Record of Decision

Mansfield Trail Dump Superfund Site

Operable Unit 2 – Contaminated Groundwater and Residual Soil Contamination

Byram Township
Sussex County, New Jersey

United States Environmental Protection Agency

Region 2

September 2019

541229

DECLARATION STATEMENT
RECORD OF DECISION

SITE NAME AND LOCATION

Mansfield Trail Dump Superfund Site (NJN000206345), Byram Township, Sussex County, New Jersey. Operable Unit 2 – Contaminated Groundwater and Residual Soil Contamination.

STATEMENT OF BASIS AND PURPOSE

This decision document presents the remedy selected to address site-wide contaminated groundwater and residual soil contamination at the Mansfield Trail Dump Superfund Site ("site") in Byram Township, Sussex County, New Jersey. The selected remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"). This decision is based on the Administrative Record established for this site.

The State of New Jersey conditionally concurs with the selected remedy. The State concurs on all aspects of the remedy except for MNA. This portion of the remedy will be further reviewed by the New Jersey Department of Environmental Protection ("NJDEP") upon collection of additional data.

ASSESSMENT OF THE SITE

The remedy selected in this Record of Decision ("ROD") is necessary to protect public health or the environment from actual or threatened releases of hazardous substances from the site into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy described in this document represents the second of two planned remedial phases, or operable units ("OUs"), for the site. OU1 addresses site-impacted potable wells and was addressed in the 2017 OU1 ROD. The OU1 remedy is currently in the design phase. OU2 addresses site-wide contaminated groundwater and residual soil contamination.

The major components of the OU2 selected remedy include:

- Capping and vapor extraction in the source area vadose zone,
- Treatment of groundwater contamination in the source area saturated zone through amendment injection,
- Monitored Natural Attenuation ("MNA") in the distal groundwater plume,
- Excavation and off-site disposal of contaminated soil in the former dump areas,
- Excavation of residual soil contamination and restoration of the affected residential area,

- Installation of additional and maintenance of existing vapor intrusion mitigation systems as needed, and
- Institutional controls for capped areas and to restrict the installation of wells in the contaminated plume.

DECLARATION OF STATUTORY DETERMINATIONS

Part 1: Statutory Requirements

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

Part 2: Statutory Preference for Treatment

Treatment is a principal element in the OU2 selected remedy.

Part 3: Five-Year Review Requirements

This remedy will not result in hazardous substances, pollutants, or contaminants remaining at the site above levels that would allow for unlimited use and unrestricted exposure. However, because it may take more than five years to attain the remediation goals, pursuant to Section 121(c) of CERCLA, policy reviews will be conducted no less often than once every five years after the completion of construction to ensure that the remedy is, or will be, protective of human health and environment.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record for the OU2 ROD.

- Chemicals of concern and their respective concentrations may be found in the “Site Characteristics” section.

- Baseline risk represented by the chemicals of concern may be found in the “Summary of Site Risks” section.

- A discussion of remediation goals may be found in the “Remedial Action Objectives” section.

- A discussion of source materials constituting principal threats may be found in the “Principal Threat Waste” section.

- Current and reasonably anticipated future land use assumptions are discussed in the “Current and Potential Future Site and Resource Uses” section.

- Estimated capital, annual operation and maintenance ("O&M") and total present worth costs are discussed in the "Description of Alternatives" section.

- Key factors that led to 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.

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

Date 9/27/19

DECISION SUMMARY

Mansfield Trail Dump Superfund Site
Operable Unit 2: Contaminated Groundwater and Residual Soil Contamination

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SITE NAME, LOCATION, AND DESCRIPTION

The Mansfield Trail Dump Superfund Site ("site") is located in a residential neighborhood in Byram Township, Sussex County, New Jersey. The site consists of former waste disposal trenches in a wooded area and groundwater contamination in the area. Contamination, primarily trichloroethylene ("TCE"), from the former waste disposal trenches has migrated into the groundwater to nearby residential potable wells. The former waste disposal trenches are bounded to the north, south, and west by upland woods, and by a former rail line to the east (Figure 1). The remedy selected for OU1 addresses impacted residential potable wells. The OU2 remedy, described herein, addresses the site-wide contaminated groundwater, residual soil contamination and related vapor intrusion at the site.

The U.S. Environmental Protection Agency ("EPA") is the lead agency, and the New Jersey Department of Environmental Protection ("NJDEP") is the support agency for this site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

EPA believes that the site was used as a dump for septic and other industrial wastes from the late 1950s through at least the early 1970s. In May 2005, the Sussex County Department of Health and Human Services and NJDEP became aware of TCE contamination in residential potable wells serving homes on Brookwood and Ross Roads and notified residents in the neighborhood of the contamination. Point-of Entry-Treatment Systems ("POETS") were installed, primarily by NJDEP, at impacted residential properties to provide safe drinking water. By June 2005, 13 residential potable wells were known to be contaminated with TCE at concentrations in excess of New Jersey Ground Water Quality Standards ("NJ GWQS") and additional POETS were installed. Currently, 19 homes are equipped with POETS, installed by NJDEP or by homeowners, to remove the contamination and to ensure potable water for area residents.

In addition, from 2006 to 2008, NJDEP collected indoor air and sub-slab soil gas samples from homes throughout the affected neighborhood. NJDEP installed vapor intrusion mitigation systems or modified existing radon mitigation systems in five of the affected homes to prevent the migration of harmful vapors associated with site-related contamination from entering the homes.

NJDEP first identified the former waste disposal trenches at the site in 2009 during an effort to determine the source of the contamination detected in the nearby residential potable wells along Brookwood and Ross Roads. On October 16, 2009, NJDEP submitted a request to the EPA Region 2 to evaluate the site for a removal action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"). Subsequent reconnaissance efforts conducted by NJDEP, EPA, and contractors in December 2009 and May 2010 indicated disposal trenches that were designated Dump Areas A, B, C, D and E (Figure 2). EPA collected soil and sludge-like-waste, groundwater (on-site monitoring wells), and residential well samples from February to May 2010. EPA also installed a background monitoring well, MW-3, south of NJDEP's previously installed monitoring wells, MW-1 and MW-2 (Figure 3). Concurrently, in February and March of 2010, EPA collected well water samples from 21 residences along Brookwood Road and Ross Road and from the Byram

Intermediate School wells. The school well samples did not exceed Maximum Contaminant Levels ("MCLs"), state and federal drinking water standards, for site-related contaminants.

Based on NJDEP and EPA's sampling from 2009 to 2010, the groundwater plume was found to begin at the former waste disposal trenches and extend downgradient toward the Brookwood Road and Ross Road residential area. The contaminated waste and soil that was present within the trench areas was determined to be a source of TCE to the underlying aquifer and presented a threat to the public via ingestion of groundwater. After performing a Removal Site Evaluation , EPA concluded that a CERCLA removal action was warranted to address the threats posed by the former waste disposal areas (i.e., trenches) at the site.

Removal Action

In March 2011, based on the impacted disposal and residential areas outlined above, the site was added to the National Priorities List ("NPL"). On September 29, 2011, an Action Memorandum was approved by EPA for the excavation and off-site disposal of TCE-contaminated soil at the site. From February 21 to May 30, 2012, EPA completed excavation activities to remove soil contamination from Dump Areas A, B, C, D and E. Approximately 11,170 tons of non-hazardous soil and debris and 383 tons of hazardous soil were removed from the site and transported to approved off-site disposal facilities. The removal action was completed on July 23, 2012. The contaminated waste disposal trenches were excavated to bedrock and re-graded and restored to match the former topography.

Remedial Investigations

From August 2013 to December 2015, EPA performed the first phase of remedial investigation ("RI") activities at the site. Ten multilevel system ("MLS") groundwater wells and eleven conventional (screened or open-hole) groundwater wells were installed. Wells in the shallow and deep groundwater aquifer were sampled between March 2014 and December 2015. During this phase EPA also collected overburden soil samples, subsurface soil samples, rock core samples, groundwater samples, soil gas and indoor air samples. Samples were taken from both the former dump area and the downgradient residential neighborhood.

A second phase of RI was performed between 2017 and 2018. Additional groundwater monitoring wells were installed at the site including three MLS wells and two conventional wells. This phase also included surface water sampling, sediment sampling, soil sampling, and three rounds of groundwater sampling. A detailed description of both phases of the investigation is included in the 2019 RI Report.

Enforcement Activities

Currently, the properties containing the former waste disposal trenches are owned by two parties: the estate of Anna McConnell (who, along with her husband Dennis J. McConnell owned the site when it was in operation) and the Hopatcong Land Development Company, Inc., which purchased part of the site from the McConnells in 1990. EPA has issued Notices of Potential Liability pursuant to Section 107(a) of CERCLA, 42 U.S.C. Section 9601(a), to Hopatcong Land

Development, Inc. in October 2014 and to the Estate of Anna McConnell in July 2015. At present, EPA is continuing its search for potentially responsible parties.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA has worked closely with local residents, public officials, and other interested members of the community since NJDEP requested assistance with the site in 2009. At the completion of the Feasibility Study ("FS") for OU2, EPA prepared a Proposed Remedial Action Plan ("Proposed Plan") presenting remedial alternatives as well as EPA's preferred remedy for the contaminated groundwater and residual soil contamination. The Proposed Plan and supporting documentation for OU2 were released to the public for comment on July 15, 2019. The Proposed Plan and index for the Administrative Record were made available to the public online, and the Administrative Record files were made available at the EPA Administrative Record File Room, 290 Broadway, 18th Floor, New York, New York and the Sussex County Library Louise Childs Branch, 21 Sparta Road, Stanhope, New Jersey.

On July 15, 2019, EPA published a Public Notice in the *NJ Herald* newspaper that provided information about the public comment period, the public meeting for the Proposed Plan, and the availability of the Administrative Record for the OU2 Proposed Plan. EPA also published a press release on July 15, 2019, to announce the release of the Proposed Plan. The public comment period closed on August 13, 2019.

A public meeting was held on July 23, 2019, at the Byram Township Municipal Building, 10 Mansfield Drive, Sparta, New Jersey. The purpose of this meeting was to inform residents, local officials, and interested members of the public about the Superfund process, present details about the Proposed Plan, and to take comments and respond to questions from area residents and other interested parties on the Proposed Plan. Responses to the comments received at the public meeting, and in writing during the public comment period, are included in the Responsiveness Summary, attached as Appendix IV to this ROD.

SCOPE AND ROLE OF THIS OPERABLE UNIT

The selected remedy described in this document represents the second of two planned remedial phases, or operable units ("OUs"), for the site. The scope of the response action for OU2 is to address human health risks associated with contaminants above remediation goals ("RGs") in contaminated groundwater and residual soil contamination at the site.

OU1 addresses potable wells at residential properties downgradient of the former waste disposal trenches that are known to be impacted (Figure 4) by site-related contaminated groundwater plume. The OU1 ROD was issued by EPA in September 2017, and the remedy is currently in the design phase.

SITE CHARACTERISTICS

The site is bordered to the east by a steep, narrow valley where an abandoned railroad bed, a bike trail and a waterway, Cowboy Creek, are located. Cowboy Creek flows north to Lubbers Run and the Musconetcong River. Both Lubbers Run and the Musconetcong River are used for recreation, including fishing, boating, and hiking. Information obtained from the New Jersey Division of Fish and Wildlife indicates that portions of the Musconetcong River are fished for human consumption. Segments of the Musconetcong River downstream of the site are federally designated as a Wild and Scenic River. The groundwater at the site is classified as a NJDEP Class II-A aquifer as described in N.J.A.C. 7:9C Ground Water Quality Standards.

The geology along the top and flanks of the ridge at the site consists of a thin (five feet or less) surficial layer of unconsolidated soil (overburden) overlying bedrock. The upper five to 10 feet of the bedrock is extremely weathered and the deeper bedrock is consolidated, fractured metamorphic and igneous rock (gneiss and pyroxene syenite) with low primary porosity, and, thus, a low potential for diffusion of contaminants into the rock matrix. The overburden is thicker in the residential area below the ridge with a maximum thickness of 40 feet. The bedrock underlying the overburden in this area is also fractured igneous and metamorphic rock (gneiss and pyroxene syenite). Bedrock outcrops are located across the site, and the depth to bedrock throughout the site ranges from near-surface to approximately 25 feet below ground surface (feet bgs). In the residential area north of the site, the bedrock elevation drops almost 300 feet from the ridge north toward Cowboy Creek. Along the ridge, the overburden and the shallow bedrock is mostly unsaturated, with the depth to groundwater approximately 60 to 80 ft bgs. In the residential area west and north of the site, the depth to groundwater ranges from approximately 12.5 ft bgs near the ridge to 15.5 ft bgs toward the west northwest.

Groundwater flow occurs primarily in the weathered shallow bedrock and through interconnected fractures in the deeper consolidated bedrock aquifer. Groundwater moves from the higher-elevation former dump areas to the north-northwest and discharges to surficial seeps and the overburden in the lower areas or flows deeper into the bedrock system. Shallow groundwater may discharge from seeps in the exposed bedrock face along the downward slope toward the northeast. Groundwater at intermediate depths may discharge in seeps further downgradient or into the wetland area. Bedrock groundwater continues to flow towards the northwest as the fracture network becomes more confined. The hydraulic conductivity of the bedrock measured at the site ranges from less than 0.001 feet/day to 23 feet/day (or a transmissivity of 345 square feet/day).

At the site, contamination from the former waste disposal trenches entered groundwater through the bedrock. Based on the topography and the detections of volatile organic compounds ("VOCs") in the residential potable wells, it is likely that shallow groundwater flows beneath Former Dump Area A, which lies on the west side of the ridge, to the west-northwest toward the Brookwood and Ross Roads neighborhood.

Nature and Extent of Contamination

Source Area

Dump Area A consisted of two trenches located on a ridgeline that trends southwest to northeast, directly upslope of and overlooking the Brookwood and Ross Roads neighborhood to the west, while Dump Areas B, C, D, and E were situated on the east side of the ridge. Dump Area A consisted of a lower trench, approximately 120 feet long and 10 feet wide, and an upper trench, approximately the same length as the lower trench. On the east side of the ridge, Dump Area B consisted of a single trench approximately 132 feet long and 15 feet wide. Dump Area C consisted of an open, roughly circular patch of disturbed vegetation approximately 140 feet in diameter adjacent to Dump Area B. Dump Area D consisted of four trenches (designated as Trenches 1 - 4). Dump Area E, first observed during the May 2010 reconnaissance, was found to consist of four parallel mounds, which are likely to be small berms surrounding the Dump Area D trenches.

The waste disposal trenches consisted of contaminated soil and sludge-like-waste from unknown origins. Analytical results of soil and waste samples collected during the waste-source-delineation phase indicated the presence of VOCs, such as TCE, cis-1,2-dichloroethylene (cis-1,2-DCE), benzene, ethylbenzene, toluene, and xylene (BTEX) compounds, as well as various chlorinated benzene compounds throughout the former waste disposal trenches. Polychlorinated biphenyls ("PCBs") were detected in composite samples collected from the former Dump Area A lower trench, Dump Area B, and Dump Area D, trenches 1 and 2.

Although former Dump Area C was observed to be littered with tires and miscellaneous trash, and was considered an additional area of concern, no evidence was found of the same type and method of waste deposition as the other disposal trenches (i.e., excavated trenches and sludge-like-waste material). Contaminants were not detected in the former Dump Area D, Trench 4.

