06	2.8E-04
Total - Shallow/Intermediate Groundwater (Only COCs considered[2])				**1.6E-02**	**7.7E-03**	**5.3E-02**	**8.E-02**

Scenario Timeframe: Current/Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Contaminant of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total[1]
Groundwater	Deep Groundwater	Site-wide	Naphthalene	NA	6.50E-04	NA	6.5E-04
			Benzene	2.50E-03	1.60E-02	3.60E-04	1.9E-02
Total - Deep Groundwater (Only COCs considered[2])				**2.6E-03**	**1.7E-02**	**3.6E-04**	**2.E-02**

Definitions & Footnotes:
COC- contaminant of concern
COPC- contaminant of potential concern
NA- not applicable
NE- not evaluated
[1] Chemcial-specific exposure route estimates shown to 2 significant figures, while the total Receptor estimates from all pathways are shown to 1 significant figure.
[2] Cancer risk has been summed for the COCs only.

Table 8
Summary of Lead Model Results

Scenario Timeframe	Groundwater Depth	Receptor	Lead EPC (µg/L)	Maximum Lead Concentration (mg/L)	GM BLL (µg/L)	Percent (%) of Individuals with BLLs > 5 µg/dL
Current/Future	Baseline Model	Child Resident	4	0.0313	2.9	**12%**
	Shallow/Intermediate Groundwater	Child Resident	13	0.0313	3.6	**25%**

Incremental BLL from baseline (µg/L): 0.7

Definitions:
BLL = Blood Lead level
COPC = Contaminant of Potential Concern
EPC = Exposure Point Concentration
GM = Geometric Mean
BOLD = Predicted propbability >5%
Notes:
Lead was not retained as a COPC in deep groundwater, therefore, was not evaluated.
Calculated using the Adult Lead and the Integrated Exposure Uptake Biokinetic Models, consistent with guidance.

Table 9
Location-Specific ARARs for
Sherwin-Williams/Hilliards Creek Superfund Site OU3

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 such as well installation adjacent to a waterbody.
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 such as well installation adjacent to a waterbody.
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.
State	New Jersey Register of Historic Places Act Rules (N.J.A.C. 7:4).	Establishes procedures for review of projects to determine whether historic resources may be affected.	Potentially Applicable	Potentially applicable during remedial activities if scientific, historic, or archaeological artifacts are identified during implementation of the remedy.
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 10
Action-Specific ARARs for
Sherwin-Williams/Hilliards Creek Superfund Site OU3

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 achieving groundwater cleanup levels and institutional controls for contaminated groundwater until standards are achieved.	Relevant and Appropriate	Substantive requirements applicable to groundwater RA.
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	Potentially Applicable	Substantive requirements for discharges to groundwater from the remedial activities which will be performed in OU3.
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 installation or abandonment of wells.
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.
State	NJ – Storm Water Management (N.J.A.C. 7:8)	Establishes requirements for managing and controlling storm water from construction.	Potentially Applicable	Applicable if remedial activities include total land disturbance exceeding regulatory threshold.
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 OU3 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.	Potentially Relevant and Appropriate	Applicable to constituents that may be used for in-situ source area treatment, and decontamination chemicals used during groundwater sampling.
State	New Jersey Water Pollution Control Act Regulations (N.J.A.C. 7:14)	Prohibits the discharge of any pollutant into the waters of the State without a valid permit.	Potentially Applicable	If injections into the groundwater discharged to a water body, the substantive requirements of a permit equivalency will be met
Federal	Resource Conservation and Recovery Act (40 C.F.R. 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	DOT Rules for Hazardous Materials Transportation (49 C.F.R. 107, 171.1-172.604)	DOT Rules for Hazardous Materials Transportation (49 C.F.R. 107, 171.1- 172.604).	Potentially Applicable	Applicable if hazardous materials are transported to or from the site.
Federal	National Ambient Air Quality Standards (40 C.F.R. 50)	Establishes air quality standards for specific criteria pollutants.	Potentially Applicable	Applicable during groundwater remediation activities, which may include vapor emissions generated during in- situ treatment activities.

Table 11
Chemical-Specific ARARs for

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 groundwater at the Site.
Federal	National Primary Drinking Water Standards	The National Primary Drinking Water Standards establish health-based maximum contaminant levels (MCLs) for a variety of constituents in drinking water.	Potentially Relevant and Appropriate	The MCLs are specific to drinking water and are not specified as groundwater cleanup criteria. However they may be applicable as criteria where NJDEP GWQS have not been established.

Table 12 To Be Considered (TBCs) for Sherwin-Williams/Hilliards Creek Superfund Site OU3			
Regulatory Level	**Citation**	**Description**	**Status**
State	NJDEP Site Remediation and Waste Management Program. Evaluation of Extractable Petroleum Hydrocarbons in Soil Technical Guidance, Version 1.0. June 2019.	Provides guidance on establishing cleanup levels for extractable petroleum hydrocarbons.	TBC
State	NJDEP Vapor Intrusion Technical Guidance, Version 5.0, May 2021.	Provides guidance on conducting vapor intrusion investigations and implementing vapor intrusion mitigation measures. Provides groundwater, sub-slab, and indoor air screening levels.	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 2.0, July 2021.	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 2.0, September 2022.	Provides guidance for how monitored natural attenuation may be employed as a groundwater remedy in compliance with NJDEP requirements established by Technical Requirements for Site Remediation N.J.A.C. 7:26E. Provides guidance on the provisions for obtaining a Remedial Action Permit Equivalency for groundwater.	TBC
Federal	OSWER Publication 9200.2-154. Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. June 2015.	Provides guidance on evaluating potential vapor intrusion impacts and mitigation measures for impacts.	TBC

Federal	OSWER Directive 9200.4-17P, Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites. April 21, 1999.	Provides guidance on the use of MNA at federal-lead sites.	TBC
Federal	Use of Monitored Natural Attenuation for Inorganic Contaminants in Groundwater at Superfund Sites, OSWER Directive 9283.1-36. August 2015.	Technical Guidance on Utilizing MNA for inorganic constituents at Superfund Sites.	TBC
Federal	Consideration of Greener Cleanup Activities in the Superfund Cleanup Process. August 2016.	Provides guidance on implementing CERCLA remedies in a manner that minimizes energy use, minimizes discharges of air pollutants and greenhouse gases, minimizes water use, and protects land and ecosystems.	TBC

Table 13a

Remediation Goals (RGs) for COCs with Specific Groundwater Quality Criteria

Constituent	NJDEP Groundwater Quality Standard (GWQS) (µg/L)	Federal Maximum Contaminant Level (MCL) (µg/L)	NJDEP Drinking Water (MCL) (µg/L)	Remediation Goal (µg/L)
Arsenic (Total)	3	10	5	**3**
Benzene	0.45	5	1	**0.45**
Iron	300	300**	300**	**300**
Manganese	50	50**	50**	**50**
Lead (Total)	5	10	15	**5**
Naphthalene	300	300	300	**300**
2-Methylnaphthalene	30	*	*	**30**
Pentachlorophenol	0.1	1	1	**0.1**

* No Primary or Secondary Standard

** Secondary Standard

Table 13b

Table 13b

– PRGs for COCs With Interim Generic Groundwater Quality Criteria – Synthetic Organic Compounds (SOCs)*

Constituent	Criteria (μg/l or ppb)
SOCs defined as carcinogens in N.J.A.C. 7:9C-1.4	5 (individual)
SOCs defined as carcinogens in N.J.A.C. 7:9C-1.4 lacking specific or interim specific criteria	25 (total)
SOCs defined as non-carcinogens in N.J.A.C. 7:9C-1.4	100 (individual)
SOCs defined as non-carcinogens in N.J.A.C. 7:9C-1.4 lacking specific or interim specific criteria	500 (total)

* Synthetic Organic Chemicals (SOCs) are identified as having "evidence of carcinogenicity" or "lacking evidence of carcinogenicity" based upon available scientific evidence. Chemicals are classified as carcinogens or noncarcinogens for the purposes of risk assessment according to the weight of evidence utilized by USEPA in the National Primary Drinking Water Regulations (50 FR 46880-46901 (1985)). The Interim generic groundwater quality criteria do not apply to naturally occurring organic chemicals.

TABLE 14: NO ACTION CLASS 4 ROM COST ESTIMATE

Option Summary: no remedial activity or monitoring. Monitoring will occur with other operable units (OUs).

ITEM	UNITS	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED COST	NOTES
PLANNING AND REPORTING					
Planning meetings	EA	0	$ 2,500	$ -	
Community Relations	LS	0	$ 20,000	$ -	
Agency Submittals	LS	0	$ 25,000	$ -	
5-Year Periodic Review	EACH	0	$ 25,000	$ -	
	Subtotal - Planning and Reporting			$ -	
	TOTAL ESTIMATED INVESTMENT (YEAR 0):			$ -	
			AACE Class 4 (-30%)	$ -	
			AACE Class 4 (+50%)	$ -	
ANNUAL LTM - YEARS 0-20					
Project Management	HR	0	$ 225	$ -	4-hrs/month
Misc. Expenses	YEAR	0	$ 1,000	$ -	
Annual Sampling	EVENTS	0	$ 15,000	$ -	
Annual Reporting	YEAR	0	$ 10,000	$ -	
	TOTAL ESTIMATED LTM - YEARS 0-30			$ -	
			AACE Class 4 (-30%)	$ -	
			AACE Class 4 (+50%)	$ -	
	Net Present Value (Years 0-20)			$ -	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
	Net Present Value Project Costs			$ -	

TABLE 15: ATTENUATION VIA NATURAL PROCESSES WITH INSTITUTIONAL CONTROLS AND LONG TERM MONITORING CLASS 4 ROM COST ESTIMATE

Option Summary: This option provides costs for preparing and implementing a Classification Exception Area/Well Restriction Area (CEA/WRA) to restrict the use of groundwater and to prevent exposure to contaminants of concern within OU3. Installation of up to 6 new monitoring wells. Attenuation via Natural Processes assumes an initial 3 years of semi-annual groundwater monitoring to document progress towards the benzene GWQS in deep groundwater and annual groundwater monitoring for an additional 15 years for a total of 20 years from planning to completion. Annual reports and four, 5-year review reports submitted to EPA are also included.

ITEM	UNITS	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED COST	NOTES
PLANNING, REPORTING, AND IMPLEMENTATION - YEARS 0-2					
Planning meetings	EA	5	$ 5,000	$ 25,000	
Access Agreements and Negotiations	LS	1	$ 50,000	$ 50,000	
Community Relations	LS	1	$ 50,000	$ 50,000	throughout project
Well Installation	LS	1	$ 250,000	$ 250,000	6 wells to 75 feet bgs with soil disposal as non-hazardous waste
Agency Submittals and CEA/WRA	LS	1	$ 45,000	$ 45,000	includes RDWP
5-Year Periodic Review w/ Annual Reporting Data	EACH	4	$ 30,000	$ 120,000	included for all 20 years
	TOTAL ESTIMATED INVESTMENT:			$ 540,000	
		AACE Class 4 (-30%)		$ 378,000	
		AACE Class 4 (+50%)		$ 810,000	
SEMI-ANNUAL MONITORING - YEARS 3-5					
Project Management	HR	96	$ 225	$ 21,600	8-hrs/month each year
Misc. Expenses	YEAR	1	$ 1,000	$ 1,000	
Semi-Annual Sampling	EVENTS	2	$ 30,000	$ 60,000	
Annual Reporting	EACH	1	$ 15,000	$ 15,000	
	TOTAL ESTIMATED MONITORING			$ 97,600	
		AACE Class 4 (-30%)		$ 68,320	
		AACE Class 4 (+50%)		$ 146,400	
		Net Present Value (Years 3-5)		$ 256,133	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
ANNUAL MONITORING - YEARS 6-20					
Project Management	HR	48	$ 225	$ 10,800	4-hrs/month each year
Misc. Expenses	YEAR	1	$ 1,000	$ 1,000	
Annual Sampling	EVENTS	1	$ 30,000	$ 30,000	
Annual Reporting	YEAR	1	$ 15,000	$ 15,000	
	TOTAL ESTIMATED MONITORING			$ 56,800	
		AACE Class 4 (-30%)		$ 39,760	
		AACE Class 4 (+50%)		$ 85,200	
		Net Present Value (Years 6-20)		$ 517,330	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
		Net Present Value Project Costs		$ 1,310,000	

Table 16a

TABLE 16a: IN-SITU CHEMICAL OXIDATION AND METALS COMPLEXATION CLASS 4 ROM COST ESTIMATE

Option Summary: This option provides costs for in-situ chemical oxidation (ISCO) to treat VOCs and SVOCs, as well as their associated TICs. Assumed sodium persulfate with alkaline activation. Alkaline activation will create a basic environment that will limit Pb mobilization. Complexation agents (if needed) to mitigate other metals mobilization. Treatment for 45-65 ft bgs over an approximate 25,000 sq ft area, treating concentrations above ~200 ppb benzene. Assumes the first 3 years of planning, design, PDIs, bench tests, pilot tests, and reports to EPA. Assumes two years for implementation and monitoring remedial progress (includes supplemental injections as needed). Assumes Attenuation via Natural Processes for the next 10 years to achieve GWQS. Annual reports and four, 5-year review reports submitted to EPA are also included.

ITEM	UNITS	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED COST	NOTES
PLANNING, REPORTING, AND PDI - YEAR 0-3					
Pre-Design Planning and Investigation	LS	1	$ 400,000	$ 400,000	Includes PDI Work Plan and Evaluation Report. Collecting updated groundwater quality data to determine if injections are warranted. ISCO bench testing with metals mobilization evaluation. Site inspection for access and potential injection constraints. Small pilot test to determine distribution/ROI, spacing for injection points and other parameters. Complexation agent bench testing included.
Permits & Permit Compliance	LS	1	$ 25,000	$ 25,000	Potential UIC permitting. With State, would be Permit-by-Rule.
Access Agreements and Negotiations	LS	1	$ 50,000	$ 50,000	
Planning meetings	EA	5	$ 2,500	$ 12,500	Client planning, regulator, and vendor meetings
Community Relations	LS	1	$ 20,000	$ 20,000	
Well Installation (remedial monitoring)	LS	1	$ 175,000	$ 175,000	4 wells to 75 feet bgs with soil disposal as non-hazardous waste
Remedial Design (RD)	% of Equip/Materials	5%	$ 1,715,000	$ 85,750	Includes 90% and 100% RD and associated documents (e.g., FSP, QAPP, etc.)
Agency Submittals and CEA/WRA	LS	1	$ 100,000	$ 100,000	Assumes one remedial action work plan, completion report, and CEA/WRA
5-Year Periodic Review w/ Annual Reporting Data	EACH	4	$ 35,000	$ 140,000	
			Subtotal - Pre-Design, Operation, & Regulatory Compliance	**$ 1,008,250**	
IMPLEMENTATION - YEARS 4-5					
GENERAL CONDITIONS					
Utility Location Survey	LS	1	$ 10,000	$ 10,000	
Survey Services (Layout/Record Drawings)	LS	1	$ 25,000	$ 25,000	For survey control & as-built record drawings
H&S Audit	EA	1	$ 5,000	$ 5,000	Audits during ISCO injection
			Subtotal - General Conditions	**$ 40,000**	
MOBILIZATION	LS	1	$ 25,000	$ 25,000	Assuming 2 rigs and injection trailers, safety equipment
			Subtotal - Mobilization	**$ 25,000**	
INITIAL INJECTION EVENT					
Injection contactor	DAY	30	$ 12,000	$ 360,000	2 rigs and injection trailers, Initial injection event
Sodium Persulfate	LB	60000	$ 3.50	$ 210,000	60,000 lbs per injection event with 15% solution. High SOD (2.5 grams oxidant per KG of soil with a safety factor of 2) plus buffering capacity.
Sodium Hydroxide	LB	70000	$ 2	$ 140,000	7,000 gallons (70,000 pounds) of 25% hydroxide solution per injection event (2:1 ratio of hydroxide to persulfate)
Oversight	DAY	30	$ 8,000	$ 240,000	2 staff plus office support
Quarterly Performance Monitoring (per event)	EA	8	$ 40,000	$ 320,000	4 performance monitoring events/year for 2 years. Assuming 20 wells sampled for VOC, SVOCs, metals, and geochemical parameters
			Subtotal - Injection Events	**$ 1,270,000**	
INITIAL INJECTION EVENT- OTHER DIRECT COSTS					
Site preparation, security fencing and storage for oxidizers, access, miscellaneous requirements/equipment	% of Equip/Materials	10%	$ 1,270,000	$ 127,000	
			Subtotal - Other Direct Costs	**$ 127,000**	
INDIRECT COSTS					
Engineering and Construction Supervision	% of Equipment	10%	$ 1,270,000	$ 127,000	
Health & Safety - modified Level D with Tyvek	% of Equipment	5%	$ 1,270,000	$ 63,500	Increased H&S consideration due to strong oxidizer use
			Subtotal - Indirect Costs	**$ 190,500**	
COMPLEXATION AGENT INJECTION EVENT (IF NEEDED)					
Injection contactor	DAY	15	$ 12,000	$ 180,000	Only needed if metals are mobilized during ISCO injection. Must be completed separately
Complexation Agent	LB	60000	$ 2	$ 120,000	
Oversight	DAY	15	$ 8,000	$ 120,000	
			Subtotal - Injection Events	**$ 420,000**	
SUPPLEMENTAL INJECTIONS (IF NEEDED)					
Potential additional injections	EACH	1	$ 2,478,750	$ 2,478,750	Potentially 3 additional injection events (1 per year) due to natural SOD, organics, and COC concentrations. Reduced scope by 50% for supplemental injections.
			Subtotal - Injection Events	**$ 2,478,750**	
			TOTAL DIRECT AND INDIRECT COSTS FOR IMPLEMENTATION	$ 4,551,250	
			TOTAL ESTIMATED INVESTMENT:	**$ 5,559,500**	
			AACE Class 4 (-30%)	**$ 3,891,650**	
			AACE Class 4 (+50%)	**$ 8,339,250**	
ANNUAL OPERATION, MAINTENANCE, AND MONITORING					
SEMI-ANNUAL MONITORING - YEARS 6-8					
Project Management	HR	96	$ 225	$ 21,600	8-hrs/month each year
Misc. Expenses	YEAR	1	$ 5,000	$ 5,000	
Semi-Annual Sampling	EVENTS	2	$ 30,000	$ 60,000	
Annual Reporting	EACH	1	$ 15,000	$ 15,000	
			TOTAL ESTIMATED MONITORING	**$ 101,600**	
			AACE Class 4 (-30%)	**$ 71,120**	
			AACE Class 4 (+50%)	**$ 152,400**	
			Net Present Value (Years 6-8)	$ 266,631	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
ANNUAL MONITORING - YEARS 9-15					
Project Management	HR	96	$ 225	$ 21,600	8-hrs/month each year
Misc. Expenses	YEAR	1	$ 5,000	$ 5,000	
Periodic Sampling and Annual Reporting	YEAR	1	$ 75,000	$ 75,000	
			TOTAL ESTIMATED COSTS	**$ 101,600**	
			AACE Class 4 (-30%)	**$ 71,120**	
			AACE Class 4 (+50%)	**$ 152,400**	
			Net Present Value (Years 9-15)	$ 547,552	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
			Net Present Value Project Costs	**$ 6,370,000**	

Table 16b

TABLE 16b: IN-SITU CHEMICAL REDUCTION AND BIOREMEDIATION CLASS 4 ROM COST ESTIMATE

Option Summary: This option provides costs for in-situ chemical reduction and biodegradation/bioaugmentation to treat metals, VOCs and SVOCs, as well as their associated TICs. Assumed injectable ZVI or chelated iron, microbes, and complexation amendments. Treatment for 45-65 ft bgs over an approximate 25,000 sq ft area, treating concentrations above ~200 ppb benzene. Assumes the first 3 years of planning, design, PDIs, bench tests, pilot tests, and reports to EPA. Assumes two years for implementation and monitoring remedial progress (includes supplemental injections as needed). Assumes Attenuation via Natural Processes monitoring for the next 10 years to achieve GWQS. Annual reports and four, 5-year review reports submitted to EPA are also included.

ITEM	UNITS	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED COST	NOTES
PLANNING, REPORTING, AND PDI - YEAR 0-3					
Pre-Design Planning and Investigation	LS	1	$ 350,000	$ 350,000	Includes PDI Work Plan and Evaluation Report. Collecting updated groundwater quality data to determine if injections are warranted. Bench testing for a potential ISCR/bioremediation with metals mobilization evaluation. Complexation agent bench testing coupled with bioaugmentation. Site inspection for access and potential injection constraints. Small pilot test to determine distribution/ROI, spacing for injection points.
Permits & Permit Compliance	LS	1	$ 25,000	$ 25,000	Potential UIC permitting. With State, would be Permit-by-Rule.
Access Agreements and Negotiations	LS	1	$ 50,000	$ 50,000	
Planning meetings	EA	3	$ 2,500	$ 7,500	Client planning, regulator, and vendor meetings
Community Relations	LS	1	$ 15,000	$ 15,000	
Well Installation (remedial monitoring)	LS	1	$ 175,000	$ 175,000	4 wells to 75 feet bgs with soil disposal as non-hazardous waste
Remedial Design (RD)	% of Equip/Materials	5%	$ 1,420,450	$ 71,023	Includes 90% and 100% RD and associated documents (e.g., FSP, QAPP, etc.)
Agency Submittals and CEA/WRA	LS	1	$ 100,000	$ 100,000	Assumes one remedial action work plan, completion report, and CEA/WRA
5-Year Periodic Review w/ Annual Reporting Data	EACH	4	$ 35,000	$ 140,000	
			Subtotal - Pre-Design, Operation, & Regulatory Compliance	**$ 933,523**	
IMPLEMENTATION - YEARS 4-5					
GENERAL CONDITIONS					
Utility Location Survey	LS	1	$ 10,000	$ 10,000	
Survey Services (Layout/Record Drawings)	LS	1	$ 25,000	$ 25,000	For survey control & as-built record drawings
H&S Audit	EA	1	$ 5,000	$ 5,000	Audits during Injection Events
			Subtotal - General Conditions	**$ 40,000**	
MOBILIZATION	LS	1	$ 15,000	$ 15,000	Assuming 2 rigs and injection trailers.
			Subtotal - Mobilization	**$ 15,000**	
INITIAL INJECTION EVENT					
Injection contactor	DAY	30	$ 12,000	$ 360,000	2 rigs and injection trailers,
ZVI Amendment	LB	80000	$ 6	$ 480,000	1 injection event. - assumes 25-50 micron ZVI
Guar	LB	5100	$ 5	$ 22,950	1 injection event
Microbes	L	100	$ 225	$ 22,500	1 injection event
Oversight	DAY	30	$ 8,000	$ 240,000	
Quarterly Performance Monitoring (per event)	EA	8	$ 35,000	$ 280,000	4 performance monitoring events per year. Assuming 20 wells sampled for VOC, SVOCs, metals, and geochemical parameters
			Subtotal - Injection Events	**$ 1,405,450**	
INJECTION EVENTS - OTHER DIRECT COSTS					
Site preparation, security fencing and storage for amendments, access, miscellaneous requirements/equipment	% of Equip/Materials	10%	$ 1,405,450	$ 140,545	
			Subtotal - Other Direct Costs	**$ 140,545**	
INDIRECT COSTS					
Engineering Design and Construction Supervision	% of Equip/Materials	10%	$ 1,405,450	$ 140,545	
Health & Safety - Level D	% of Equip/Materials	1%	$ 1,405,450	$ 14,055	
			Subtotal - Indirect Costs	**$ 154,600**	
COMPLEXATION AGENT INJECTION EVENT (IF NEEDED)					
Injection contactor	DAY	15	$ 12,000	$ 180,000	Only needed if metals are mobilized. Must be completed separately
Complexation Agent	LB	60000	$ 2	$ 120,000	
Oversight	DAY	15	$ 8,000	$ 120,000	
			Subtotal - Injection Events	**$ 420,000**	
SUPPLEMENTAL INJECTIONS (IF NEEDED)					
Potential additional injections	EACH	1	$ 877,797	$ 877,797	1 additional injection event (50%) for ZVI, microbes, and complexation agents (if needed).
			Subtotal - Injection Events	**$ 877,797**	
			TOTAL DIRECT AND INDIRECT COSTS FOR IMPLEMENTATION	$ 3,053,392	
			TOTAL ESTIMATED INVESTMENT	**$ 3,986,914**	
			AACE Class 4 (-30%)	**$ 2,790,840**	
			AACE Class 4 (+50%)	**$ 5,980,371**	
ANNUAL OPERATION, MAINTENANCE, AND MONITORING					
SEMI-ANNUAL MONITORING - YEARS 6-8					
Project Management	HR	96	$ 225	$ 21,600	8-hrs/month each year
Misc. Expenses	YEAR	1	$ 5,000	$ 5,000	
Semi-Annual Sampling	EVENTS	2	$ 30,000	$ 60,000	
Annual Reporting	EACH	1	$ 15,000	$ 15,000	
			TOTAL ESTIMATED MONITORING	**$ 101,600**	
			AACE Class 4 (-30%)	**$ 71,120**	
			AACE Class 4 (+50%)	**$ 152,400**	
			Net Present Value (Years 6-8)	$ 266,631	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
ANNUAL MONITORING - YEARS 9-15					
Project Management	HR	96	$ 225	$ 21,600	8-hrs/month each year
Misc. Expenses	YEAR	1	$ 5,000	$ 5,000	
Periodic Sampling and Annual Reporting	YEAR	1	$ 75,000	$ 75,000	
			TOTAL ESTIMATED COSTS	**$ 101,600**	
			AACE Class 4 (-30%)	**$ 71,120**	
			AACE Class 4 (+50%)	**$ 152,400**	
			Net Present Value (Years 9-15)	$ 547,552	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
			Net Present Value Project Costs	**$ 4,800,000**	

Table 16c

TABLE 16c: IN-SITU SEQUESTRATION, BIOREMEDIATION, AND METALS COMPLEXATION CLASS 4 ROM COST ESTIMATE

Option Summary: This option provides costs for in-situ sequestration and biodegradation/bioaugmentation to treat VOCs and SVOCs, as well as their associated TICs. This process will not increase metals mobilization but may not expedite metals treatment in groundwater unless complexation agents are used as an amendment. Assumed injectable powder activated carbon, microbes, sulfate, and complexation amendments. Treatment for 45-65 ft bgs over an approximate 25,000 sq ft area, treating concentrations above ~200 ppb benzene. Assumes the first 3 years of planning, design, PDIs, bench tests, pilot tests, and reports to EPA. Assumes two years for implementation and monitoring remedial progress (includes supplemental injections as needed). Assumes Attenuation via Natural Processes monitoring for the next 10 years to achieve GWQS. Annual reports and four, 5-year review reports submitted to EPA are also included.

ITEM	UNITS	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED COST	NOTES
PLANNING, REPORTING, AND PDI - YEAR 0-3					
Pre-Design Planning and Investigation	LS	1	$ 300,000	$ 300,000	Includes PDI Work Plan and Evaluation Report. Collecting updated groundwater quality data to determine if injections are warranted. Carbon and Carbon/Sulfate bench testing with metals mobilization evaluation. Complexation agent bench testing. Site inspection for access and potential injection constraints. Small pilot test to determine distribution/ROI, spacing for injection points.
Permits & Permit Compliance	LS	1	$ 50,000	$ 50,000	Potential UIC permitting. With State, would be Permit-by-Rule.
Access Agreements and Negotiations	LS	1	$ 125,000	$ 125,000	
Planning meetings	EA	2	$ 2,500	$ 5,000	Client planning, regulator, and vendor meetings
Community Relations	LS	1	$ 10,000	$ 10,000	
Well Installation (remedial monitoring)	LS	1	$ 175,000	$ 175,000	4 wells to 75 feet bgs with soil disposal as non-hazardous waste
Remedial Design (RD)	% of Equip/Materials	5%	$ 1,300,000	$ 65,000	Includes 90% and 100% RD and associated documents (e.g., FSP, QAPP, etc.)
Agency Submittals and CEA/WRA	LS	1	$ 100,000	$ 100,000	Assumes one remedial action work plan, completion report, and CEA/WRA
5-Year Periodic Review w/ Annual Reporting Data	EACH	4	$ 35,000	$ 140,000	
			Subtotal - Pre-Design, Operation, & Regulatory Compliance	**$ 970,000**	
IMPLEMENTATION - YEARS 4-5					
GENERAL CONDITIONS					
Utility Location Survey	LS	1	$ 10,000	$ 10,000	
Survey Services (Layout/Record Drawings)	LS	1	$ 25,000	$ 25,000	For survey control & as-built record drawings
H&S Audit	EA	1	$ 5,000	$ 5,000	Audits during Carbon/Sulfate Injection.
			Subtotal - General Conditions	**$ 40,000**	
MOBILIZATION	LS	1	$ 15,000	$ 15,000	Assuming 2 rigs and injection trailers.
			Subtotal - Mobilization	**$ 15,000**	
INITIAL INJECTION EVENT					
Injection contactor	DAY	20	$ 12,000	$ 240,000	2 rigs and injection trailers
Carbon Amendment	LB	150000	$ 3	$ 450,000	1 injection event. - assumes PAC, 20 micron.
Sulfate (Gypsum or similar)	LB	115000	$ 2	$ 172,500	1 injection event
Microbes	L	100	$ 225	$ 22,500	1 injection event
Oversight	DAY	20	$ 8,000	$ 160,000	
Quarterly Performance Monitoring (per event)	EA	8	$ 30,000	$ 240,000	4 performance monitoring events per year. Assuming 20 wells sampled for VOC, SVOCs, metals, and geochemical parameters
			Subtotal - Injection Events	**$ 1,285,000**	
INJECTION EVENTS - OTHER DIRECT COSTS					
Site preparation, security fencing and storage for amendments, access, miscellaneous requirements/equipment	% of Equip/Materials	10%	$ 1,285,000	$ 128,500	
			Subtotal - Other Direct Costs	**$ 128,500**	
INDIRECT COSTS					
Engineering Design and Construction Supervision	% of Equip/Materials	10%	$ 1,285,000	$ 128,500	
Health & Safety - Level D	% of Equip/Materials	1%	$ 1,285,000	$ 12,850	
			Subtotal - Other Indirect Costs	**$ 141,350**	
COMPLEXATION AGENT INJECTION EVENT (IF NEEDED)					
Injection contactor	DAY	15	$ 12,000	$ 180,000	Only needed if metals are mobilized. Must be completed seperately
Complexation Agent	LB	60000	$ 2	$ 120,000	
Oversight	DAY	15	$ 8,000	$ 120,000	
			Subtotal - Injection Events	**$ 420,000**	
SUPPLEMENTAL INJECTIONS (IF NEEDED)					
Potential additional injections	EACH	1	$ 402,463	$ 402,463	1 additional injection event (25%) for sulfate and microbes only (if needed).
			Subtotal - Injection Events	**$ 402,463**	
			TOTAL DIRECT AND INDIRECT COSTS FOR IMPLEMENTATION	$ 2,432,313	
			TOTAL ESTIMATED INVESTMENT	**$ 3,402,313**	
			AACE Class 4 (-30%)	**$ 2,381,619**	
			AACE Class 4 (+50%)	**$ 5,103,469**	
ANNUAL OPERATION, MAINTENANCE, AND MONITORING					
SEMI-ANNUAL MONITORING - YEARS 6-8					
Project Management	HR	96	$ 225	$ 21,600	8-hrs/month each year
Misc. Expenses	YEAR	1	$ 5,000	$ 5,000	
Semi-Annual Sampling	EVENTS	2	$ 30,000	$ 60,000	
Annual Reporting	EACH	1	$ 15,000	$ 15,000	
			TOTAL ESTIMATED MONITORING	**$ 101,600**	
			AACE Class 4 (-30%)	**$ 71,120**	
			AACE Class 4 (+50%)	**$ 152,400**	
			Net Present Value (Years 6-8)	$ 266,631	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
ANNUAL MONITORING - YEARS 9-15					
Project Management	HR	96	$ 225	$ 21,600	8-hrs/month each year
Misc. Expenses	YEAR	1	$ 5,000	$ 5,000	
Periodic Sampling and Annual Reporting	YEAR	1	$ 75,000	$ 75,000	
			TOTAL ESTIMATED COSTS	**$ 101,600**	
			AACE Class 4 (-30%)	**$ 71,120**	
			AACE Class 4 (+50%)	**$ 152,400**	
			Net Present Value (Years 9-15)	$ 547,552	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
			Net Present Value Project Costs	**$ 4,220,000**	

Table 17

TABLE 17: GROUNDWATER PUMP AND TREAT CLASS 4 ROM COST ESTIMATE

Option Summary: Pump groundwater with up to 20 extraction wells (for a contingecy) at approximately 60 gpm and convey water to a new centralized treatment plant located within OU3. Treatment components were oversized to allow flexibility and create capacity in the event additonal wells or higher flow rates are observed. Treatment consists of equalization, chemical pre-treatment, clarifier, filter press, biofouling treatment, bag filtration, Greensand filters, sacrificial GAC, and specialty media for supplemental treatment for PFAS, arsenic, and heavy metals. The OMM costs for this RAA are may likely to extend beyod the 20 year timeframe. However, for comparison purposes, the costs were restricted to 20 years.