The 2012 EPA removal action included excavating Dump Areas A, B, D, and E containing waste and contaminated soil to bedrock.

Source Area Groundwater

Groundwater was sampled by the EPA in 2014, 2017, and 2018. The highest concentrations of contaminants in groundwater at the site are seen in the shallow bedrock aquifer directly beneath the former dump areas, particularly Dump Areas A and D. The areas beneath Dump Areas A and D will be referred to as the source area for the purposes of this remedy.

Because of the complex fracture network in bedrock, contamination may be present in discontinuous fractures potentially as dense non-aqueous phase liquid ("DNAPL")[1] both in the vadose and saturated portions of the bedrock and may be sorbed to soil that has infilled these fractures. Contamination trapped in fractures can act as a source over time due to the flushing action of groundwater table fluctuations or rainwater infiltration.

In April and August 2014, bedrock cores were collected in areas with the highest contaminant concentrations and analyzed to determine if contaminant mass has diffused into the bedrock matrix. The results indicate that the concentrations in the bedrock matrix are low and that any minor contaminant mass in the bedrock matrix does not appear to provide a source of

[1] A dense non-aqueous phase liquid or DNAPL is a denser-than-water liquid that is immiscible in or does not dissolve in water readily.

contamination to groundwater. During the rock core sampling and analysis, the full length of each core was visually observed for the presence of DNAPL. DNAPL was identified within a rubble zone at approximately 68 ft bgs in the upper trench of Dump Area A (CB-3).

Contaminants present in the dissolved phase in the groundwater at the site consist primarily of TCE and cis-1,2-DCE. The distribution of cis-1,2-DCE is similar to that of TCE; however, cis-1,2-DCE was observed at concentrations largely below the state and federal drinking water standards of 70 µg/L. The highest TCE concentrations underlying the former dump areas in the shallow bedrock (approximately 65–80 ft bgs) are 320 µg/L on the ridge and 130 µg/L in the deepest bedrock monitoring well port (approximately 460–475 ft bgs).

Other VOCs detected at elevated concentrations in groundwater include 1,1,1-TCA, 1,1-DCA, and chlorobenzene. 1,4-dioxane is widespread and was detected in 36 of 42 groundwater samples during the third RI sampling event. Concentrations of 1,4 dioxane are generally below standards, with a maximum recorded concentration of 7.3 µg/L, exceeding NJ GWQS of 0.4 µg/L. Lead, which is present in shallow soil, exceeded NJ GWQS of 5 µg/L in groundwater in two of four samples in the third sampling event, with a maximum concentration of 9.5 µg/L. Overall groundwater metals data do not suggest significant impacts related to site dumping, but rather natural background conditions.

Groundwater Downgradient of Source Area

Groundwater flow through the bedrock is mostly restricted to connected, water-bearing fractures and conductive zones. Geophysical studies of monitoring well boreholes were used to evaluate these bedrock fractures. Contaminated groundwater in bedrock appears to migrate laterally into overburden north and northwest of the former source area as the bedrock surface drops off along Brookwood Road.

Previous investigations included installation of overburden groundwater monitoring wells and multi-level bedrock groundwater monitoring wells to determine the nature and extent of groundwater contamination. EPA sampled twenty-four monitoring wells in the shallow and deep groundwater aquifer between March 2014 and December 2015 (Figure 4). Sampling during this time period found that TCE levels exceeded the NJ GWQS of 1 µg/L in six out of 13 shallow groundwater samples and 62 out of 94 deep groundwater samples (Figure 6). Concentrations of TCE ranged between 0.11 µg/L and 320 µg/L. Similar trends were found in the 2017 and 2018 sampling rounds with TCE ranging between 0.24J µg/L and 190 µg/L (Figure 5).

Contaminant concentrations decrease laterally and with depth away from the source areas. Deep bedrock monitoring wells in the distal plume, extending from the residential area into Cowboy Creek, showed TCE concentrations ranging from non-detect to 57 µg/L (Figure 7). TCE concentrations in the deepest bedrock monitoring well ports along Brookwood Road (approximately 270 to 296 ft. bgs) ranged between 0.33J µg/L and 46 µg/L during the 2017 and 2018 sampling rounds. Cis-1,2-DCE was detected in a majority of groundwater samples collected in November 2017 and January 2018 with concentrations ranging from 0.14J to 240 µg/L. Only two samples in each sampling event exceeded the RI screening criteria of 70 µg/L. Vinyl chloride was detected as high as 44 µg/L, with 8 out of 89 groundwater samples exceeding the RI screening criteria of 1 µg/L in the 2017 sampling and 6 out of 78 groundwater samples exceeding criteria in the January 2018 sampling event.

Natural Attenuation

Data collected at the site indicate natural attenuation mechanisms are actively attenuating groundwater contaminant concentrations. Evidence for natural attenuation at the site includes:

1) a downward concentration trend was already occuring in residential wells prior to the 2012 excavation;

2) Compound Specific Isotope Analysis ("CSIA") indicates that degradation is occurring in groundwater between the shallowest ports of the source zone wells (e.g., where mass may be discharging to groundwater from the vadose zone source) and the downgradient wells;

3) microbiology sample results indicate that the principal zone of reactivity for destructive attenuation appears to be under and directly adjacent to the former dump areas;

4) CSIA and microbial data indicate that both microbial reductive dehalogenation and aerobic cometabolic degradation of TCE are biodegradation mechanisms actively attenuating groundwater concentrations at the site; and

5) dilution and dispersion are also actively attenuating groundwater concentrations at the site as evidenced by declining concentrations from the ridge to the distal plume.

Residential Wells and Vapor Intrusion

Based on sampling conducted by residents and NJDEP, 19 residential wells in the site area were found to contain TCE concentrations above the NJ GWQS of 1 µg/L. EPA performed several rounds of residential well sampling as part of the RI. NJDEP continues to monitor and maintain eligible POETS at impacted residences under the state Spill Compensation Fund. The ROD for OU1 issued by EPA in 2017 selected a remedy that calls for construction of a waterline and connection to a water supply system to provide a source of potable water to residences with wells impacted by site-related contamination. Design of this remedy is currently ongoing.

Vapors migrating from the groundwater plume extending beneath the residential area have the potential to act as a source of indoor air contamination (Figure 8). After initial sampling completed by NJDEP in 2006, five vapor mitigation systems were installed at impacted properties. Multiple rounds of sub-slab and indoor air samples collected at properties in the vicinity of impacted properties (from 2011 to 2019) have been analyzed since then. Recent sub-slab and indoor air concentrations at residential properties indicate that installed mitigation systems are effective.

Soil

The highest concentrations of contaminants in soil were found to be confined to the upper two feet in an area north of Dump Area A, then continuing downslope into the rear (southern) portion of a residential property on Brookwood Road. In the residential area PCBs were detected in soil in 20 out of 38 samples at a maximum concentration of 2.8 milligrams per kilogram (mg/kg) (Aroclor 1254) and detected at 23 out of 92 samples in the former dump areas at a maximum of 2.4 mg/kg (Aroclor 1260). The EPA residential soil screening level for both Aroclor 1254 and Aroclor 1260 is 0.24 mg/kg. Lead was detected at a maximum of 1,460 mg/kg, exceeding the state residential soil standard of 400 mg/kg in 7 out of 38 samples in the residential area and 1 out of 92 samples in the former dump areas. Similar to lead, chromium detections in soil are found primarily in surface soils; however, they are generally found at concentrations similar to background. Further, previous groundwater and pre-excavation waste sampling concluded chromium was in the trivalent form in both media. Other metals detected in soil include arsenic and antimony, both of which were limited to one exceedance of screening criteria which was co-located with the maximum lead exceedance.

Polyaromatic hydrocarbons ("PAHs") were detected above screening criteria in 2 out of 82 samples in the 2014 investigation and in 1 out of 16 samples in the 2017 investigation. PAH data suggest only minor isolated impacts related to site dumping. The highest concentrations of PAHs found in the former railroad bed area are likely related to the rail ties or other processes that left behind these materials and are not site-related. Sampling of former dump area soils revealed limited detections of VOCs above applicable screening criteria. 1,4-Dichlorobenzene was detected in Dump Area D subsurface soil above screening criteria at one location. Sampling of the residential area soil did not reveal any VOCs above applicable screening criteria. Pesticides did not exceed screening criteria in site soils.

The slope where the highest concentrations of PCBs are found is generally steep and only has a few feet of overburden soil above the bedrock surface. The extent of contamination is confined to the slope with samples collected in a residential backyard. Samples from the adjacent properties were below the EPA residential soil screening level. This data and topography suggest PCB-containing materials were dumped in or around Dump Area A and have migrated via surficial runoff or movement of fine-grained materials down the steep slope and onto a portion of the residential property. Some very limited areas of soils with elevated PCBs were found in former Dump Areas B and E. PCBs were not detected in other site media including sediments, surface water, or groundwater during the 2014 or 2017 investigations.

Sediment and Surface Water Contamination

The sediment samples collected from Cowboy Creek, residential catch basins and a drainage swale. Lead and chromium data do not suggest significant impacts related to site dumping, but rather natural background conditions. In sediment, lead and chromium were detected at concentrations up to 76.8 mg/kg and 16.1 mg/kg, respectively, but all detections were below levels naturally found in the area.

PAHs exceeded the sediment screening criteria and background in one sediment sample from the drainage swale adjacent to a former railroad bed. However, the PAH concentrations observed in this sample were an order of magnitude higher than those found in site soil, suggesting non-site related impacts from rail ties or other processes are the sources of PAHs. Three pesticides (gamma-chlordane, 4,4'-DDE, and 4,4'-DDT) were detected in the same sample, but the low concentration suggests the contamination in the sediment sample is likely non-site related. No PCBs were detected in sediments. Sampling of the residential catch basin sediments did not reveal any VOCs above applicable screening criteria. No other site-related contaminants were detected in sediment.

In surface water, TCE was detected at 0.15 µg/L at one location in Cowboy Creek (SW-03), below the state and federal criteria for surface water quality for fresh water (1 µg/L and 2.5 µg/L respectively). Other site-related contaminants were similarly detected at low concentrations (1,4-dioxane at up to 0.12J µg/L).

Several metals were detected above the RI screening criteria in surface water samples. Lead exceeded screening criteria in surface water at one location and was detected in 3 out of 21 samples. Several metals, including arsenic, manganese, aluminum, and iron, exceeded the screening criteria in multiple samples, but concentrations were all below the background threshold values ("BTVs") calculated based on the background surface water samples collected. Cadmium was detected in 2 of 21 samples at low levels.

Shallow aquifer seep sampling was also performed in the residential area where seeps had been observed after large rain events. TCE and cis-1,2-DCE were detected in the results from the groundwater seep; TCE exceeded NJ GWQS (1 µg/L) and federal MCL (5 µg/L) at a maximum concentration of 34 µg/L.

Since there is a direct pathway from groundwater to surface water, by remediating the contaminated groundwater, site-related contamination in surface water (primarily the TCE and 1,4-dioxane from groundwater discharge) are expected to be addressed.

Based on analytical results from the completed investigations chemicals of concern at the site include PCBs and lead in soil and VOCs in groundwater.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Land Use

A public pedestrian and bicycle path passes through the site to the east of the former dump areas and continues along the east side of the Cowboy Creek area. Dirt paths extend from this trail and continue past the upper dump areas or down into the railroad cut and the whole area appears to be used intermittently as trails for four-wheel drive vehicles. Currently there is no fencing around the former dump. The Cowboy Creek area north of the Brookwood Road residences appears to have some use as a recreation area, as several tree forts or tree stands were observed in the area.

The primary land use downgradient of the former dump areas is residential. It is anticipated that the future land use for this area will remain consistent with current use. The property containing the former dump areas is currently zoned as residential, however, because of the geography and power line, the current and anticipated future use of the property is non-residential. The Cowboy Creek Area to the northwest of the site is owned by the nearby school and is expected to remain undeveloped, with some recreational use.

Groundwater Uses

Area groundwater is classified by NJDEP as a Class IIA resource; it is a current source of drinking water, and it is expected to remain a source of drinking water in the future. Properties with potable wells with sampling results above NJ GWQSs have been referred to NJDEP for further evaluation and action, which includes confirmation sampling, and the installation and maintenance of POETS, until EPA has implemented the OU1 remedy which is currently in the design phase.

SUMMARY OF SITE RISKS

As part of the OU2 RIFS, EPA conducted a Human Health Risk Assessment ("HHRA") and Ecological Risk Assessment to estimate the current and future effects of contaminants on human and ecological receptors. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land and groundwater uses. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline human health and ecological risk assessments for the site.

Human Health Risk Assessment

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

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

Hazard Identification

In this step, the chemicals of potential concern ("COPCs") in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence and bioaccumulation. The risk assessment for OU2 focused on groundwater, soil and sediment related to the site which may pose significant risk to human health. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of VOCs in groundwater and PCBs and lead in soils at concentrations of potential concern.

This ROD focuses on the site-related groundwater contamination plume in the area immediately downgradient of the former dump site, and surface soils in the residential area that were impacted by the former dump. Groundwater onsite is used by residents for drinking water purposes. Although POETS have been installed within impacted homes, if additional wells become contaminated or the POETS are not maintained, exposure to contaminated groundwater could occur. A comprehensive list of all COPCs can be found in the HHRA in the Administrative Record. Only the COCs, or the chemicals requiring remediation at the site, are listed in Table 1.

Exposure Assessment

Consistent with Superfund policy and guidance, the HHRA is a baseline human health risk assessment and therefore assumes no remediation has been performed or institutional controls established to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure ("RME") expected to occur under current and future conditions at the site. The RME is defined as the highest exposure that is reasonably expected to occur at a site.

The primary land use downgradient of the former dump areas is residential. It is anticipated that the future land use for this area will remain consistent with current use. The property containing the former dump areas is currently zoned as residential, however, because of the geography and power line, the current and anticipated future use of the property is non-residential.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for exposure to groundwater. Exposure pathways assessed in the HHRA are presented in Table 2 and include exposure of residents to groundwater via ingestion, dermal contact with groundwater and inhalation of volatiles while showering and residential exposure to surface soils via ingestion and dermal contact. Adult and child residents have been identified as potentially exposed populations. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upper-bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. Consistent with EPA guidance, for lead exposures, the arithmetic mean of all samples collected from the surface soil interval (0-2 feet) was used as the exposure point concentration ("EPC"). A summary of the EPCs for the site-related COCs 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 human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. This information for the site-related COCs is presented in Table 3 (noncancer toxicity data summary) and Table 4 (cancer toxicity data summary). Additional toxicity information for all COPCs is presented in the HHRA.

Risk Characterization

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

Noncarcinogenic risks 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 HQs for all compounds within a particular medium that impacts a particular receptor population.

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

HQ = Intake/RfD

Where: HQ = hazard quotient

Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1, separate HI values are then calculated for those chemicals which are known to act on the same target organ. 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 hazards associated with these chemicals for each exposure pathway is contained in Table 5.

Table 5 shows that the HI for noncancer effects is 94 for the adult resident and 81 for the child resident from exposure to cis-1,2 DCE, TCE, and vinyl chloride in groundwater and PCB Aroclor 1254 in soils (HQ of 1). The noncarcinogenic risks for both populations were attributable primarily to TCE in groundwater.

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 (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

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

A summary of the estimated cancer risks is presented in Table 6. The results indicated that the cancer risks exceeded the acceptable risk range for residential exposure to tap water and shower vapors primarily due to groundwater concentrations of TCE and vinyl chloride.

Elevated concentrations of lead were detected in OU2 residential surface soils. Since there are no published quantitative toxicity values for lead, it is not possible to evaluate risks from lead exposure using the same methodology as other COCs. However, because the toxicokinetics (the absorption, distribution, metabolism, and excretion of toxins in the body) of lead are well understood, lead is regulated based on blood lead level ("BLL"). In lieu of evaluating risk using typical intake calculations and toxicity criteria, EPA developed models which are used to predict blood lead concentration and the probability of a child's BLL exceeding specific target concentrations based on a given multimedia exposure scenario. The risk reduction goal for OU2 is to limit the probability of a typical child's (or that of a group of similarly exposed individual's) BLL exceeding 5 micrograms per deciliter (µg/dL) to 5 percent or less. For this HHRA, lead risks were evaluated using EPA's Integrated Exposure Uptake Biokinetic (IEUBK) model for the child residents as the most conservative receptor.

As summarized in Table 7, the predicted probabilities of a child's BLL exceeding 5 µg/dL surpassed EPA's risk reduction goal of 5 percent for one residential property. More than 32 percent of children living on the residential property most impacted by the former dump area contamination would have BLLs greater than 5 µg/dL.

Ecological Risk Assessment

A screening level ecological risk assessment ("SLERA") was conducted for the site to determine the potential for risk to ecological receptors based upon exposure to contaminants in soil, surface water, and sediment. Site media were screened against values protective of ecological receptors and food chain modeling was conducted to determine risks to trophic level receptors. The results of the SLERA identified contaminants of potential ecological concern ("COPECs") and therefore the risk assessment process continued on to a Step 3a analysis. The objective of the Step 3a analysis was to determine if COPECs identified in the SLERA pose risk under more realistic assumptions. During the Step 3a, refined exposure point concentrations were calculated based upon 95% UCL values and background inorganic results were considered. Screening of soil, sediment and surface water media contaminants indicated exceedances of screening values. Further, food chain modeling was conducted using more realistic exposure frequency and ingestion variables. The results of the Step 3a evaluation indicated fewer risks from exposure to chemicals detected in site media when compared to the SLERA. Overall, food chain modeling results indicated no risk to terrestrial soil receptors based upon the calculation of lowest observed adverse effect level (LOAEL) HQs. In the aquatic environment, risk was identified to the invertivorous bird (the spotted sandpiper) from exposure to zinc. However, based upon a comparison of the range of site sediment zinc concentrations to background sediment zinc concentrations it is unclear whether zinc sediment concentrations are site-related. In addition, a preliminary remediation goal for zinc was calculated based upon risk to the spotted sandpiper. This value was less than site background concentrations and therefore it was determined that action to address zinc in sediment was not warranted.

Uncertainties

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

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

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

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

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near OU2 and is highly unlikely to underestimate actual risks related to OU2.

More specific information concerning uncertainty in the health risks is presented in the human health risk assessment report.

Basis for Taking Action

Based on the results of the RI and quantitative human health risk assessment, the response action selected in this OU2 ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of contaminants 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") and risk-based levels established in the risk assessment.

The RAOs for the Mansfield Trail Dump OU2 are:

Soil:

- Reduce or eliminate exposure of human receptors to contaminated soil at concentrations exceeding remedial goals.
- Prevent or minimize contaminated soil from serving as a source of contamination to sediment, surface water, and groundwater.

Groundwater:

- Restore the impacted aquifer to its most beneficial use as a source of drinking water by reducing contaminant levels to the remedial goals.
- Prevent or minimize unacceptable risk from exposure (via direct contact, ingestion, or inhalation) to contaminated groundwater attributable to the site.
- Minimize the potential for further migration of groundwater containing site contaminants at concentrations greater than remediation goals.
- Prevent or minimize contaminated groundwater from serving as sources of current and future vapor intrusion.

To achieve the RAOs, site-specific final RGs will be used, derived from Preliminary Remediation Goals ("PRGs"), which are based on such factors as ARARs, risk, and background. EPA and NJDEP have promulgated MCLs and NJDEP has promulgated NJ GWQSs, which are enforceable, health-based, protective standards for various drinking water contaminants. For this remedy, EPA selected the more stringent of the MCLs and/or NJ GWQSs as the PRGs for COCs in site groundwater. EPA has identified RGs that are consistent the NJDEP residential direct contact soil remediation standards (RDCSRS) for unsaturated soil.

The lists of RGs for soil and groundwater may be found in Tables 8 and 9 respectively. A list of ARARs can be found in Tables 11 through 13.

The sub-slab contaminant-screening criteria and indoor air concentration requiring mitigation were based on EPA's vapor intrusion screening levels (VISLs) guidance for residential properties. However, the VISLs are frequently updated based on evolving toxicity information. Therefore, the screening criteria may be subject to change. The latest screening criteria for vapor intrusion will be used to evaluate vapor intrusion data collected in the future. Current Vapor Intrusion Screening Levels are shown in Table 10.

DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA requires that remedial actions be protective of human health and the environment, be cost-effective, attain a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains ARARs unless a waiver can be justified, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, CERCLA includes a preference for the use of treatment as a principal element to reduce the toxicity, mobility, or volume of the hazardous substances, pollutants and contaminants at a site permanently and significantly.

Potential technologies applicable to groundwater remediation were identified and screened by effectiveness, implementability, and cost criteria, with emphasis on effectiveness.

Detailed descriptions of the remedial alternatives for OU2 are presented below. Capital costs are those expenditures that are required to construct a remedial alternative. O&M costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project, calculated using a discount rate of seven percent and up to a 30-year time interval. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy, negotiate performance of the remedy with the responsible parties, or procure contracts for design and construction. Detailed information regarding the alternatives can be found in the final OU2 FS Report.

Institutional Controls

Institutional controls are administrative and legal controls that help to minimize the potential for human exposure to contaminants. Institutional controls may include a classification exception area/well restriction area ("CEA/WRA") for groundwater and a deed notice for capped areas. A CEA/WRA is an institutional control provided for under NJDEP regulations that documents the area where water quality standards cannot be met and limits installation of groundwater extraction wells, and a deed notices would prevent disturbance of the engineered cover and identify use restrictions for the capped area.

Common Elements

For Groundwater Alternatives GW-2 through GW-5, a PDI would be performed to refine the vertical and horizontal extents of the areas requiring remediation. Surface water monitoring within Cowboy Creek and vapor intrusion monitoring in the residential area would also be performed to ensure contaminated groundwater is not impacting surface water and residents are protected from potential vapor intrusion. Maintenance of existing VI mitigation systems and installation of new systems would be performed as necessary. Monitoring of the residential wells within the distal plume will be conducted as part of the OU1 remedial action. To the extent necessary, additional monitoring would be added to the monitoring program consistent with the OU2 remedial action. Monitoring requirements for sub-slab and indoor air will be developed during the design phase. In all alternatives, site restoration would be completed as necessary to restore affected properties to as close as reasonably possible to pre-existing condition after construction activities are completed. Institutional controls, such as a CEA/WRA, would be required to restrict the installation of wells in the contaminated groundwater plume, at least while the remedy is being implemented. A deed notice would be required for capped areas (which do not include any residential properties).

Five-Year Reviews

Except for the no action alternative, all groundwater alternatives are expected to allow for unlimited use and unrestricted exposure, however all will take more than five years to attain the RGs. Pursuant to Section 121(c) of CERCLA, policy reviews will be conducted no less often than once every five years after the completion of construction to ensure that the remedy is, or will be, protective of human health and environment. Five-year review requirements for the soil alternatives are discussed below.

Soil Alternatives:

Alternative S-1 - No Action

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under the no action alternative, no remedial actions would be implemented as part of the No Action Alternative. Furthermore, this alternative would not involve any monitoring of groundwater or institutional controls. Any improvement of groundwater quality would be through natural attenuation processes.

Total Capital Cost:	$ 0
Operation and Maintenance:	$ 0
Total Present Net Worth:	$ 0
Construction Timeframe:	0 years

Alternative S-2 – Capping

Alternative 2 includes the capping of the contaminated soil in the residential area and targeted excavation of residual contaminated soil in the former dump areas to eliminate exposure pathways to receptors.

A PDI would further delineate the soil contamination and confirm the extent of the cap in the residential area. The cap would include erosion control fabric for stabilization on the steep slope and new drainage pathways would be incorporated into the cap to allow for surface runoff from the dump areas upgradient to discharge safely and in a controlled manner. Limited excavation would be performed in the former dump areas where contaminant levels were identified exceeding RGs. This would prevent any future migration of contaminants in soil through surface runoff. After excavation and appropriate disposal, confirmation sampling would be conducted to verify that soil concentrations meet RGs.

O&M would include regular inspection to ensure the cap is stable and intact over time. Engineering controls including diversion structures and temporary fencing may also be needed in the remediation areas. Institutional controls in the form of a deed notice would be implemented to restrict disturbance to the soil cover identify use restrictions. Since CERCLA contaminants would be left on the site above levels that allow for unlimited use and unrestricted exposure, five-year reviews would be conducted to ensure that the action remained protective of human health and the environment.

Capital Cost:	$ 1,796,000
Present Worth of O&M Cost:	$ 54,000
Present-Worth Cost:	$ 2,467,000
Estimated Construction Time Frame:	9 months

Alternative S-3 – Excavation and Off-Site Disposal

Alternative 3 includes the excavation and off-site disposal of contaminated soil in the residential and former dump areas (Figure 9). A PDI would further delineate the soil contamination to confirm the extent of excavation. It is assumed excavation would be conducted with a combination of small excavation equipment and hand excavation. After excavation and appropriate disposal, confirmation sampling would be conducted to verify that soil concentrations meet RGs. If confirmation sampling reveals additional contamination above RGs, further excavation would be performed in the area where the contamination is identified.

After site soil is confirmed to meet RGs, excavated areas would be backfilled with imported clean fill and topsoil, compacted, and graded. Drainage pathways, if previously disturbed during excavation activities, would be restored to original conditions.

Since this alternative would result in levels of hazardous substance, pollutants or contaminants that would allow for unlimited use and exposure, no five-year reviews would be required after the implementation of the action.

Capital Cost:	$ 2,399,000
Present-Worth Cost:	$ 2,399,000
Estimated Construction Time Frame:	10 months

Groundwater and Bedrock Vadose Zone Alternatives

Alternative GW-1 – No Action

As with the soil alternatives, regulations governing the Superfund program generally require that the “no action” alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action to address contaminated groundwater within the OU2 to prevent human exposure and restore the groundwater aquifer.

Capital Cost:	$ 0
O&M Cost:	$ 0
Present Worth Cost:	$ 0
Estimated Construction Time Frame: 0 years	

Alternative GW- 2 – Capping of Source Area Vadose Zone and MNA of Source Area Saturated Zone and Distal Plume

Under this alternative, the contaminated source area bedrock vadose zone would be capped to reduce infiltration of rainwater, thus limiting the migration of vadose zone contamination into groundwater. MNA would be implemented for the groundwater contamination in the source area and the distal plume. An extensive monitoring program would be conducted to evaluate groundwater contaminant concentrations over time to ensure that attenuation mechanisms, such as biodegradation, are reducing concentrations at an acceptable rate throughout the plume. The cap would remain in place and require O&M until groundwater is restored to RGs.

Capital Cost:	$ 2,167,000
Present Worth of Cap O&M Cost:	
Year 1 to 5:	$ 194,000
Year 6 to 10:	$ 103,000
Year 11 to 30:	$ 126,000
Present Worth of Monitoring:	$ 1,564,000
Total Present Worth Cost:	$ 4,154,000
Estimated Construction Time Frame:	11 months

Alternative GW- 3 – Capping and Soil Vapor Extraction ("SVE") of Source Area Vadose Zone and MNA of Source Area Saturated Zone and Distal Plume

The contaminated source area bedrock vadose zone would be capped as described in Alternative 2, while vapor extraction would be implemented to actively treat any residual contamination in the source area bedrock vadose zone.

Vapor extraction removes contaminant vapors from the subsurface for treatment above ground. Vapors would be extracted from the bedrock vadose zone above the water table by applying a vacuum. The cap would serve as an impermeable barrier to enhance the performance of the vapor extraction system and to prevent rainwater from infiltrating into the treatment zone. A pilot study would be conducted prior to implementation to determine design parameters for the vapor extraction system. Vapor extraction wells would be installed within the confirmed extent of the source area vadose zone and vapor monitoring points would be installed to track the progress. Extracted vapor would be treated prior to discharge. The system is expected to be run for approximately 5 years.

MNA would be implemented in the saturated source area and the distal plume. An extensive monitoring program would be conducted to evaluate groundwater contaminant concentrations over time to ensure that attenuation mechanisms, such as biodegradation, are reducing concentrations at an acceptable rate.

If vapor extraction is effective in substantially reducing mass in the subsurface, a multilayered cap with associated long-term O&M might not be needed. Long-term O&M of a multilayered cap is included in the cost estimates so costs could be lower if it was found to be unnecessary.

Capital Cost:	$ 4,078,000
Present Worth of Cap O&M Cost:	
Year 1 to 5:	$ 194,000
Year 6 to 10:	$ 103,000
Year 11 to 30:	$ 126,000
Present Worth of Monitoring:	$ 1,564,000
Present Worth Cost:	$ 6,528,000

Estimated Construction Time Frame: 23 months

Alternative GW- 4 – Capping and SVE of Source Area Vadose Zone, In- Situ Treatment of Source Area Saturated Zone, and MNA of Distal Plume

For this alternative, vapor extraction and capping would be implemented as described in Alternative 3 for the contaminated source area bedrock vadose zone. In-situ treatment would also be conducted to treat the contaminated groundwater plume in the source area saturated zone, including the injection of amendments such as zero valent iron or bioaugmentation amendments (Figure 10). The type of amendment would be determined during the remedial design based the results of a treatability study and on-site pilot testing. Amendment selection criteria would include performance in the complex geologic setting, including reaction longevity to ensure sustained reactivity with groundwater contamination in bedrock fractures.

Performance monitoring would be conducted during the operation of active treatment. MNA would be implemented for groundwater contamination in the distal plume as described in Alternative GW-3.

Capital Cost:	$ 6,410,000
Present Worth of Cap O&M Cost:	
Year 1 to 5:	$ 194,000
Year 6 to 10:	$ 103,000
Year 11 to 30:	$ 126,000
Present Worth of Monitoring:	$ 1,564,000
Present Worth Cost:	$ 9,106,000
Estimated Construction Time Frame: 30 months	

Alternative GW- 5 – Capping, Dual-Phase Vapor Extraction (“DPE”) of Source Area Vadose and Saturated Zones, and MNA of Distal Plume

Alternative GW-5 includes combined vapor and groundwater extraction in a DPE remedy to treat both the contaminated vapors in the source area vadose zone and the groundwater plume in the source area saturated zone. DPE includes vapor extraction and groundwater extraction to draw both contaminated vapors and groundwater from the subsurface, with subsequent treatment at the surface to remove contaminants.

Capping would be implemented as described in Alternative GW-3. Design parameters for a DPE system would be obtained through the performance of a pilot study during the design phase. Vapor and groundwater monitoring points would be installed to track the performance of the system. Extracted vapor and groundwater would be treated prior to discharge. Depending on groundwater extraction rates, treated water might be discharged to the aquifer or to public sewer systems. MNA would be implemented for groundwater contamination in the distal plume as described in GW-3.