ITEM	UNITS	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED COST	NOTES
PLANNING, REPORTING, AND PDI - YEAR 0-5					
Pre-Design Planning and Investigation	LS	1	$ 600,000	$ 600,000	Includes PDI Work Plan and Evaluation Report. Collecting updated groundwater quality data to determine if injections are warranted. Aquifer testing, groundwater modeling, geotech investigation, bench testing.
Permits & Permit Compliance, Access	LS	1	$ 100,000	$ 100,000	NPDES permit, well permits, etc.
Access Agreements and Negotiations	LS	1	$ 50,000	$ 50,000	
Planning meetings	EA	5	$ 5,000	$ 25,000	
Community Relations	LS	1	$ 50,000	$ 50,000	
Remedial Design (RD)	% of Equip/Materials	5%	$ 8,425,745	$ 421,287	Includes 90% and 100% RD and associated documents (e.g., FSP, QAPP, etc.)
Agency Submittals and CEA/WRA	LS	1	$ 250,000	$ 250,000	Assumes one remedial action work plan, completion report, and CEA/WRA
5-Year Periodic Review w/ Annual Reporting Data	EACH	4	$ 50,000	$ 200,000	
Subtotal - Pre-Design, Operation, & Regulatory Compliance				**$ 1,696,287**	
IMPLEMENTATION - YEARS 6-7					
GENERAL CONDITIONS					
Utility Location Survey	LS	1	$ 20,000	$ 20,000	
Survey Services (Layout/Record Drawings)	LS	1	$ 25,000	$ 25,000	Survey control & As-Built record drawings
H&S Audit	EA	2	$ 5,000	$ 10,000	
Subtotal - General Conditions				**$ 55,000**	
MOBILIZATION	LS	1	$ 100,000	$ 100,000	
Subtotal - Mobilization				**$ 100,000**	
RECOVERY WELL AND PUMPING SYSTEM					
Well installation	EA	20	$ 15,000	$ 300,000	Up to 20 wells, 4" Diameter SS wells, average depth 65'
Well development	HR	160	$ 400	$ 64,000	8 hours per well
Well pumps	EA	20	$ 5,000	$ 100,000	up to 5 gpm pumps
Well pump instrumentation	EA	20	$ 5,000	$ 100,000	1 flow meter and 1 level transducer per well
Pump system controls	LS	1	$ 225,000	$ 225,000	Pump controls/motor control integrated with treatment system controls
Well head plumbing	EA	20	$ 1,500	$ 30,000	Assumes local flowmeter at each well
Well vaults installed	EA	20	$ 3,000	$ 60,000	
Well Conduits 1" conduit for controls with spares	LF	2,500	$ 125	$ 312,500	Excavation, 1" Control Conduit for flow meter/level transducer, 1" Power Conduit
Well Conduits 3" conduit for water with spares	LF	2,500	$ 100	$ 250,000	Excavation, 3" HDPE Header Pipe, backfill
Road crossing/restoration	EA	2	$ 75,000	$ 150,000	Includes trench box, utility support, restoration, permitting, and police detail
Pump Stations w/ 75 gpm transfer pumps-installed	EA	2	$ 80,000	$ 160,000	needed to help convey water long distance
Bedding material	CY	750	$ 40	$ 30,000	
trenching soil waste disposal	TON	350	$ 90	$ 31,500	
Well installation waste disposal (non-hazardous)	TON	100	$ 90	$ 9,000	Excavation, 3" HDPE Header Pipe, backfill
Surface water discharge piping	FT	400	$ 75	$ 30,000	
Surface water outfall	LS	1	$ 50,000	$ 50,000	
Subtotal - Recovery Well and Pumping System Installation				**$ 1,902,000**	
TREATMENT SYSTEM - PURCHASED EQUIPMENT					
Equalization/reaction tank - 15,000 gallons	EA	1	$ 30,000	$ 30,000	
Reaction tank mixer	EA	1	$ 10,000	$ 10,000	
Chemical dosing system	EA	2	$ 35,000	$ 70,000	Includes backup system
Process pump - 75 gpm	EA	2	$ 5,000	$ 10,000	
Clarifier system- 75 gpm	EA	2	$ 75,000	$ 150,000	With mixers
Coagulant/flocculant dosing	EA	1	$ 50,000	$ 50,000	
pH adjustment system	EA	1	$ 50,000	$ 50,000	
Sludge pump - 5 gpm	EA	2	$ 1,500	$ 3,000	
Sludge thickening tank - 500-gallons	EA	1	$ 1,000	$ 1,000	
Sludge pump - 5 gpm	EA	2	$ 1,500	$ 3,000	
Filter press	EA	2	$ 50,000	$ 100,000	
Air compressor for sludge pumps and filter press	EA	2	$ 10,000	$ 20,000	
Sludge process decant tank - 250 gallons	EA	1	$ 500	$ 500	
Decant water process pump - 5 gpm	EA	2	$ 2,500	$ 5,000	
Biofouling sequestrant metering system	EA	1	$ 35,000	$ 35,000	
Post clarifier holding tank - 5,000 gallons	EA	1	$ 10,000	$ 10,000	
Process pump - 75 gpm	EA	2	$ 5,000	$ 10,000	
Primary Filtration - Multibag Filters	EA	2	$ 10,000	$ 20,000	
Greensand vessels - 6,000lb vessels	EA	4	$ 75,000	$ 300,000	with redundant setup in lead/lag configuration
LGAC vessels - 3,000 lbs vessels	EA	4	$ 50,000	$ 200,000	with redundant setup in lead/lag configuration
PFAS Treatment Vessels - 6,000 lb	EA	4	$ 75,000	$ 300,000	with redundant setup in lead/lag configuration
Arsenic Treatment Vessels - 6,000lb	EA	4	$ 75,000	$ 300,000	If needed to meet discharge limits. Includes redundant train
Metals Treatment Vessels - 6,000lb	EA	4	$ 75,000	$ 300,000	If needed to meet discharge limits. Includes redundant train
Effluent Tank - 5,000 gallons	EA	1	$ 10,000	$ 10,000	
Greensand regeneration setup	EA	1	$ 40,000	$ 40,000	Includes pump and tanks, not chemicals
Discharge pump - 75 gpm	EA	1	$ 5,000	$ 5,000	
Initial GAC fill	LB	12000	$ 2	$ 24,000	
Initial PFAS Media Fill	LB	24000	$ 3.50	$ 84,000	
Initial HS-AS fill	LB	24000	$ 4.25	$ 102,000	
Initial HS-MT fill	LB	24000	$ 3.70	$ 88,800	
Initial Greensand Fill	CF	800	$ 90	$ 72,000	
Subtotal - Treatment System Purchased Equipment				**$ 2,403,300**	

Table 17 cont.

TABLE 17: GROUNDWATER PUMP AND TREAT CLASS 4 ROM COST ESTIMATE

Option Summary: Pump groundwater with up to 20 extraction wells (for a contingecy) at approximately 60 gpm and convey water to a new centralized treatment plant located within OU3. Treatment components were oversized to allow flexibility and create capacity in the event additonal wells or higher flow rates are observed. Treatment consists of equalization, chemical pre-treatment, clarifier, filter press, biofouling treatment, bag filtration, Greensand filters, sacrificial GAC, and specialty media for supplemental treatment for PFAS, arsenic, and heavy metals. The OMM costs for this RAA are may likely to extend beyod the 20 year timeframe. However, for comparison purposes, the costs were restricted to 20 years.

ITEM	UNITS	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED COST	NOTES
TREATMENT SYSTEM - OTHER DIRECT COSTS					
Equipment Installation	% of Equipment	40%	$ 2,403,300	$ 961,320	
Instrumentation and Controls	% of Equipment	15%	$ 2,403,300	$ 360,495	
Piping	% of Equipment	50%	$ 2,403,300	$ 1,201,650	
Electrical	% of Equipment	15%	$ 2,403,300	$ 360,495	
Heating	% of Equipment	10%	$ 2,403,300	$ 240,330	
Water/Sewer	% of Equipment	5%	$ 2,403,300	$ 120,165	
New Building	% of Equipment	20%	$ 2,403,300	$ 480,660	
Yard/Ground Improvements	% of Equipment	10%	$ 2,403,300	$ 240,330	clearing/grubbing/disposal/earthwork/ground improvement
		Subtotal - Other Direct Costs		**$ 3,965,445**	
		TOTAL DIRECT COSTS		$ 8,425,745	
INDIRECT COSTS					
Engineering Design and Supervision	% of Equipment	33%	$ 2,403,300	$ 793,089	
Construction Expenses	% of Equipment	45%	$ 2,403,300	$ 1,081,485	
Health & Safety - Level D	% of Equipment	10%	$ 2,403,300	$ 240,330	
		TOTAL INDIRECT COSTS		$ 2,114,904	
		TOTAL ESTIMATED CAPITAL INVESTMENT		**$ 12,236,936**	
		AACE Class 4 (-30%)		**$ 8,565,855**	
		AACE Class 4 (+50%)		**$ 18,355,404**	

TABLE 6: GROUNDWATER PUMP AND TREAT CLASS 4 ROM COST ESTIMATE

ITEM	UNITS	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED COST	NOTES
ANNUAL OPERATION, MAINTENANCE, AND MONITORING YEARS 8-20					
Operator - Routine Operations & Maintenance	HR	3640	$ 90	$ 327,600	full time operator - day shift only (10 hrs/day)
Project Management	HR	240	$ 225	$ 54,000	20 hours per month
Health and Safety supplies/equipment	LS	1	$ 5,000	$ 5,000	
Fixed Maintenance Costs	% of Direct	2%	$ 8,425,745	$ 168,515	Scheduled building and system maintenance and replacement equipment costs Includes annual well, pump, and piping maintenance
Electrical	Kw-hr	400000	$ 0.35	$ 140,000	40 HP for pumps assumed, +50% for heat, lights, controls
Bag Filters	EA	624	$ 10	$ 6,240	12 bags per week
Bag filter disposal - in 55-gal drum	EA	10	$ 300	$ 3,000	30 bags per drum
pH adjustment chemicals	Totes	6	$ 3,000	$ 18,000	Assumes 0.5 275-gallon tote per month
Coagulant/Flocculant system chemicals	Totes	12	$ 5,000	$ 60,000	Assumes 1 275-gallon tote per month
Precipitant	Totes	12	$ 5,000	$ 60,000	Assumes 1 275-gallon tote per month
Biofouling sequestrant	Totes	6	$ 5,000	$ 30,000	Assumes 0.5 275-gallon tote per month
Greensand regenerant - KMNO4	LB	700	$ 6	$ 4,201	Assume quarterly regeneration, 1 lb KMnO4/5 gal water
Spent regenerant disposal	GAL	3500	$ 2	$ 7,000	Includes pickup/disposal
Media Changeout - labor and equipment	LB	15000	$ 5	$ 75,000	Assume annual changeout, Includes labor/equipment for spent GAC removal and new GAC fill. Includes normalized costs for triannual changeout for other media
Replacement Greensand	CF	70	$ 90	$ 6,300	Assumes changeout every 3 years for 2 vessels; normalized for annual costs
Replacement GAC	LB	6000	$ 2	$ 12,000	Replacement GAC every year
Initial PFAS Media Fill	LB	6000	$ 3.50	$ 21,000	
Replacement HS-AS	LB	6000	$ 4.25	$ 25,500	Assumes changeout every 3 years for 2 vessels; normalized for annual costs
Replacement HS-MT	LB	6000	$ 3.70	$ 22,200	Assumes changeout every 3 years for 2 vessels; normalized for annual costs
Spent media disposal	Ton	100	$ 1,000	$ 100,000	21 tons every 3 years; normalized for annual costs
Solids disposal from sludge system	Ton	100	$ 1,000	$ 100,000	based off of 750 mg/L TSS, every year
Monthly sampling and discharge reporting	MONTH	12	$ 8,000	$ 96,000	
Annual Reporting	Year	1	$ 25,000	$ 25,000	
Misc. expenses	MONTH	12	$ 1,000	$ 12,000	
		Subtotal Estimated Annual O&M		**$ 1,379,000**	
		Total Estimated Annual O&M		**$ 1,379,000**	
		AACE Class 4 (-30%)		**$ 965,300**	
		AACE Class 4 (+50%)		**$ 2,068,500**	
		Net Present Value O&M (Years 8-20)		11,525,200	Net present value at 7% per USEPA Guidance for non-federal remediation sites.
		Net Present Value Project Costs		**$ 23,760,000**	

Assumptions

1. Required treatment system flow is assumed to be 60 gallons per minute and consists of groundwater only.
2. This estimate assumes connection to a local power supply.
3. This estimate assumes discharge to surface water
4. All treatment equipment includes redundant equipment to allow the system to continue operating during period of maintenance or equipment repair.
5. The estimate for the pumping well network assumes multiple local control panels to minimize overall amount of electrical/controls piping.
6. Equipment replacement assumed.
7. Percentages used for installation costs on the basis of total equipment cost or total direct cost are provided from Peter and Timmerhaus.

APPENDIX III

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

09/25/2025

REGION ID: 02

Site Name: SHERWIN-WILLIAMS/HILLIARDS CREEK SITE
CERCLIS ID: NJD980417976
OUID: 03
SSID: 02QN
Action: ROD

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
758111	09/25/2025	ADMINISTRATIVE RECORD INDEX FOR OU3 - GROUNDWATER FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	3	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
618301	11/21/2019	RESPONSE TO US EPA COMMENTS 10/03/2019 ON THE JUNE 2019 DRAFT HUMAN HEALTH RISK ASSESSMENT REPORT FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	6	Letter	KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)	(THE SHERWIN-WILLIAMS COMPANY)
618303	11/21/2019	REVISED HUMAN HEALTH RISK ASSESSMENT REPORT PART 1 OF 3 FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	95	Report	(THE SHERWIN-WILLIAMS COMPANY)	(GRADIENT CORPORATION)
618304	11/21/2019	REVISED HUMAN HEALTH RISK ASSESSMENT REPORT PART 2 OF 3 APPENDIX A FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	3347	Report	(THE SHERWIN-WILLIAMS COMPANY)	(GRADIENT CORPORATION)
618305	11/21/2019	REVISED HUMAN HEALTH RISK ASSESSMENT REPORT PART 3 OF 3 APPENDIX B - H FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	458	Report	(THE SHERWIN-WILLIAMS COMPANY)	(GRADIENT CORPORATION)
618299	01/22/2020	US EPA APPROVES THE 11/21/2019 REVISED HUMAN HEALTH RISK ASSESSMENT REPORT FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1	Letter	(THE SHERWIN-WILLIAMS COMPANY)	KLIMCSAK,RAYMOND (US ENVIRONMENTAL PROTECTION AGENCY)
735820	07/15/2024	IDENTIFICATION OF CANDIDATE TECHNOLOGIES MEMORANDUM FOR THE FORMER MANUFACTURING PLANT FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	28	Report	(THE SHERWIN-WILLIAMS COMPANY)	(THE ELM GROUP INCORPORATED)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

09/25/2025

REGION ID: 02

Site Name: SHERWIN-WILLIAMS/HILLIARDS CREEK SITE
CERCLIS ID: NJD980417976
OUID: 03
SSID: 02QN
Action: ROD

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
735821	08/14/2024	US EPA APPROVAL OF THE IDENTIFICATION OF CANDIDATE TECHNOLOGIES MEMORANDUM FOR THE FORMER MANUFACTURING PLANT FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	2	Letter	(THE SHERWIN-WILLIAMS COMPANY)	MONTROY,BRIAN (US ENVIRONMENTAL PROTECTION AGENCY)
735817	10/04/2024	FORMER MANUFACTURING PLANT GROUNDWATER REMEDIAL INVESTIGATION REPORT FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	2105	Report		(WESTON SOLUTIONS INCORPORATED)
735818	10/04/2024	FORMER MANUFACTURING PLANT GROUNDWATER REMEDIAL INVESTIGATION REPORT - APPENDICES FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1509	Report		(WESTON SOLUTIONS INCORPORATED)
735819	10/10/2024	US EPA APPROVAL OF THE FORMER MANUFACTURING PLANT GROUNDWATER REMEDIAL INVESTIGATION REPORT FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	2	Letter	(THE SHERWIN-WILLIAMS COMPANY)	JOSEPHSON,JEFF,J (US ENVIRONMENTAL PROTECTION AGENCY)
763683	10/17/2024	GROUNDWATER REMEDIAL INVESTIGATION REPORT ADDENDUM FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	7	Report	MONTROY,BRIAN (US ENVIRONMENTAL PROTECTION AGENCY)	(THE SHERWIN-WILLIAMS COMPANY)
763684	12/18/2024	US EPA APPROVAL OF THE GROUNDWATER REMEDIAL INVESTIGATION REPORT ADDENDUM FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	2	Email	(THE SHERWIN-WILLIAMS COMPANY)	MONTROY,BRIAN (US ENVIRONMENTAL PROTECTION AGENCY)
763687	07/08/2025	NJDEP CONCURRENCE ON THE PROPOSED PLAN FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	1	Letter	EVANGELISTA,PAT (US ENVIRONMENTAL PROTECTION AGENCY)	HAYMES,DAVID (NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

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09/25/2025

REGION ID: 02

Site Name: SHERWIN-WILLIAMS/HILLIARDS CREEK SITE
CERCLIS ID: NJD980417976
OUID: 03
SSID: 02QN
Action: ROD

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
682930	07/11/2025	DRAFT FINAL FEASIBILITY STUDY FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	305	Report	(THE SHERWIN-WILLIAMS COMPANY)	(THE ELM GROUP INCORPORATED)
758110	07/24/2025	PROPOSED PLAN FOR OU3 - GROUNDWATER FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	35	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)
766102	07/11/2025	FINAL FEASIBILITY STUDY FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	304	Report	(THE SHERWIN-WILLIAMS COMPANY)	(THE ELM GROUP INCORPORATED)
766103	09/22/2025	US EPA APPROVAL OF THE FINAL FEASIBILITY STUDY FOR OU3 FOR THE SHERWIN-WILLIAMS/HILLIARDS CREEK SITE	2	Letter	(THE SHERWIN-WILLIAMS COMPANY)	MONTROY,BRIAN (US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX IV

STATE LETTER OF CONCURRENCE

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CONTAMINATED SITE REMEDIATION & REDEVELOPMENT
401 East State Street
P.O. Box 420, Mail Code 401-06
Trenton, New Jersey 08625-0402
Tel. (609) 292-1250 • Fax (609) 777-1914
www.nj.gov/dep

PHILIP D. MURPHY
Governor

TAHESHA L. WAY
Lt. Governor

SHAWN M. LATOURETTE
Commissioner

September 23, 2025

Pat Evangelista, Director
Superfund and Emergency Management Division
USEPA Region II
290 Broadway
New York, NY 10007-1866

Re: Record of Decision
Sherwin Williams/Hilliards Creek Superfund Site, Operable Unit 3
Gibbsboro Borough, Camden County

Dear Mr. Evangelista,

The New Jersey Department of Environmental Protection (Department) has completed its review of the Record of Decision (ROD) for the Sherwin Williams/Hilliards Creek Superfund Site, Operable Unit 3. The ROD was prepared by the United States Environmental Protection Agency to address groundwater contamination with concentrations exceeding the New Jersey Ground Water Quality Standards emanating from the soil source area.

The Department concurs with the selected remedy, Alternative 3, which includes:

- In-situ treatment of groundwater through in-situ chemical oxidation (ISCO), in-situ chemical reduction (ISCR) with bioremediation, and sequestration and enhanced bioremediation
- Establishment of institutional controls
- Attenuation via natural processes following in-situ treatment, and
- Long-term monitoring of groundwater after implementation of in-situ treatment.

The proposed remedy is consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan and is protective of public health and the environment.

The Department appreciates the opportunity to participate in the decision-making process to select an appropriate remedy. If you have any questions regarding this matter, contact Gwen Zervas at (609) 940-4515, or via e-mail at Gwen.Zervas@dep.nj.gov.

Sincerely,

David E. Haymes
Assistant Commissioner

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APPENDIX V

RESPONSIVENESS SUMMARY

APPENDIX V

RESPONSIVENESS SUMMARY

Operable Unit 3 of the Sherwin-Williams/Hilliards Creek Superfund Site
Gibbsboro, Camden County, New Jersey

INTRODUCTION

A responsiveness summary is required by Superfund policy. It provides a summary of comments and concerns received during the public comment period, and the United States Environmental Protection Agency's (EPA's) responses to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision for selection of a remedial alternative for the site.

BACKGROUND ON COMMUNITY INVOLVEMENT

The subject of this Record of Decision (ROD) and Responsiveness Summary is OU3 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, Voorhees and Lindenwold, New Jersey. Public interest in the "Sherwin-Williams Sites" has been high.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The RI report, FS report, and the Proposed Plan for the Site were released to the public for comment on July 27, 2025. These documents were made available to the public in the administrative record file at the EPA Region 2 Office in New York City, as well as online at: www.epa.gov/superfund/sherwin-williams. Additionally, the documents are also available at the following local repositories, Gibbsboro Borough Hall/Library, 49 Kirkwood Road, Gibbsboro, New Jersey 08026 and the M. Alan Vogelson Region Branch Library – Voorhees, 203 Laurel Road, Voorhees, New Jersey 08043. The notice of availability for the above-referenced documents was published in the Courier Post on July 27, 2025. The public comment period on these documents was held from July 27, 2025, to August 26, 2025.

On August 7, 2027, EPA conducted a public meeting at Gibbsboro Senior Center, 772 Pole Hill Park Drive, Gibbsboro, New Jersey 08026, to inform local officials and interested citizens about the Superfund process, to review current and planned remedial activities at the Site, and to respond to any questions from area residents and other attendees.

SUMMARY OF COMMENTS AND RESPONSES

The following correspondence (see Attachment A) was received during the public comment period:

- Email from Craig Oren asking for the Sherwin Williams Site address and the citation to the Federal Registry Notice of the availability of the plan.
- Email containing a formal letter providing comments from Borough of Gibbsboro.

A summary of the comments contained in the above letters and the comments provided by the public at the public meeting, as well as EPA's response to those comments, follows.

Comment # 1: A resident asked, when is the proposed beginning of the OU3 project: will it be 2, 3, or 4 years?

Response to Comment # 1: EPA estimates that construction of the OU3 cleanup will take approximately two years; however, it will be several years before the cleanup begins. It is difficult to predict the exact timeframe because there are numerous steps that need to take place before the remediation can begin. Once the Record of Decision (ROD) selecting the remedy has been signed, EPA will present Sherwin-Williams with an opportunity to perform the remedy. If Sherwin-Williams elects to conduct the OU3 remedy, EPA and the United States Department of Justice will enter negotiations with Sherwin-Williams to conduct the work that is detailed in this ROD. If an agreement is reached, such an agreement would be documented and formalized in an amendment to the existing judicial Consent Decree, that would be signed by EPA and Sherwin-Williams and presented for court approval, which would include a statement of work under which Sherwin-Williams will conduct the cleanup. As part of that work, Sherwin-Williams will develop a more detailed time frame to prepare the design, and major cleanup milestones. Next, Sherwin Williams will complete a pre-design investigation or PDI, which could take multiple iterations to get all the data needed to complete the design for the cleanup. After the PDI is complete, EPA anticipates that Sherwin -Williams will design the remedy under EPA's oversight. Once the design is complete, EPA anticipates that Sherwin Williams will carry out the work (install the injection wells and inject the treatments into the ground). Once that is complete, EPA would expect a short pause in site work to allow the treatments to work before long term monitoring of the remedy begins.

Comment # 2: A resident stated that their home is sort of on the edge of where the groundwater contamination has been found, and it has never been tested. They asked if their property could be tested, and if the remediation will have any impact on it.

Response to Comment # 2: The property in question is located up and to the side of the groundwater flow at the Site, approximately 200 feet east of the light non aqueous phase liquid (LNAPL) limit. Clean groundwater and soil samples have been collected between the limits of the LNAPL and the residence in question. Additionally, groundwater flow is to the south, away from the residence. Based on this information, EPA concluded testing at the property is not warranted at this time. EPA will continue to evaluate future conditions periodically throughout the design and implementation of the OU3 remedy. EPA does not anticipate the OU3 cleanup will have an impact on the property in question.

Comment # 3: Several residents asked whether, if Alternative 3 is chosen, there will be any piping or discharge from the treatment process or will it all be pumped into the ground? Additionally, will the treatment area of 25,000 square feet be one location or will it be spread out in many areas, and if this treatment is best for treating deep soils, are there other locations that have soil contamination?

Response to Comment # 3: Alternative 3 is a groundwater remedy and will not result in any discharge at the surface. Rather than piping, wells will be used to pump treatment material into the groundwater. All wells will be installed on the Sherwin-Williams Property (FMP Area) in the area referred to as the former Tank Farm A (TFA) area. The treatment area will be one contiguous area that is approximately 25,000 square feet and about 55 to 75 feet below the ground surface. The size of the treatment area and its depth will be fine-tuned during the pre-design investigations phase. Once the design has been completed, treatment material will be pumped into the ground and the material will stay in this area and break down the contamination. Shallow soils contamination, which is the source of the groundwater contamination, is being addressed under the OU2 cleanup which is currently in progress.

Comment # 4: A resident asked if the pipeline that will be used to transport sediment from Kirkwood Lake is going to run through their back yard, and why does EPA not have an area in Voorhees and Kirkwood to handle this material. The resident also asked if the cleanup of Kirkwood Lake is going to happen before the Square Circle Lake (i.e. Bridgewood Lake)?

Response to Comment # 4: This question concerns the OU4 remedy selected in 2021 which addressed various waterbodies at the Sites. The pipeline that will carry dredge material from Kirkwood Lake to the sediment dewatering/treatment area will run along Hilliards Creek on public lands, not private property. Several pump stations will assist in pumping the sediment back to the treatment area. In terms of the schedule, EPA continues to clean up contamination related to OU4 from upstream to downstream (Silver Lake to Kirkwood Lake). Camden County has initiated the dredging of Kirkwood Lake outside of EPA's schedule, so it may be dredged ahead of EPA's schedule, prior to Bridgewood lake and Hilliard's Creek. As for the question of why contaminated sediments are being pumped back to Gibbsboro, there are a variety of reasons for this decision including selecting a location central to the cleanup of both Bridgewood and Kirkwood Lakes that would lessen the overall impact on the local communities.

Comment # 5: A resident asked if the groundwater cleanup will affect the cleanup that already happened in the back yards along West Clementon Road?

Response to Comment # 5: The groundwater treatment will be injected into the deep groundwater approximately 55 to 75 feet below the ground surface in the footprint of the former TFA area on the FMP Area property. These operations will not affect the residential cleanups that were already completed along West Clementon Road.

Comment # 6: A resident with monitoring wells on their property asked if it safe to assume that these wells will be used to inject bioremediation or is there a potential that more wells will be needed?