Capital Cost:	$ 4,837,000
Present Worth of Cap O&M Cost:	
Year 1 to 5:	$ 194,000

Year 6 to 10:	$ 103,000
Year 11 to 30:	$ 126,000
Present Worth of Monitoring:	$ 1,564,000
Present Worth Cost:	$ 7,872,000
Estimated Construction Time Frame:	22 months

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA §121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial response measures pursuant to the NCP, 40 CFR §300.430(e)(9) and EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of each of the individual response measures per remedy component against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each response measure against the criteria.

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

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1. Overall Protection of Human Health and the Environment

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

The No Action Alternatives (S-1, GW-1) for both soil and groundwater are not protective of human health and the environment, because they do not reduce contamination, or include groundwater monitoring to determine the fate and transport of the plume over time and are without any means to evaluate the time until remediation goals are met. Future exposure to soil and groundwater contamination could result in unacceptable and uncontrolled risks to the public.

Because S-1 and GW-1 are not protective of human health and the environment, they were eliminated from consideration under the remaining evaluation criteria.

The remaining two soil alternatives are protective of human health and the environment. Alternative S-2 uses capping to prevent exposure to contaminated soil and S-3 uses excavation and off-site disposal to achieve the same result. Alternative S-2 would include an institutional control in the form of a deed notice for property where soil contamination remained in place above residential standards.

The remaining groundwater alternatives are protective of human health and the environment. Alternatives GW-2 through GW-5 have components of natural attenuation with long-term monitoring for groundwater contamination in the distal plume. Alternatives GW-3 through GW-5 include vapor extraction for addressing remaining contamination in the source area vadose zone. GW-4 and GW-5 include additional active treatment of groundwater contamination in the shallow bedrock aquifer. All groundwater alternatives would include a CEA/WRA.

2. Compliance with applicable or relevant and appropriate requirements (ARARs)

Section 121(d) of CERCLA and NCP §300.430(f) (ii) (B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner, and are more stringent than Federal requirements, may be relevant and appropriate.

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

For soil, the New Jersey RDCSRS for PCBs is identified as an ARAR and the RG for PCBs. Alternatives S-2 and S-3 would meet the chemical-specific ARAR since PCB-contaminated soil would be contained or removed from the site. Location-specific and action-specific ARARs would be met by complying with all substantive requirements that apply to the actions, such as handling of remediation waste and storm water management.

EPA and NJDEP have promulgated MCLs, which are enforceable standards for various drinking water contaminants (and are chemical-specific ARARs). If any state standard is more stringent than the federal standard, then compliance with the more stringent ARAR is required. As groundwater within site boundaries is a source of drinking water, the more stringent of the federal MCLs, NJ MCLs, and NJ GWQS are evaluated as ARARs and used to develop RGs. In GW-2, MNA alone would restore the aquifer to meet RGs but in an unreasonable time frame (greater than 500 years). All alternatives that involve active groundwater treatment, GW-3, GW-4, and GW-5, would restore the aquifer to RGs in less time than Alternative GW-2. Air treatment for emissions from treatment plants to meet Clean Air Act and applicable NJDEP ARARs may be required for GW-3, GW-4, and GW-5, and could be met.

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

3. Long-Term Effectiveness and Permanence

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

Soil Alternative S-2 relies on adequate inspection and maintenance to prevent erosion or damage of the cap from re-exposing contaminated soil, particularly in the steep slope areas. It would also rely on implementation of a deed notice. Alternative S-3 would have the least residual risk since all contaminated soil above RGs would be removed from the site. Control measures would not be necessary for Alternative S-3, indicating that S-3 has greater long-term protectiveness compared to Alternative S-2.

Alternatives GW-2 through GW-5 would all provide long-term effectiveness and permanence to varying degrees. The magnitude of residual risk is greatest for GW-2 since no active removal or destruction of contaminants would occur. GW-2 would rely on the cap to prevent infiltration of rainwater that could mobilize VOC mass stored in the vadose zone. GW-3, capping and vapor extraction, would be next highest in residual risk since active treatment would be limited to the vadose zone. GW-4 and GW-5 would provide a higher degree of long-term effectiveness because the area of the most contaminated groundwater would be treated in addition to the vadose zone.

The adequacy and reliability of the caps for GW-2 through GW-5 would rely on routine inspection and maintenance and institutional controls. Without adequate inspection and maintenance, erosion or damage to the cap would allow precipitation to enter the vadose zone adding to the mobilization of contaminants in the vadose zone and groundwater. The requirement for maintaining the integrity of caps for GW-2 is the most significant since there would be no additional treatment. The active treatment components (vapor extraction, in-situ treatment, and DPE) under GW-3 through GW-5 are reliable technologies. However, the adequacy of controls would need to be determined during the design through PDI and pilot studies since the site has complex geology (e.g., a complicated fracture network with dead-end fractures) and potential dense non-aqueous phase liquids (DNAPLs). Alternative GW-4 provides greater long-term effectiveness compared to Alternative GW-5 because it is expected to result in a greater reduction in contaminant mass migrating from source area bedrock fractures into groundwater, therefore, resulting in restoration of the aquifer in a shorter time frame.

In the FS, a model was used for comparison purposes to estimate the length of time it would take each alternative to restore the aquifer to RGs. (Time estimates would be further refined during the design phase, with additional investigations and pilot testing.) Due to the complex geology, Alternatives GW-2, GW-3 and GW-5 are expected to take over 200 years for full restoration of aquifer. Under Alternative GW-4, groundwater in the vicinity of the impacted residential wells located downgradient of the source area, is expected to reach RGs within 30 years and the shallow contaminated bedrock aquifer in the source area within 150 years.

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

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

Neither Alternative S-2 nor S-3 reduce toxicity, mobility or volume through treatment. Alternative S-2 would reduce the mobility of the contaminants through capping but the toxicity and volume of contamination would not change. Alternative S-3 would reduce the mobility and volume of contamination since all contaminated soil would be transported off-site for disposal, but toxicity would not be changed.

Capping under Alternatives GW-2 through GW-5 would reduce the infiltration of the rainwater, thereby reducing the mobility of the VOCs in the vadose zone, though not through treatment. MNA, vapor extraction, amendment injections, and DPE under alternatives GW-2 through GW-5 are all treatment technologies and all have the capability of reducing the toxicity and volume of VOCs. Although implementing any technology in the fractured bedrock geology at the site presents significant challenges, alternative GW-4 would achieve reduction of toxicity and volume the fastest because the transmissive fractures where contamination flux is the greatest could be identified during a PDI using borehole geophysics and transmissivity testing, and a long-lasting amendment would be injected into these features. Over time, the amendment in the transmissive features would be used to treat contaminant mass moving out of fractures before the contamination has a chance to move downgradient. Pilot testing to maximize the placement of the amendment in the fractures at the site would be needed.

5. Short-Term Effectiveness

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

Alternatives S-2 and S-3 would both impact local traffic along Brookwood Road during the short-term if equipment requires access through a residential area to implement the work. S-3 would have the greatest requirements for transportation of contaminated materials for off-site disposal, but this could be done via the road along the dump areas rather than on Brookwood Road through the residential community. S-2 would require the largest quantity of import materials; this also could be done from the dump areas. Construction would generate noise and dust during the day, which would be controlled to minimize impact to the residential community. The duration of on-site construction would be longest for S-3, which reflects the most short-term impact to the community. Stormwater management would need to be considered for both S-2 and S-3.

Alternative GW-2 would have low to moderate impact in the non-residential area where the remediation would take place due to the construction of the cap and periodic maintenance. GW-3 would have low to moderate impacts similar to GW-2 for the cap and a small area of vapor extraction wells. Alternatives GW-4 and GW-5 would have moderate impacts because of the need for drilling to install and operate the injection (GW-4) or DPE system (GW-5), which would continue for several years. The operation of the vapor extraction system (GW-4) and DPE system (GW-5) is estimated to continue for five years each. In both cases access to the site would be required and temporary facilities would need to be located nearby.

6. Implementability

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

Alternative S-3 is implementable because equipment and experienced vendors for excavation and backfilling are readily available. Limited entry to the residential area would make excavation slightly difficult. S-2 would has greater complexity in design, implementation, and long-term monitoring since it would involve the design and construction of a cap along a steep slope. The cap installation of over an acre may trigger stormwater management requirements such as installation of a stormwater retention pond. This is problematic since there is no suitable space for the pond. Additionally, a long-term inspection and maintenance plan would need to be developed for S-2 to maintain the cap to ensure continued protection of human health and the environment. Stormwater management would need to be considered for S-3 but to a lesser extent as excavation would not increase runoff at the residential area as much as capping under S-2 would. There are no O&M requirements under S-3. A deed notice would be required for S-2 to prevent disturbance of the cap; no such deed notice would be required for S-3.

Of the active alternatives, alternative GW-2 would be the easiest to implement since the capping work would be conducted on the surface, with minimal constructability concerns. GW-3, GW-4, and GW-5 share a common implementability challenge due to difficulty of addressing contamination in the fractured rock subsurface: the complexity of the fracture network with variations in transmissivity of fractures means that it would potentially be difficult to effectively identify and target the transmissive fractures for each technology. Alternatives GW-2 through GW-5 may trigger the need to install a stormwater retention pond due to disturbance of ground surface and/or installation of an impermeable cap. The vapor extraction system, in-situ treatment, and DPE components of Alternatives GW-3 through GW-5, respectively, are estimated to require operation for five years.

In the case of GW-5, given the low storativity of the fractured bedrock aquifer and the observed large fluctuation in the potentiometric surface, it may be difficult to operate a long-term groundwater extraction system effectively in order to extract and treat mass coming out of fractures in the bedrock. In Alternative GW-4, the amendment injected into the saturated zone of bedrock would remain in the subsurface for a longer period of time and therefore have more interaction with contaminants. It is expected that GW-4 would be able to reduce mass migrating from fractures in the bedrock in the source area to a greater degree and faster than GW-5.

7. Cost

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

The present-worth costs for all alternatives are calculated using a discount rate of 7 percent. Costs are calculated based on a 30-year timeframe. The estimated capital, annual O&M, and present-worth costs for each of the alternatives are presented in the following table.

Alternative	Capital Cost	Total Present-Worth Cost
S-1	$0	$0
S-2	$1,796,000	$2,467,000
S-3	$2,399,000	$2,399,000
GW-1	$0	$0
GW-2	$2,167,000	$4,154,000
GW-3	$4,078,000	$6,528,000
GW-4	$6,410,000	$9,106,000
GW-5	$4,837,000	$7,872,000

Modifying Criteria *– The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.*

8. State Acceptance

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

The State of New Jersey conditionally concurs with the selected remedy. The State concurs on all aspects of the remedy except for MNA. This portion of the remedy will be further reviewed by NJDEP upon collection of additional data.

9. Community Acceptance

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

EPA solicited input from the community on the remedial response alternative proposed for the site. Oral comments presented at the public meeting were recorded, and EPA received written comments during the public comment period. The Responsiveness Summary addresses all public comments received by EPA during the public comment period. Overall, the community members, elected officials, and stakeholders were in favor of EPA's preferred alternative.

PRINCIPAL THREAT WASTE

The NCP, which governs EPA cleanups, at 40 C.F.R. § 300.430(a)(1)(iii), states that EPA expects to use "treatment to address the principal threats posed by a site, wherever practicable" and "engineering controls, such as containment, for waste that poses a relatively low long-term threat" to achieve protection of human health and the environment. This expectation is further explained in an EPA fact sheet (OSWER #9380.3-06FS), which states that principal threat wastes are 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. Low-level threat wastes are source materials that generally can be reliably contained and that would present only a low risk in the event of exposure.

The concept of principal threat and low-level threat waste is applied on a site-specific basis when characterizing source material. Source material is defined as material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, air, or act as a source of direct exposure.

Site soil, contaminated with lead and PCBs, is not considered a principal threat waste as it is not considered source material and is not highly mobile. Groundwater is not considered principal threat waste. The completed removal action addressed source material which was principal threat waste within the dump areas. Residual DNAPL, though infrequently found at the site in the RI or observed in the confirmation samples from the removal action, may still be present in the subsurface in low-transmissivity fractures in the underlying bedrock and could potentially act as a source of contamination to groundwater. Additional work will be conducted in the PDI to further investigate whether DNAPL remains in the subsurface. The mobility of any residual source material would be limited if it is present in low-transmissivity fractures.

SELECTED REMEDY

Based upon consideration of the results of the site investigations, the requirements of CERCLA, the detailed analysis of the remedial alternatives, and public comments, EPA has determined that Alternatives S-3 and GW-4 is the appropriate remedy for OU2. The remedy best satisfies the requirements of CERCLA Section 121 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR § 300.430(e)(9). The major components of the selected remedy include:

- Capping and vapor extraction in the source area vadose zone,
- Treatment of groundwater contamination in the source area saturated zone through amendment injection,
- MNA in the distal groundwater plume,
- Excavation and off-site disposal of contaminated soil in the former dump areas,
- Excavation of residual soil contamination and restoration of the affected residential area,
- Installation of additional and maintenance of existing vapor intrusion mitigation systems as needed, and

- Institutional controls for capped areas and to prevent the installation of wells in the contaminated plume.

The selected remedy alternative for soil, Alternative S-3,was selected over the other soil alternatives because excavation of soil will prevent risks from direct contact to contaminated media and minimize leaching of contaminants to groundwater, and limit erosion of contaminated soil through excavation of contaminated soil above RGs, thereby eliminating the need for long-term monitoring or institutional controls, such that future use of the areas after completion of the remedial action need not be restricted.

The selected remedy alternative for groundwater, Alternative GW-4, would reduce risk within a reasonable time frame, as compared to the other groundwater alternatives, with greater long-term effectiveness, reducing mass migrating from fractures in the bedrock in the source area to a greater degree and faster than Alternative GW-5 at a comparable cost, and it will provide a long-term reliable remedy.

Based on the information available at this time, the selected remedy provides the best balance of trade-offs among the response measures with respect to the nine evaluation criteria.

Summary of the Rationale for the Selected Remedy

The selection of Alternatives S-3 and GW-4 provides the best alternative for OU2with respect to the evaluation criteria. The selected alternative will be protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action, is cost-effective, and will utilize permanent solutions to the maximum extent practicable.

Summary of the Estimated Remedy Costs

The estimated capital and total present-worth cost for the selected soil and groundwater remedies are $2,399,000 and $9,106,000 respectively. Table 14 and Table 15 provides the basis for the cost estimate for Alternative S-3, GW-4.

It should be noted that these cost estimates are order-of-magnitude engineering cost estimates that are expected to be within plus 50 to minus 30 percent of the actual project cost. These cost estimates are based on the best available information regarding the anticipated scope of the selected remedy. Changes in the cost estimates are likely to occur as a result of new information and data collected during the engineering design of the remedy.

Green Remediation

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

STATUTORY DETERMINATIONS

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

Protection of Human Health and the Environment

The selected remedy, Alternatives S-3 and GW-4, will be protective of human health and the environment through the excavation of contaminated soil and treatment of contaminated groundwater.

The remedy will, once complete, eliminate all significant risks to human health associated with the exposure to contaminated soils and groundwater. This action will result in the reduction of potential exposure to contaminated soil and groundwater to within EPA's generally acceptable risk range. Implementation of the selected remedy will not pose unacceptable short-term risks or adverse cross-media impacts.

Compliance with ARARs

The selected remedy will comply with chemical-specific, action-specific and location-specific ARARs.

The selected remedy for groundwater and soil has been developed to meet federal and state ARARs. A comprehensive ARAR discussion is included in the final FS and a complete listing of ARARs for the selected remedy is included in Tables 11 through 13 (see Appendix I).

Cost Effectiveness

EPA has determined that the selected remedy is cost-effective and represents a reasonable value. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness." (NCP §300.430 (f) (1) (ii) (D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of the selected remedy was determined to be proportional to costs and hence, this alternative represents a reasonable value for the money to be spent.

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital and annual O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of an alternative using a 7% discount rate. The estimated present-worth cost of the selected OU2 soil and groundwater remedy is $11,505,000. EPA believes that the cost of the selected alternative is proportional to its overall effectiveness because it eliminates exposure to contaminated soil, prevents further migration of contaminated groundwater and actively treats contamination in the source area, providing greater protectiveness than other Alternatives.

Utilization of Permanent Solutions and Alternative Treatment Technologies

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the site. Of those alternatives that are protective of human health and the environment and comply with ARARs (or provide a basis for invoking a waiver), EPA has determined that the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and State and community acceptance.

The selected remedy will provide adequate long-term control of risks to human health and the environment through excavation of residual soil contamination, capping of the source area and monitored natural attenuation of the downgradient plume. The selected remedy does not present short-term risks different from the other alternatives.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied under the selected groundwater remedy since the SVE wells in the source area vadose zone and injection wells in the source area saturated zone will be actively treating contamination in the groundwater aquifer. EPA's prior removal actions at the site addressed hazardous materials and soils in the former waste disposal trenches that were considered principal threat waste.

Five-Year Review Requirements

Although this remedy will not result in hazardous substances, pollutants, or contaminants remaining at the site above levels that would allow for unlimited use and unrestricted exposure, it may take more than five years to attain the RGs. Pursuant to Section 121(c) of CERCLA, policy reviews will be conducted no less often than once every five years after the completion of construction to ensure that the remedy is, or will be, protective of human health and environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU2 was released for public comment on July 15th, 2019. The comment period closed on August 13, 2019. The Proposed Plan identified Alternative S-3, GW-4 as the preferred alternative to address contaminated soil and groundwater at the site. Upon review of all comments submitted, EPA has determined that no significant changes to the preferred alternative, as it was presented in the Proposed Plan, are warranted.

APPENDIX I - Tables & Figures

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

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

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Groundwater	cis-1,2-Dichloroethene	1.7	90	μg/L	10/10	53	ug/L	95% Student's-t UCL
	Trichloroethylene	3.8	270	μg/L	10/10	184	ug/L	95% Adjusted Gamma UCL
	Vinyl Chloride	0.18 J	50	μg/L	6/10	19.7	ug/L	95% KM (t) UCL

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

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Residential Area Surface Soil	Aroclor 1254	32 J	2800	μg/kg	14/19	1184	μg/kg	95% KM (t) UCL
	Aroclor 1260	65 J	1800 J	μg/kg	12/19	782	μg/kg	95% KM (t) UCL
	Lead	4.8	1460	mg/kg	19/19	320	mg/kg	Arithmetic mean

J – qualifier for estimated value

95% Student's-t UCL – 95% upper confidence limit, Student's-t statistic (mean, STD)

95% Adjusted Gamma-UCL – 95% upper confidence limit, Adjusted Gamma statistic (mean, STD)

95% KM (t)-UCL – 95% upper confidence limit, Kaplan Meier statistic (mean, STD)

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

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for the COCs in groundwater and residential area surface soil. The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

TABLE 2. Selection of Exposure Scenarios

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis
Current/Future	Groundwater	Tap Water	Tap Water/Shower Head	Resident	Adult and Child (birth to <6 years)	Ing/Der/Inh	Quantitative
Current/Future	Soil	Surface Soil (0-2’)	Residential Area Surface Soil	Resident	Adult and Child (birth to <6 years)	Ing/Der	Quantitative

Ing – Ingestion
Der – Dermal
Inh – Inhalation

Summary of Selection of Exposure Pathways

This table describes the exposure pathways that were evaluated for the risk assessment. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 3

Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
cis-1,2-Dichloroethene	Chronic	2.0E-01	mg/kg-day	1	2.0E-01	mg/kg-day	Kidney	3,000	IRIS	9/30/2010
Trichloroethylene	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Heart, Immune System, Developmental , Kidney	10 to 1,000	IRIS	9/28/2011
Vinyl Chloride	Chronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	Liver	30	IRIS	8/7/2000
Aroclor 1254	Chronic	2.0E-05	mg/kg-day	1	2.0E-05	mg/kg-day	Eye, Finger, Toe Nail, Immune System	300	IRIS	10/1/1994
Aroclor 1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfC: Target Organ	Dates:
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
Trichloroethylene	Chronic	2.0E-03	mg/m^3	Heart, Immune System, Liver	10 to 100	IRIS	9/28/2011
Vinyl Chloride	Chronic	1.0E-01	mg/m^3	Liver	30	IRIS	8/7/2000

Key

NA: No information available
IRIS: Integrated Risk Information System

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference concentrations (RfCs).

TABLE 4

Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
cis-1,2-Dichloroethene	NA	NA	NA	NA	Inadequate information to assess carcinogenic potential	IRIS	9/30/2010
Trichloroethylene	4.6E-02	$(mg/kg\text{-}day)^{-1}$	4.6E-02	$(mg/kg\text{-}day)^{-1}$	Carcinogenic to humans	IRIS	9/28/2011
Vinyl Chloride	7.2E-01	$(mg/kg\text{-}day)^{-1}$	7.2E-01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	8/7/2000
Aroclor 1254[1]	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/1996
Aroclor 1260[1]	2.0E+00	$(mg/kg\text{-}day)^{-1}$	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	10/1/1996
Lead	NA	NA	NA	NA	NA	NA	NA

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
cis-1,2-Dichloroethene	NA	NA	Inadequate information to assess carcinogenic potential	IRIS	9/30/2010
Trichloroethylene	4.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	9/28/2011
Vinyl Chloride	4.4E-06	$(ug/m^3)^{-1}$	A	IRIS	8/7/2000

Key:

A: Human Carcinogen

B2: Probable human carcinogen – indicates sufficient evidence in animals and inadequate or no evidence in humans

[1] – based on upper-bound slope factor for high risk and persistence polychlorinated biphenyls

NA: No information available
IRIS: Integrated Risk Information System

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5

Risk Characterization Summary - Noncarcinogens

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water/shower head	cis-1,2-Dichloroethene	Kidney	0.8	NA	NA	0.8
			Trichloroethylene	Heart, Immune System, Developmental, Kidney, Liver	11	1.9	80	93
			Vinyl Chloride	Liver	0.2	0.01	0.2	0.4
Soil	Surface Soil	Residential Area Surface Soil	Aroclor 1254	Eye, Finger, Toe Nail, Immune System	0.07	0.04	NA	0.1
			Aroclor 1260	NA	NA	NA	NA	NA
							Hazard Index Total=	**94**

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water/shower head	cis-1,2-Dichloroethene	Kidney	1.3	NA	NA	1.3
			Trichloroethylene	Heart, Immune System, Developmental, Kidney, Liver	18	3.1	57	78
			Vinyl Chloride	Liver	0.3	0.02	0.1	0.4
Soil	Surface Soil	Residential Area Surface Soil	Aroclor 1254	Eye, Finger, Toe Nail, Immune System	0.8	0.3	NA	1.1
			Aroclor 1260	NA	NA	NA	NA	NA
							Hazard Index Total	**81**

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for exposure to groundwater and surface soil containing site-related chemicals. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

TABLE 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Site Resident
Receptor Age: Lifetime (Adult/child)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water/shower head	cis-1,2-Dichloroethene	NA	NA	NA	NA
			Trichloroethylene	1.6E-04	2.6E-05	3.2E-04	5E-04
			Vinyl Chloride	9.2E-04	4.9E-05	2.8E-03	4E-03
Soil	Surface Soil	Residential Area Surface Soil	Aroclor 1254	3E-06	1E-06	NA	5E-06
			Aroclor 1260	2E-06	9E-07	NA	3E-06
						Total Risk =	**1E-02**

Summary of Risk Characterization – Carcinogens

The table presents site-related cancer risks for groundwater exposure. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}. The cancer risk from trichloroethylene and vinyl chloride in groundwater exceeds the acceptable risk range, indicating an unacceptable risk from exposure to groundwater.

TABLE 7
Risk Characterization Summary – Lead
Medium-Specific Exposure Point Concentration

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

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Exposure Point Concentration (EPC)[1]	Units	Geometric Mean Blood Lead Level (µg/dL)[2]	Lead Risk[3]
Soil	Surface Soil	Residential Surface Soil	Lead	320	mg/kg	4.2	32.1%

[1] – The lead EPC was the arithmetic mean of all samples collected from the surface soil interval (0-2ft)

[2] – Consistent with the EPA Superfund Lead-Contaminated Residential Site Handbook, lead risks were evaluated for the child using the Integrated Exposure and Uptake Biokinetic Model

[3] – Lead risks are expressed as the probability of having a blood lead level greater than 5 µg/dL; EPA's risk reduction goal is to limit the probability of a child's blood lead concentration exceeding 5 µg/dL to 5% or less.

Table 8: Soil Remediation Goals

Chemical Name	Unit	NJDEP Residential Direct Contact Soil Remediation Standards [1]	Background Threshold Value [3]	Remediation Goals
Polychlorinated Biphenyls (PCBs)				
PCBs [4]	mg/kg	0.2	NA	0.2
Inorganics				
Lead [5]	mg/kg	400	155.2	400

Notes:

[1] NJDEP 2012. Residential Direct Contact Health-Based Criteria and Soil Remediation Standards. Last amended September 18, 2017; http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

[2] Background threshold values (BTVs) displayed are surface soils BTVs developed by EES JV for SVOCs and metals based on a statistical evaluation of background analytical results using EPA's ProUCL, version 5.0 and EPA's Technical Guide - Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations, September 2013.

[3] PCBs Maximum Concentrations Observed is based on combined concentrations of detected aroclors at any one location.

[4] EPA Region 2 recently indicated lead concentrations at residential properties (in addition to meeting the 400 mg/kg maximum concentration PRG) shall be subject to meeting a 200 mg/kg property wide average cleanup goal.

mg/kg = milligrams per kilogram

NA = not applicable

NJDEP = New Jersey Department of Environmental Protection

BTV = background threshold value

PRG = preliminary remediation goal

Table 9: Groundwater Remediation Goals

Chemical Name	Unit	National Primary Drinking Water Standards (EPA MCLs) [1]	NJ Groundwater Quality Standards [2]	NJ Drinking Water Standards [3]	Remediation Goals [4]
Volatile Organic Compounds (VOCs)					
1,1,1-Trichloroethane	µg/L	200	30	30	30
1,1-Dichloroethane	µg/L	NL	50	50	50
1,1-Dichloroethene	µg/L	7	1	2	1
Chlorobenzene	µg/L	100	50	50	50
cis-1,2-Dichloroethene	µg/L	70	70	70	70
Trichloroethene	µg/L	5	1	1	1
Vinyl Chloride	µg/L	2	1	2	1
Semi-Volatile Organic Compounds (SVOCs)					
1,4-Dioxane	µg/L	NL	0.4	NL	0.4

Notes:

(1) EPA 2009. National Primary Drinking Water Standards (EPA 816-F-09-004, May 2009); http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf.

(2) NJDEP 2018. New Jersey Ground Water Quality Standards Class IIA (N.J.A.C. 7:9C, August 9, 2018); https://www.nj.gov/dep/rules/rules/njac7_9c.pdf.

(3) NJDEP 2018. New Jersey Drinking Water Standards (September 4, 2018); http://www.nj.gov/dep/standards/drinking%20water.pdf.

(4) Remediation Goals (RGs) were selected from the lowest of the EPA MCLs, NJ Groundwater Quality Standards, and NJ Drinking Water Standards.

µg/L = micrograms per liter
EPA = United States Environmental Protection Agency
MCL = Maximum Contaminant Level
NJ = New Jersey
NJDEP = New Jersey Department of Environmental Protection
NL = not listed

Table 10: Vapor Intrusion Screening Levels (VISLs)

Chemical Name	Unit	Regional Screening Level (RSL) Resident Ambient Air Table (TR=1E-06, HQ=1) April 2019 [1]
1,1,1-Trichloroethane	µg/m^3	5200
1,1-Dichloroethane	µg/m^3	1.8
1,1-Dichloroethene	µg/m^3	210
Chlorobenzene	µg/m^3	52
cis-1,2-Dichloroethene	µg/m^3	NL
Trichloroethene	µg/m^3	0.48
Vinyl Chloride	µg/m^3	0.17
1,4-Dioxane	µg/m^3	0.56

Notes:

(1) EPA Generic Regional Screening Level (RSL) Resident Ambient Air Table (TR=1E-06, HQ=1) April 2019; https://semspub.epa.gov/work/HQ/199444.pdf

µg/m^3= micrograms per cubic meter

EPA = United States Environmental Protection Agency

NL = not listed

Table 11
Chemical-specific ARARs and TBCs
Mansfield Trail Dump, Operable Unit 2
Byram Township, New Jersey

Regulatory Level	Citation	Status	Requirement Synopsis	Comment
Federal	Safe Drinking Water Act; National Primary Drinking Water Standards (40 CFR 141.50-52) - MCLs	Applicable	Establishes federal MCLs, maximum permissible levels of contaminants in water that is delivered to any user of a public drinking water systems.	The standards were used in to developing the RGs for site groundwater.
State	New Jersey Residential Direct Contact Soil Remediation Standards (NJAC 7:26D)	Applicable	Establishes standards for remediation of contaminated soil .	The standards were used to develop the RGs for PCBs. The lead standard is not ARAR, but the RGs developed for OU2 are consistent with the standard.
State	New Jersey Impact to Groundwater Soil Screening Levels (NJAC 7:26D)	TBC	Establishes criteria for soil cleanups.	The criteria were evaluated in developing the RGs.
State	New Jersey Ground Water Quality Standards Class IIA (NJAC 7:9C)	Applicable	Establishes the water quality standards for the State's groundwater cleanups based on the type of groundwater use. Groundwater at the site is classified as Class IIA, suitable for drinking water use.	The standards were used in developing the RGs for site groundwater.
State	New Jersey Drinking Water Quality Standards (NJAC 7:10)	Applicable	Establishes drinking water standards (MCLs) for the State.	The standards were used in developing the RGs for site groundwater.