Response to Comment # 6: The wells that are on the property in question will not be used to administer treatment material into the deep groundwater as part of the OU3 cleanup; however, these wells will be used for monitoring purposes (i.e., to track the effectiveness of the OU3 remedy in meeting the RAOs). The wells that will be used for administering the treatment will be placed on the FMP Area property in the TFA area. EPA does not expect that additional monitoring wells will be needed on the property in question at this time.

Comment # 7: A resident asked why the costs for Alternative 4 are significantly higher than the costs for the other alternatives and would Alternative 4 be better than the other alternatives?

Response to Comment # 7: The reason the costs for Alternative 4 are significantly higher than the cost of the other alternatives is because it requires a tremendous amount of infrastructure that is not required for the other alternatives, including a groundwater treatment plant and 2,500 liner feet of conveyance piping, and all the additional labor needed for construction. As for the relative merit of the alternatives: all the alternatives, other than no action, met the threshold requirements of being protective of human health and the environment and meeting ARARS or providing a basis for a waiver. As described in the ROD, EPA performed a detailed analysis, using the nine evaluation criteria that govern remedy selection for Superfund sites. For each alternative, in addition to the threshold criteria, the five balancing criteria (long term effectiveness and performance, reduction in toxicity, mobility, and volume through treatment, short term effectiveness, implementability, and cost), and the modifying criteria (state and community acceptance) were considered. Based on this analysis, EPA concluded that Alternative 3, Focused In-Situ Treatment with Attenuation via Natural Process, Institutional Controls and Long-Term Monitoring, best meets the selection criteria. While Alternative 4 was a viable cleanup approach, it would have been difficult to implement and would have had a larger impact on the community during construction in comparison to the other alternatives.

Comment # 8: A resident asked whether Alternative 3 would leave the same residual contamination as Alternative 4, once the cleanup was complete?

Response to Comment # 8: Alternative 3, which is projected to take 15 years, and Alternative 4, which EPA projected would take 20 years, were both projected to meet the remedial objectives and meet the NJDEP GWQS when complete.

Comment # 9: A resident asked what is the environmental impact on the community from the installation of the wells proposed in Alternative 3, how many, what type and where would they be placed?

Response to Comment # 9: EPA currently anticipates that four additional monitoring wells will be installed to monitor the long-term performance, but the number of injection wells installed as part of Alternative 3 has yet to be determined. The installation of the monitoring and injection wells, depending on the depth, should take about a day for each well. Depending on where the pre-design investigation shows data gaps, the monitoring wells could be placed on public land or private property, with EPA's preference for installation being within public rights of way. The injections wells will be placed on the FMP Area property. There should be limited disturbance to the local community. Additionally, during the investigation, construction, and remedy implementation phases, a health and safety plan will be developed and perimeter air monitoring will be conducted to assure the protection of the local community.

Comment # 10: A few residents asked for more information about the cleanup process, and whether Sherwin-Williams will design the plans, are negotiations with Sherwin-Williams on-going and how much Sherwin-Williams will contribute towards the cleanup.

Response to Comment # 10: See Response to Comment #1. Sherwin-Williams is currently performing cleanup work for other OUs of the Site. If Sherwin-Williams elects to perform the OU3 cleanup, EPA and the Department of Justice will negotiate with it to conduct the work under an amendment to the current judicial consent decree. Assuming that occurs, EPA and NJDEP will review and approve all reports and design submittals. The consent decree amendment would also address financial assurance, the purpose of which is to assure that if Sherwin-Williams is no longer conducting the work, funds are available for the remediation and long-term monitoring.

Comment # 11: A Gibbsboro official and a resident asked about the impact of the selected remedy on the developable lots like the Paint Works Site, also referred to as the Main Plant Area, and the adjacent properties on United States Avenue.

Response to Comment # 11: EPA does not anticipate the OU3 cleanup will lead to restrictions on the development of parcels around the Silver Lake and across U.S. Avenue. Lots not owned by the Borough will have to be developed in accordance with the institutional controls that are part of the OU2 and OU3 remedies (deed restrictions (OU2) and CEA/WRA (OU3)); however, with all stakeholders working together, development should be able to procced. Additionally, owners of properties that are not affected by the OU2 and OU3 remedies do not have to wait until the OU3 remedy has been completed. The remedial efforts, building designs and infrastructure can be designed in such a way as to not impact the development of these parcels.

Comment # 12: A Gibbsboro official asked when sampling of soil under the 2 and 4 Forster Avenue building slabs will take place, and about the ability to redevelop these properties once the soil stockpiling is completed?

Response to Comment # 12: The 2 and 4 Foster Avenue building slabs are currently being used for the storage of contaminated sediment removed from Silver Lake as part of the OU4 cleanup. This operation is in progress now and EPA anticipates it will continue into the 4th quarter of 2025. After the cleanup of Silver Lake has been completed, this area will continue to be used as a staging area for soils excavated from the Former Lagoon Area, 7 Foster Avenue, and the Seep Area. The cleanup of these areas, part of the OU2 cleanup, is tentatively scheduled to be carried out from early 2026 to early 2027. There is still contamination beneath the building slabs that has not been addressed. A PDI to delineate the remaining contamination will take place once all the soil removal (Former Lagoon, 7 Foster, Seep Area) has been completed. Additionally, a soil vapor extraction and nutrient injection system will be installed and operated to remediate the LNAPL as part of the OU2 cleanup at the Site. Optimally, it would be best to wait until all this work has been competed before redevelopment begins, but redevelopment could happen sooner given proper planning to avoid interfering with the cleanup and other such considerations.

Comment # 13: A Gibbsboro official expressed several concerns about the potential for daylighting, breakthrough, or the release of amendments into sensitive areas, the transportation and storage of amendments, and the safety of construction workers and the passers-by during remediation. Their concerns include:

1. Will 24-hour monitoring during the injection process be by a human or via electronic means?
2. When will the health and safety plan be developed?

3. Wouldn't it make more sense to evaluate the risks to workers and the public from the proposed solutions at the same time as alternate approaches are evaluated?
4. What if the risks from the implementation of the selected alternate are unacceptable?
5. How does the public and the local government get briefed on the health and safety plan and what opportunity do they have to provide input to the plan?

Response to Comment # 13: 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.

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:

1. ***Will 24-hour monitoring during the injection process be by a human or via electronic means?*** 24-hour monitoring will not be required as part of remedy implementation. Monitoring will only be conducted during periods when active injections of amendments are taking place to ensure no daylighting, breakthrough, or releases into sensitive areas occurs. This will entail manual inspection, by a human looking for signs of breakthrough or daylighting within the treatment area, as well as any sensitive areas (catch basins, drainage culverts, etc) in the vicinity. Additionally, it should be noted that the amendments will be injected into the deep groundwater, approximately 55 to 75 feet below the ground surface which would be significantly deeper than any of the surrounding utilities. Lastly, lower injection pressures would be used during the injection process to ensure that daylighting and breakthrough would not happen.

2. ***When will the health and safety plan be developed?*** The health and safety plan is developed during the preparation of the Remedial Action Work Plan (RAWP) which is submitted after the detailed design has been approved. It includes details on the steps necessary to implement the remedial action and includes additional support plans like the Health and Safety Plan, a Construction Quality Assurance/Quality Control Plan, Perimeter Air Monitoring Plan, Field Sampling Plan and an Emergency Response Plan, etc. This plan will be submitted to EPA and NJDEP for review, comment and approval before work can commence.

3. ***Wouldn't it make more sense to evaluate the risks to workers and the public from the proposed solutions at the same time as alternate approaches are evaluated?*** EPA has evaluated the risks to workers and the public through the comparative analysis which can

be found in Section 5 of the feasibility study and summarized in the evaluation of alternatives section in the Proposed Plan. As part of this evaluation, EPA considered the short-term effectiveness of each of the alternatives. This criterion evaluates the protectiveness of each alternative in terms of its impacts on the local community, construction workers and the environment during the remedial action. Through this evaluation EPA determined that protection of the public, on-site workers and the environment could be achieved. If EPA had determined that these protections could not be achieved this alternative would have dropped out of consideration and would not have been selected.

4. ***What if the risks from the implementation of the selected alternate are unacceptable***? See response to Comment # 13 (3) above.

5. ***How does the public and the local government get briefed on the health and safety plan and what opportunity do they have to provide input to the plan?*** The public and local government typically do not get briefed or provide input on the health and safety plan, although there have been instances where aspects of the health and safety plan have been shared with first responders so they are aware of Site-related hazards in case of emergencies. This health and safety plan describes the activities that will be performed at the Site and protections that will be provided to on-site workers and area residents from physical, chemical, and all other hazards posed by the remedial work. EPA will review the plan to ensure all the necessary elements to protect human health and the environment have been included. Once reviewed it can be made available upon request and project updates can be provided to the community on a regular basis.

Comment # 14: The Borough of Gibbsboro also expressed concerns about the generation of poisonous gases during the implementation of Alternative 3, stating **"**Previously, it was stated that methane gas was a byproduct of the natural (and proposed) attenuation of the contaminants. There is no mention of methane gas being a byproduct of any of the alternatives". The following are the Borough's concerns:

1. Is methane, or other gases, no longer a concern for the public?
2. If the venting of methane, or any poisonous gas is possible, it should be disclosed and methods for collection and storage should be shared with the public.
3. Previously, EPA requested that the Gibbsboro Planning Board require vapor barriers for the new townhomes being constructed on lot 4. Is that no longer a requirement?

Response to Comment # 14: Methane is still a concern for the public, and it is being addressed under the OU2 remedy with the installation of a soil vapor extraction system. Most of the methane production is caused by the biodegradation of the residual LNAPL that is floating on the surface of the shallow groundwater. Additionally, the biodegradation process that will be taking place as part of the OU3 remedy will be concentrated in the deep groundwater at an approximate depth of 55 to 75 feet below the ground surface. Couple that with the fact that the groundwater treatment areas are located within the footprint of the soil vapor extraction system, there are no additional methane-related hazards that would need to be addressed as part of the OU3 selected remedy. EPA requested that the Gibbsboro Planning Board require vapor barriers for the new townhome construction on lot 4, and this request still applies.

Comment # 15: The Borough of Gibbsboro expressed concerns about the redevelopment of lots located in the vicinity of the Former Manufacturing Plant, stating "The Borough of Gibbsboro intends to redevelop, within the next 18 months, block 8.01, lot 3.07 for use as a restaurant or catering facility. To facilitate that use, the Borough requests that monitoring wells and equipment be located on the adjacent Sherwin-Williams properties, and that land use restrictions and controls should be limited to a restriction on groundwater use. (The same concern exists for block 21, lots 1.01 and 2.)"

Response to Comment # 15: EPA will support the Borough in its redevelopment plans to the extent it can. The best approach for a seamless redevelopment is to get all stakeholders involved in the redevelopment process as early as possible. Although OU3 remedial activities will be confined to the FMP Area, the OU2 remedial efforts will not. EPA cannot guarantee that all monitoring wells and equipment will be located on the adjacent Sherwin-Williams Property (FMP Area), but EPA can work together with the Borough to minimize the impact of the cleanup on the Borough's redevelopment plans as much as possible. It is not EPA's intention that the remediation activities interfere with current or anticipated future use of any portion of the Site, as long as redevelopment does not interfere with the implementation or future protectiveness of the remedies for the Site. As for future use restrictions, EPA cannot limit the use of restrictions to groundwater only when residual soil contamination remains in place. 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. As discussed in the OU2 ROD, complete removal of residual levels of soil contamination at depth presents greater implementability challenges (one of the nine criteria cited above) by increasing excavation depths below the groundwater table and increasing the volume of soil to be dewatered and removed, and would have provided 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. For both OU3, the subject of this ROD, and OU2, which addresses soil contamination, EPA selected protective remedies that represent the best balance considering all nine criteria.

Comment # 16: The Borough of Gibbsboro has concerns about impacts or any restrictions/controls that will be imposed on the residential properties along South United States Avenue.

Response to comment # 16: Other than the placement of the Classification Exception Area/ Well Restriction Area (CEA/WRA), which will restrict the use of contaminated groundwater, there are no other restrictions for the residential properties across U.S. Avenue.

Comment # 17: The Borough of Gibbsboro has concerns in relation to a section of the Proposed Plan that states "If during the PDI phase this study yields less than optimal results, EPA may evaluate other technologies, i.e. ISCO and ISCR with bioremediation." The following are the Borough's concerns:

1. How long will it take for EPA to determine if the selected alternative is functioning as predicted?
2. How will the public be kept informed?
3. If the remedy is less effective than predicted, will another plan be developed, followed by another public hearing, and public comment period?
4. Waiting a decade to achieve optimal results is a long time - for this reason we again urge EPA to monitor emerging technologies that may enable acceleration of the remediation of this site concurrent with the implementation of alternate 3.

Response to comment # 17: 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:

1. ***How long will it take for EPA to determine if the selected alternative is functioning as predicted?*** Based on the evaluation of the three in-situ treatment technologies, sequestration and enhanced bioremediation was the most promising given existing site conditions, and for its use of non-hazardous amendments that would effectively and quickly treat benzene. Although it is hard to provide an exact time frame for when the decision on whether to use sequestration or enhanced bioremediation, or opt for a different in-situ treatment, will be made, EPA can say that the decision will be made during the PDI investigation after the bench scale study has been completed. The results of this study will provide a decision point to see if other in-situ treatments will need to be evaluated.

2. ***How will the public be kept informed?*** EPA will hold periodic public information sessions to keep the public informed about the projects.

3. ***If the remedy is less effective than predicted, will another plan be developed, followed by another public hearing, and public comment period?*** Although, EPA selected sequestration with bioremediation as the remedial alternative, there is some leeway to change amendments if needed, without having to restart the entire process since the ROD lists other amendments (ISCO and ISRC) as also possibly being effective. These other amendments are also considered to fit within the selected remedy, Focused In-Situ Treatment, Attenuation via Natural Processes, and LTM. Because the selected remedy incorporates consideration of alternate amendment types, it would not be a lengthy process to make this kind of change.

4. ***Waiting a decade to achieve optimal results is a long time - for this reason we again urge EPA to monitor emerging technologies that may enable acceleration of the remediation of this site concurrent with the implementation of alternate 3.*** EPA is committed to cleaning up the legacy contamination associated with the Sherwin Williams Superfund Site and will continue to monitor emerging technologies as necessary to ensure a timely cleanup.

Comment # 18: The Borough of Gibbsboro requested that the historic use of the Former Manufacturing Plant be revised to correct two items as provided below:

1. **Factory Operations:** The factory ceased production of paint and other products in August 1978, not in 1977. From September through December 31, 1978, the factory was shut down and final product was shipped out as well as salvage materials that Sherwin-Williams removed. The Borough has documentation to corroborate these dates.
2. **Pre-Lucas use of the Mill Pond (Silver Lake):** Prior to John Lucas' purchase of John Ford's mill, the site had existed as both grist- and sawmills dating back into the 1700s, not the early 1800s.

Response to Comment # 18: EPA acknowledges the Borough’s comment. EPA does not have information to make changes to the Site history description in the ROD at this time.

APPENDIX V

RESPONSIVENESS SUMMARY
ATTACHMENT A

LETTERS SUBMITTED DURING THE PUBLIC COMMENT PERIOD

From:	Montroy, Brian
To:	Craig Oren
Subject:	RE: Sherwin Williams
Date:	Thursday, July 31, 2025 2:52:00 PM

Your Welcome. Have a great rest of the eek.

Brian K. Montroy, PG (NY), CPG
Remedial Project Manager, Central New Jersey Remedial Section
212.637.4177
Montroy.brian@epa.gov

From: Craig Oren <oren@rutgers.edu>
Sent: Thursday, July 31, 2025 2:38 PM
To: Montroy, Brian <Montroy.Brian@epa.gov>
Subject: RE: Sherwin Williams

You don't often get email from oren@rutgers.edu. Learn why this is important

Caution: This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Brian,

Thank you – this is very helpful. I'll let you know if I think I need more information.

Best, Craig Oren

From: Montroy, Brian <Montroy.Brian@epa.gov>
Sent: Thursday, July 31, 2025 12:31 PM
To: Craig Oren <oren@rutgers.edu>
Subject: RE: Sherwin Williams

Mr. Oren,

Thank you for your inquiry. There is no Federal Register notice for the release of the Proposed Plan, as this method is only used for proposed and final rules. However, the Agency does place a notice regarding the release of the Plan in local newspapers. For the release of this Proposed Plan, we placed a notice in the Cherry Hill Courier Post with a run date of Sunday 7/27/2025. In addition to the newspaper notice, we also announced the release of the Proposed Plan and the start of the public comment period in an official press release. I have appended the news release to this email for your convenience. I hope this helps. Should you need any additional information please let me know. Thank you and have a great day.

Brian

Brian K. Montroy, PG (NY), CPG
Remedial Project Manager, Central New Jersey Remedial Section
212.637.4177
Montroy.brian@epa.gov

From: Craig Oren <oren@rutgers.edu>
Sent: Wednesday, July 30, 2025 10:57 AM
To: Montroy, Brian <Montroy.Brian@epa.gov>
Subject: Sherwin Williams

You don't often get email from oren@rutgers.edu. Learn why this is important

Caution: This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Mr. Montroy,

I am not ready to file a comment on the remedial plan, but could you tell me the address of the Sherwin Williams site? Can you also give me a citation to the Federal Register notice of the availability of the plan? I live not far away, and so I'd like to follow what happens.

Thank you for your help!

Craig Oren

Professor Emeritus Craig N. Oren home telephone

856-795-2431
Rutgers Law School

Send all postal correspondence to home address:

1802 Rolling Ln.
Cherry Hill,N.J. 08003-3326 mailto: oren@rutgers.edu

View my research on my SSRN Author page:
https://ssrn.com/author=39319.

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Edward G. Campbell, III
Mayor

Amy C. Troxel, RMC
Borough Clerk

1924 Celebrating 100 Years 2024

August 25, 2025

Regular Mail & email

Montroy.Brian@epa.gov

Brian Montroy
290 Broadway
19th Floor
New York, New York 10007

RE: Comments Regarding EPA's Proposed Cleanup Plan
Superfund Site: Sherwin-Williams/Hilliard's Creek
Operable Unit 3: Groundwater contamination associated with FMP

Dear Brian,

I am providing comments on behalf of the Borough of Gibbsboro regarding EPA's proposed cleanup plan for Operable Unit 3 of the Sherwin-Williams/Hilliard's Creek Superfund Site at the former manufacturing plant (FMP). Sherwin-Williams left Gibbsboro at the end of 1978. 47 years later EPA, Sherwin-Williams and Gibbsboro continue addressing the industrial legacy left behind.

The Borough of Gibbsboro is the owner of several parcels within or adjacent to the FMP including block 8.01, lots 5, 3.07, and 3.09, and block 21 lots 1.01 and 2. It is the Borough's intention to redevelop these parcels and there is concern that restrictions may be imposed during, or after, a lengthy, and possibly incomplete, remediation. While we generally support the selection of alternate 3, ***we urge EPA, or Sherwin-Williams at EPA's direction, to continue to evaluate emerging technologies that may enable acceleration of the remediation of this site concurrent with the implementation of alternate 3***.

Evaluated alternatives 2 through 4 diminish the contaminant levels by accelerating natural processes and are estimated to take, minimally, a decade to achieve acceptable results. Alternate 2 is estimated to take twenty years. In the published plan EPA concludes that the selected alternative (alternative 3) "***would have moderate impacts on the environment and public during implementation.*** Impacts could be from pressure build-up, which could lead to chemical releases. Additionally, ***daylighting or breakout of the injected amendment could also be released into sensitive areas*** (catch basins, drainage culverts, etc.) outside the treatment area. The balance of lower injection pressures and 24 [hour] monitoring of the area surrounding the injection is an effective way to mitigate these issues. Additionally, ***transportation and storage of the amendments at the FMP Area during treatment activities could have short term impacts on the surrounding area***. Spills and other incidents could have an effect on workers or the environment. ***If phased injection events were necessary as part of Alternative 3, this would cause added impacts on the community***. Consideration of both worker and passers-by safety would occur during remedy implementation and be addressed in the health and safety plan." While it is good that EPA recognizes the risks associated with the selected remedy, it is puzzling that the agency defers discussion of the ramifications to the health and safety plan - which will be developed at a later time! The raises the following questions and concerns:

1. Will 24-hour monitoring be by a human presence or via electronic means?
2. When will the health and safety plan be developed?
3. Wouldn't it make more sense to evaluate the risks to workers and the public from the proposed solutions at the same time as alternate approaches are evaluated?
4. What if the risks from the implementation of the selected alternate are unacceptable?
5. How does the public and the local government get briefed on the health and safety plan and what opportunity do they have to provide input to the plan?
6. **Poisonous Gases:** Previously, it was stated that methane gas was a byproduct of the natural (and proposed) attenuation of the contaminants. There is no mention of methane gas being a byproduct of any of the alternatives.
   6.1. Is methane, or other gases, no longer a concern for the public?
   6.2. If the venting of methane, or any poisonous gas is possible, it should be disclosed and methods for collection and storage should be shared with the public.
   6.3. Previously, EPA requested that the Gibbsboro Planning Board require vapor barriers for the new townhomes being constructed on lot 4. Is that no longer a requirement?
7. The Borough of Gibbsboro intends to redevelop, within the next 18 months, block 8.01, lot 3.07 for use as a restaurant or catering facility. To facilitate that use, we request that monitoring wells and equipment be located on the adjacent Sherwin-Williams properties. Also land use restrictions and controls should be limited to a restriction on groundwater use. (The same concern exists for block 21, lots 1.01 and 2.)
8. Is there any impact or will there be any restrictions or controls imposed on the residential properties along South United States Avenue?

The plan states, "If during the PDI phase this study yields less than optimal results, ***EPA may*** ***evaluate other technologies***, i.e., ISCO and ISCR with bioremediation."

9. How long will it take for EPA to determine if the selected alternative is functioning as predicted?
10. How will the public be kept informed?
11. If the remedy is less effective than predicted, will another plan be developed, followed by another public hearing, and public comment period?
12. Waiting a decade to achieve optimal results is a long time – for this reason we again urge EPA to monitor emerging technologies that may enable acceleration of the remediation of this site concurrent with the implementation of alternate 3.

GENERAL REDEVELOPMENT:

The Borough of Gibbsboro requests that the selected remedy be designed and implemented to enable concurrent development or redevelopment of the properties in and around the FMP. These lands are owned by Sherwin-Williams (lots 3.03, 3.04, 3.05 & 3.06, and properties south of Foster Avenue) and the Borough of Gibbsboro. We also request that implementation minimize engineering controls and land use restrictions that are imposed on these properties. The speed of implementation and the ultimate performance of the selected remedy are paramount to putting these properties back into productive use. The work done by EPA and Sherwin-Williams has been of high quality and in reasonable timeframes.

SCREENING OF LONG-TERM REMEDIES FROM PUBLIC VIEW:

As the OU3 remedy will take a decade or more to complete, we request that EPA require that the operations be screened to maximum extent possibly from public view and that any equipment be muffled to reduce noise. Service and inspection of the implementation should be conducted from the Foster Avenue entrances to the properties. (**NOTE:** There are many dead trees along the fence line on South United States that were installed by Sherwin-Williams that should be replaced. The trees should be larger to hide the current and future activity taking place between US Ave and the parking lots at the FMP.)

OTHER COMMENTS:

EPA's account of the historical use of the FMP should be revised to correct two items:

Factory Operations: The factory ceased production of paint and other products in August 1978, not in 1977. From September through December 31, 1978, the factory was shut down and final product was shipped out as well as salvage materials that Sherwin-Williams removed. I have documentation to corroborate these dates.

Pre-Lucas use of the Mill Pond (Silver Lake): Prior to John Lucas' purchase of John Ford's mill, the site had existed as both grist- and sawmills dating back into the 1700s, not the early 1800s.

Thank you for the hard work the US EPA has applied to the Gibbsboro Superfund sites and please consider the issues and comments raised herein.

Sincerely,

Edward G. Campbell, III
Mayor

cc: Amy C. Troxel, Borough Clerk
The Honorable Corey Booker, US Senator-NJ
The Honorable Donald Norcross, First District-NJ
The Honorable Louis Greenwald
The Honorable Melinda Kane
Gibbsboro Borough Council
Gibbsboro Planning Board
Gibbsboro Environmental Commission

<u>APPENDIX V</u>

RESPONSIVENESS SUMMARY
ATTACHMENT B

PROPOSED PLAN

Sherwin-Williams/Hilliards Creek Superfund Site
Operable Unit 3
Gibbsboro, Camden County, New Jersey

July 2025

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered to address contaminated groundwater at the Sherwin-Williams/Hilliards Creek Superfund Site (Site) and identifies the preferred remedial alternative with the rationale for this preference. This operable unit is Operable Unit 3 (OU3), the third of four operable units identified for the Site. The Site is located in Gibbsboro, Camden County, New Jersey (Figure 1).

This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA, also known as Superfund), and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of contamination at OU3 of the Site and the remedial alternatives summarized in this Proposed Plan are more fully described in the Remedial Investigation (RI) Report, dated October 4, 2024, and the Feasibility Study (FS) Report, dated July 11, 2025, as well as other documents in the administrative record file for OU3. EPA encourages the public to review these documents to gain a more comprehensive understanding of the Site, the Superfund activities that have been conducted, and the remedial alternative that is being proposed.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
July 27, 2025, to August 26, 2025
EPA will accept written comments on the Proposed Plan during the public comment period. Written comments must be postmarked no later than August 26, 2025. To request an extension, send a request in writing to Brian Montroy by 5:00 PM on August 26, 2025.

IN PERSON PUBLIC MEETING:

August 07, 2025, at 6 pm
EPA will hold a public meeting to explain the Proposed Plan and the 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
772 Pole Hill Park Drive
Gibbsboro, New Jersey 08026

In addition, documents from the administrative record file are available online at: www.epa.gov/superfund/sherwin-williams

The purpose of this Proposed Plan is to inform the public of EPA's preferred remedial alternative and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred alternative.

The preferred alternative includes in-situ source area treatment of Site-related contaminated groundwater which originates in the vicinity of Tank Farm A and extends to the south to the Former Lagoon Area and east into the Eastern Off-Property area (Figure 2). Implementation of a long-term groundwater monitoring program for both the shallow/intermediate and deep groundwater would track and monitor changes in the groundwater contamination to ensure the remedial action objectives (RAOs) are attained. Additional monitoring wells would be installed and included as part of the monitoring well network. The sampling program would also monitor groundwater quality including geochemical conditions and degradation byproducts generated by the treatment processes. The results from the long-term monitoring program would be used to evaluate the migration and changes in volatile organic compound (VOC) contaminants over time for both inside and outside of the treatment area. Throughout the remedial action, institutional controls would be implemented as needed.

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The Proposed Plan describes the preferred alternative for OU3 of the Site. Changes to the preferred alternative, or a change from the preferred remedy to another remedial alternative described in this Proposed Plan, may be made by EPA, in consultation with NJDEP, if public comments or additional data indicate that such a change will result in a more appropriate remedial action. EPA will make the final decision regarding the selected alternative after EPA has taken into consideration all public comments. For this reason, EPA is soliciting public comments on all of the alternatives considered in the Proposed Plan and on the detailed analysis section of the FS Report because EPA may select an alternative other than the preferred alternative.

COMMUNITY ROLE IN SELECTION PROCESS

EPA provides an opportunity for the public to participate in selection of the remedy so the concerns of the community can be considered in selecting a remedy for each Superfund site. To this end, this Proposed Plan has been made available to the public for a public comment period which begins on July 27, 2025, and concludes on August 26, 2025.

A public meeting will be held on August 07, 2025, at the Gibbsboro Senior Center to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments received during the public comment period, together with EPA's responses, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document that formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

Brian Montroy
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866
Telephone: 212-637-4177
Email: Montroy.Brian@epa.gov

SCOPE AND ROLE OF ACTION

The Proposed Plan addresses groundwater contamination at the Site. This operable unit, OU3, is the third of four operable units for the Site. Site remediation activities are sometimes separated into different phases, or OUs, so that remediation of different, discrete environmental media or geographic areas of a site can proceed separately, whether sequentially or concurrently, resulting in a more efficient and expeditious cleanup of the entire site.

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. The Sites represent source areas from which contamination has migrated to downgradient areas within Gibbsboro and Voorhees.

Sherwin-Williams/Hilliards Creek Superfund Site: The Sherwin-Williams/Hilliards Creek Superfund Site has been divided into several OUs to remediate the contamination more efficiently. Operable Unit 1 (OU1) includes residential properties and was addressed under a ROD, issued by EPA in September 2015. That cleanup has been completed, except for one property which EPA will address as part of Operable Unit 4 (OU4) because of its location within the flood plain. Operable Unit 2 (OU2) includes the Former Manufacturing Plant (FMP) Area, Light Non-Aqueous Phase Liquids (LNAPL), and the upper portion of Hilliards Creek. OU2 is being addressed under a ROD issued in August 2020; the remedial designs and remedial actions (RD/RAs) for various areas within OU2 are in various stages of design and/or completion. OU4

(Waterbodies) includes the lower portion of Hilliards Creek, Silver Lake, Bridgewood Lake, and Kirkwood Lake, and is being addressed under a ROD which EPA issued in September 2021. Much like OU2, various elements of OU4 are in various stages of design, with remedial action set to begin in the summer of 2025. Operable Unit 3 (OU3) is the subject of this Proposed Plan and addresses the Site-related contaminated groundwater at and associated with OU2, the FMP Area of the Site.

Route 561 Dump Site: The Dump Site is located approximately 700 feet to the east of the FMP Area. It includes retail businesses, a portion of a residential area, wooded vacant lots, and a small creek. A fenced portion of the Dump Site is located at the base of an earthen dam that forms Clement Lake. White Sand Branch is a small creek which originates at the 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 Superfund Site: The Burn Site consists of a fenced area, a former landfill area, a railroad track area, and several other components. The fenced portion of the Burn Site and its associated contamination is approximately thirteen acres in size and encloses the remaining 400 feet of White Sand Branch. A 500-foot portion of a small creek, Honey Run Brook, 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 West 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.

The table below lists the RODs for the various Sherwin-Williams Sites.