Acronyms:

ARARs - Applicable or Relevant and Appropriate Requirements
TBC - To be considered
CFR - Code of Federal Regulations MCLs - Maximum Contaminant Levels
N.J.A.C. - New Jersey Administrative Code
RGs - Remediation Goals
RSL - regional screening level
TSCA - Toxic Substances Control Act

Table 12
Location-specific ARARs and TBCs
Mansfield Trail Dump, Operable Unit 2
Byram Township, New Jersey

Regulatory Level	Citation	Status	Requirement Synopsis	Comment
Wetlands and Floodplains Standards and Regulations				
Federal	Statement of Procedures on Floodplain Management and Wetlands Protection (40 CFR 6 Appendix A)	TBC	This Statement of Procedures sets forth Agency policy and guidance for carrying out the provisions of Executive Orders (EO) 11988 and 11990.	The Site has both freshwater forested/shrub wetlands and floodplains surrounding Cowboy Creek and Lubbers Run, downgradient of the dump areas. Remedial design and remedial action will take into consideration floodplain management and wetlands protection.
Federal	Policy on Floodplains and Wetland Assessments for CERCLA Actions (OSWER Directive 9280.0-12, 1985)	TBC	Superfund actions must meet the substantive requirements of EO 11988, EO 11990, and 40 CFR part 6, Appendix A.	The Site has both freshwater forested/shrub wetlands and floodplains surrounding Cowboy Creek and Lubbers Run, downgradient of the dump areas. Remedial design and remedial action will take into consideration floodplain management and wetlands protection.
Federal (Non-Regulatory)	Wetlands Executive Order (EO 11990)	TBC	Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance natural and beneficial values of wetlands.	Freshwater forested/shrub wetlands are present downgradient of the Site in the vicinity of Cowboy Creek and Lubbers Run. A freshwater pond is mapped in the National Wetlands Inventory near the dump areas, however, was not confirmed during site reconnaissance. The remedial design and remedial action will include best management practices to avoid or minimize harm to wetlands.
Federal (Non-Regulatory)	Floodplain Management (EO 11988)	TBC	Federal agencies are required to reduce the risk of flood loss, to minimize the impact of floods, and to restore and preserve the natural and beneficial values of floodplains.	The potential effects of any action (e.g. construction of impervious surface) will be evaluated to ensure that the planning and decision making reflect consideration of flood hazards and floodplains management, including restoration and preservation of natural undeveloped floodplains.
Federal	Clean Water Act Section 404 (40 CFR 230- 233)	Potentially Applicable	Regulates discharge of dredged and fill material into the "waters of the United States". Implemented through the 404(b)(1) guidelines, 40 CFR Part 230.	Freshwater forested/shrub wetlands are present downgradient of the Site in the vicinity of Cowboy Creek and Lubbers Run. A freshwater pond is mapped in the National Wetlands Inventory near the dump areas, however, was not confirmed during site reconnaissance. During remedial design effect on wetlands will be evaluated and addressed consistent with these requirements.

Table 12
Location-specific ARARs and TBCs
Mansfield Trail Dump, Operable Unit 2
Byram Township, New Jersey

Regulatory Level	Citation	Status	Requirement Synopsis	Comment
State	New Jersey Freshwater Wetlands Protection Act Rules (NJAC 7:7A, NJSA 13:98-1)	Potentially Applicable	This act establishes requirements for regulated activity disturbing wetlands (e.g. any excavation, dredging, drainage, construction, etc.).	Freshwater forested/shrub wetlands are present downgradient of the Site in the vicinity of Cowboy Creek and Lubbers Run. A freshwater pond is mapped in the National Wetlands Inventory near the dump areas, however, was not confirmed during site reconnaissance. Remedial Design and Remedial Action will take into account any effect on wetlands.
Wildlife Habitat Protection Standards and Regulations				
Federal	Endangered Species Act (16 USC 1531 et seq.; 40 CFR 400)	Potentially Applicable	This act establishes standards for the protection of threatened and endangered species.	The USFWS reported that the site is located within areas that provide habitat for several federally listed threatened and endangered species. The potential effects of federally listed endangered and threatened
Federal	Migratory Bird Treaty Act (MBTA, 1 USC 03 *et seq* .)	Potentially Applicable	This act establishes standards for the protection of migratory bird species, including individual birds or their nests or eggs.	The USFWS provided a list of birds that exist on the USFWS Birds of Conservation Concern list and are known to have vulnerabilities within the project area. The potential effect on these birds will be considered during the Remedial Design.
State	New Jersey Endangered and Nongame Species Conservation Act (NJSA 23:2A-1 - 15)	Potentially Applicable	This act protects and conserves endangered and nongame species.	The NJDEP's Natural Heritage Program identified a natural heritage priority site that is approximately 0.5 mile northeast of the Cowboy Creek area (downgradient of the site). The potential effects on New Jersey listed endangered and nongame species will be considered during the Remedial Design.
State	New Jersey Endangered Plant Species List Act (NJAC 7:5B)	Potentially Applicable	This act protects endangered plant species.	The NJDEP Natural Heritage Program reported that the site contains populations of two unnamed plant species that are imperiled in the state. The effects on endangered plant species will be evaluated during the Remedial Design.

Table 12
Location-specific ARARs and TBCs
Mansfield Trail Dump, Operable Unit 2
Byram Township, New Jersey

Regulatory Level	Citation	Status	Requirement Synopsis	Comment
Cultural Resources, Historic Preservation Standards and Regulations				
Federal	National Historical Preservation Act Regulations (36 CFR Part 800)	Potentially Applicable	This requirement establishes procedures to provide for preservation of historical and archeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program.	The impact of proposed remedy on historical and archeological sensitive areas will be evaluated during the Remedial Design.
Federal	New Jersey Highlands Water Protection and Planning Act (N.J.S.A. 13:20-1 et seq.)	Applicable	This requirement preserves open space and natural resources (including water resources) within the Highlands Region of New Jersey.	Since the site is located within the preservation area, remedial alternatives that are considered "major Highlands development" as defined by this act. Consultation with NJDEP will establish compliance.

Acronyms:

ARARs - Applicable or Relevant and Appropriate Requirements
CERCLA - Comprehensive Environmental Response Compensation and Liability Act
CFR - Code of Federal Regulations
EO - executive order
MBTA - Migratory Bird Treaty Act
NEPA - National Environmental Policy Act
NJAC - New Jersey Administrative Code
NJSA - New Jersey Statues Annotated
OSWER - Office of Solid Waste and Emergency Response
USC - United States Code
USFWS - United States Fish and Wildlife Service
TBC - To Be Considered

Table 13
Action-specific ARARs and TBCs
Mansfield Trail Dump, Operable Unit 2
Byram Township, New Jersey

Regulatory Level	Citation	Status	Requirement Synopsis	Comment
General - Site Remediation				
Federal	RCRA Identification and Listing of Hazardous Wastes (40 CFR 261)	Potentially Applicable	This regulation describes methods for identifying hazardous wastes and lists known hazardous wastes.	This regulation is applicable to the identification of hazardous wastes, if any, that are generated, treated, stored, or disposed during remedial activities.
Federal	RCRA Standards Applicable to Generators of Hazardous Wastes (40 CFR 262)	Potentially Applicable	Describes standards applicable to generators of hazardous wastes.	Standards will be followed if any hazardous wastes are generated on-site.
State	New Jersey Hazardous Waste Regulations - Identification and Listing of Hazardous Waste (NJAC 7:26G-5)	Potentially Applicable	This regulation describes methods for identifying hazardous wastes and lists known hazardous wastes.	This regulation will be applicable to the identification of hazardous wastes, if any, that are generated, treated, stored, or disposed of during remedial activities.
State	New Jersey Stormwater Management Rule (NJAC 7:8)	Potentially Applicable	This regulation sets the requirements for stormwater management during construction.	Applicable if remedial activities include total land disturbance exceeding regulatory threshold.
State	New Jersey Soil Erosion and Sediment Control Act (NJAC 2:90, NJSA 16:52A)	Potentially Applicable	This act outlines the requirements for soil erosion and sediment control measures.	Applicable to remedial construction activities that result in total land disturbance greater than or equal to 5000 sf.
State	New Jersey Noise Control (NJAC 7:29)	Relevant and Appropriate	This standard provides the requirements for noise control.	This standard will be applied to establish limits on noise that can be generated during remedial activities.

Table 13
Action-specific ARARs and TBCs
Mansfield Trail Dump, Operable Unit 2
Byram Township, New Jersey

Regulatory Level	Citation	Status	Requirement Synopsis	Comment
Waste Transportation				
Federal	Department of Transportation (DOT) Rules for Transportation of Hazardous Materials (49 CFR Parts 107, 171, 172, 177 to 179)	Potentially Applicable	This regulation outlines procedures for the packaging, labeling, manifesting, and transporting hazardous materials.	Applicable to transport hazardous material from the site, if any.
Federal	RCRA Standards Applicable to Transporters of Hazardous Waste (40 CFR 263)	Potentially Applicable	Establishes standards for hazardous waste transporters.	Applicable to transport hazardous material from the site, if any.
State	New Jersey Transportation of Hazardous Materials (N.J.A.C. 16:49)	Potentially Applicable	This regulation establishes recordkeeping requirements and standards related to the manifest system for hazardous wastes.	Applicable to transport hazardous material from the site, if any.
Water Discharge or Subsurface Injection				
Federal	National Pollutant Discharge Elimination System (NPDES) (40 CFR 100 et seq.)	Potentially Relevant and Appropriate	NPDES requirements govern compliance with water quality standards, a discharge monitoring system, and records maintenance.	Vapor extraction system may generate small amount of waste water, which may discharge to surface water. In New Jersey, EPA has delegated the authority to regulate pollutant discharges under this program to NJDEP.
State	The New Jersey Pollutant Discharge Elimination System (NJPDES) (NJAC 7:14A)	Potentially Applicable	This regulation governs the discharge of any pollutants into or adjacent to State waters that may alter the physical, chemical, or biological properties of State waters.	Vapor extraction system may generate small amount of waste water, which may discharge to surface water, in which case the project will meet substantive NJPDES requirements for regulated surface water discharges.
Off-Gas Management				
Federal	Clean Air Act (CAA)—National Ambient Air Quality Standards (NAAQs) (40 CFR 50)	Potentially Applicable	These provide air quality standards for particulate matter, lead, NO_2, SO_2, CO, and volatile organic matter.	During remediation and treatment, if any such air emissions are generated, they will be controlled and monitored to comply with these standards.

Table 13
Action-specific ARARs and TBCs
Mansfield Trail Dump, Operable Unit 2
Byram Township, New Jersey

Regulatory Level	Citation	Status	Requirement Synopsis	Comment
Federal	Standards of Performance for New Stationary Sources (40 CFR 60)	Potentially Applicable	Set the general requirements for air quality.	During operation of any equipment that comprises a "new stationary source", regulated air emissions, if any, will be controlled and monitored to comply with these standards.
Federal	National Emission Standards for Hazardous Air Pollutants (40 CFR 61)	Potentially Applicable	These provide air quality standards for hazardous air pollutants.	During remediation, if any regulated hazardous air pollutants are emitted, emissions will be controlled and monitored to comply with these standards.
State	New Jersey Air Pollution Control Act (NJAC 7:27)	Potentially Applicable	This regulation describes requirements and procedures that govern the emission of contaminants into the ambient atmosphere.	During remediation, if any regulated air pollutants are emitted, emissions will comply with substantive requirements. .
State	New Jersey Ambient Air Quality Standards (NJAC 7:27-13)	Potentially Applicable	This standard provides the requirements for ambient air quality control.	During remediation, if any regulated air pollutants are emitted, emissions will comply with substantive requirements

Acronyms:

ARARs - Applicable or Relevant and Appropriate Requirements
TBC - To Be Considered
CAA - Clean Air Act
CAMU - Corrective Action Management Units
CFR - Code of Federal Regulations
CO - Carbon monoxide
EPA - Environmental Protection Agency
LDR - Land Disposal Restrictions
NAAQS - National Ambient air Quality Standards
NJPDES - New Jersey Pollutant Discharge Elimination System
NO_2 - Nitrogen dioxide
NPDES - National Pollutant Discharge Elimination System
OSHA - Occupational Safety and Health Administration
OSWER - Office of Solid Waste and Emergency Response
PCB - polychlorinated biphenyl
RCRA - Resource Conservation and Recovery Act
SO_2 - Sulfur dioxide
TSCA - Toxic Substances control Act
UIC - Underground Injection Control

Table 14: Cost Estimate Summary – S-3
Mansfield Trail Dump Site – OU2
Byram Township, Sussex County, New Jersey

No.	Description	Cost
	Remedial Action	
01	General Requirements	$532,000
02	Site Preparation/Site Work	$111,300
03	Excavation and Backfill of Contaminated Soils	$501,290
05	Transportation and Disposal of Excavated Soils	$505,000
06	Post-excavation Sampling	$28,000
	Subtotal	*$1,677,590*
	Contingency (30%: 20% scope + 10% bid contingency)	$503,277
	Subtotal	*$2,180,867*
	General Contractor Markup (profit) 10%	$218,087
	Total Remedial Action Capital Costs	**$2,399,000**
	PRESENT WORTH	
	Total Capital Cost	$2,399,000
	Total Present Worth	**$2,399,000**

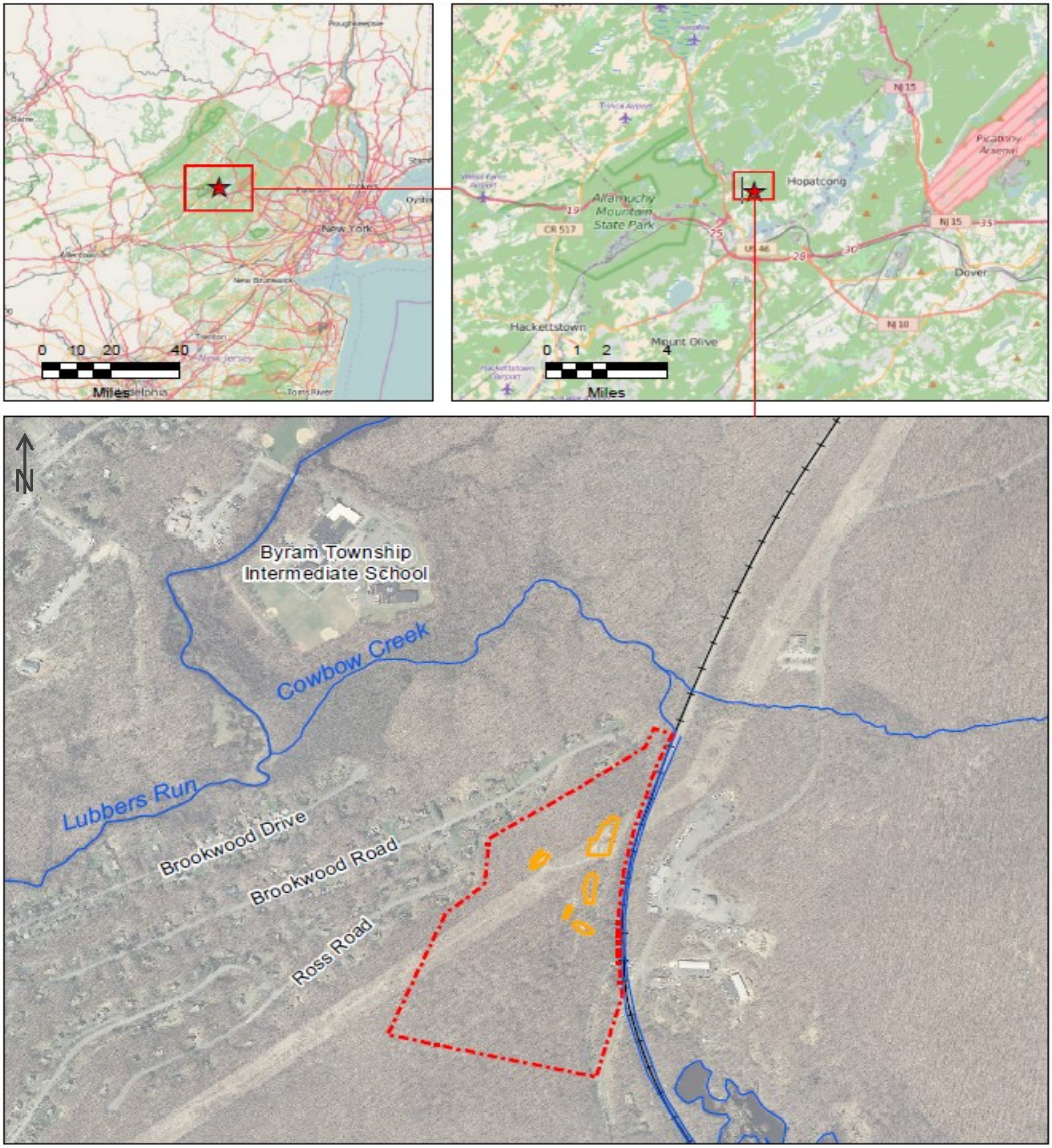
Notes:

1. Percentages used for indirect costs are based on guidance from Section 5.0 of "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study", EPA 2000.
2. The project cost presented herein represents only feasibility study level, and is thus subject to change pending the results of the pre-design investigation, which is intended to collect sufficient data to assist in the development of remedial design and associated detailed cost estimate. Expected accuracy range of the cost estimate is -30% to +50%. Present worth calculation assumes 7% discount rate after inflation is considered.
3. Total present worth is rounded to the nearest $1,000. Inflation and depreciation are excluded from the present value cost.
4. A detailed cost estimate can be found in the OU2 Feasibility Study.

Table 15: Cost Estimate Summary – GW-4
Mansfield Trail Dump Site – OU2
Byram Township, Sussex County, New Jersey

No.	Description	Cost
CAPITAL COSTS		
01	General Requirements	$1,787,000
02	Cap Construction (from Alternative GW-2)	$744,000
03	First year Cap O&M (from Alternative GW-2)	$30,000
04	SVE Construction (from Alternative GW-3)	$661,000
05	First year SVE O&M (from Alternative GW-3)	$254,000
06	In Situ Treatment	$1,024,000
07	First Year In Situ Treatment Performance Monitoring	$124,000
	Subtotal	*$4,624,000*
	Contingency 20%	$925,000
	Subtotal	*$5,549,000*
	General Contractor Bond and Insurance 5%	$278,000
	Subtotal	*$5,827,000*
	General Contractor Costs (Profit) 10%	$583,000
-	**Total Remedial Action Capital Costs**	**$6,410,000**
OPERATION AND MAINTENANCE COSTS		
01	Annual OM&M for Cap (from Alternative GW-2)	
	Present Value of Cap OM&M - Years 1 through 5	$193,812
	Present Value of Cap OM&M - Years 6 through 10	$102,916
	Present Value of Cap OM&M - Years 11 through 30	$125,577
	Subtotal	*$422,305*
02	Annual O&M for SVE System Operation Year 2-5 (from Alternative GW-3)	$146,000
	Present worth of O&M Years 2-5 Operation (from Alternative GW-3)	*$463,000*
03	Annual In Situ Treatment Performance Monitoring Year 2-5	$77,700
	Present worth of In Situ Treatment Performance Monitoring	*$246,000*
04	Annual Monitoring Cost for MNA and LTM (from Alternative GW-2)	$126,000
	Present worth of Monitoring (30 Years) (from Alternative GW-2)	*$1,564,000*
PRESENT WORTH		
	Total Capital Cost	$6,410,000
	Total OM&M Cost	$2,696,000
	Total Present Worth	**$9,106,000**

Note: The project cost presented herein represents only feasibility study level, and is thus subject to change pending the results of the pre-design investigation, which is intended to collect sufficient data to assist in the development of remedial design and associated detailed cost estimate. Expected accuracy range of the cost estimate is -30% to +50%. Present worth calculation assumes 7% discount rate after inflation is considered.



Legend

Former Source Area

Former Waste Disposal Trenches

Notes:

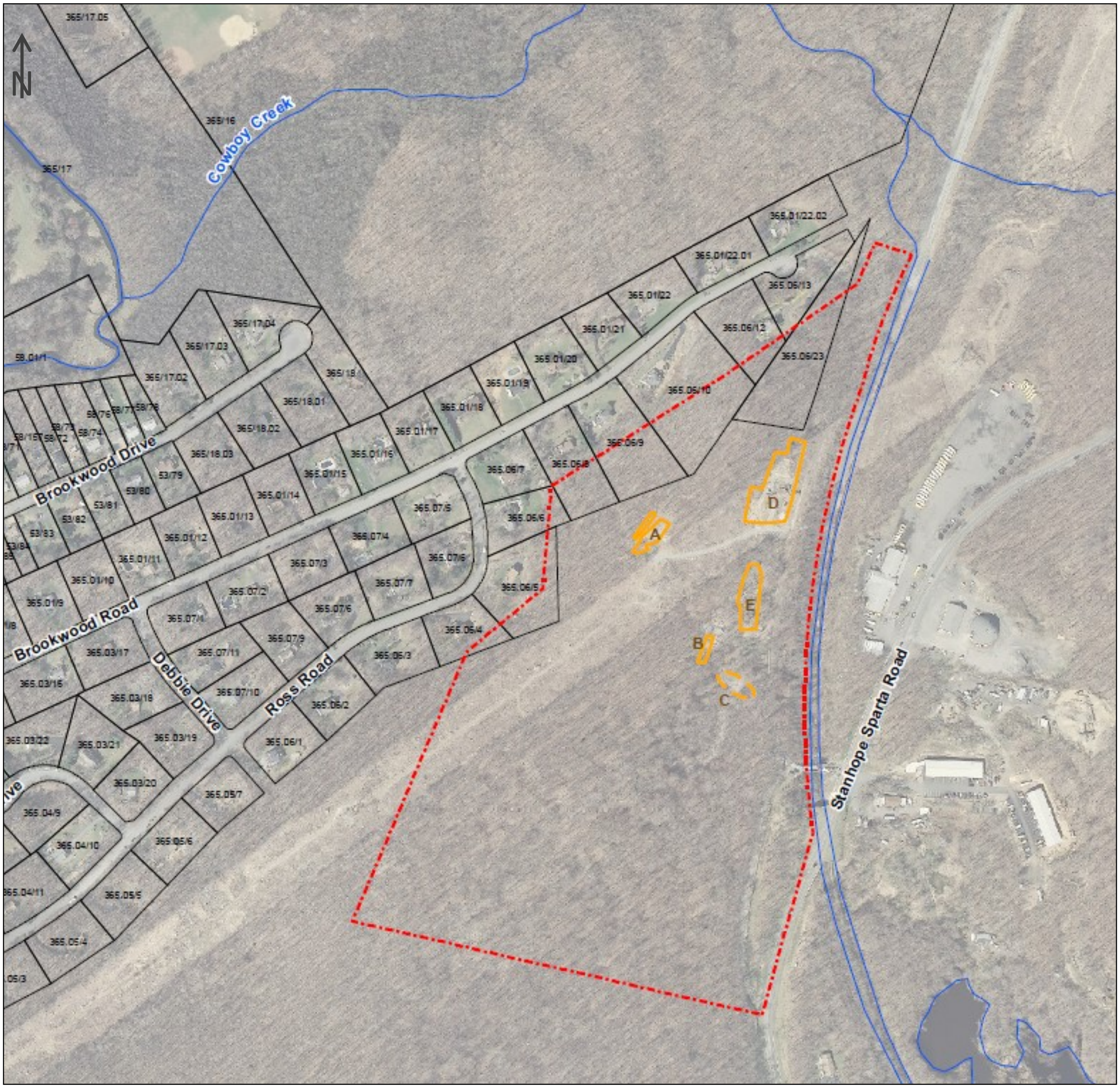
Basemaps source: ESRI

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU2 Record of Decision

FIGURE 1

Site Location Map

EPA Region 2 September 2019



Legend

Former Source Area

Former Waste Disposal Trenches

Notes:

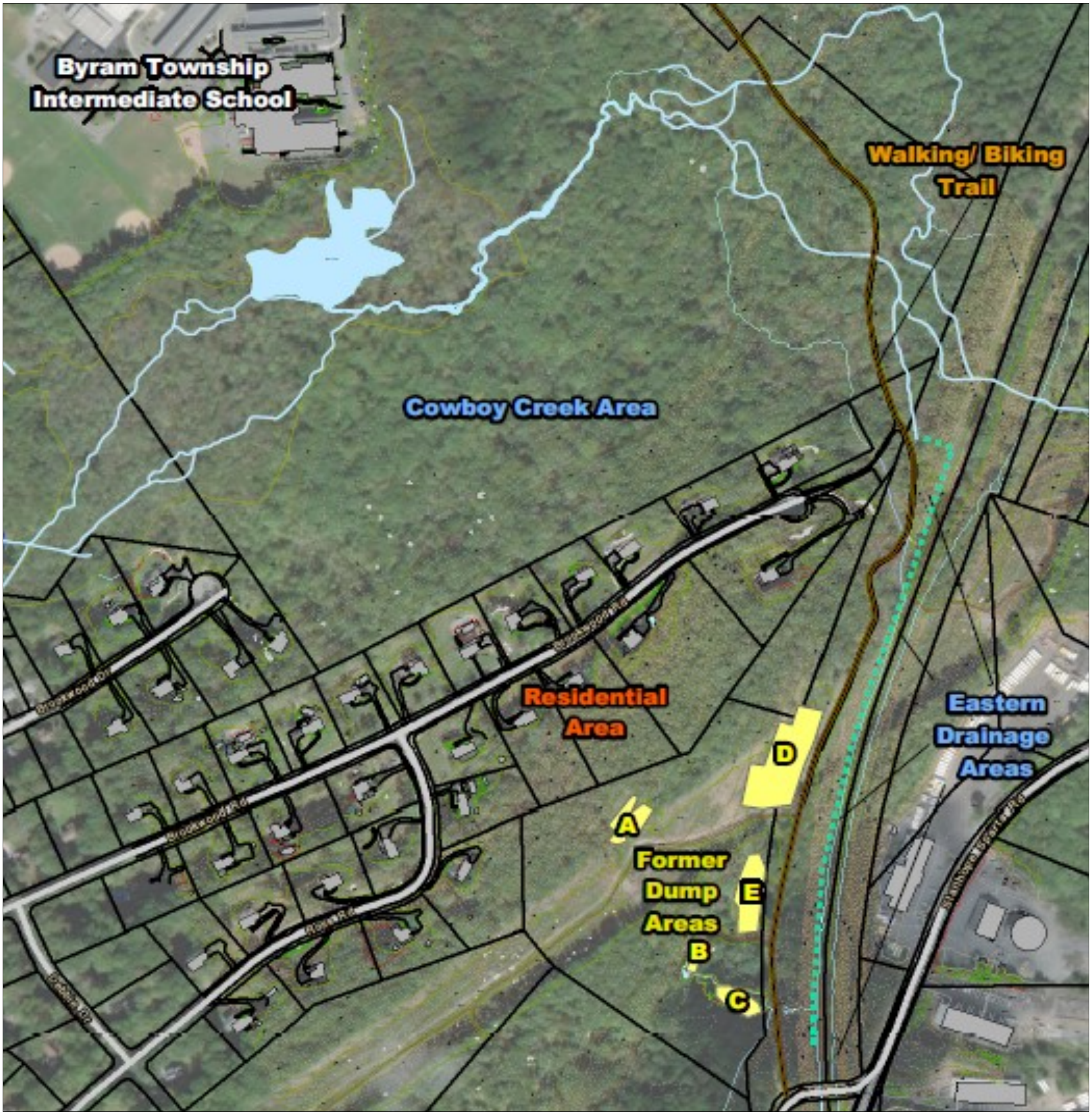
Basemaps source: ESRI

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU2 Record of Decision

FIGURE 2

Former Source Area Map

EPA Region 2 September 2019



Former Dump Areas
Other Parcels
Cowboy Creek
Intermittent Stream

Topographic Contours
50 ft Contours
5 ft Contours

N.T.S.

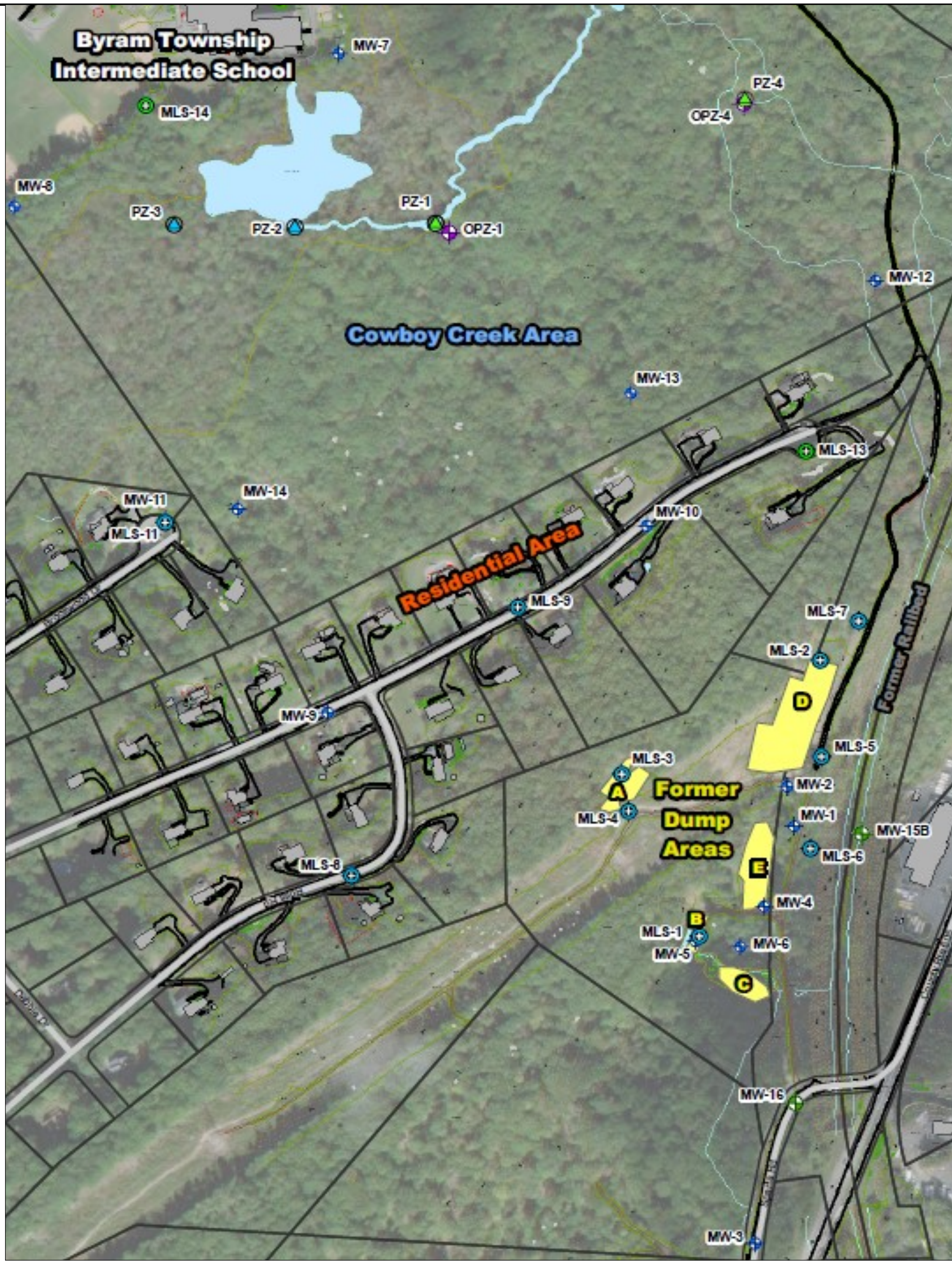
Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU1 Record of Decision

FIGURE 3

Site Plan Map

EPA Region 2 September 2019

Notes:
1. Aerial photograph from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), March/April 2012.