Sherwin Williams/Hilliards Creek Site

Operable Unit	Record of Decision	Status
1- Residential	2015	Complete
2- Former Manufacturing Plant (FMP)	2020	In Progress
3- Groundwater at FMP	Anticipated 2025	Not Started
4- Waterbodies	2021	In Progress

United States Avenue Burn Site

Operable Unit	Record of Decision	Status
1- Residential	2015	Complete
2- Soil and Sediment	2017	Complete
3- Groundwater	TBD	TBD

Route 561 Dump Site

Operable Unit	Decision Document	Status
1- Residential	2015	Complete
2- Soil and Sediment	2016	Complete
3- Groundwater	TBD	TBD

SITE BACKGROUND

Site Description

The Sherwin-Williams/Hilliards Creek Superfund Site Operable Unit 3 is located in Gibbsboro, Camden County, New Jersey. It is bounded to the north by Silver Lake and Route 561, to the east by U. S. Avenue, to the west by East and West Clementon Road, and to the south by vacant land, a cemetery, and Bridgewood Lake.

The FMP Area currently comprises four buildings, the 1, 5, 7, and 10 Foster Avenue buildings, and the 2 and 4 Foster Avenue and 6 East Clementon (6EC) building slabs. The 1, 5, and 7 Foster Avenue buildings are located south of Foster Avenue, while the 10 Foster Avenue building and the 2 and 4 Foster Avenue and 6EC building slabs are located north of Foster Avenue. Most of the FMP Area is owned by The Sherwin-Williams Company (Sherwin-Williams), with two lots, one at the corner of Foster Avenue and East Clementon Road, and the other immediately west of U.S. Avenue, owned by the Borough of Gibbsboro.

The topography of the FMP Area slopes from the northeast, where the elevations are highest, to the southwest. In the locations where the FMP Area is developed, surfaces such as parking lots and building locations are relatively flat and graded towards stormwater collection points. In the vicinity of Hilliards Creek and Bridgewood Lake, the topographic gradient slopes gently towards these water bodies.

There are seven subareas in total that make up the FMP Area of the Sherwin-Williams/Hilliards Creek Superfund Site. To assist in the presentation of this Proposed Plan, six subareas identified as OU2 source areas will be used to present the groundwater contamination associated with former Site operations, as described below (**Figure 2**):

- **<u>Former Main Plant (MP):</u>** This is the northwest part of the Site. This area consists of the former 6 East Clementon Road building slab, the parking area west of the 2 and 4 Foster Avenue building slabs, the 10 Foster Avenue building, and the Silver Lake conveyance system, which is located beneath the paved parking area.
- **<u>The Former Resin Plant (FRP) and Tank Farm A (TFA)</u>**: This is the area immediately north of Foster Avenue and west of U.S. Avenue. The area includes the 2 and 4 Foster Avenue and 3 U.S. Avenue building slabs, and the building slab from a former structure known as the red barn.
- **<u>The Seep Area:</u>** This is the area south of Foster Avenue, west of U.S. Avenue, and east of Hilliards Creek. This area includes the 1 and 5 Foster Avenue buildings. The Seep Area is bordered to the west by Hilliards Creek.
- **<u>Former Tank Farm B (TFB)/7 Foster Avenue (7FA):</u>** This area consists of the former Tank Farm B area, including the current location of the 7 Foster Avenue building and parking area located west of Hilliards Creek. To the east is the Seep Area, and to the west are residential properties B-1 through B-8, which have been the subject of a prior remedial action.
- **<u>The Former Lagoon Area (FLA):</u>** This is the area where the former wastewater lagoons were located. The lagoons were closed by Sherwin-Williams, under NJDEP oversight, in 1979. The FLA is located south of the Seep Area, east of Hilliards Creek and west of U.S. Avenue. Bridgewood Lake is located south of the FLA. The southern off-property area is located to the south of the FLA and is a small section of the Cedar Grove Cemetery.
- **<u>The Eastern Off-Property Area (EOP):</u>** This is the area east of U.S. Avenue where the residential properties designated as Properties E-1 and E-7 through E-11, and the former service station/tavern, are located.

Site Geology & Hydrogeology

The FMP Area is situated within the New Jersey Coastal Plain Physiographic Province. The New Jersey Coastal Plain extends from the Fall Line in the west, to the Atlantic Ocean in the east, and from the Raritan Bay in the northeast to the Delaware Bay in the southwest.

Observations during the RI were consistent with the description of the geologic and hydrogeologic units from the published geological literature:

- The first unit encountered is the Lower Kirkwood Formation. This formation consists of sand and clay. The upper sand is typically fine- to medium-grained, massive- to thick-bedded, locally cross-bedded, light-yellow to white, locally very micaceous, and extensively stained by iron oxides in near-surface beds.
- The lower 5 to 10 feet of the Lower Kirkwood Formation grades into darker grayish brown to greenish clay or clayey sand (the Lower Kirkwood Clay), which marks the boundary with the underlying Vincentown Formation.

- Below the Lower Kirkwood Clay is the Vincentown Formation which, along with the Hornerstown Formation and the Navesink Formation, forms the composite confining unit, a lower permeability unit separating the Lower Kirkwood Formation from the Mount Laurel Formation.
- Below the composite confining unit is the Mount Laurel Formation, a regional drinking water aquifer.

Groundwater at the FMP Area has historically been categorized into three zones: 1) shallow; 2) intermediate; and 3) deep. "Shallow" wells are those installed at depths up to 20 feet below ground surface (bgs) and "intermediate" wells are installed at depths from 20 to 37 feet bgs; both are set in the Lower Kirkwood Formation. The "deep" wells are those installed from the clay portion of the Lower Kirkwood Formation (approximately 55 feet bgs) and into the Vincentown, Hornerstown, Navesink, and Mount Laurel Formations.

Site History

The former paint and varnish manufacturing plant property in Gibbsboro, New Jersey, was developed in the early 1800s as a sawmill, and later 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 FMP Area included wastewater lagoons, above-ground storage tanks, a railroad line and spur, drum storage areas, and numerous production and warehouse buildings. The facility was closed in 1977 and was sold to a developer in 1981.

In 1978, after plant operations ceased, NJDEP issued an administrative order directing Sherwin-Williams to excavate and properly dispose of the waste material remaining in the lagoons. During the 1980s, NJDEP issued an administrative order to Sherwin-Williams ordering it to take actions to contain and characterize contaminated groundwater and a petroleum-like seep in the FMP Area. In 1990, NJDEP entered into an administrative consent order (ACO) with Sherwin-Willams to investigate the extent of groundwater contamination and the petroleum-like seep. During the 1990s, NJDEP discovered two additional source areas, the Dump Site, and the Burn Site. Contamination in both areas is attributable to historic dumping activities associated with the FMP Area.

In the mid-1990s, enforcement responsibilities for the Dump Site and the Burn Site were transferred from NJDEP to EPA. EPA issued several administrative orders to Sherwin-Williams in 1995 and 1997, directing Sherwin-Williams to further characterize and delineate the extent of contamination associated with these areas and to fence them off to minimize the potential for human exposure. EPA proposed the Dump Site to the National Priorities List (NPL) in 1998. The Burn Site was added to the NPL in 1999.

In 1998, EPA sampled the upper portions of Hilliards Creek and several residential properties. Contaminants (mainly lead and arsenic) were detected in these soil and sediment samples. EPA entered into two administrative orders on consent (AOCs) with Sherwin-Williams in 1999. Under the first AOC, Sherwin-Williams conducted additional sampling of Hilliards Creek and Kirkwood Lake to further characterize the extent of contamination. This sampling, which concluded in 2003, included residential properties along Hilliards Creek and Kirkwood Lake. The second AOC, signed in September 1999, required Sherwin-Williams to conduct an RI/FS for the Dump Site, the Burn Site, and the Sherwin-Williams/Hilliards Creek Site. The Sherwin-Williams/Hilliards Creek Site, which includes the Residential Properties (OU1), FMP Soils, Sediment, and LNAPL (OU2), the Groundwater (OU3) (the subject of this Proposed Plan), and the Waterbodies (OU4), was added to the NPL in 2008.

Results of the Remedial Investigation for OU3

Prior to the FMP Area becoming part of the Sherwin-Williams/Hilliards Creek Site in 2007, Sherwin-Williams performed interim measures, beginning in 1979, and site investigations, beginning in the 1990's. The earliest work was performed under the oversight of NJDEP, which transferred authority to the EPA Removal Branch in 2002. Sherwin-Williams initiated the groundwater investigation of the FMP Area in 2009, as part of the RI/FS work carried out under the September 1999 AOC. The following is a summary of these early interim actions and investigations, and how they relate to the groundwater contamination addressed by OU3.

Previous Interim Measures

The first interim measure was conducted by Sherwin-Williams in 1979, under the oversight of NJDEP. This measure included the excavation and disposal of approximately 8,100 CY of impacted soil from the FLA. Subsequent interim measures focused on addressing and preventing LNAPL discharges at the Seep Area. These measures started in 1994, under NJDEP oversight (1994 to 2001), and continued, as needed, under EPA oversight (2001 to present), with the most recent measure occurring in October 2024.

In addition to the interim actions taken to address discharges to Hilliards Creek, Sherwin-Williams inspected all floors in buildings located within the FMP Area footprint, identifying and sealing any penetrations or cracks that were acting as pathways for subsurface vapor transport, and installed vents in subsurface sumps to provide a path for vapor transport to the outside.

Previous Investigations

The first monitoring wells were installed in the FMP Area prior to 1991. These were shallow monitoring wells designed to monitor the effectiveness of the interim measure performed in 1979 for the FLA, and to evaluate conditions upgradient of the FMP Area. Most of these investigation activities were performed under NJDEP oversight and were conducted from 1991 through 2000. During this time frame, Sherwin-Williams conducted five phases of work that focused on the former Tank Farm A Area, Seep Area, former Tank Farm B Area, and the FLA. Beginning in 2002, Sherwin-Williams conducted three site-wide investigations under the oversight of the EPA Region 2 Removal Branch. These efforts included a geophysical investigation to identify subsurface utilities, historic features, and possible transport pathways for LNAPL, a soil screening and confirmatory sampling program to delineate the extent of LNAPL in FMP Area soil, and a site-wide water level and monitoring well sampling program.

Groundwater Remedial Investigation

Further investigations of the FMP Area were incorporated as part of the RI for the Sherwin-Williams/Hilliards Creek Site. In March 2007, EPA requested that Sherwin-Williams prepare a work plan for characterization of the FMP Area. Since this time, numerous groundwater characterization activities and investigation activities have been conducted. These activities included the following work:

- Groundwater sampling (2009–2018), including:
    - Monitoring well installation;
    - Monitoring well development and redevelopment;
    - Groundwater level measurements; and,
    - Groundwater sample collection and analysis.
- Aquifer testing (2009–2018);
- Downhole natural gamma logging (2012–2018);
- Shallow and intermediate groundwater screening (2012);
- A survey of groundwater/surface water interactions (2017);
- An evaluation of biodegradation of LNAPL constituents in groundwater (2018);
- Installation and sampling of upgradient background wells (2020);
- Installation and sampling of replacement wells on a downgradient residential property (2021);
- Additional groundwater sampling conducted following EPA's review of the Draft Groundwater Remedial Investigation (RI) Report and in response to "*EPA and NJDEP Request for Additional Groundwater Sampling*" (2021);
- Several OU2 Pre-Design Investigation (PDI) sampling events were also used to support the OU3 Groundwater RI
    - OU2 PDI sampling event conducted in support of the source removal actions at the FLA (2020–2022);
    - OU2 PDI sampling conducted in support of the LNAPL recovery and treatment activities in the Former Resin Plant/Tank Farm A Area and the EOP Area (2022);
    - Sampling conducted as part of the baseline pre-RA sampling within the Burn Site (2022);

- Resampling of monitoring well MPMW0052 (December 2023); and
- Abandonment of monitoring well MPMW0052 and installation and sampling of replacement well MPMW0052R (2024).

Through the groundwater investigations and the soil investigations conducted as part of the OU2 and OU3 RIs and later during the PDI for OU2, a detailed understanding of the nature and extent of contaminants of concern (COCs) in groundwater, their sources, and the factors that influence their fate and transport, was developed. In total, including wells installed prior to the groundwater RI conducted by Sherwin-Williams and overseen by EPA, 110 groundwater monitoring wells have been installed and sampled. These wells are shown on **Figure 3**. As discussed above, based on data collected, groundwater at the Site has been categorized into three water bearing zones: shallow groundwater, intermediate groundwater, and deep groundwater (**Figure 4**).

Below is a summary of the RI results:

<u>Light Non-Aqueous Phase Liquid</u>

LNAPL is present on the surface of the shallow groundwater in the former Tank Farm A Area, Eastern Off-Property (EOP) Area and Seep Area (**Figure 5**). The LNAPL is comprised primarily of degraded mineral spirits with some VOCs and semi-volatile organic compounds (SVOCs), including benzene, naphthalene, and VOC/SVOC Tentatively Identified Compounds (TICs), and is the direct source of contamination to shallow and intermediate groundwater above NJDEP Ground Water Quality Standards (GWQS) and Interim Generic Ground Water Quality Criteria (IGGWQC) for synthetic organic compounds (SOCs). Dissolution of the LNAPL is the primary mechanism by which benzene and VOC/SVOC TICs come to be present in Site groundwater at concentrations greater than the GWQS and the IGGWQC. LNAPL is also an indirect source of some of the arsenic found in groundwater at concentrations greater than the GWQS. The reducing conditions created by the biodegradation of the LNAPL and dissolved-phase hydrocarbons mobilizes naturally occurring arsenic in the soil, resulting in dissolved-phase arsenic concentrations greater than the GWQS. The RI also found that on a site-wide basis the LNAPL is generally not mobile, with only a handful of wells showing signs of mobile LNAPL during periods of low groundwater levels. Recoverable LNAPL is limited to well HP-3, and recovered volumes continue to decline over time. The LNAPL discussed in this section is being addressed under the OU2 remedial action which is currently in the design phase. Since it is the primary source of the groundwater contamination discussed in this Proposed Plan, implementation of the OU2 remedy for LNAPL is expected to have significant beneficial impact in reducing the groundwater contamination addressed under OU3.

<u>Benzene</u>

Benzene is a key primary constituent in shallow, intermediate, and deep groundwater at concentrations greater than the GWQS at the FMP Area. Benzene was transported horizontally in shallow groundwater through the former TFA and Seep Areas towards the FLA and EOP Areas. In addition to the horizontal transport, contamination was also transported vertically from the former TFA Area into the Vincentown and Hornerstown Formations by the presence of a downward vertical gradient from the Lower Kirkwood Formation to the Vincentown Formation, where a thinning of the lower Kirkwood Clay has been observed. Based on the continued elevated benzene concentrations in MW-30 in the Lower Kirkwood Formation, it was concluded that back diffusion of benzene absorbed in the basal clay in this area acts as a secondary source of benzene in deep groundwater. The vertical extent of the benzene in deep groundwater is limited to the Vincentown and Hornerstown Formations. The Navesink Formation clay unit, identified during the RI, is an effective confining layer preventing groundwater flow into the deeper Mount Laurel Formation.

With the exception of a few locations, benzene concentrations in groundwater have declined across the Site since sampling was initiated in 2009. In instances where a decline was not noted, groundwater concentrations have remained stable or have increased. The increases were primarily in newer wells where only a few rounds of data were available for comparison; however, overall, many years of data show that benzene concentrations in the FMP Area groundwater have substantially declined, suggesting mass reduction of approximately 90% since 1990 (**Figure 6**).

Synthetic Organic Compounds (SOCs)
VOC/SVOC TICs are present in groundwater within the limits of the LNAPL plume (**Figure 5**) and in the FLA. There are no GWQS or maximum contaminant levels (MCLs) for VOC/SVOC TICs, but NJDEP has established IGGWQCs for SOCs shown in Table 3B below. SOCs are defined as any synthetic (not naturally occurring) organic chemical for which NJDEP has not established a GWQS.

In shallow groundwater, the highest total VOC/SVOC TICs are present within the inferred extent of the LNAPL plume. The VOC/SVOC TICs have been identified as primarily alkanes and methylated benzenes that have been attributed to the LNAPL. VOC/SVOC TICs are also present in the FLA at concentrations greater than the 500 micrograms per liter (µg/L) IGGWQC for total SOCs.

The VOC/SVOC TIC concentrations in the FLA are lower than those within the LNAPL plume, and the composition of the VOC/SVOC TICs is different than the composition in the LNAPL plume (**Figure 7**) (alkanes and methylated benzenes vs. organic acids and phenolic compounds).

VOC/SVOC TIC concentrations within the LNAPL area in intermediate groundwater are much lower than in shallow groundwater. The extent of VOC/SVOC TICs in intermediate groundwater at concentrations greater than 500 µg/L is also less than in shallow groundwater. A similar pattern is observed in the FLA; higher VOC/SVOC TIC concentrations are present in shallow groundwater than in intermediate groundwater. As discussed above, the LNAPL, and the associated TICs, are being addressed under the OU2 remedial action. Implementation of the OU2 remedy is expected to have significant beneficial impact in reducing the VOC/SVOC TIC contamination addressed under OU3.

The only location where VOC/SVOC TICs exceed 500 µg/L in deep groundwater is at MW-30, where a downward vertical hydraulic gradient and a thinning of the Lower Kirkwood Clay was identified. As such, like the transport of benzene, the downward transport of VOC/SVOC TICs from the Lower Kirkwood Formation to the Vincentown Formation, and horizontal transport through the Vincentown Formation, is the primary transport mechanism for the VOC/SVOC TICs.

Other VOC and SVOCs
In addition to the benzene and VOC/SVOC TICs discussed above, some additional VOCs and SVOCs were found at concentrations greater than the GWQS in various wells in the 2018 sampling, including 2-methylnaphthalene, naphthalene, 1,1,2,2-trichloroethane, trichloroethene, tetrachloroethene, vinyl chloride, 1,1,2-trichloroethane, and 1,2-dichloroethane. Below is a brief description of the RI findings.

Chlorinated VOCs
Chlorinated VOCs were found at concentrations greater than the GWQS in some wells. Except for one well, most exceedances are found in shallow and intermediate wells located within the Seep Area and FLA. In total, chlorinated compounds were detected in 9 wells: two in the Seep Area, two in the Eastern Off-Property Area, and five in the FLA. The chlorinated VOCs detected, although above GWQS, are sporadic and are located with the footprint of the OU2 source area in which both soils and LNAPL are being treated as part of the OU2 remedy, and concentrations are expected to decrease post-OU2 remediation implementation.

Naphthalene/2-Methylnaphthalene
Naphthalene was found in two wells, including a shallow well in the FRP/TFA Area and a shallow well in the EOP Area, at concentrations greater than the GWQS during the OU3 RI and the LNAPL PDI sampling performed in 2022 for the OU2 remedial design. The OU2 ROD specifies that biological treatment of the LNAPL will be performed in both the FRP/TFA Area and the EOP Area. Since the LNAPL is the source of the naphthalene in groundwater, it is expected that the naphthalene concentrations in the shallow groundwater will decline when the remedy for the LNAPL is implemented as part of the OU2 remedy.

The Human Health Risk Assessment (HHRA) for OU3, discussed below, identified that 2-methylnaphthalene in groundwater contributes to an individual Hazard Quotient (noncancer) greater than one. Like naphthalene, 2-methylnaphthalene has been detected at concentrations greater than the GWQS in only one well, MW-24. Like naphthalene, the LNAPL is the source of the 2-methylnaphthalene in groundwater, and it is expected that the 2-methylnaphthalene concentrations will decline when the LNAPL remedy is implemented.

Arsenic

Soil representing sources of arsenic to groundwater was identified during the RI and subsequent PDI for the 6EC and MP subareas of OU2 as identified below:

- Beneath and adjacent to the former 6EC building slab,
- In the southeast corner of the 10 Foster Avenue building on both sides of the Silver Lake conveyance,
- Beneath the parking area of the 2 and 4 Foster Avenue buildings north of Foster Avenue and east of the Silver Lake conveyance system, and
- South of Silver Lake, east of the Silver Lake conveyance system.

The depths at which arsenic is present at concentrations at or exceeding 50 milligrams per kilograms (mg/kg) in saturated soil ranged from approximately 6 ft bgs to more than 20 ft bgs.

Arsenic is found at concentrations greater than the NJDEP GWQS in shallow groundwater throughout the FMP Area, because of two primary mechanisms:

1. **Sources of arsenic present in soil** – Although not specifically addressed in OU3, arsenic sources to groundwater have been identified in the FMP Area. The OU2 ROD defines sources of arsenic as locations where saturated soil contains arsenic at concentrations of 50 mg/kg or more. These areas were fully characterized as part of the PDI for the MP and 6EC, and 7 Foster Avenue subareas of OU2. The MP and 6EC arsenic sources have already been removed as part of the OU2 remedial action that has been completed for the MP and 6EC subareas. The arsenic source areas identified in the 7 Foster Avenue subarea will be addressed in a future excavation. The excavation cut lines for this area are currently being designed and excavation of this subarea will be implemented in early 2026.
2. **Mobilization of naturally occurring arsenic –** Due to the reducing conditions caused by the biodegradation of the LNAPL and dissolved phase organic constituents in groundwater, naturally-occurring arsenic in soil has been mobilized. "Reductive dissolution" and "reductive desorption" of the aquifer formations result in releases of the naturally occurring arsenic in soil into the groundwater.

In some instances, both these mechanisms described above may be responsible for the presence of the arsenic in groundwater.

The highest concentrations of arsenic are found in two shallow groundwater wells near where the OU2 arsenic soil source areas have been identified. The highest concentrations of arsenic have been found in well MPSB0049 immediately south of the 6EC building slab and within a large arsenic source area. The other well with high concentrations is well MPMW0009, which is located in the Seep Area, downgradient of the identified soil arsenic source areas detailed above. In locations other than these two well locations, arsenic concentrations range from less than the GWQS to approximately 10 µg/L, which is the MCL.

Arsenic is generally not present at concentrations greater than the GWQS in deep groundwater. The one location where arsenic is routinely found in deep groundwater at concentrations greater than the GWQS is MW-30, which is located within the former TFA Area. As a result of the presence of the LNAPL, reducing conditions in this area extend to deep groundwater. As such, EPA attributes the presence of arsenic at concentrations greater than the GWQS to the reducing conditions at this location.

The OU3 GW RI concluded that the dissolved-phase arsenic is in a "steady-state" condition because the hydrocarbon plume that is the source of the reducing conditions is not expanding, the extent of arsenic present at concentrations greater than the GWQS is stable, and there is little transport of the arsenic beyond the influence of the reducing conditions. Beyond the zones of reducing conditions the groundwater returns to ambient geochemical conditions, returning arsenic concentrations to ambient conditions. Similar to other contaminants, it is expected that the arsenic concentrations will decline when the LNAPL remedy is implemented.

Lead

Lead is not extensively found at concentrations greater than the GWQS 5 µg/L at the FMP Area. Lead was reported at a concentration greater than the GWQS in only four locations in 2018: MW-38 (16.1 µg/L), MPMW0017 (24.1 µg/L), MPMW0030 (18.7 µg/L), and MPMW0032 (31.3 µg/L). In 2021, Sherwin-Williams implemented another groundwater sampling event. The sampling results from this event showed that lead was not present at concentrations greater the GWQS in any of the wells except for MW-38, where lead was detected at 51 µg/L and 19 µg/L in the unfiltered and filtered samples, respectively. From the information collected during the OU2 and OU3 RIs, EPA has concluded that the most likely explanation for the lead in MW-38 is the entrainment of solids rather than a groundwater contamination. Lead was not detected above GWQS in any of the deep wells.

Other Metals

In addition to the compounds listed above, concentrations of aluminum, iron, manganese, sodium beryllium, cadmium, chlorides, thallium, and zinc were also detected at concentrations greater than their respective GWQS in shallow and intermediate groundwater. A detailed account of these metals can be found in the OU3 RI report. Although these compounds were detected above their respective GWQS, concentrations were sporadic and not indicative of an anthropogenic source, or they were determined to be naturally occurring; however, due to the reducing conditions caused by the biodegradation of the LNAPL, naturally occurring iron and manganese in soil has been mobilized. "Reductive dissolution" and "reductive desorption" of the aquifer formations result in releases of the naturally occurring iron and manganese in soil into the groundwater.

Pentachlorophenol (PCP)

Soil representing sources of pentachlorophenol (PCP) to groundwater was identified during the RI and subsequent PDI sampling events for the 7 Foster Avenue/Tank Farm B (7FA/TFB) and the FLA subareas of OU2. The sources of PCP impacts to groundwater are identified for removal as part of the 7FA/TFB and FLA remedial effort as part of the OU2 remedial action currently underway. PCP has also been found in shallow groundwater at concentrations greater than the NJDEP GWQS. These exceedances in shallow groundwater have been identified primarily in the former 7FA/TFB Area and in the shallow and intermediate groundwater in the FLA. Potential PCP source areas will be addressed during the OU2 source area soil remedial action. Once the source area soils have been removed, concentrations are expected to decline. PCP is not found in deep groundwater.

Perfluorooctanoic acid and Perfluorooctanesulfonic acids (PFOA and PFOS)

Limited sampling for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) was performed during the OU3 RI. The NJDEP GWQS for PFOA (14 nanograms per liter [ng/L]) was exceeded in two locations, MW-30 (18.6 ng/L) and MPMW0046 (18.8 ng/L). In addition to MW-30 and MPMW0046, PFOA was also present at concentrations greater than the federal MCL of 4 ng/L in MW-11 (4.59 ng/L) and MPMW0009 (13.7 ng/L). The federal MCL for PFOA was also exceeded in upgradient shallow well MW-28 (5.55 ng/L). The NJDEP GWQS for PFOS (13 ng/L) was exceeded in only MPMW0046 (33 ng/L). The federal MCL for PFOS (4 ng/L) was also exceeded in MW-11 (7.43 ng/L) and MPMW0009 (12.7 ng/L). Both PFOA and PFOS were found in upgradient deep wells MPMW0060 and MPMW0061 at concentrations below the GWQS and the federal MCL. Concentrations of both PFOA and PFOS are below the GWQS and MCL in the most downgradient sampling location (MW-41).

EPA is not aware of any history of use of PFOA/PFOS at the FMP Area during historic operations. Further, soil source area removals during the OU2 remedial actions will be performed in the locations where the highest concentrations of

PFOA/PFOS were found in the groundwater. Given the relatively low concentrations of PFOA/PFOS, once the OU2 source removal activities are conducted, EPA expects that PFOA/PFOS concentrations will decline to background levels. Additional sampling for PFOA and PFOS will be performed following implementation of the OU2 remedy as part of the long-term monitoring program for the Sites.

1,4-Dioxane

1,4-dioxane was reported at concentrations greater than the NJDEP GWQS of 0.4 µg/L in several intermediate monitoring wells throughout the FMP Area in the 2018 sampling. Sampling conducted in 2017 and 2018 for the existing wells and 2021, for the newly installed upgradient wells, are the only events in which 1,4-dioxane was included as an analyte. Where reported, the 1,4-dioxane concentrations in intermediate groundwater ranged from approximately 1 µg/L to 3 µg/L. The highest concentrations (approximately 3 µg/L) were found in MW-20, located in the parking area west of the 2 Foster Avenue building, and MPMW0035, located south of the FLA. In the wells sampled between these two wells, 1,4-dioxane concentrations were approximately 1 µg/L to 1.5 µg/L. EPA has not identified the source(s) of the 1,4-dioxane. EPA is not aware of any documentation of the use of chlorinated solvents, particularly 1,1,1-TCA, at the FMP Area and there is no indication of a source of chlorinated solvents at the FMP Area which are common co-contaminants associated with 1,4-dioxane usage. The relatively low concentrations of 1,4-dioxane present in intermediate groundwater also suggest that there was no significant or centralized release of 1,4-dioxane at the FMP during historic operations. Additionally, there are no public sewers in the vicinity of the FMP Area. The 1,4-dioxane may be present in septic systems because of its use as a component of consumer products, such as laundry detergents or shampoos, or because it was a component of a septic tank degreasing agent.

Summary of RI Results

As discussed above, groundwater is characterized into three zones – shallow, intermediate, and deep. Shallow and intermediate groundwater is contaminated with arsenic, PCP, LNAPL constituents (SOC, naphthalene, 2-methylnaphthalene, and benzene). The source areas for contamination in the shallow and intermediate zones will be addressed by the OU2 remedial actions. Contaminants from the shallow and intermediate zones have migrated to the deep groundwater through a preferential pathway caused by a downward gradient in the vicinity of MW-30. While several contaminants are present in the deep groundwater, the primary one is benzene, with the highest concentrations observed at MW-30. Elsewhere in the deep groundwater, contamination is more heterogenous and diffuse. Monitoring data collected since 2009 show rapid degradation in downgradient wells, and the size of the benzene plume has decreased significantly.

Lines of Evidence to Support Attenuation via Natural Processes

An evaluation of natural attenuation conditions was conducted as part of the RI and they were further evaluated during the FS. Overall, the analyses indicated that some level of natural attenuation of Site-related contaminants is occurring. Lines of evidence (LOE) for the use of attenuation via natural processes at the FMP Area have been developed in several different studies and are summarized in the technical memorandum, "Lines of Evidence Supporting Attenuation via Natural Processes" which is Attachment 1 to the FS. The primary natural processes at work are biodegradation, dispersion, dilution, sorption, volatilization, and precipitation. A more detailed summary of these LOE is presented below:

- Direct evidence in the form of reduction in concentration and mass for benzene and other COCs over time shows that attenuation via natural processes is occurring.
- Assessment of post-source removal groundwater data for the adjacent Route 561 Dump Site shows direct evidence of the reduction in arsenic concentrations following the source removal. Conditions at the Dump Site are similar to the Sherwin Williams/Hilliards Creek Site, therefore similar results can be expected at the FMP following the arsenic source removal.
- Hydrogeologic (field indicator parameters, site specific seepage velocity) and geochemical (biogenic heat signatures showing biological activity, electron donors and acceptors, dissolved gasses, arsenic speciation data, and organic carbon content) data support the conclusion that following source removal and treatment, attenuation via natural processes will be an effective remedial approach for the LNAPL-related COCs, arsenic, and pentachlorophenol.

• Microbial studies performed as part of the OU2 LNAPL PDI document the ongoing biodegradation of LNAPL and dissolved hydrocarbons in groundwater at the FMP.

Current and Potential Future Land and Resource Uses

The FMP Area is a large parcel of land that is currently in use with a variety of land uses, including commercial, residential, and undeveloped land. North of Foster Avenue is zoned as Office/Technical Park . This area is currently used as an office and industrial park, although many of the buildings are vacant, and the likely future use will be for commercial/industrial purposes. EPA's understanding of the future use of the FMP Area is based on its long experience at the Site, including consultation with local officials and community outreach.

South of Foster Avenue and west of U.S. Avenue, the land use is commercial through the developed portions of the 7 Foster Avenue and the 1 and 5 Foster Avenue building areas. South of these developed areas, the Upper Hilliards Creek flood plain and the FLA are mostly undeveloped, with a portion being used for a cemetery. The off-property area to the southwest of the FMP Area is zoned as Office/Residential; thus, it could potentially be developed for either commercial office or residential use, but based on the current use, the likely future use is as a cemetery and undeveloped land.

The EOP Area located east of U.S. Avenue is primarily residential, except for one commercial property which is the former location of a service station/tavern. The former building has been razed and the property is currently vacant and undeveloped. Future use of this area is likely to remain residential.

Site groundwater, although classified by NJDEP as Class IIA Groundwater for Potable Water Supply, which is consistent with the federal groundwater classification, is not currently used as a drinking water source. Properties located in the vicinity of the Site are connected to the municipal water supply and it is not likely that groundwater will be used as a drinking water source in the foreseeable future.

WHAT IS HUMAN HEALTH RISK AND HOW IS IT CALCULATED?

Human Health Risk Assessment: 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 releases under current- and anticipated future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure (RME) scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (i.e., soil, fish, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. that were 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 fish. 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" RME 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 risks 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 a site and are referred to as chemicals of concern, or COCs, in the final remedial decision document or the Record of Decision.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, LNAPLs in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element. There are no principal threat wastes associated with OU3.

RISK SUMMARY

As part of the OU3 RI/FS, a baseline risk assessment was 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 of releases of hazardous substances from a site if no actions to mitigate such releases are taken, under current and future land and groundwater uses. Typically, a baseline risk assessment includes a human health risk assessment (HHRA) and a screening level ecological risk assessment (SLERA). Because this OU addresses groundwater without a direct pathway to ecological receptors, no SLERA was conducted for OU3. Conclusions of the baseline risk assessment are discussed below. The HHRA, with full details of all receptor populations evaluated, exposure pathways evaluated, and resultant risk and hazard estimates is available in the administrative record file for OU3.

Human Health Risk Assessment (HHRA)

A four-step human health risk assessment process was used for assessing Site-related cancer risks and noncancer health hazards in the absence of any remedial action. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (see text box "What is Human Health Risk and How is it Calculated") for more details on the risk assessment process.

The HHRA began with selecting chemicals of potential concern (COPCs) associated with OU2 that have impacted FMP Area groundwater that could potentially cause adverse health effects in exposed populations. Due to subsurface groundwater conditions below the FMP Area, shallow, shallow/intermediate, and deep groundwater were screened and evaluated separately in the HHRA. COPCs were determined for each depth zone by comparing detected concentrations to conservative screening criteria as described in the HHRA for OU3. COPCs that were retained for further quantitative analysis included 14 metals, cyanide, 4 pesticides, 11 SVOCs, 12 VOCs, and 8 TICs. Not all contaminants were retained as COPCs in every depth zone.

The exposure assessment step identified potential human receptors based on a review of current and reasonably foreseeable future land and groundwater use within OU2 and OU3 of the Sherwin-Williams/Hilliards Creek Superfund Site. As discussed in the "Current and Potential Future Land and Resource Uses" section, the FMP Area is a large parcel of land with a variety of land uses, including commercial, residential, and undeveloped land. Groundwater beneath OU2 is designated as a drinking water source by the state of New Jersey. It is expected that the future land and groundwater use in this area will remain unchanged. Based on the current zoning and land use, the receptor populations evaluated in the HHRA included a current/future: construction worker, utility worker, and child and adult resident. Workers were quantitatively evaluated for dermal exposure to shallow groundwater only. Residents were separately evaluated for exposure to shallow/intermediate and deep groundwater via ingestion, dermal contact, and inhalation (*i.e*., while showering or bathing).

In this assessment, exposure point concentrations (EPCs) 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 OU3. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures. A complete summary of all exposure scenarios can be found in the final OU3 HHRA report, which can be found in the administrative record file for OU3.

For contaminants other than lead, two types of toxic health effects were evaluated for COPCs: 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. Exposure to lead was evaluated using appropriate blood lead modeling. Results of the modeling was compared to EPA's risk reduction goal to limit the probability of a child's, or that of a group of similarly exposed individuals, blood lead concentrations exceeding 5 micrograms per deciliter (µg/dL) to 5% or less.

Summary of HHRA Results

This section provides a summary of the conclusions of the HHRA per varying depths of groundwater present below the FMP Area. The bold values in **Table 1** highlight the cancer risk and noncancer hazard estimates that exceeded EPA's threshold criteria. Risk and hazard were evaluated for potential current/future exposure to groundwater beneath the FMP Area by a utility worker, construction worker, and a child and adult resident. Even though current exposure was quantitatively evaluated in the HHRA, it should be noted that no one is currently drinking contaminated Site groundwater beneath the FMP Area.

Table 1:

Receptor Population	Noncancer Hazard Index	Total Excess Lifetime Cancer Risk	Groundwater Depth
Utility Worker- adult	0.5	**$3x10^{-4}$**	Shallow
Construction Worker- adult	**12**	**$3x10^{-4}$**	Shallow
Resident- child	**561**	**$8x10^{-2}$**	Shallow/Intermediate
Resident- adult	**878**		
Resident- child	**237**	**$2x10^{-2}$**	Deep
Resident- adult	**395**		

Notes:

Bold values- Cancer Risk>$1x10^{-4}$ or Hazard Index>1

As summarized in **Table 1** above, the hazard indices for the construction worker exposed to shallow groundwater (12), child resident exposed to shallow/intermediate groundwater (561), child resident exposed to deep groundwater (237), adult resident exposed to shallow/intermediate groundwater (878), and adult resident exposed to deep groundwater (395), exceeded EPA's threshold of 1. In addition, the cancer risk estimates for all receptors evaluated exceeded EPA's threshold range of $1x10^{-6}$ to $1x10^{-4}$ with risk estimates ranging from $3x10^{-4}$ to $8x10^{-2}$. The greatest contributors to groundwater risks and hazards varied by receptor, endpoint (cancer or noncancer), and groundwater depth, but those chemicals that exceeded a cancer risk of 10^{-4} or hazard quotient of 1 were: arsenic, cadmium, cobalt, cyanide, iron, manganese, thallium, vanadium, hexavalent chromium, 1,1-biphenyl, 2-methylnaphthalene, benzo(a)pyrene, naphthalene, pentachlorophenol, 1,2-dichlorothane, benzene, ethylbenzene, trichloroethylene, vinyl chloride, o-xylene, and m & p-xylenes. The following TICs also exceeded risk thresholds: 1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbeznene, and amylene hydrate. The compounds that contribute most to risk or hazard, by percentage, as detailed in the HHRA for OU3, include arsenic and pentachlorophenol in shallow groundwater; naphthalene and pentachlorophenol in shallow/intermediate groundwater; and benzene in deep groundwater. These compounds, along with the TICs and lead discussed below, are considered the COCs for OU3 groundwater. The other compounds contributing to risk or hazard were either already below drinking water standards, not site-related, or were sporadically detected and likely to be addressed during implementation of the OU2 remedy. Additional details related to the nature and extent of these compounds can be found in the RI.

Risk from exposure to lead in groundwater was evaluated separately for the child resident using the Integrated Exposure and Uptake Biokinetic (IEUBK) model. Lead was evaluated using the IEUBK model for the child resident exposed to shallow/intermediate groundwater only, because lead was not retained as a COPC in deep groundwater. Results of the IEUBK model are shown in **Table 2** below. Model results were compared to EPA's risk reduction goal, which is to limit the probability of having a Blood Lead Level (BLL) greater than 5 µg/dL to 5% or less. In the baseline IEUBK run, the predicted geometric mean (GM) BLL for the child resident, with a default concentration of 4 µg/L in drinking water, is 2.9 µg/dL, and the probability of exceeding 5 µg/dL was 12%. The predicted GM BLL for the child resident exposed to shallow/intermediate groundwater (with an EPC of 13 µg/L) was 3.6 µg/dL, and the probability of the BLL exceeding 5 µg/dL was 25%. As such, lead was retained as a risk driving COC in the shallow/intermediate groundwater zone.

Table 2:

Receptor Population	Lead EPC (µg/L)	GM BLL (µg/dL)	Predicted Probability BLL> 5 µg/dL	Groundwater Depth
Child resident	4	2.9	**12%**	Baseline Model
Child resident	13	3.6	**25%**	Shallow/Intermediate Groundwater

Notes:

BLL- blood lead level; EPC- exposure point concentration; GM- geometric mean

Bold values- predicted probability >5%

Lead not retained as a COPC in deep groundwater and hence was not evaluated

Due to the presence of VOCs in groundwater (OU3) and soil at OU2, several investigations have been conducted to date to evaluate the potential for subsurface vapor intrusion (VI) into indoor air of overlying structures. As discussed in the HHRAs for OU2 and OU3, results from residential property sampling were evaluated and discussed separately from the commercial property sampling at properties in the FMP Area. Results of VI sampling in all nearby residential structures showed sub-slab results below EPA's Vapor Intrusion Screening Levels (VISLs) and the NJDEP Residential Soil Gas Screening Levels, indicating the potential for subsurface VI is unlikely. However, sampling conducted at several commercial properties at the FMP Area showed exceedances of non-residential state and EPA VISLs in the sub-slab and indoor air sampling results. The OU2 and OU3 HHRAs identified benzene and ethylbenzene as the only analytes with exceedances in both sub-slab and indoor air and concluded that the potential for subsurface vapor intrusion exists for commercial workers. Further, the OU2 and OU3 HHRAs concluded that if the FMP Area commercial properties were to be redeveloped into residential use, there could be potential risk to the future resident. There are currently no commercial operations at the FMP Area, and redevelopment into residential uses is unlikely.

In summary, results of the OU3 HHRA showed unacceptable risk and hazard stemming from exposure to several chemicals present in Site-related groundwater at the FMP Area. Further, the potential for sub-surface vapor intrusion exists in some of the commercial buildings located in the FMP Area.

Ecological Risk Assessment

This OU addresses groundwater without a direct pathway to ecological receptors; therefore, no SLERA was conducted for OU3.

Summary of Human Health and Ecological Risks

In summary, direct contact exposure to groundwater by all potential human health receptors evaluated showed unacceptable risk and or hazard stemming from exposure to the COCs arsenic, lead, benzene, PCP, naphthalene, and VOC/SVOC TICs as detailed in the "Summary of HHRA Results" section above. Based on the results of the RI and the risk assessments, EPA has determined that the actual or threatened releases of hazardous substances from OU3, if not addressed by the preferred alternative or one of the other active measures considered, may present a threat to human health or welfare or the environment. It is EPA's current judgment that the preferred remedial alternative identified in the Proposed Plan is necessary to protect public health or welfare and the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) advisories, criteria and guidance, and site-specific risk-based levels.

The following RAOs have been established for OU3:

1. Restore groundwater to the most beneficial use as a source of drinking water by reducing Site-related contaminant levels to the more stringent of the state and federal MCLs or NJDEP GWQS.
2. Prevent potential current and future unacceptable risks to human receptors resulting from ingestion, inhalation or dermal contact with groundwater containing Site-related contaminants above levels of concern.
3. Prevent further migration of Site-related contaminants in groundwater above levels of concern.
4. Prevent potential vapor intrusion of Site-related VOCs and SVOCs in groundwater to indoor air at concentrations above levels of concern.

EPA expects that the OU2 remedy will primarily address the vertical migration of contamination from the shallow and intermediate aquifers. Horizontal migration of the deep benzene plume will be the focus of the OU3 remedy.

To achieve the RAOs, EPA has identified the preliminary remediation goals (PRGs) for OU3, shown in **Tables 3A and 3B** below**.** Due to the nature of the LNAPL at the Site (i.e., high concentrations of VOC and SVOC compounds without specific standards), the PRGs for the constituents of the LNAPL, which are primarily TICs, are based on NJDEP's Interim Generic GWQS for Synthetic Organic Compounds in groundwater.

TABLE 3A – PRGs for COCs With Specific Groundwater Quality Criteria

Constituent	**NJDEP Groundwater Quality Standard (GWQS) (µg/L)**	**Federal Maximum Contaminant Level (MCL) (µg/L)**	**NJDEP Drinking Water (MCL) (µg/L)**	**Preliminary Remediation Goal (µg/L)**
Arsenic (Total)	3	10	5	**3**
Benzene	0.45	5	1	**0.45**
Iron	300	300**	300**	**300**
Manganese	50	50**	50**	**50**
Lead (Total)	5	10	15	**5**
Naphthalene	300	300	300	**300**
2-Methylnaphthalene	30	*	*	**30**
Pentachlorophenol	0.1	1	1	**0.1**

* No Primary or Secondary Standard
** Secondary Standard

TABLE 3B – PRGs for COCs With Interim Generic Groundwater Quality Criteria – Synthetic Organic Compounds (SOCs)*

Constituent	Criteria (µg/l or ppb)
SOCs defined as carcinogens in N.J.A.C. 7:9C-1.4	5 (individual)
SOCs defined as carcinogens in N.J.A.C. 7:9C-1.4 lacking specific or interim specific criteria	25 (total)
SOCs defined as non-carcinogens in N.J.A.C. 7:9C-1.4	100 (individual)
SOCs defined as non-carcinogens in N.J.A.C. 7:9C-1.4 lacking specific or interim specific criteria	500 (total)

* Synthetic Organic Chemicals (SOCs) are identified as having "evidence of carcinogenicity" or "lacking evidence of carcinogenicity" based upon available scientific evidence. Chemicals are classified as carcinogens or noncarcinogens for the purposes of risk assessment according to the weight of evidence utilized by USEPA in the National Primary Drinking Water Regulations (50 FR 46880-46901 (1985)). The Interim generic groundwater quality criteria do not apply to naturally occurring organic chemicals.

No occupied buildings currently exist on the FMP area. Any vapor intrusion data collected as part of sampling efforts related to future development would be compared to the applicable EPA and New Jersey VISLs and Indoor Air Remediation Standards.

SUMMARY OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, requires that remedial actions must 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 practicable. Section 121(b)(1) also establishes a preference for remedial actions that employ, as a principal element, treatment to reduce permanently and significantly the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. Section 121(d) further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4).

Potential technologies applicable to groundwater remediation were identified and screened using the effectiveness, implementability, and cost criteria, with emphasis on effectiveness. Those technologies that passed the initial screening were assembled into alternatives. Detailed descriptions of the remedial alternatives for addressing the groundwater contamination that comprises OU3 can be found in the Draft Final FS Report, dated July 11, 2025. The FS Report presents four alternatives, including a no action alternative.

The duration time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to negotiate with responsible parties, design the remedy, procure contracts for design and construction, or conduct operation and maintenance of the OU3 remedy.

Common Elements

Except for the No Action alternative (Alternative 1), all of the alternatives include the following common components:

- Assumption that implementation of the OU2 remedy will be completed and will remove the source to the shallow, intermediate, and deep groundwater. As stated in the 2020 OU2 ROD, "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." Attenuation via natural processes following completion of the OU2 source control activities is expected to occur in the shallow and intermediate groundwater. Additionally, in accordance with the OU2 ROD, the OU2 remedy includes that engineering controls (ECs) and ICs will be established for any new structure built within the commercial property of the FMP Area.

- Pre-Design Investigation (PDI) - The objective of a PDI would be to fill data gaps and obtain design parameters for the completion of the remedial design. A PDI could include groundwater screening, well installation and sampling, and hydraulic testing to further delineate the vertical and lateral extent of the treatment zones in the overburden aquifers. Models could be developed using the OU3 RI and PDI results to visualize contaminant distribution and evaluate the aquifer characteristics to assist in the remedial design.

- Institutional Controls (ICs) - Institutional controls such as a groundwater Classification Exception Area (CEA) and Well Restriction Area (WRA), which provide notice of groundwater contamination exceeding standards and well drilling restrictions, would be implemented to eliminate the exposure pathways of contaminated groundwater to receptors. Institutional controls would be implemented during and after the remedial action until the groundwater quality meets the NJDEP GWQS. EPA will finalize the CEA/WRA based on the results of the PDI and post-OU2 RA sampling.

- Long-term Monitoring – A long-term monitoring (LTM) program would be established for shallow, intermediate, and deep groundwater to evaluate the concentration changes and ensure contamination is not migrating.

- 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. A review of the remedial action pursuant to CERCLA Section 121(c), 42 U.S.C. §9621(c), will be conducted five years after the commencement of the remedial action to ensure that the remedy continues to provide adequate protection to human health and the environment because this remedy will result in hazardous substances remaining on-site above health-based levels that allow for unlimited use and unrestricted exposure.

Alternative 1: No Action

Capital Cost:	$0
Total O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable
Estimated time to reach RAOs:	Not Applicable

The NCP requires that a "No Action" alternative be developed as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted for OU3 to remediate contaminated media or otherwise mitigate the migration of contamination that poses unacceptable risks to human health and the environment. This alternative does not include monitoring or institutional controls or five-year reviews.

The No Action alternative provides a baseline for comparison with other active remedial alternatives. Because no remedial activities would be implemented under the No Action alternative, long-term human health and environmental risks would remain the same as those identified in the OU3 HHRA. There are no capital, operations /maintenance, or monitoring costs and no permitting or institutional legal restrictions. This alternative would not meet all the RAOs established for groundwater.

Alternative 2: Attenuation via Natural Processes with ICs and LTM

Capital Cost:	*$540,000*
Total O&M Costs:	*$773,000*
Present-Worth Cost:	*$1,310,000*
Construction Time (establish IC):	*2 years*
Estimated time to reach RAOs:	20 years

This alternative relies on natural processes, including physical, chemical, or biological processes, to reduce mass, toxicity, mobility, volume, or concentrations of contaminants in groundwater without human intervention. As described above, these processes include biodegradation, dispersion, dilution, sorption, volatilization, and precipitation.

This alternative would consist of the installation of new monitoring wells to supplement the existing monitoring well network. For cost estimating purposes, it is assumed that monitoring to evaluate contaminant levels in Site groundwater would be conducted for a period of 20 years. This is based on regression analyses documenting the linear decline of benzene from the later 1990s to 2018, as detailed in Attachment 1 of the Feasibility Study, assuming OU2 source areas are addressed. Because benzene is the most widespread and prevalent groundwater contaminant and extends beyond the influence of the OU2 remedy, its attenuation is expected to be representative of other Site-related contaminants.

Alternative 3: Focused In-Situ Treatment with Attenuation via Natural Processes, ICs and LTM

Capital Cost:	*$3,402,3132*
Total O&M Costs:	*$841,183*
Present-Worth Cost:	*$4,220,000*
Construction Time:	*1 year*
Estimated time to reach RAOs:	12 years

Under this alternative, the residual mass of VOCs, SVOCs, and associated TICs in the MW-30 area would be treated with in-situ treatment technologies. Three technologies were evaluated during the OU3 FS: in-situ chemical oxidation (ISCO), in-situ chemical reduction (ISCR) with bioremediation, and sequestration and enhanced bioremediation. All were found to be effective at reducing residual concentrations of COCs within the MW-30 secondary source area. The effectiveness of the in-situ treatment technology depends on the amendment/reagent type and dosage rates, delivery and distribution in the treatment area, and the ability of the amendments/reagents to degrade COCs. Based on the evaluation of the three in-situ treatment technologies, sequestration and enhanced bioremediation was the most promising given existing site conditions, and for its use of non-hazardous amendments that would effectively and quickly treat benzene.

A PDI would be required to fully understand the extent of the MW-30 secondary source area and subsurface heterogeneities. Additionally, bench-scale testing would be needed for the selection of dosage rates, and pilot testing would be required to optimize amendment/reagent delivery into the subsurface. If the PDI phase yielded evidence of less-than-optimal results using sequestration and enhanced bioremediation, testing ISCO and ISCR with bioremediation alternative would be evaluated.

During and following implementation of active source treatment technologies, monitoring would be used to evaluate source area treatment and attenuation via natural processes to ensure the RAOs are attained in both inside and outside the treatment area. The integration of in-situ treatment and attenuation via natural processes would enhance the effectiveness of the overall site cleanup efforts of OU3.

This alternative would require:

- Re-installation of additional groundwater monitoring wells removed during the OU2 RA.
- Installation of injection points and performance of injections. The treatment area is estimated to be approximately 25,000 square feet, at depths ranging from elevation 45 ft to 65 ft above mean sea level (approximately 55 to 75 feet below ground surface). For cost estimating purposes, it was assumed 20 days of drilling would be needed for the placement of the amendment and 2 injection events would be needed.
- Installation of additional wells to supplement the existing monitoring well network.

As presented in **Attachment 1 of the FS** (and **Figure 6**), the decline in benzene concentrations in wells beyond the influence of the secondary source has been rapid. In some wells, the GWQS for benzene has been achieved in a time frame of approximately 10 years. Therefore, it is assumed that the LTM following the in-situ injections would be conducted for 10 years. Because benzene is the most widespread and prevalent groundwater contaminant and extends beyond the influence of the OU2 remedy, its attenuation is expected to be representative of other Site-related contaminants.

For cost estimating purposes, it is assumed that planning, reporting and pre-design investigations would take place in years 1 through 3, implementation of the source control measure would take place in years 4 and 5, and operation, maintenance, and monitoring of the treatment alternative would take place in years 6 through 15.

Alternative 4: Groundwater Extraction and Treatment, ICs and LTM

Capital Cost:	*$12,236,936*
Total O&M Costs:	*$11,525,200*
Present-Worth Cost:	*$23,760,000*
Construction Time:	*2 years*
Estimated time to reach RAOs:	13 years

This alternative, groundwater extraction and treatment, ICs, and LTM, would consists of extraction wells pumping contaminated deep groundwater to the surface for treatment. Extraction and treatment is a well-established technology with known design standards and performance criteria, however the extraction system design for this alternative would need to be supported using groundwater modeling and field-testing to determine extraction well positioning and flow rates, as well as bench- and pilot-scale testing for water treatment before discharge or disposal of the treated water.

In addition to the modeling and bench and pilot testing, a PDI would be needed to support the number and location of wells, to determine soil properties, well design, capture zones from field pumping tests, groundwater/surface water interaction, and treatability testing to determine the appropriate methods and treatment efficiency.

For cost-estimating purposes, a conceptual groundwater extraction and treatment design would include:

- Construction of a groundwater extraction and treatment system, including obtaining access from landowners for extraction and monitoring well installation, installation of conveyance piping, and LTM of the extraction and treatment system. This could include:
    - 20 extraction wells, with up to 20-foot screens, installed at depths greater than 100 feet below the ground surface.
    - Pumping rates for the wells are assumed to be 3 gallon per minute (gpm) across OU3, for total treatment system capacity of 60 gpm.
    - Centralized treatment plant would be constructed at 1 Foster Avenue and would include two lift stations and approximately 2,500 linear feet of trenching and conveyance piping.
    - Filtered groundwater would be treated using chemical oxidation, ion exchange, chemical reduction/precipitation, or a combination thereof. A filter press would reduce liquids and produce a solid for off-site disposal. Treated groundwater would be transferred into an air stripper, granular activated

carbon (GAC), and/or membrane filtration system for VOC and SVOC treatment as a polishing step prior to a metered surface water discharge.

- O&M would consist of monitoring influent/effluent flows and concentrations, air discharges, and groundwater conditions in the LTM network.

Figure 7 provides the conceptual layout of the extraction well system as developed for Alternative 4. Given the low hydraulic conductivity in the MW-30 area, the extraction and treatment system would need to be designed to cover a larger area to effectively treat the dissolved phase contaminants from the secondary source area.

The planning, reporting, and pre-design investigation would take 5 years to complete. Given the complexity of the system to build, it is estimated that that it would take 2 years to construct. Based on data presented in **Attachment 1 of the FS**, it is estimated that it would take approximately 13 years to reach PRGs.

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements (ARARs), long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance. Refer to the text box for a description of the evaluation criteria.

This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how each compared to the other options under consideration. An explanation of each of the criteria can be found in the adjacent text box. A detailed analysis of alternatives can be found in the FS Report.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Threshold Criteria

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.

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.

Primary Balancing Criteria

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

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.

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.

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

Modifying Criteria

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.

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

Overall Protection of Human Health and the Environment

Excluding Alternative 1 (No Action), each of the alternatives presented will be protective of public health and the environment under current conditions, assuming that the OU2 soil remedy has been implemented. There is no current or anticipated use of groundwater at the FMP Area where site-related groundwater COCs are present at concentrations greater than the PRGs, no receptors are currently affected by groundwater, and groundwater concentrations, once the OU2 remedy is completed, are expected to further decline. Any potential VI impacts will also be addressed by the OU2 remedy.

Alternative 1, No Action, would not be protective of human health and the environment since it does not include measures to prevent exposure to groundwater containing COCs at concentrations greater than the PRGs. Further, there would be no LTM of deep groundwater to document when the PRGs are achieved.

Attenuation via Natural Processes with ICs and LTM (Alternative 2) would be protective. The CEA/WRA would prevent use of the groundwater containing COCs at concentrations greater than the PRGs, and LTM will be performed to document when the PRGs are achieved. However, without treatment of the source at MW-30, achieving the PRGs will require an extended time frame.

The two remaining alternatives, Focused In-Situ Treatment with Attenuation via Natural Processes and ICs (Alternative 3), and Groundwater Extraction and Treatment (Alternative 4), would be protective of public health and the environment and would include the same IC as Alternative 2, a CEA/WRA to prevent use of groundwater until the PRGs are achieved. They would also include LTM to document the progress towards and achievement of the PRGs.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Although the PRGs may eventually be achieved under Alternative 1 (No Action), because deep groundwater would not be monitored, EPA could not assess progress towards PRGs. Therefore, this alternative would not comply with the chemical-specific ARARs, consisting of the NJDEP GWQS or the state and federal MCLs. Because no action would be taken, no action-specific or location-specific ARARs would apply. Because Alternative 1 does not meet the threshold criterion of compliance with ARARs, it is not further evaluated.

Attenuation via Natural Processes with ICs and LTM (Alternative 2) would achieve the PRGs and eventually comply with chemical-specific ARARs and meet the RAOs. The ICs would aid in preventing use of the groundwater containing COCs at concentrations greater than the GWQS. Attenuation via Natural Processes with ICs and LTM is expected to require 20 years to achieve the GWQS for benzene in deep groundwater.

In-Situ Treatment with Attenuation via Natural Processes, ICs and LTM (Alternative 3) would comply with chemical-specific ARARs (NJDEP GWQS or state and federal MCLs) and action specific ARARs and meet RAOs. Alternative 3 would include all of the components of Alternative 2 but would add a focused in-situ treatment for the secondary source of benzene in deep groundwater (area around MW-30). This treatment would minimize the migration of COCs. The time to achieve the PRGs would be reduced compared to Alternative 2 (15 years compared to 20 years). LTM of deep groundwater would be performed to track progress of the remedy as required by NJDEP regulation.

Alternative 4 would meet chemical-specific ARARs (NJDEP GWQS or state and federal MCLs). Following the OU2 source area actions, groundwater extraction and treatment would achieve the NJDEP GWQS for benzene in deep groundwater in a time frame similar to that for attenuation alone, approximately 15 to 20 years. ICs in the form of a CEA/WRA would be established to aid in preventing the use of groundwater until the PRGs are achieved, and LTM would be performed to document progress toward achieving the standards.

Reduction of Toxicity, Mobility, or Volume through Treatment

Under Alternative 2, natural processes would result in reduction of the toxicity, mobility, and volume of COCs through dispersion, dissolution, precipitation, sorption, and biodegradation in groundwater. However, these natural attenuation processes associated with Alternative 2 are not treatment, and it is projected that 20 years or longer would be required for groundwater concentrations to achieve the PRGs in the MW-30 area.

The in-situ treatment technologies associated with Alternative 3 would reduce toxicity, mobility, and volume of COCs through treatment. One would oxidize the benzene in the MW-30 area. The other two technologies would enhance anaerobic biodegradation of the benzene.

Alternative 4, extraction and treatment, would reduce the mobility and volume over an extended period of time. The reduction in toxicity in groundwater would occur; however, the COCs would not be destroyed or degraded, only transferred/aerated, and concentrated on filter media, which would not reduce the toxicity to the environment as the media would require disposal or incineration.

Short-Term Effectiveness

Alternative 2 would have the least amount of impact on the public and the environment during implementation.

The In-Situ Treatment and Attenuation via Natural Processes alternative (Alternative 3) would have moderate impacts on the environment and public during implementation. Impacts could be from pressure build-up, which could lead to chemical releases. Additionally, daylighting or breakout of the injected amendment could also be released into sensitive areas (catch basins, drainage culverts, etc.) outside the treatment area. The balance of lower injection pressures and monitoring of the area surrounding the injection is an effective way to mitigate these issues. Additionally, transportation and storage of the amendments at the FMP Area during treatment activities could have short term impacts on the surrounding area. Spills and other incidents could have an effect on workers or the environment. If phased injection events were necessary as part of Alternative 3, this would cause added impacts on the community. Consideration of both worker and passers-by safety would occur during remedy implementation and be addressed in the health and safety plan.

Groundwater Extraction and Treatment (Alternative 4) would have the greatest impacts on the community, construction workers, and the environment. Construction of the extraction and treatment system would consist of well installation, installation of conveyance piping and trenching, pump station construction, and installation of access roads for well and piping installation. Utilities, including electricity and water, would need to be provided to the system. Water treatment chemicals would be transported to the Site, and sludge would be transported away from the Site for off-Site disposal. Noise and nuisance dust would also be a concern for the community during the time it takes to construct the extraction and treatment system. Discharges from the treatment system may have difficulty achieving discharge limits for metals that are present in groundwater. Operation of the treatment system would also have adverse impacts. There is the potential for spills of water treatment chemicals and breaks in conveyance lines.

Implementability

Because EPA expects that the OU3 groundwater RA would be implemented at the same time and in the same area that the OU2 LNAPL treatment remedy is being performed, coordination between these activities would be required.

Alternative 2 (ICs with LTM) would be simple to implement as it includes no construction activities. There is a moderate difficulty in establishing the CEA/WRA, but that is a well understood administrative process in New Jersey.

The in-situ treatment, Alternative 3, has an overall moderate degree of difficulty to implement. However, in-situ treatment technologies are known to be available and successful at achieving project goals. Engineering/construction services, materials, and supplies are readily available. Regulatory agency knowledge of these technologies has grown, and this technology is widely accepted such that agency approvals are generally routine once the appropriate documentation is provided.

Once the PDI and bench-scale study had identified the best in-situ treatment technology, the remedial design would be completed. Monitoring of site conditions after injection events would be necessary to evaluate potential contaminant mobilization and/or migration. Phased injection events may be necessary.

The groundwater extraction and treatment alternative, Alternative 4, would have the greatest degree of difficulty of implementation due to the areal extent of COCs requiring capture, the need for multiple road crossings to bring infrastructure to a centralized spot, the low-flow extraction rates necessary to prevent dewatering of extraction wells, and the technologies needed to treat COCs. As noted previously, the presence of high concentrations of metals has the potential to foul all components of the treatment system, including the pumps, conveyance lines and treatment system components. Long-term operation of the system would require ongoing maintenance and repairs. Although the extraction and treatment technology has been used over decades to remediate groundwater at numerous contaminated sites, under certain conditions, it has been found that as a result of factors such as back diffusion, once a system has been turned off, achieving goals may take longer than originally predicted and therefore, be less effective at targeting areas of matrix diffusion.

Cost

A comparative summary of the cost estimate for each alternative is presented below. Costs are based on a 7% discount rate. The cost estimates are engineering cost estimates that are expected to be within the range of plus 50% to minus 30% of the actual project cost. Further detail on the cost is presented the FS Report.

Alternative	Capital Cost	Total O&M Cost	Total Present-Worth Cost
1	$0	$0	$0
2	$540,000	$773,000	$1,310,000
3	$3,402313	$841,183	$4,220,000
4	$12,236,936	$11,525,200	$23,760,000

State/Support Agency Acceptance

In a letter dated July 8, 2025, NJDEP provided its concurrence with the preferred alternative.

Community Acceptance

Community acceptance will be evaluated after the public comment period ends and will be described in the Responsiveness Summary section of the OU3 ROD. Based on public comment, the preferred alternative could be modified from the version presented in this Proposed Plan, or another alternative selected.

PREFERRED ALTERNATIVE

Based upon an evaluation of the remedial alternatives, EPA, in consultation with NJDEP, has identified Alternative 3, Focused In-Situ Treatment with Attenuation via Natural Processes and LTM, as the preferred alternative for OU3.

The preferred alternative has the following key components:

- Assumption of implementation of the OU2 remedy;
- Pre-Design Investigation;
- Institutional Controls;
- The installation of injection wells in the area surrounding the secondary source at MW-30;
- Installation of additional monitoring wells to 75 feet below the ground surface to supplement the existing monitoring well network for LTM purposes;
- Attenuation processes, including biodegradation, dilution, dispersion, sorption, volatilization, and precipitation, as the primary mechanism for contaminant reduction for areas where active remediation is not implemented.
- Long-Term Monitoring would be conducted for shallow, intermediate, and deep groundwater;
- Five-year reviews.

The total estimated present-worth cost for the preferred alternative is $4,220,000, based on the assumption that sequestration with enhanced bioremediation is the most effective technology given existing site conditions, and therefore would be the technology used for in-situ treatment. A PDI would be required to fully understand the extent of the MW-30 source area and subsurface heterogeneities. Additionally, bench-scale testing would be needed for the selection of dosage rates, and pilot testing would be required to optimize amendment/reagent delivery into the subsurface. If during the PDI phase this study yields less than optimal results, EPA may evaluate other technologies, i.e., ISCO and ISCR with bioremediation. It is EPA's expectation that the OU2 source remedy will have a significant and beneficial impact on the OU3 groundwater. As such, the proposed OU3 alternative, along with implementation of the remedy for OU2, will constitute a comprehensive remedy for groundwater.

Implementation of a long-term groundwater monitoring program for both the shallow/intermediate and deep groundwater would track and monitor changes in the groundwater contamination to ensure the RAOs are attained for both areas inside and outside the treatment area. The sampling program would also monitor groundwater quality including geochemical conditions and degradation byproducts generated by the treatment processes. The results from the long-term monitoring program would be used to evaluate the migration and changes in contaminants over time outside the treatment area.

Basis for the Remedy Preference

Site-related COCs are present in shallow and intermediate groundwater. The source areas are being addressed through a combination of the OU2 remedial action source control activities and LTM under the OU2 ROD. These source control activities include excavation of soils to expedite attainment of groundwater clean-up levels, and the removal and treatment of LNAPL. Attenuation via natural processes following completion of the OU2 source control activities is expected to occur in the shallow and intermediate groundwater. Once source area removal for OU2 has been completed, an IC in the form of a CEA/WRA will be established.

Three potential in-situ treatment technologies have been evaluated to attain PRGs in deep groundwater: 1) in-situ chemical oxidation (ISCO), 2) chemical reduction/biological treatment, and 3) sequestration and biological degradation. Each of these three approaches has advantages and potential shortcomings. The preferred alternative includes a PDI and treatability studies, which will be used to confirm the use of sequestration and enhanced bioremediation as the optimal in-situ technology.

The in-situ treatment technology would be capable of reducing dissolved-phase benzene concentrations and treating any residual source material that may be present. The in-situ treatment technology would be followed by the use of attenuation via natural process for benzene in deep groundwater and accompanied by an IC in the form of a CEA/WRA with LTM, until such time as PRGs are achieved. Because benzene is the most widespread and prevalent groundwater contaminant and extends beyond the influence of the OU2 remedy, its attenuation is expected to be representative of other Site-related contaminants.

Alternative 3 would be protective of human health and the environment and would comply with ARARs. The time period for the PRG for benzene to be achieved would be reduced from the time period under the other alternatives considered, and the CEA/WRA with LTM would prevent groundwater use until such time as drinking water standards are achieved. The focused treatment would meet the RAO of minimizing migration of contamination.

Alternative 3 would provide permanence and long-term protectiveness. With the sources removed or treated as part of the OU2 and 3 remedies, there would be no ongoing contribution to groundwater contamination, so once the cleanup goals are achieved, there is little risk of groundwater concentrations increasing in the future.

The in-situ treatment technology will also provide a reduction of toxicity, mobility, and volume through treatment. The treatment in the secondary source area will reduce both the benzene and VOC/SVOC TIC concentrations in the treatment area, as well as downgradient benzene concentrations. Lower benzene concentrations equate to a smaller volume of benzene, and the lower concentrations will limit the transport of benzene at concentrations greater than the PRGs.

The in-situ technologies have a moderate degree of short-term impacts. These risks are primarily associated with transportation of the treatment chemicals. However, any risks to the community workers and environment from the in-situ technologies can be addressed by having a robust health and safety plan. Finally, the in-situ technologies are implementable. The equipment and reagents are readily available.

Based upon the information currently available, EPA, in conjunction with NJDEP, believes that Alternative 3 would meet the threshold criteria and provide the best balance of tradeoffs among the alternatives with respect to the balancing criteria. The preferred alternative would satisfy the statutory requirements of CERCLA Section 121: (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; and (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The preferred alternative would also meet the statutory preference for the use of treatment as a principal element. With respect to the two modifying criteria, state acceptance and community acceptance, NJDEP concurs with the preferred alternative, and community acceptance will be evaluated upon the close of the public comment period.

For further information on the Site, please contact:

Brian Montroy
Remedial Project Manager
(212) 637-4177
Montroy.brian@epa.gov

Maya Greally
Community Involvement Coordinator
(212) 637-3588
Greally.Maya@epa.govGreal

The administrative record file, which contains copies of the Proposed Plan and support documentation, is available online at www.epa.gov/superfund/Sherwin-Williams and at the following location:

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

Written comments on this Proposed Plan should be mailed to Brian Montroy by August 26, 2025, at the address below or sent via email.

Brian Montroy
Remedial Project Manager
290 Broadway, 19th Floor
New York, New York 10007
(212) 637-4177
Montroy.brian@epa.gov
Hours: 8AM – 4PM

Figure 1: Site Location Map

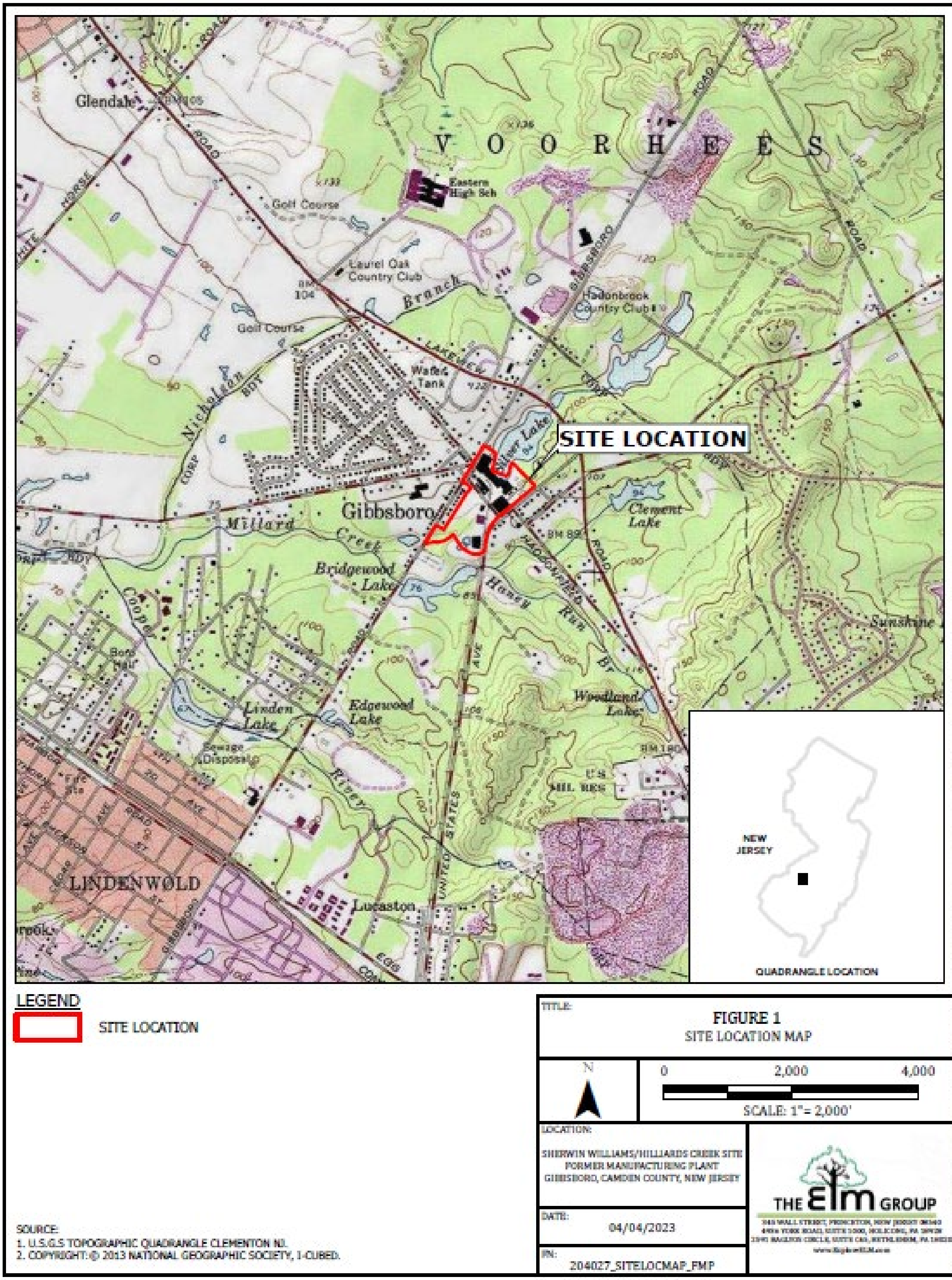
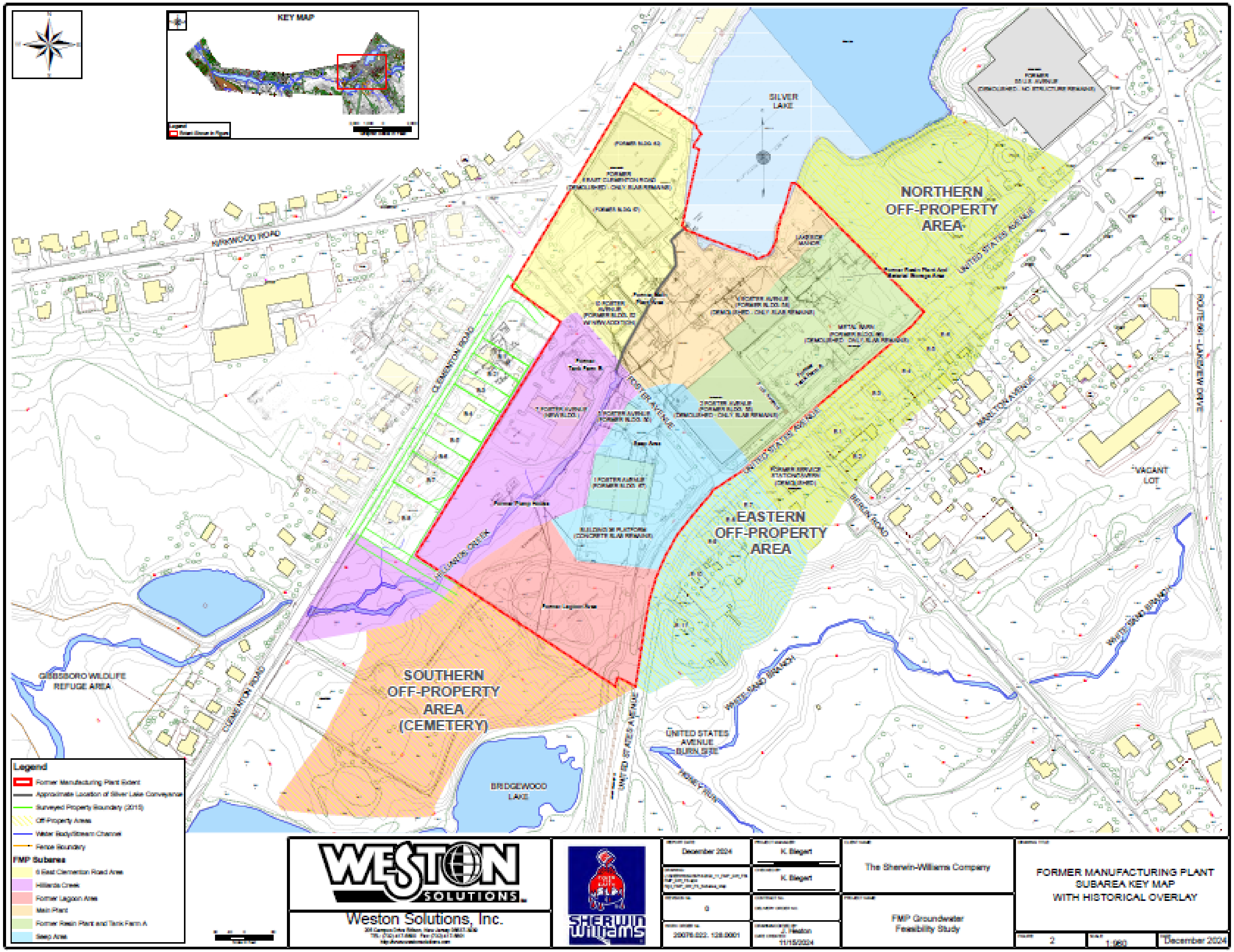


Figure 2:



KEY MAP
SILVER LAKE
NORTHERN OFF-PROPERTY AREA
EASTERN OFF-PROPERTY AREA
SOUTHERN OFF-PROPERTY AREA (CEMETERY)
GIBBSBORO WILDLIFE REFUGE AREA
BRIDGEWOOD LAKE
UNITED STATES AVENUE BURN SITE
VACANT LOT
KIRKWOOD ROAD
CLEMENTON ROAD
UNITED STATES AVENUE
ROUTE 561 - LAKEVIEW DRIVE
WHITE SAND BRANCH
Legend
Former Manufacturing Plant Extent
Approximate Location of Silver Lake Conveyance
Surveyed Property Boundary (2015)
Off-Property Areas
Water Body/Stream Channel
Fence Boundary
FMP Subareas
6 East Clementon Road Area
Hilliards Creek
Former Lagoon Area
Main Plant
Former Resin Plant and Tank Farm A
Seep Area
WESTON SOLUTIONS
Weston Solutions, Inc.
SHERWIN WILLIAMS
December 2024
K. Biegert
The Sherwin-Williams Company
FMP Groundwater Feasibility Study
FORMER MANUFACTURING PLANT SUBAREA KEY MAP WITH HISTORICAL OVERLAY
20076.022.128.0001
11/15/2024
2
December 2024

Figure 3:

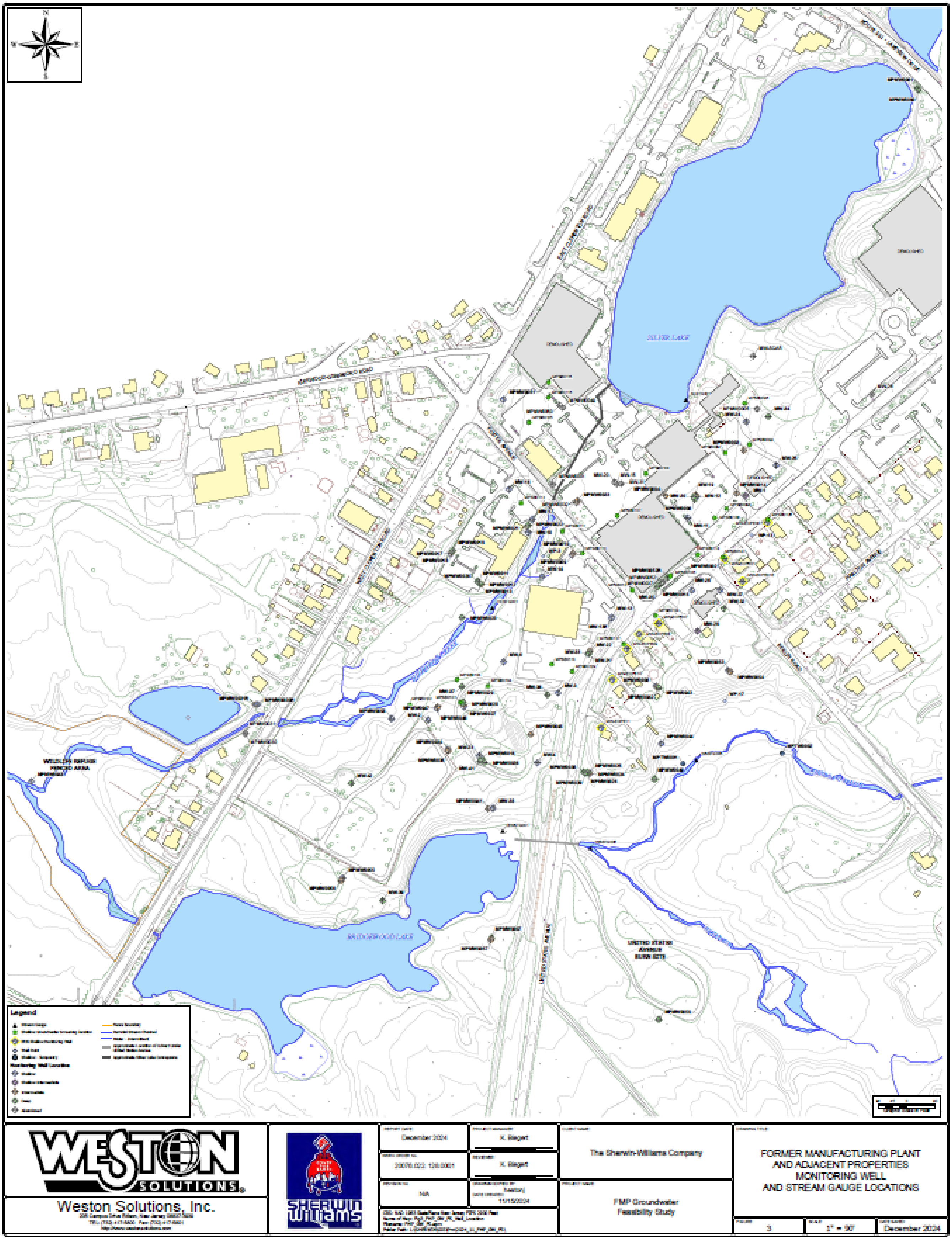
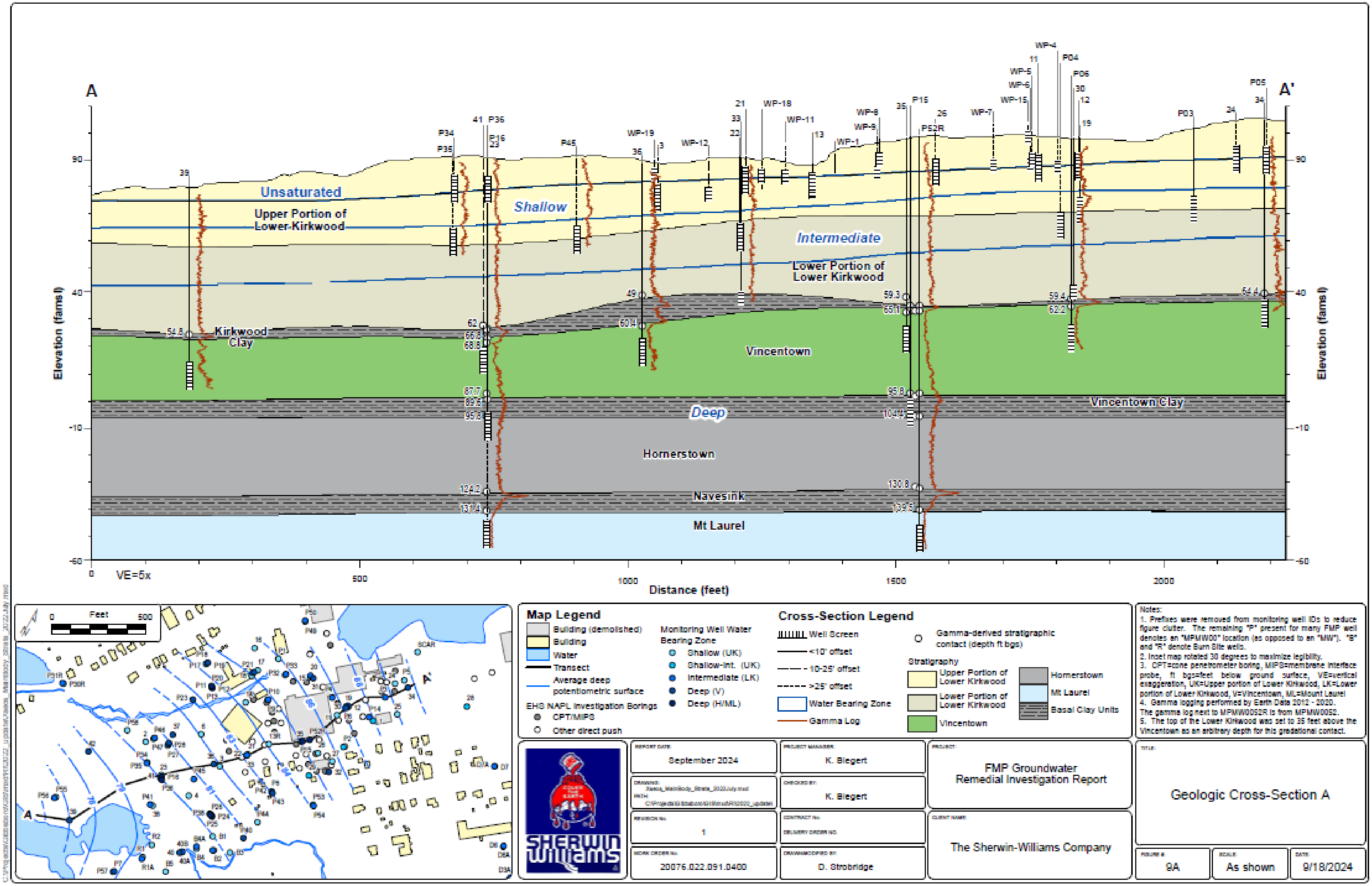

Legend
Weston Solutions, Inc.
December 2024
The Sherwin-Williams Company
FORMER MANUFACTURING PLANT
AND ADJACENT PROPERTIES
MONITORING WELL
AND STREAM GAUGE LOCATIONS
FMP Groundwater
Feasibility Study
N/A
11/15/2024
3
December 2024

Figure 4:



A
A'
Elevation (famsl)
Distance (feet)
VE=5x
Unsaturated
Upper Portion of
Lower Kirkwood
Shallow
Intermediate
Lower Portion of
Lower Kirkwood
Kirkwood
Clay
Vincentown
Deep
Vincentown Clay
Hornerstown
Navesink
Mt Laurel
Feet
Map Legend
Building (demolished)
Building
Water
Transect
Average deep potentiometric surface
EHS NAPL Investigation Borings
CPT/MIPS
Other direct push
Monitoring Well Water Bearing Zone
Shallow (UK)
Shallow-Int. (UK)
Intermediate (LK)
Deep (V)
Deep (H/ML)
Cross-Section Legend
Well Screen
<10' offset
10-25' offset
>25' offset
Water Bearing Zone
Gamma Log
Gamma-derived stratigraphic contact (depth ft bgs)
Stratigraphy
Upper Portion of Lower Kirkwood
Lower Portion of Lower Kirkwood
Vincentown
Hornerstown
Mt Laurel
Basal Clay Units
Notes:
1. Prefixes were removed from monitoring well IDs to reduce figure clutter. The remaining "P" present for many FMP well denotes an "MPMW00" location (as opposed to an "MW"). "B" and "R" denote Burn Site wells.
2. Inset map rotated 30 degrees to maximize legibility.
3. CPT=cone penetrometer boring, MIPS=membrane interface probe, ft bgs=feet below ground surface, VE=vertical exaggeration, UK=Upper portion of Lower Kirkwood, LK=Lower portion of Lower Kirkwood, V=Vincentown, ML=Mount Laurel
4. Gamma logging performed by Earth Data 2012 - 2020. The gamma log next to MPMW0052R is from MPMW0052.
5. The top of the Lower Kirkwood was set to 35 feet above the Vincentown as an arbitrary depth for this gradational contact.
SHERWIN WILLIAMS
REPORT DATE: September 2024
PROJECT MANAGER: K. Biegert
CHECKED BY: K. Biegert
REVISION No. 1
WORK ORDER No. 20076.022.091.0400
DRAWN/MODIFIED BY: D. Strobridge
PROJECT: FMP Groundwater Remedial Investigation Report
CLIENT NAME: The Sherwin-Williams Company
TITLE: Geologic Cross-Section A
FIGURE # 9A
SCALE: As shown
DATE: 9/18/2024

Figure 5:

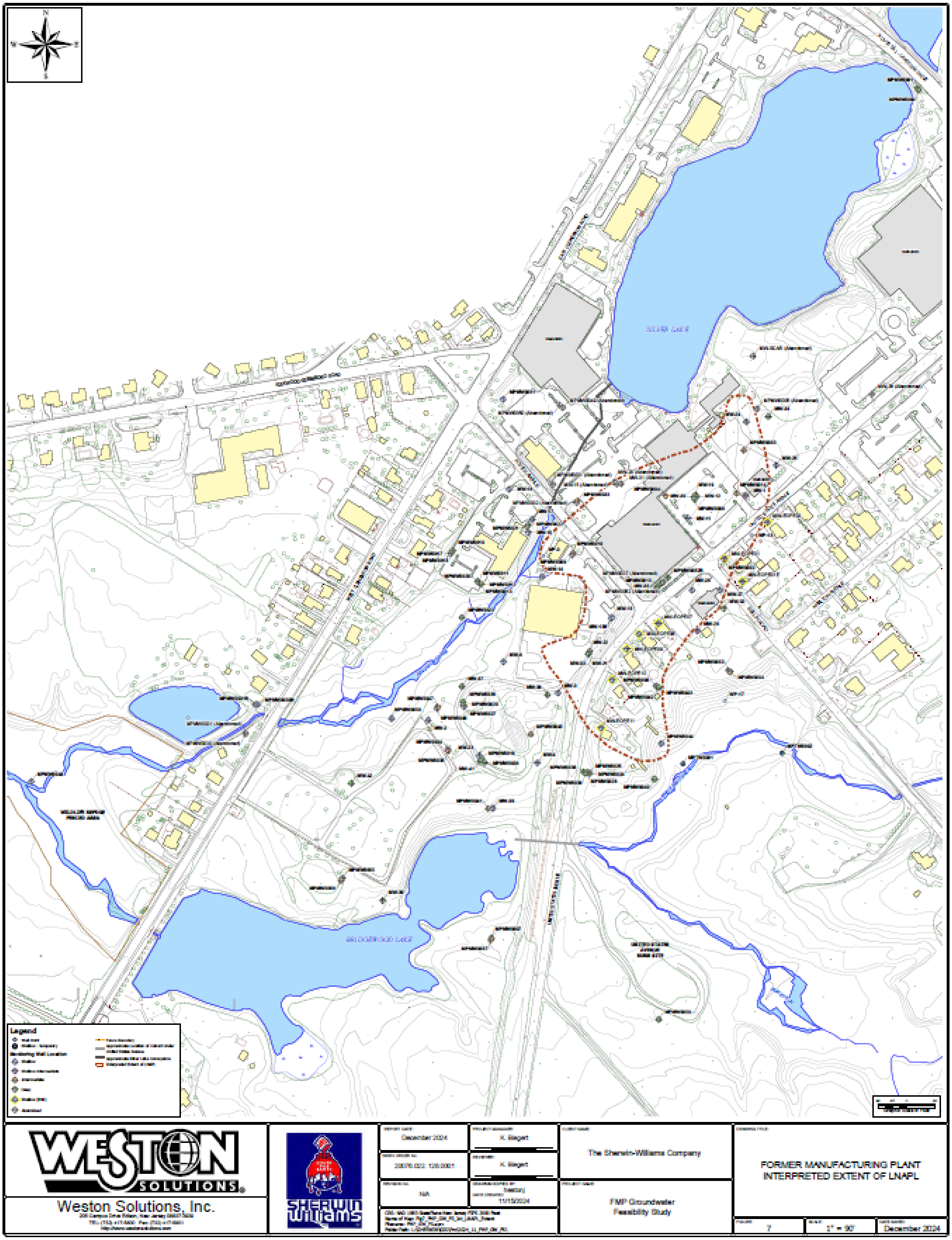
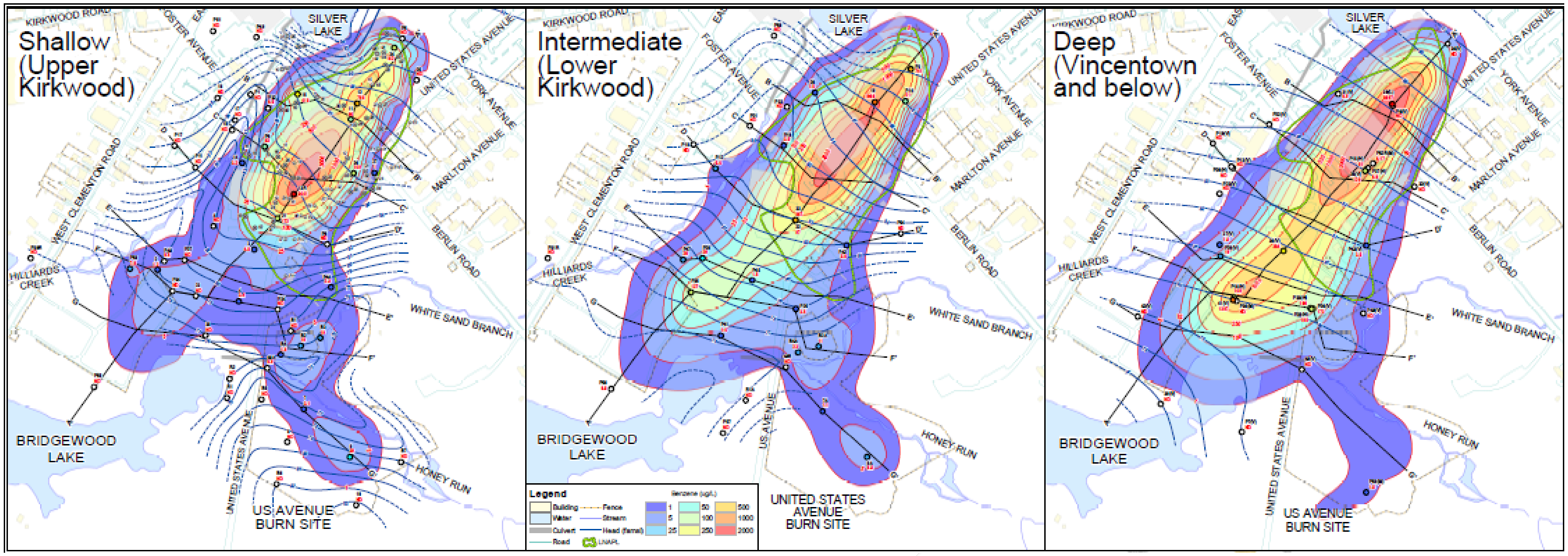

SILVER LAKE
BRIDGEWOOD LAKE
Legend
Weston Solutions, Inc.
December 2024
K. Biegert
20076.022.128.0001
K. Biegert
N/A
11/15/2024
The Sherwin-Williams Company
FMP Groundwater
Feasibility Study
FORMER MANUFACTURING PLANT
INTERPRETED EXTENT OF LNAPL
7
1" = 90'
December 2024

Figure 6:
Year: 1990



Year 2020:

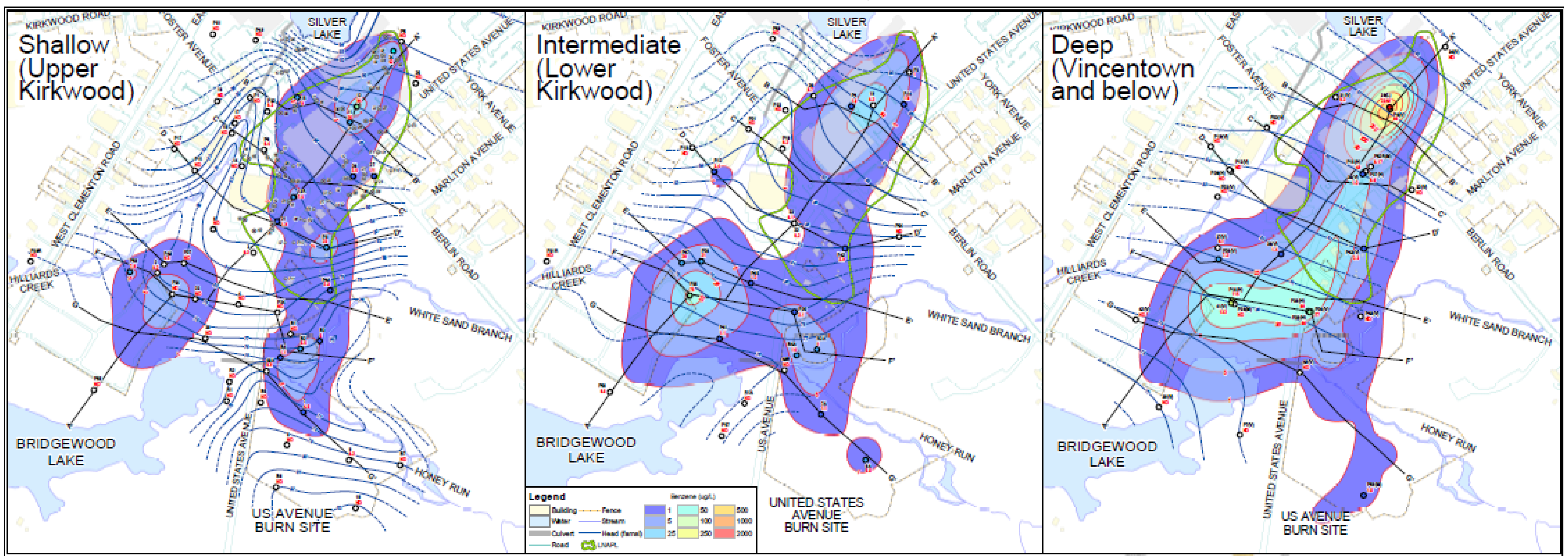
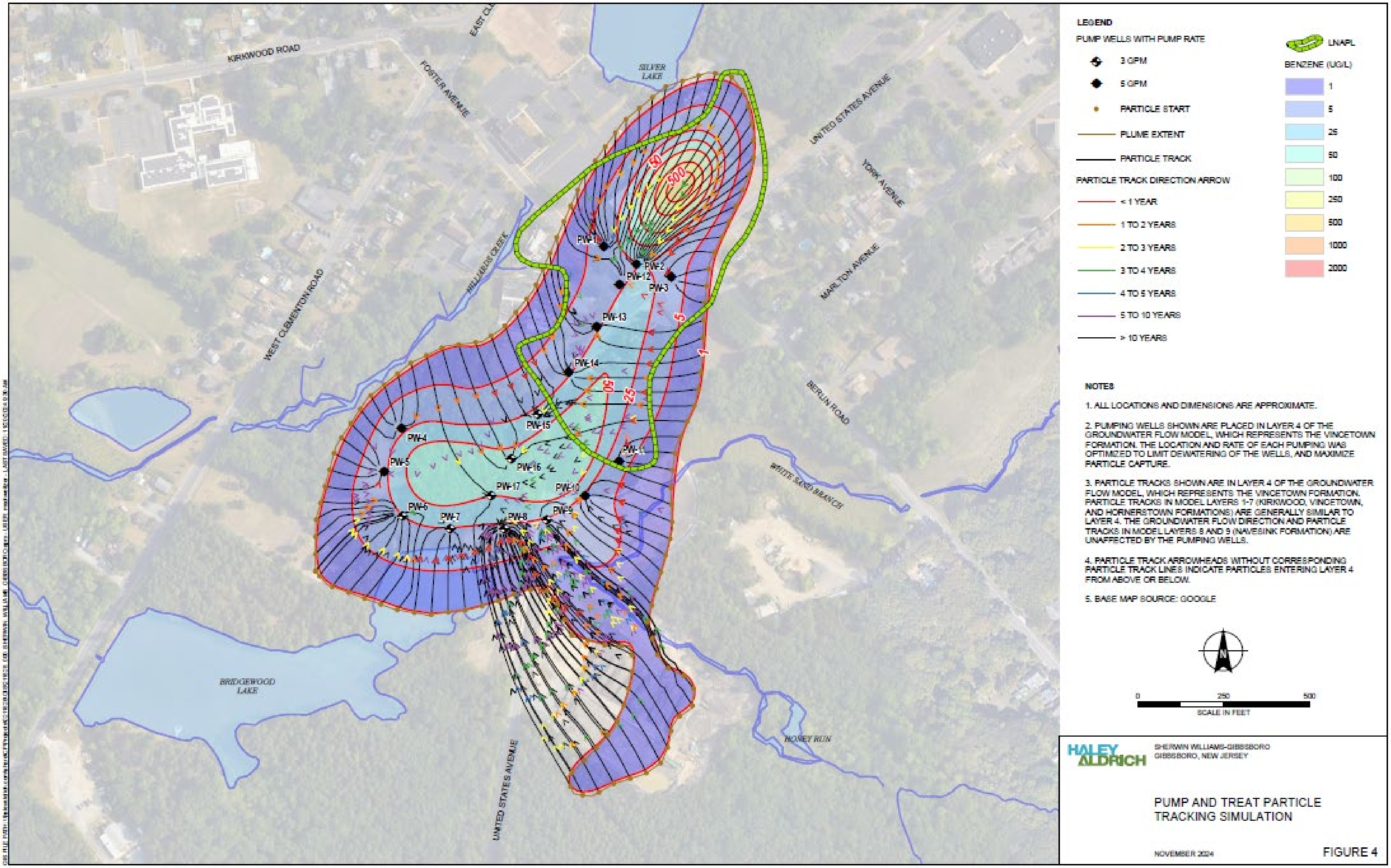


Figure 7


KIRKWOOD ROAD
FOSTER AVENUE
SILVER LAKE
UNITED STATES AVENUE
YORK AVENUE
MARLTON AVENUE
BERLIN ROAD
WHITE SAND BRANCH
WILLIAMS CREEK
WEST CLEMENTON ROAD
BRIDGEWOOD LAKE
HONEY RUN
PW-1
PW-2
PW-3
PW-4
PW-5
PW-6
PW-7
PW-8
PW-9
PW-10
PW-11
PW-12
PW-13
PW-14
PW-15
PW-16
PW-17
LEGEND
PUMP WELLS WITH PUMP RATE
3 GPM
5 GPM
PARTICLE START
PLUME EXTENT
PARTICLE TRACK
PARTICLE TRACK DIRECTION ARROW
< 1 YEAR
1 TO 2 YEARS
2 TO 3 YEARS
3 TO 4 YEARS
4 TO 5 YEARS
5 TO 10 YEARS
> 10 YEARS
LNAPL
BENZENE (UG/L)
1
5
25
50
100
250
500
1000
2000
NOTES
1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. PUMPING WELLS SHOWN ARE PLACED IN LAYER 4 OF THE GROUNDWATER FLOW MODEL, WHICH REPRESENTS THE VINCETOWN FORMATION. THE LOCATION AND RATE OF EACH PUMPING WAS OPTIMIZED TO LIMIT DEWATERING OF THE WELLS, AND MAXIMIZE PARTICLE CAPTURE.
3. PARTICLE TRACKS SHOWN ARE IN LAYER 4 OF THE GROUNDWATER FLOW MODEL, WHICH REPRESENTS THE VINCETOWN FORMATION. PARTICLE TRACKS IN MODEL LAYERS 1-7 (KIRKWOOD, VINCETOWN, AND HORNERSTOWN FORMATIONS) ARE GENERALLY SIMILAR TO LAYER 4. THE GROUNDWATER FLOW DIRECTION AND PARTICLE TRACKS IN MODEL LAYERS 8 AND 9 (NAVESINK FORMATION) ARE UNAFFECTED BY THE PUMPING WELLS.
4. PARTICLE TRACK ARROWHEADS WITHOUT CORRESPONDING PARTICLE TRACK LINES INDICATE PARTICLES ENTERING LAYER 4 FROM ABOVE OR BELOW.
5. BASE MAP SOURCE: GOOGLE
0
250
500
SCALE IN FEET
HALEY ALDRICH
SHERWIN WILLIAMS-GIBBSBORO
GIBBSBORO, NEW JERSEY
PUMP AND TREAT PARTICLE TRACKING SIMULATION
NOVEMBER 2024
FIGURE 4

<u>APPENDIX V</u>

RESPONSIVENESS SUMMARY
ATTACHMENT C

PUBLIC NOTICE

AFFIDAVIT OF PUBLICATION

Order Number : 11521156

STATE OF WISCONSIN
Brown County

Of the **Courier Post**, a newspaper printed in Cherry Hill, New Jersey and published in Cherry Hill, in State of New Jersey and Camden County, and of general circulation in Camden and Gloucester Counties, who being duly sworn, deposeth and saith that the advertisement of which the annexed is a true copy, has been published in said newspaper in the issue:

07/27/2025

Legal Clerk

Notary Public State of Wisconsin County of Brown

4-6-27
My commission expires

DENISE ROBERTS
Notary Public
State of Wisconsin

The EPA Invites the Public to Comment on the Proposed Cleanup Plan to Address Groundwater Contamination at the Sherwin-Williams/ Hilliards Creek Superfund Site in Gibbsboro, Camden County, New Jersey

The U.S. Environmental Protection Agency issued a proposed cleanup plan to address groundwater contaminated with benzene, arsenic, volatile organic compounds, or VOCs, and other contaminants, that remain at the Sherwin-Williams/Hilliards Creek Superfund site, located at Foster Avenue and Gibbsboro Road in Gibbsboro, New Jersey.

Since the mid-1990s, the EPA has been overseeing the work to address contamination at the site. The EPA's proposed plan addresses the cleanup of the contaminated groundwater at the site. Under a separate cleanup plan, the EPA is addressing contaminated soil at the former manufacturing facility property and preparing for the cleanup of contaminated sediment in waterbodies.

The EPA's proposed plan for the groundwater contamination includes using micro-organisms that break down contamination over time, as well as relying on natural processes, restricting groundwater use, and monitoring the groundwater to ensure that the treatment is working. The EPA will review the cleanup every five years to ensure it is protective of people's health and the environment.

The EPA will make a final decision on the cleanup approach after considering public comments. The EPA is accepting public comment from July 27, 2025 to August 26, 2025.

The EPA will hold a public meeting from 6:00 p.m. – 8:00 p.m. on Thursday, August 7, 2025 at Gibbsboro Senior Center, 772 Pole Hill Park Drive, Gibbsboro, NJ 08026. To see the proposed plan, visit: www.epa.gov/superfund/sherwin-williams.

The public can submit written comments to Brian Montroy, Remedial Project Manager, at Montroy.Brian@epa.gov, or mailed to 290 Broadway, 19th floor, New York, New York 10007-1866 no later than August 26, 2025.

July 27 2025
LNYS0340460
$34.32

Courier Post

Govt Public Notices

Originally published at courierpostonline.com on 07/27/2025

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Since the mid-1990s, the EPA has been overseeing the work to address contamination at the site. The EPA's proposed plan addresses the cleanup of the contaminated groundwater at the site. Under a separate cleanup plan, the EPA is addressing contaminated soil at the former manufacturing facility property and preparing for the cleanup of contaminated sediment in waterbodies.
The EPA's proposed plan for the groundwater contamination includes using micro-organisms that break down contamination over time, as well as relying on natural processes, restricting groundwater use, and monitoring the groundwater to ensure that the treatment is working. The EPA will review the cleanup every five years to ensure it is protective of people's health and the environment.
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July 27 2025
LNYS0340460
$34.32

SHERWIN-WILLIAMS/HILLIARDS CREEK SUPERFUND SITE

GIBBSBORO, NEW JERSEY

JULY 2025

The Proposed Cleanup Plan

The U.S. Environmental Protection Agency is requesting public comment on its proposed plan to address contaminated groundwater at the Sherwin-Williams/Hilliards Creek Superfund site in Gibbsboro, Camden County, New Jersey. This plan looks at three alternative approaches for addressing pentachlorophenol, or PCP, light non aqueous phase liquid, or LNAPL, and metals, as sources of contamination to groundwater. For more information about these contaminants, please visit: www.atsdr.cdc.gov/toxfaqs.

Figure 1. Map showing the site.

The EPA's preferred approach is to gather additional data to create a targeted treatment plan that uses microorganisms to break down contamination. This treatment will enhance the the natural processes that are already breaking down contamination over time to clean up the groundwater. The EPA's approach also includes restricting the future groundwater use in the impacted area, as well as monitoring the groundwater to ensure that the treatment is working.

This proposed plan will restore the groundwater so that it can be a source of drinking water in the future. The EPA considers this approach to be the most protective of people's health and the environment. The proposed plan is available on the site's website at www.epa.gov/superfund/sherwin-williams.

Public Meeting

The EPA will hold a public meeting on **August 7, 2025 from 6:00 p.m. to 8:00 p.m.** at Gibbsboro Senior Center, 772 Pole Hill Park Drive Gibbsboro, NJ 08026.

If you cannot speak, read, write, or understand the English language or you are a person with disabilities and need reasonable modifications and/or auxiliary aids and services, please contact Maya Greally at greally.maya@epa.gov or call (929) 656-3415 to request services free of charge no later than August 1, 2025.

Public Comment Period

The EPA is requesting the public's input on its proposed plan **from July 27, 2025 to August 26, 2025**. The public is encouraged to review the plan, attend the public meeting, and comment on the cleanup options.The EPA will make a final decision after considering public comments.

Send your written comments to Brian Montroy at Montroy.Brian@epa.gov or by sending written comments to Brian Montroy, 290 Broadway, 19th Floor, New York, New York 10007 **no later than August 26, 2025.**

Past Activities

The Sherwin-Williams/Hilliards Creek Superfund site is being cleaned up in four different stages, called Operable Units, or OUs.

> **Operable Unit 1:** Addresses the cleanup of contaminated soil on residential properties. The EPA completed cleanup work in February 2022 and there is ongoing monitoring of the area.
> **Operable Unit 2**: Addresses the contamination at the former manufacturing facility. Cleanup work began in early 2024 and will continue in phases over the following years.
> **Operable Unit 3**: Addresses the groundwater contamination associated with the former manufacturing facility. This is the area that this proposed plan addresses.
> **Operable Unit 4**: Addresses the contamination of sediment in Silver Lake, Bridgewood Lake, Kirkwood Lake, Hilliards Creek. The EPA chose a cleanup plan for this operable unit in October 2021 and cleanup work began July 2025.

NOTE: This proposed plan only addresses OU3, the contaminated groundwater associated with the former manufacturing facility. Public comment should focus on the proposed cleanup plan for the contaminated groundwater at the site.

Figure 2. Map of the different areas of the site.

Site Background

The property was first developed in the early 1800s as a sawmill, and later a grain mill. In 1851, John Lucas & Company purchased the property and converted the mill into a paint and varnish manufacturing facility. In 1930, Sherwin-Williams purchased the Lucas company and expanded operations at the facility. The manufacturing facility closed in 1977.

When the paint and varnish manufacturing facility was operating, the facility dumped waste directly into Hilliards Creek and improperly stored waste in tanks, drums, and unlined waste lagoons, leading to widespread soil, sediment, surface water, and groundwater contamination.

The facility also dumped waste in two different areas, the Route 561 Dump site and the U.S. Avenue Burn Superfund site. These areas are not part of the Sherwin-Williams/Hilliards Creek Superfund site, but they do have related contamination. These sites are refered to as the Sherwin-Williams sites and the EPA manages them together because they are related cleanup projects.

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Courier Post

SOUTH JERSEY

EPA has more plans for ex-Sherwin-Williams site in Gibbsboro. How to learn more.

Jim Walsh
Cherry Hill Courier-Post

July 29, 2025 | Updated July 30, 2025, 5:31 p.m. ET

The U.S. Environmental Protection Agency plans to target polluted groundwater in the latest phase of its yearslong cleanup at a Gibbsboro Superfund site.

The effort already has removed more than 100 tons of contaminated soil left by a former paint manufacturing plant on the shore of Silver Lake.

As its next step, the EPA said it plans to inject "safe organic materials and nutrients into the ground to support the growth of naturally occurring bacteria, which help break down harmful chemicals in the groundwater over time."

Big improvement:: Celebrating changes at Lipari Landfill in Mantua, Alcyon Lake in Pitman

The groundwater "is the last element to be addressed at the former manufacturing plant," said Gibbsboro Mayor Ed Campbell.

"The reason for this is that the groundwater contamination emanates from various sources that have now been, or are in the process of being, remediated. The removal of the source often results in a significant improvement in the groundwater," he said.

The mayor noted ongoing efforts to turn the area around Silver Lake into a "walkable" town center with restaurants, offices and homes.

The Sherwin-Williams paint plant operated from the mid-1800s to 1997 as a dominant presence in Gibbsboro, a town that covers a little more than 2 square miles.

This facility, found near the headwaters of Hilliards Creek, kept paint sludge and wastewater in unlined lagoons, the EPA said, and improperly handled often-leaking tanks and drums. The agency started its cleanup in 2016.

Workers so far have removed approximately 66 tons of soil from the manufacturing site and 52 tons from 49 residential properties in the area.

They've also recovered approximately 8,100 cubic yards of sludge material from lagoons, and 14,000 gallons of a buried mixture of water and oil.

The EPA and New Jersey authorities are to restrict the use of groundwater to prevent exposure while the next phase is ongoing, the statement said. The water is to be tested to track progress over time.

A public meeting on the proposal is scheduled for Aug. 7 from 6-8 p.m. at the Gibbsboro Senior Center at 772 Pole Hill Park Drive.

The EPA is accepting public comments on its proposal through Aug. 26. Comments may be emailed to montroy.brian@epa.gov.

Additional information is available at the Superfund site's profile page.

(This story was updated to add information.)

Jim Walsh is a senior reporter for the Courier-Post, Burlington County Times and The Daily Journal. Email: Jwalsh@cpsj.com.

APPENDIX V

RESPONSIVENESS SUMMARY
ATTACHMENT D

PUBLIC MEETING TRANSCRIPT

In the Matter Of:

IN RE: PUBLIC MEETING

50205784

EPA MEETING

August 07, 2025

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REVISED
EPA MEETING

August 7, 2025

6:03 p.m.

Gibbsboro Senior Center
772 Pole Hl Pk Drive
Gibbsboro, New Jersey 08026

Shayne Colomy
Digital Reporter
Commission No. 50205784

ATTENDEES

Maya Greally, Community Involvement Coordinator
Brian Montroy, Remedial Project Manager
Dylan Zalewski, NJDEP
Edward Campbell, Mayor
Julie Nace
Brennan Woodall
Brittany Gustavson, Section Supervisor
Dave Evans
Robert Danser
Jeffrey Pike
Alfonso Pena
Joy McCurry
Scott Littlefield
Andrew Parsinitz
Dennis Deichert
Matthew (no last name given)

MS. GREALLY: [Inaudible] EPA's Cleanup Plan for Operable Unit 3, or the contaminated ground -- groundwater portion of the Sherwin-Williams Hilliard's Creek superfund site.

My name is Maya, and I'm the community involvement coordinator for the site. Just so everyone is aware, this meeting is being -- the audio is being recorded. It's part of the public record, and it'll be typed up later and also be made part of the public record. And there are bathrooms in the back here on the right, as well as we have our two exits right behind you all.

So we have a brief agenda here. We'll start by introducing some of the EPA site team who are here to answer your questions. We'll have a brief welcome from the mayor, a presentation about the superfund process, and the proposed plan itself, and to finish we'll have time to take questions and comments. We just ask that if you have any questions or comments, you save it until the end and we'll have plenty of time to answer them.

So now for introductions, as I mentioned, my name's Maya. I'm the EPA's community involvement coordinator for the site. We also have Brian here, who is the remedial project manager for the groundwater portion of the site. From EPA, we also have Brittany, who is our section supervisor, Julie, and Brennan back there, who are also working on the site. We also, from NJDEP, New Jersey Department of Environmental Protection, have Dylan -- I'm so sorry.

MR. ZALEWSKI: Zalewski.

MS. GREALLY: Zalewski. Sorry about that.

And of course, Mayor Campbell. So now I'll hand it over to the mayor for a welcome.

MR. CAMPBELL: It's after 6:00, so good evening. It's tempting to say welcome and sit down, but I'm going to say a couple of words. If this is your first EPA public hearing, this is one of many. It's been a very long journey to get here, but we made a lot of progress. In particular, I think the last five years or so, an awful lot of work has been done in Gibbsboro. For that, I'm very grateful to EPA, DEP, Sherwin- Williams, because they do function as a team.

A lot of times there are a lot of technical questions, but we get through it, and I am fortunate to be briefed once a month for several of these, and quarterly to have a meeting with the agencies to go through any issues that we have.

So from a logistics perspective, the restrooms are in the back to the right. When you leave, if you're not familiar with the grounds, you can get out at the light there. So you want to go out -- straight out here, and just bear a little bit to the left and you can see the traffic signal. Go out there. It's a lot safer than going out at the unregulated intersection over here.

And lastly, if you are a resident of Gibbsboro and you've never walked through this building, I encourage you to go over into what we call the recreation annex, because we have a little two-lane bowling alley. There are only two towns in New Jersey that have a municipal bowling alley. We're one of them, and it's a great facility. People rent it for kids and whatnot, and just an awesome facility.

This used to be a military base. Air Force station, radar station. Now there's an active FAA facility here, but we own all the land around the radar, and all the way down to town.

With that, welcome. Again, I hope you have a lot of good questions and that it's informative for you. Thanks.

MS. GREALLY: Thank you, Mayor Campbell.

So moving on to the presentation. During the presentation, we're going to cover the superfund process, some information about the site history and site background, then we'll go through the proposed cleanup plan, and provide a summary of, you know, next steps and have time for questions.

So just to make sure we're all starting from the same place, this is the Comprehensive Environmental Response Compensation and Liability Act, or CERCLA, is what we know as the superfund law. It was passed by Congress in 1980, and this is what allows the EPA to clean up contamination in order to protect human health and the environment. Since superfund is a law, there are very specific steps that the EPA has to follow, and we call that the superfund process.

I'm just going to take a minute to go through the different steps of that process and make -- so we can think about what has already happened at the site, where we are in that process now, and what's going to be coming next.

So this is a little flow chart that shows the big steps of the process. As you can see, there's community involvement that happens throughout. Community involvement can look like this meeting that we're having right now, it can look like the public comment period that's ongoing, or it can be, you know, email updates about the cleanup.

So the cleanup process actually begins when the EPA is made aware of potential contamination, and we do what is called a preliminary assessment. So that's an investigation into the contamination and what potential threats there is to human health in the environment.

Using the information from that preliminary assessment, the EPA decides if the area meets the criteria needed to become a superfund site. If it does meet that criteria, the site is listed on the national priorities list, which is what makes it an official superfund site.

So this site, the Sherwin-Williams Hilliard's Creek site, was listed in 2008. Once the site is listed, the EPA conducts a remedial investigation and feasibility study. This is a detailed investigation into the contamination, including how it's traveling, vertically and horizontally, and the potential impacts to human health in the environment if it is not cleaned up.

Using the information from that remedial investigation and feasibility study, the EPA puts together a proposed plan. The proposed plan includes several different options for addressing the contamination. Once the plan is published, there's a public comment period where the public can provide their input on the proposed options, and this is where we currently are in the process.

So after the public comment period ends, the EPA reviews the comments and chooses a final cleanup plan for the site. The selected final cleanup plan for a site is put into a document called a Record of Decision.

So after we have that Record of Decision and the cleanup plan is selected, we move on to the actual cleanup work itself. Before that work can begin, there is a detailed engineering plan that's put together called a remedial design, and the remedial design often requires us to do additional sampling and investigation.

Once that remedial design is complete, we move on to the cleanup and construction work, and that's called remedial action. Once the remedial action or cleanup work is complete, we enter the operation and maintenance phase. During this phase cleanup work can be ongoing, and the EPA is regularly checking in on the cleanup process.

After many years of monitoring and review, if we find through these reviews that the site's contamination has been addressed, a site can be removed from the national priorities list and is no longer a superfund site.

So now I'm going to hand it over to Brian and he's going to go into the more specifics of tonight.

MR. MONTROY: Thank you, Maya.

Good evening. My name is Brian Montroy. I am one of three remedial project managers for the Sherwin- Williams Hilliard's Creek superfund site. I'm here tonight to talk to you about the proposed cleanup for Operable Unit 3, also known as site groundwater. This presentation will provide a summary of the cleanup alternative, which were presented in the proposed plan.

Before I get into the summary of the proposed alternatives, I want to spend a little bit of time to discuss the site background. The site was operated as a paint, varnish, lacquer, and manufacturing plant from 1851 to 1977, when the plant closed. Historic operations associated with the manufacturing operations included waste lagoons, above ground storage tanks, drum storage, rail spur, and associated tanker cars.

The plant was sold in 1981 and was developed as the corporate center, which operated until 2022 when Sherwin-Williams repurchased the property.

The Sherwin-Williams sites are made up of three distinct units: The Route 561 dump site, which is located adjacent to Clementon Lake; the U.S. Avenue burn site, which is located adjacent to Bridgewood Lake; the Sherwin-Williams Hilliard's Creek superfund site, which has been broken down into smaller pieces or operable units.

These operable units are also referred to as OUs: OU-1, which is made up of the residential properties; OU-2, which includes the former manufacturing plant; OU-3, which includes the site groundwater and is the subject of this public meeting; and OU-4, which is referred to as the water bodies. This unit includes Silver Lake, Bridgewood Lake, Hilliard's Creek, and Kirkwood Lake.

All of these sites are contaminated with waste from the former manufacturing process, and are being addressed separately. This cleanup effort for -- the cleanup effort for the dump site, the burn site, and OU-1 have been completed, while the efforts for OU-2 and OU-4 are currently ongoing. If you have any questions about the other sites, please let us know after the meeting and we can follow up individually.

I'm sure you have seen a lot of work is happening at the former facility located on Foster Avenue. The construction crews have been hard at work cleaning up contaminated soil, sediment, that are associated with OU-2 and OU-4. These cleanup activities are targeting the contaminate sources to the groundwater.

Tonight's presentation will go through an overview of the next steps in the cleanup process to address the legacy contamination from the historic paint operations. But before we can get into this part of the presentation, I'm going to quickly recap the work which has been completed at the site.

Since being listed on the national priority list in 2008, numerous soil, sediment, and groundwater investigations have been completed under the direction of EPA. These investigations were also determined -- they also determined the nature and the extent of the contamination, or more simply put, how far the contamination has spread.

Based on the results it was determined that site soils, sediment, groundwater have been impacted by historic operations. These investigations also determined that the contaminated soil and the lot -- light non-aqueous phase liquid, or LNAPL, which is a mixture of paint constituents floating on top of the groundwater, are the primary source of contamination found in the groundwater.

Although these sources of contamination to the groundwater at the site are being addressed under the OU-2 cleanup, which was selected by EPA in 2020, excavation work -- and excavation work to these sources started in 2024 and is currently ongoing.

Additionally, based on the information collected, three distinct groundwater zones were identified: The shallow, which is shown in the yellow shading; the intermediate, which is shown in the tan color; and then the deep groundwater zone, which is everything below the intermediate zone.

As previously stated, historic operations at the site have impacted groundwater with the contaminants -- with contaminants of concern, or COCs, listed. Many of these contaminants listed -- of a -- listed come from the LNAPL and the contaminated soils at the site. It was determined that the COCs pose an unacceptable risk to human health and the environment, and is why EPA is taking the action to clean up the site.

Now that we have summarized the findings in the investigation, I will move on to the purpose of tonight's meeting, the presentation to proposed cleanup alternatives for the site.

There were four cleanup alternatives developed for the site. The first alternative looks at what happens if no action was taken. This alternative is only used as a comparison for the other alternatives. In the coming slides I'll provide a description of the remaining alternatives, and the common elements that each of them share. Except for the no action alternative, Alternative 1, each of the remaining alternative share six common components, or elements. In the next couple of slides, I will discuss these common elements.

The first common element is the implementation of the OU-2 cleanup. This cleanup includes excavation and offsite disposal of contaminated soil, the removal of LNAPL from the groundwater surface, and the breakdown of any LNAPL using microorganisms. As previously stated, both site soils and LNAPL have been identified as sources to the shallow, intermediate, and deep groundwater at the site.

Although the cleanup is not part of the OU-3 proposed plan and this presentation, it will have a significant impact on the on the OU-3 cleanup by removing the ongoing sources to the groundwater.

The next common element I would like to discuss is what will happen to the shallow and intermediate groundwater once the OU-2 cleanup is complete. These two groundwater zones will attenuate via natural processes, or in other words, the zones will rely on physical, chemical, and biological breakdown of the contamination without any human intervention.

On the next slide, I'm going to show you a brief video that shows how past cleanup efforts, along with attenuation via natural processes, have reduced groundwater contamination at the site. To orient you to the figure, I would like to point out a couple of key landmarks. Silver Lake is at the top of the page; Bridgewood Lake, it's towards the left of the page; and U.S. Avenue, that kind of runs right through the middle of the area.

On this slide, you will see the interpreted limits of the benzene contamination defined by groundwater sampling collected from 1990 to 2020. The area in red shows zones of higher contamination. As you move away from these areas, the contamination level decreases, with the areas in blue showing the lowest levels.

Throughout this time, removal of LNAPL,

lights -- limited soil excavation, and the breakdown of the contaminants via natural processes is taking place. This time-lapse shows how the combination of these processes is cleaning up the groundwater contamination. It is expected with the -- with the cleanup of the OU-2 source, groundwater quality in the shallow intermediate zones will continue to improve.

Now that we have an understanding of how -- of how the common elements of the OU-2 cleanup will affect the OU-3 alternative, I will run through the remaining common elements.

Common Element number 3 is the implementation of a pre-designed investigation or a PDI. This process consists of collecting additional information to fine tune understanding of the site's contamination. This information will be included in a detailed engineering plan Maya mentioned earlier, called the remedial design.

Common Element 4 would place institutional controls on the site. Institutional controls are restrictions that are put in place that limit the use of contaminated areas. In the case of OU-3, groundwater use would be restricted in the footprint of the contamination to prevent exposure.

Common Element number 5 would in -- would be the implementation of a long term groundwater monitoring program. This program would include sampling groundwater wells across the site to track the progress of the cleanup.

And lastly, Common Element 6 would include the release of periodic reports called five-year reviews. These reports would document the progress of the cleanup.

In addition to the common elements I just discussed, Alternative 2, attenuation via natural processes, will rely on the physical, chemical, and biological processes to break down the contamination into deep groundwater. These processes are currently working in the groundwater and would continue to work without human invention -- intervention.

Lastly, I would like to point out that there is an error on Page 20 of the proposed plan. It mistakenly represents the estimated construction time as two years. The correct estimate time frame for the Alternate 2 should be zero years, since there are -- is no construction needed for this alternative.

Alternative 3 would focus in -- or would -- alternative 3 would use focused in-situ treatment to clean up the deep groundwater contamination. Three technologies were evaluated during the OU-3 feasibility study and were found to be effective at reducing the contaminants of concern within the deep source area, which is shown in the figure by the orange and the yellow.

Alternative 3 would include the implementation of the common elements discussed earlier, the installation of numerous injection wells in the general vicinity of the orange and yellow area shown above. The final locations of these points would be determined after the pre-design investigations have been completed.

Once installed, treatments would be pumped into the ground through these points. The estimated treatment area is approximately 25,000 square feet, and is located approximately 55 to 75 feet below the ground surface.

Lastly, Alternative 3 would also include the installation of monitoring wells that will be used for the long term monitoring program.

The last alternative I would like to discuss is Alternative 4. Alternative 4 would consist of pumping contaminated deep groundwater to the surface for treatment. The conceptual design for the groundwater extraction and treatment system would include the implementation of the common elements discussed earlier, the construction of the centralized groundwater treatment facility, and the installation of 20 deep extraction wells, two pumping stations, and approximately 2,500 linear feet of piping, which will move the contaminated groundwater to and from the treatment plant.

As shown on the screen, there are nine criteria that EPA uses to evaluate the proposed alternatives. Two threshold criteria, five for the balancing criteria, and two for the modifying criteria. No criteria shown here determines what cleanup alternative will be selected. EPA looked at criteria like protectiveness, long and short term effectiveness, ease of implementation, and cost to aid with their alternative selection.

Based on this evaluation, EPA consultation with New Jersey DEP has identified Alternative 3, the focused in-situ treatment, attenuation via natural processes, institutional controls, and long term monitoring as the preferred alternative for the cleanup of OU-3.

The total estimated cost for this alternative is approximately $4,220,000, and is based on using sequestration with enhanced bio remediation for the cleanup. This is just a fancy way of saying that the injected treatments would absorb and break down the contaminants in the deep groundwater.

The key components for the preferred alternative are the implementation of the OU-2 remedy, which is currently in progress, followed by attenuation via natural processes for the shallow and intermediate groundwater, the implementation of a pre-design investigation to fully understand the deep source area. This information will be used in the -- in the remedial design. It will also include the placement of institutional controls in the -- in the area where the groundwater contamination is located.

Lastly, the cleanup would be evaluated using long term monitoring. This would consist of collecting groundwater information from the -- from the shallow, the intermediate, and the deep groundwater to track and monitor changes both inside and outside the treatment zone.

Thank you. This concludes my presentation of the proposal alternatives for Operable Unit 3. I will turn the presentation back to Maya so we can get to the next steps questions part of this presentation.

MS. GREALLY: So thank you, Brian. So to

quickly review, before we get into questions and comments, written public comment is being accepted on the proposed plan until August 26th. If you'd like to submit written public comment, you can send them through the mail, or email Brian using this information here. If you want take a picture, it's also on the sheets that you all got at the front.

After the public comment period closes, the EPA will prepare and publish the record of decision that I talked about earlier, and that's the final cleanup plan. It will include responses to all the public comments we receive, including any verbal comments or questions we get at this meeting.

So to move on to questions and comments, to make sure that we're getting as many questions and comments as possible, we're going to ask that folks ask one question at a time. I'm sure many folks have multiple questions, just want to make sure we get as many voices in the room as possible.

Before you ask your comment -- or before you ask your question or give your comment, I'm just going to ask that you state your name and affiliation, so that can mean if you're here representing an organization, if you just want to say what neighborhood or street you're from, or if you're just here as a resident, that's totally fine, as well.

And I'm going to be walking around the room. So in a second, I'll just ask folks to raise their hands. We'll go in order of when folks raise their hands. And since this meeting is being recorded, we don't have a mic, but I have this little recorder fellow here. So I'll just ask that you wait to begin until I can get close enough to make sure that we have a good transcript.

Does anyone have questions about any of that, before --

Okay, great. So all -- over to you all.

Okay. I see blue, and then green.

You can just talk into --

MR. EVANS: I'm Dave Evans, 18 United States Avenue, so I'm directly across from the site. The question I have is -- first question is, when is the proposed beginning of this project, whether it be 2, 3, or 4?

MR. MONTROY: It is definitely a couple years out. There --

MR. EVANS: A couple years, two, four, five?

MR. MONTROY: It -- it's hard to say. The process to go ahead, and -- there's a negotiation process first that has to happen. So once we go ahead and we produce our ROD, that opens up the negotiation period.

So it's hard to put a number on how long it's going to go ahead and take EPA and Sherwin-Williams to negotiate the cleanup.

So -- and then the next step after that is the pre-design investigation. And depending on how it's implemented, or what we find, it could take multiple iterations of the -- of the pre-design investigation to get all the data that they need in order to come up with a design to go ahead and clean it up.

It's hard to put a number on it. And then after that, they have to go ahead and design the remedy, so that takes some time, as well. And then beyond that, there is a mobilization, there is getting the treatments, the wells in, the treatments into the ground. And then there's a short period of time of waiting for the treatments to go ahead and take effect.

MR. EVANS: Okay. Thanks. My property, 18 United States Avenue, has never been tested. So I -- on your diagrams, it's sort of on the fringe of where that groundwater is. Is there any possibility to test my property, as far as, you know, any of the impact that it might have on this?

MR. MONTROY: I definitely can go ahead and take a look at that, and get back to you about it.

MR. EVANS: Okay.

MR. DANSER: Robert Danser, 101 Kirkwood Road, right on the site that the -- I assume the pipeline's going to be running through the back of my property to Kirkwood Lake, correct? Is that the way it's going to go, and the pumping station's going to pump it through Bridgewood Lake? That's where --

MR. MONTROY: You -- you're talking about the cleanup of Kirkwood Lake?

MR. DANSER: That's going to start first before they do Square Circle lake?

MR. MONTROY: Honestly, I'm not 100 percent sure on the time. I know that the timelines are converging, so I'm not sure what's going to happen, and how -- or what's going to come first.

MR. DANSER: My question is, if it is at Voorhees and Kirkwood, why don't they have their own pumping site over there instead of running all this pipeline through Gibbsboro, through the back waters, through our back wood? Something could happen to that line, and it breaks and contaminates all over again, so --

MR. MONTROY: Okay.

MR. DANSER: I mean, that's a long run.

MR. MONTROY: No. Understood.

MR. DANSER: So I mean, that's my concern.

MR. MONTROY: Unfortunately, I'm not prepared to talk about the Kirkwood Lake today.

MR. DANSER: Okay.

MR. MONTROY: But I definitely can go ahead and take concerns back to the office and get into it.

MR. DANSER: Thank you.

MR. PIKE: I'm Jeff Pike, and I live in Voorhees, near Farmhouse Lane, and I have a question. If the chosen alternative is number 3 that has the in- situ treatment, is there any discharge for that, or is it all just pumped into the ground?

MR. MONTROY: It's all pumped into the ground.

MR. PIKE: No -- no pipe or anything?

MR. MONTROY: There's no pipes. No. It's all self-contained wells that will go ahead and put the treatment into the ground. That treatment will stay in the localized area it's pumped into, and then it will do its job in that area.

MR. PIKE: Thank you.

MR. MONTROY: You're welcome.

MR. PENA: Hi, Alfonso Pena. I don't live in town, but just to follow up to his question, just because I was a little confused, maybe. So the -- you'll have -- they'll be pumped through the ground, you said something about 25,000 square feet? Will they -- are they going to be placed in different areas? You said -- I'm sorry, you said something about total spread?

MR. MONTROY: Yeah. No, I definitely -- I got you. Just let me get out of this and get back to a slide where I can go ahead and show you what I'm discussing.

MR. PENA: Okay.

MR. MONTROY: So basically, we're looking to treat this area right here, this yellow and orange area right here. This area is located within the footprint of the former manufacturing site, and it's located right at the corner of where the historic tank farm used to be. It -- the area is estimated to be about 25,000 square feet. That is one thing they're going to go ahead and confirm during the PDI investigation.

So again, it's located on the site, and it's about 55 to 75 feet deep. So it is well below the ground surface, and contained within the footprint of the former manufacturer.

MR. PENA: And this -- I'm sorry.
MR. MONTROY: No, go ahead.
MR. PENA: This only -- this is best for targeting down deep soil? Is -- I'm -- there's other areas that have soil contamination, that was --
MR. MONTROY: So the soil contamination is being handled under the OU-2 cleanup, which is being -- they're being addressed by excavation. So those source areas to the groundwater are going to -- they're being -- they're in the process of being excavated right now.
MR. PENA: Okay. All right. Thank you.
MS. McCURRY: Hi, I'm Joy. I live in 23B West Clementon -- West Clementon, where they did the green -- you know, they did the backyards on that strip. And then the lake is like -- they're doing something with the lake dam.
Will all that stuff have anything come back into the yard, into my yard? Will that have any, like --
MR. MONTROY: Are you talking about the groundwater treatment?
MS. McCURRY: Yeah --
MR. MONTROY: Or are you talking about --
MS. McCURRY: -- will that affect the cleanup,

what they already did in my backyard?

MR. MONTROY: It will not, no. We are injecting everything 55 feet below the ground surface to 75 feet below the ground surface.

MS. McCURRY: Okay. So I don't have to worry about any kind of contamination coming back into the yard?

MR. MONTROY: No.

MR. LITTLEFIELD: I'm Scott Littlefield. I'm at 11 United States Avenue. I currently have monitoring wells on my property.

Is it safe to assume that those would be the same wells that we'd administer the bio remediation, or is there potential that it'll expand?

MR. MONTROY: No. Those wells that are in your yard will be used for monitoring purposes.

MR. LITTLEFIELD: Okay.

MR. MONTROY: The wells that will be used for injection will be solely for that. They'll be installed just for the injection portion.

MR. LITTLEFIELD: Okay.

MS. GREALLY: Question?

MATTHEW: Yeah, yeah. I'm Matthew. What's the -- so that -- I wasn't paying attention, [inaudible] right now. You explained the four

alternatives.
The last one was 20 million; is that right?
MR. MONTROY: The total cost is, I think, 24.
MATTHEW: Okay. So why is that one, like, six times as much as the --
MR. MONTROY: Because of the -- because of the infrastructure that needs to be installed. The groundwater treatment plant itself is very expensive to build.
MATTHEW: Rather, is it better?
MR. MONTROY: Better? I wouldn't say that it's better. All the alternatives that we chose were chose because they could do the job. It has a larger impact on the community. It would have a larger impact overall for just everything, just tearing up the community, putting in the piping, building the station.
The reason that we didn't choose it was because of the impact that it was going to have. It didn't have very good short term or long term impacts.
MS. GREALLY: Other questions? Yep.
MR. PARSINITZ: Andrew Parsinitz, 112 West Clementon Road. So I'm going to piggyback off of that question, 3 versus 4, right? It seems like

those are the two -- what I would suggest would be the reasonable alternatives. And I think one is clearly way more expensive than the other.

I guess, timing wise, it looked like Option 4 would be completed in about five years faster; is that right?

MR. MONTROY: That's what they're projecting, yes. They're projecting it, get to -- get to finish five years in advance.

MR. PARSINITZ: But ultimately at the end of the 20 years for Option 3, or at the end of the 15 years for Option 4, we believe -- the EPA's position is that the dilution would be at the same level, right? The amount of contaminants at the conclusion of 20 years in Option 3 and at the conclusion of option -- of 15 years in the Option 4 would be the same amount of contaminates?

MR. MONTROY: Yeah, I think it was 15 years in Option 3, and it was 20 years in Option 4. The projection is that it will go ahead and meet the cleanup criteria.

MR. PARSINITZ: Can I see those? Because I thought it was opposite. I thought it was 20 years for Option 3.

MR. MONTROY: So Option 4 was 20 years --

MR. PARSINITZ: Oh, wow.
MR. MONTROY: -- option 3 was 15 years.
MR. PARSINITZ: So 3 is faster --
MR. MONTROY: Faster.
MR. PARSINITZ: -- and cheaper?
MR. MONTROY: And cheaper. Less impact.
MR. PARSINITZ: And is that the status now? The --
MR. MONTROY: As of 2020.
MR. PARSINITZ: As of 2000?
MR. MONTROY: As of 2020.
MR. PARSINITZ: Okay. Thank you.
MR. MONTROY: And since 1990, it has been shrinking.
MS. GREALLY: Any questions? It's just a fantastic presentation.
Okay. One last call?
MR. PARSINITZ: Yeah. Brian, can you describe -- sorry, Andrew Parsinitz. I'm violating the rule, but nobody else was raising their hand.
Can you describe the environmental impact on the community in Alternative 3? What are we -- we're looking at, you said, a number of wells. How many -- how many wells?
MR. MONTROY: They're projecting four.

MR. PARSINITZ: Okay.
MR. MONTROY: They're projecting four. And that will be limited disturbance, a couple days a well.
MR. PARSINITZ: Most likely in the wooded area of --
MR. MONTROY: It depend -- it depends. Their pre-design investigation will go ahead and determine where they need to put the wells for monitoring purposes. So based on what they see there being a data gap in, that's where they'll have to go ahead and put a well.
Typically, they like to put them in public right of ways, so they don't have to go ahead and disturb residences, but I can't say that somebody won't be asked, you know, to sign an access agreement to put a well in.
MR. EVANS: Is that the monitoring wells or the injection?
MR. MONTROY: The monitoring wells. The injection wells are all going to be on the manufacturing property.
MR. EVANS: And how many of them are there?
MR. MONTROY: We don't know yet.
MR. EVANS: Approximately?

MR. MONTROY: I don't know. It's all going to --

MR. EVANS: 30? 40?

MR. MONTROY: I'm sorry, I don't know. It's all going to be determined by the pre-design investigation.

MR. PARSINITZ: Can you tell us what you've seen in your experience, in other superfund sites?

MR. MONTROY: It depends. It depends. I really don't want to go ahead and throw a number at it and then it'd be, like, completely off of where they wound up based on their design. I'm sorry.

MATTHEW: I'm kind of ignorant to the whole superfund thing and how it works. Sherwin-Williams is designing the plan?

MR. MONTROY: They're -- they -- they're doing the cleanup, yes.

MATTHEW: They did the poisoning too, which is ironic.

When you say the negotiation, like, is ongoing with Sherwin-Williams; is that right?

MR. MONTROY: Well, it hasn't started yet for this particular operable unit.

MATTHEW: But what would that entail, like, how much they're putting towards it? Or --

MR. MONTROY: Oh, no. They're going to do the cleanup. It -- it's at their cost. They -- the negotiations is timeframes on when and how fast they have to turn around documents. It has to do with, you know, the time frame that they have to go ahead and implement certain portions of the cleanup. It -- and the documents that we're going to need from them in order to get there.

MS. GREALLY: Can I jump in and explain a little bit about, like, superfund, as well?

So it's just -- yeah, just -- so superfund, there's two sort of major ways that will pay for a cleanup. It's either through, you know, tax dollars, or -- why superfund was really exciting when it first started is because we are -- we pursue the folks who are, you know, responsible -- potentially -- it's called a potentially responsible party.

So those who, you know, own the property, contributed to the contamination, we will basically have a legal agreement with them that they're going to pay X amount towards the cleanup, and then we will oversee them as they complete the clean up.

MS. NACE: And I just wanted to add that those Sherwin-Williams designs, everything comes through EPA and DEP for approval, and it goes back and forth until we're happy with it. And the negotiations for each step of the project also include what we call financial assurance.

So the estimated cost of the project, Sherwin-Williams has to give us a bond, a surety bond, for that amount of money. So if they decide to -- they can't do anymore, walk away, we have that money, and we'll execute it ourselves. So it -- it's no taxpayer money funds, this is enough.

MR. PENA: Okay. You spoke on -- they -- so they secure -- they secure bonds for them to -- so --

MS. NACE: Yeah, there's different methods, but bonds are one way.

MR. PENA: Okay. Have they -- if they did go with Alternative 4, is there enough funds secured?

MS. NACE: So that's part of the negotiation. So if we decide to go with Alternative 4, then we issue the record of decision, and then we go into negotiation with Sherwin-Williams. A part of that is for them to give us that bond for that amount --

MR. PENA: When you say negotiation, are they not -- are they not liable to -- for the amount that you choose? If you say --

MS. NACE: They are. And this is just the details to make sure we get that money. So if they don't do it, we have it.

MR. CAMPBELL: The municipality owns a couple of lots in this immediate area and there are residents whose properties are prospectively impacted. What's the impact of the selected remedy on the developability of the lots, like the paint works and the adjacent properties on United States Avenue?

MR. MONTROY: There shouldn't be. The -- they could design the injection point in such a way that would not impact the developability of that lot.

MR. CAMPBELL: So follow up, there's a big slab that they're using for the contaminated soil and the municipality is fine with that. But eventually the removal of the soil is going to be done. That slab could be redeveloped?

MR. MONTROY: Are you talking to the -- are you talking about the 2 4 Foster Avenue slab?

MR. CAMPBELL: Yes. Yes.

MR. MONTROY: Okay. Go on, I'm sorry. I didn't mean to interrupt you.

MR. CAMPPBELL: No, no. It's okay. Just saying that empty development can be filled?

MR. MONTROY: I guess the -- there is contamination that is underneath the 2, 4 Foster

Avenue slabs. And again, this is all related back to the OU-2 operable unit. That soil has not been fully delineated. The delineation of that soil will happen after the other cleanups have been done. At least that's the plan right now.

So I'm not sure how much of that slab, at this point in time, needs to be removed in order to remove the contamination that is underneath that slab.

MR. CAMPBELL: So when you say after the current remediations are done, does that include OU-3?

MR. MONTROY: OU-3 can be implemented without finishing up the OU-2, since we are only -- since we're looking at proposing treating the deep contamination.

MR. CAMPBELL: I'm going to follow-up again. You're pretty close to having all the contaminated soil north of Foster Avenue -- between Foster Avenue and Silver Lake removed, other than under that slab.

So will that testing take place in the next year?

MR. MONTROY: Currently, the plan is to use that staging area for the 7 Foster Avenue proportion of the 7 Foster Avenue clean up, and for part of the former lagoon area clean up. So those are slated to be done later this year, early next year. So you know, it is going to be probably another year or so.

MR. CAMPBELL: Okay. And I'm just going to -- my last comment. As you know, the town has had just a significant impact from the superfund. There are a lot of buildings that the paint works demolished, and we lost a lot of tax revenue. But we would like to see everything done to expedite the removal of the soil so that the properties can at least start looking at what the future is, what that holds.

MR. MONTROY: Okay.

MR. CAMPBELL: Not necessarily your problem, but it is.

MR. MONTROY: Understood. And we are trying to go ahead and get through these cleanups as fast as we can, as if we are moving pretty rapidly compared -- comparatively, things have sped up and we hope they'll continue that way. They are poised to go from one cleanup to the next, and keep going, and going, and going until they are done. So there is going to be -- there should be no breaks.

MR. CAMPBELL: And they are to the benefit of the people that are not plugged into that. There has been an awful lot of work done in town and you can see it right now. We just want to tell it, faster.

MR. MONTROY: I've been there.
MR. CAMPBELL: 15 years is quite a long time.
MS. GREALLY: Did I see a hand over on this side, in the back?
MR. DEICHERT: Just a follow-up on our mayor's comments. The concern is when you put the wells in, there -- there're permanently, correct?
MR. MONTROY: No, they're there --
MR. DEICHERT: No?
MR. MONTROY: -- as long as we need them. They will --
MR. DEICHERT: So permanently.
MR. MONTROY: -- they will be --
MR. DEICHERT: So permanently. The bottom line is this, we want to build on top of the wells.
When will we be able to do that? His concern is, we won't able to build on top of them, and we won't be able to put a rateable in there.
MR. MONTROY: There are ways to design systems that foster development. It just takes close-knit working between the developers, and the regulatory agencies, and the P -- and the PRPs. There are ways to go ahead and do it.
MR. DEICHERT: Well, why don't we take that into consideration now, instead of waiting, and when

the design comes in on the wells, to let them know we want access to that ground without having to wait another 15 years.

MR. MONTROY: Understood. Understood. Point taken. I think the biggest problem with that is, if you don't have a potential development in place, it makes it difficult to go ahead and design it, because what they'll do is they'll move things to go ahead and accommodate your specific development. But if you don't have a specific development in mind, it makes it hard to go ahead and design around it.

MR. DEICHERT: Bottom line is this: You're not going to be able to get anybody to develop on it if they're there. If you tell them there's a well there, they're going to restrict you from doing something. Make it available for us to promote that property around the lake. But with your wells there, and somebody wants to build there, and they got to wait to -- you want to see what they want to do first, bottom line is the ball is in your court.

Don't flip it back on the developer or the people we may be able to get to build there, take care of it now, so that when we bring someone and say, listen, we have a beautiful piece of land right here on the lake, place to walk around, whether you sit, eat, whatever you want to do, but they want to see what you want to put up first, if you want to develop the wells, or vice versa. It's the cart before the horse.

Do it, and then we can promote it, but we can't promote it and say, oh yeah, but there's wells here. We don't know what they're going to do.

MR. MONTROY: Understood. Understood. Point taken. Like I said, there are ways to work with that, or within those constraints, and we are willing to work with them.

MR. DEICHERT: My name's Dennis Deichert. I'm on Clementon Road, across from the cemetery.

MS. GREALLY: Any other questions? You all faked me out last time, so double checking. Last call?

Okay. Well, thanks everyone for coming out today. We really appreciate it. I'm just going to -- yeah, go -- here we go. Awesome.

So if you want more, like, specific details, or to see any of the documents that we were talking about tonight, they're available on the site's website, which the link is there. And then if you scan that QR code with your phone, it'll also bring you to the site's website. And we also have

Sherwin-Williams' website down there, as well. This is also Brian and I's contact information. You're able to reach out to us about the proposed plan, or at any point during the cleanup about anything at all, and that's what we're here for.

So I'll let you all go, and we'll hang around up here if you have anything else. Just a reminder that it won't be part of, sort of, like, the public record. This would just be --

THE REPORTER: Yeah, we'll --

MS. GREALLY: -- us chatting per usual.

THE REPORTER: We'll conclude the public record at 6:50 p.m.

MS. GREALLY: Awesome. Thank you.

(Meeting concluded at 6:50 p.m.)

CERTIFICATE OF REPORTER

I, SHAYNE COLOMY, a Digital Reporter and Notary Public in and for the State of New Jersey, do hereby certify:

That the proceeding took place before me at the time and place herein set forth; that the testimony and proceedings were accurately captured with annotations by me during the proceeding.

I further certify that I am not related to any of the parties to this action by blood or marriage and that I am not interested in the outcome of this matter, financial or otherwise.

IN WITNESS THEREOF, I have hereunto set my hand this 11th day of August, 2025.

Shayne Colomy

SHAYNE COLOMY
Notary Commission New Jersey/50205784
Commission Expires: January 15, 2028

CERTIFICATE OF TRANSCRIPTIONIST

I, Jacqueline Poolton, Certified Shorthand Reporter/Registered Professional Reporter/Certified Realtime Reporter, do hereby certify:

That the foregoing is a complete and true transcription of the original digital audio recording of the testimony and proceedings captured in the above-entitled matter. As the transcriptionist, I have reviewed and transcribed the entirety of the original digital audio recording of the proceeding to ensure a verbatim record to the best of my ability.

I further certify that I am neither attorney for nor relative or employee of any of the parties to the action; further, that I am not a relative or employee of any attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this matter.

IN WITNESS THEREOF, I have hereunto set my hand this 18th day of August, 2025.

____
Jacqueline Poolton, CSR/RPR/CRR
NJ-CSR License No. 30XI00218100
Expires: June 30, 2026

LEGAL TRANSCRIPTIONIST'S CERTIFICATE OF REVISION

EPA MEETING

TAKEN ON August 7, 2025

CASE: EPA MEETING

I declare that I, Amy Freeman, Legal Transcriptionist, have reviewed the original digital audio recording of the above-stated proceeding and made the following changes:

Made all client requested changes to the transcript.

Having advised all attending parties in this proceeding and hearing no objection, I hereby certify that the revised transcript has been delivered to the ordering parties:

Andrew Wadden, Esq.

Dated this 3rd day of September, 2025.

Amy Freeman

Amy Freeman, CVR