N.T.S.

- 2017 Monitoring Well
- 2017 MLS Well
- 2017 In-Creek Piezometer
- 2017 Overburden Piezometers
- Existing Monitoring Well
- Existing MLS Well
- Existing In-Creek Piezometer
- Tax Parcels
- Former Dump Areas

Notes:

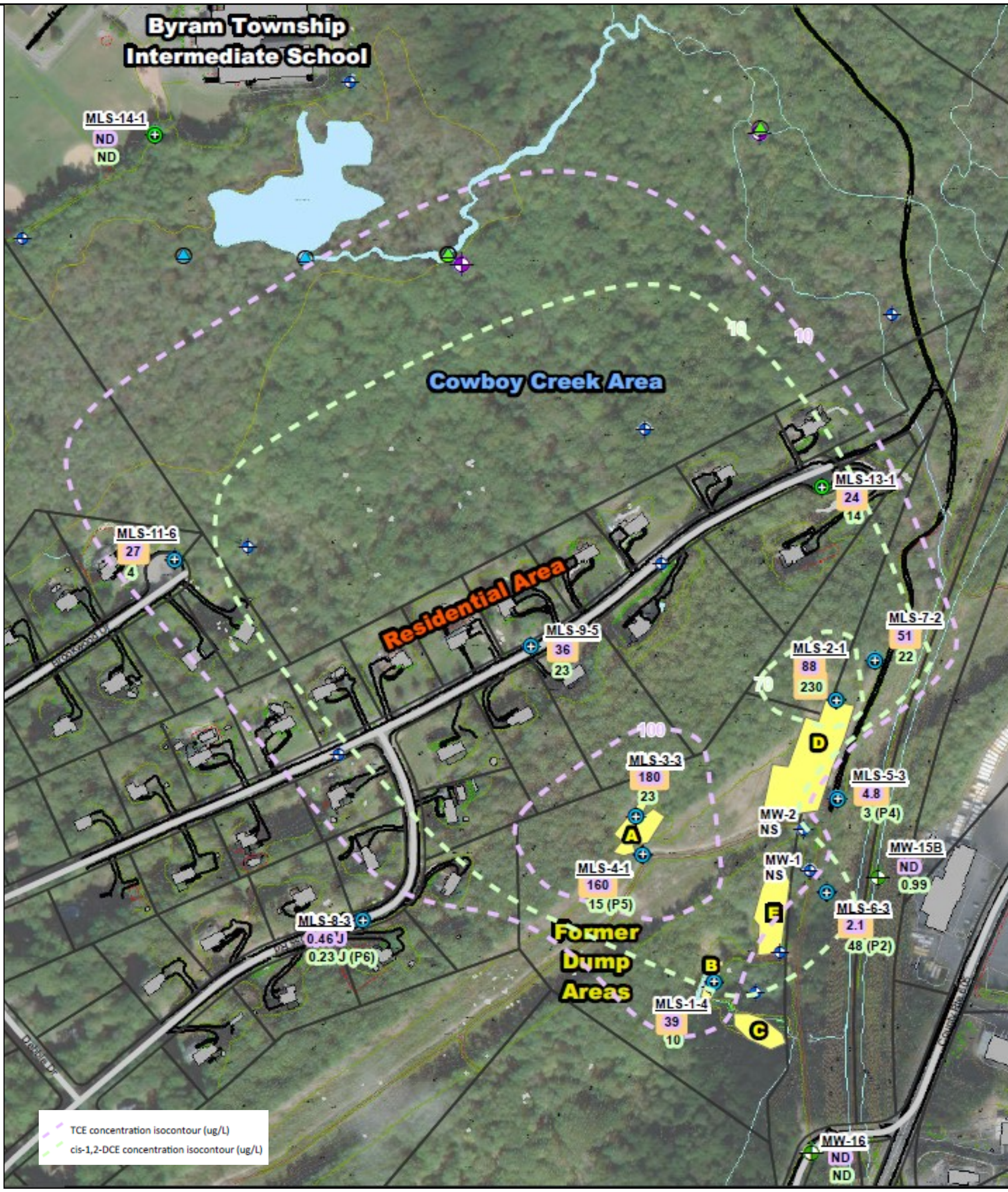
1. Aerial photograph from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), March/April 2012.

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU1 Record of Decision

FIGURE 4

Monitoring Well Map

EPA Region 2 September 2019



N.T.S.

- 2017 Monitoring Well
- 2017 MLS Well
- 2017 In-Creek Piezometer
- 2017 Overburden Piezometers
- Existing Monitoring Well
- Existing MLS Well
- Existing In-Creek Piezometer
- Tax Parcels
- Former Dump Areas

MLS-1-P1	Monitoring Well
ND	TCE Concentration (ug/l)
ND	cis-1,2-DCE Concentration (ug/L)

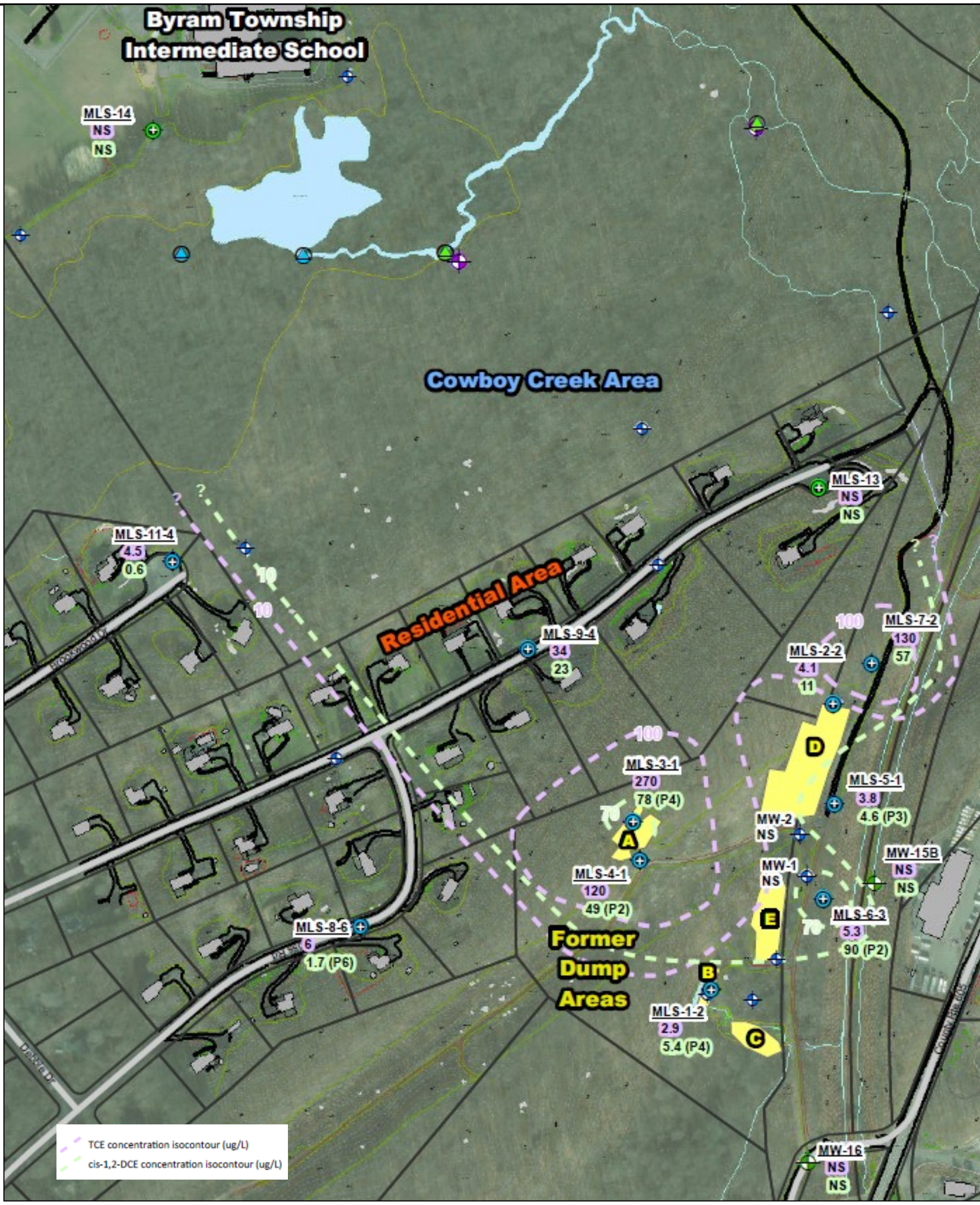
Notes:

1. Groundwater results are presented for the November 2017 sampling. The port with the highest concentration is presented.
2. Exceedances of RI screening criteria are highlighted orange.
3. Acronyms:
   - D - dilution
   - J - estimated value
   - ND - non detect
   - TCE - Trichloroethene
4. Aerial photograph from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), March/April 2012.

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU1 Record of Decision

FIGURE 5
Deep Bedrock Plume Map
(November 2017)

EPA Region 2 — September 2019



N.T.S.

- 2017 Monitoring Well
- 2017 MLS Well
- 2017 In-Creek Piezometer
- 2017 Overburden Piezometers
- Existing Monitoring Well
- Existing MLS Well
- Existing In-Creek Piezometer
- Tax Parcels
- Former Dump Areas

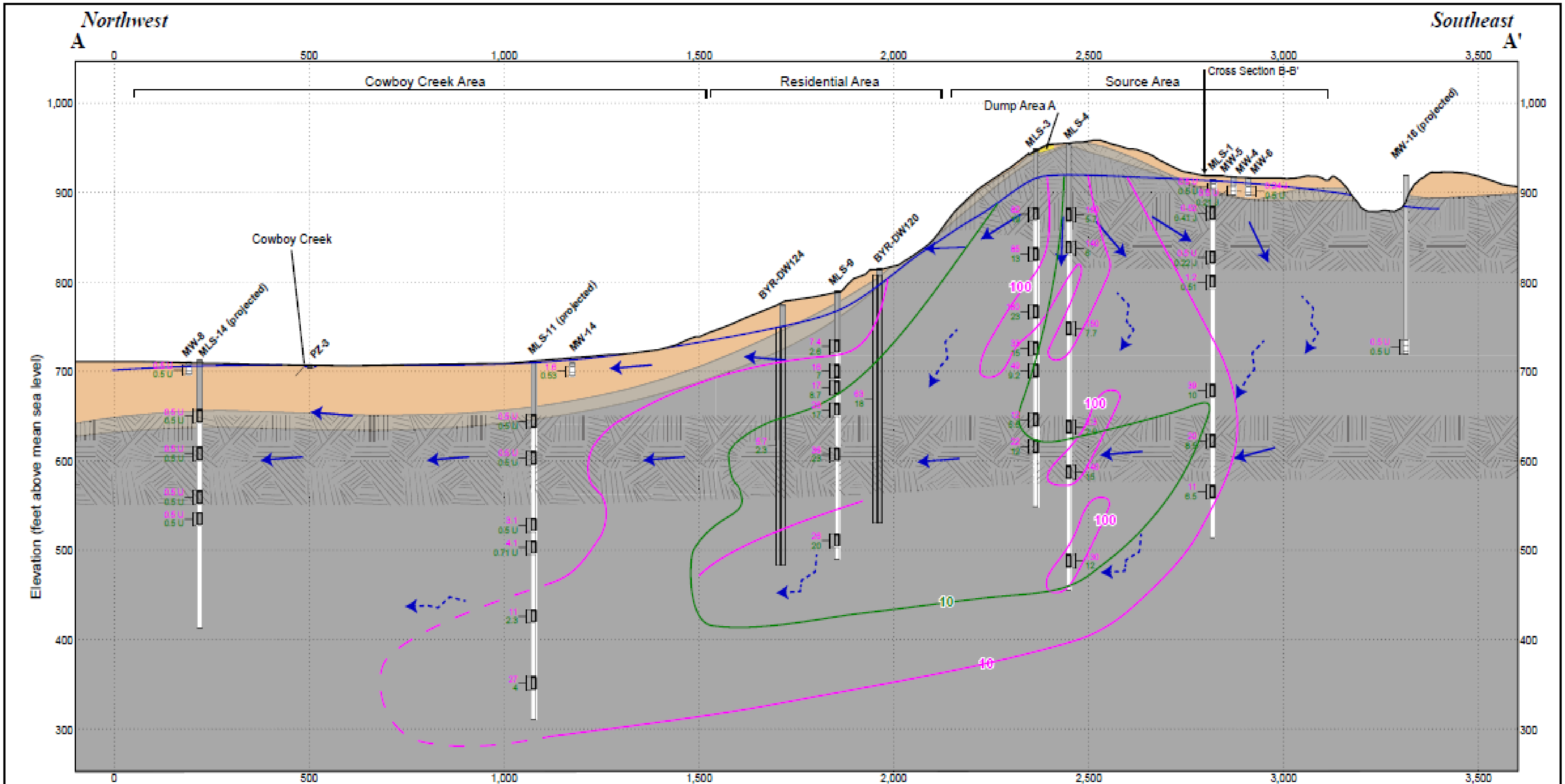
Notes

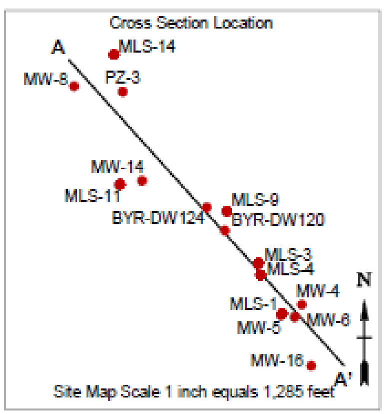
1. Groundwater results are presented for the November 2014 sampling, when a well was not sampled the results from September 2015 are presented.
2. Acronyms:
   - J- estimated value
   - NS - Not Sampled
   - TCE - Trichloroethene
   - U- non detect
3. Aerial photograph from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), March/April 2012.

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU1 Record of Decision

FIGURE 6
Deep Bedrock Plume Map
(November 2014)

EPA Region 2 | September 2019





Dump Area
Overburden
Weathered Bedrock
Bedrock
Fractured/Tranmissive Zone
Fracture flow through competent bedrock and down dip
Fracture flow through transmissive bedrock zones
Casing
Screened Interval
Open Borehole
Sample Interval
FLUTe Liner
FLUTe Sampling Port
TCE approximate groundwater contamination extent (dashed where inferred)
cis-1,2-DCE approximate groundwater contamination extent (dashed where inferred)
Shallow Potentiometric Surface (01/2018)

*Residential well data collected 10/2017

U - not detected, detection limit is value to left
J - estimated concentration
NC - not collected

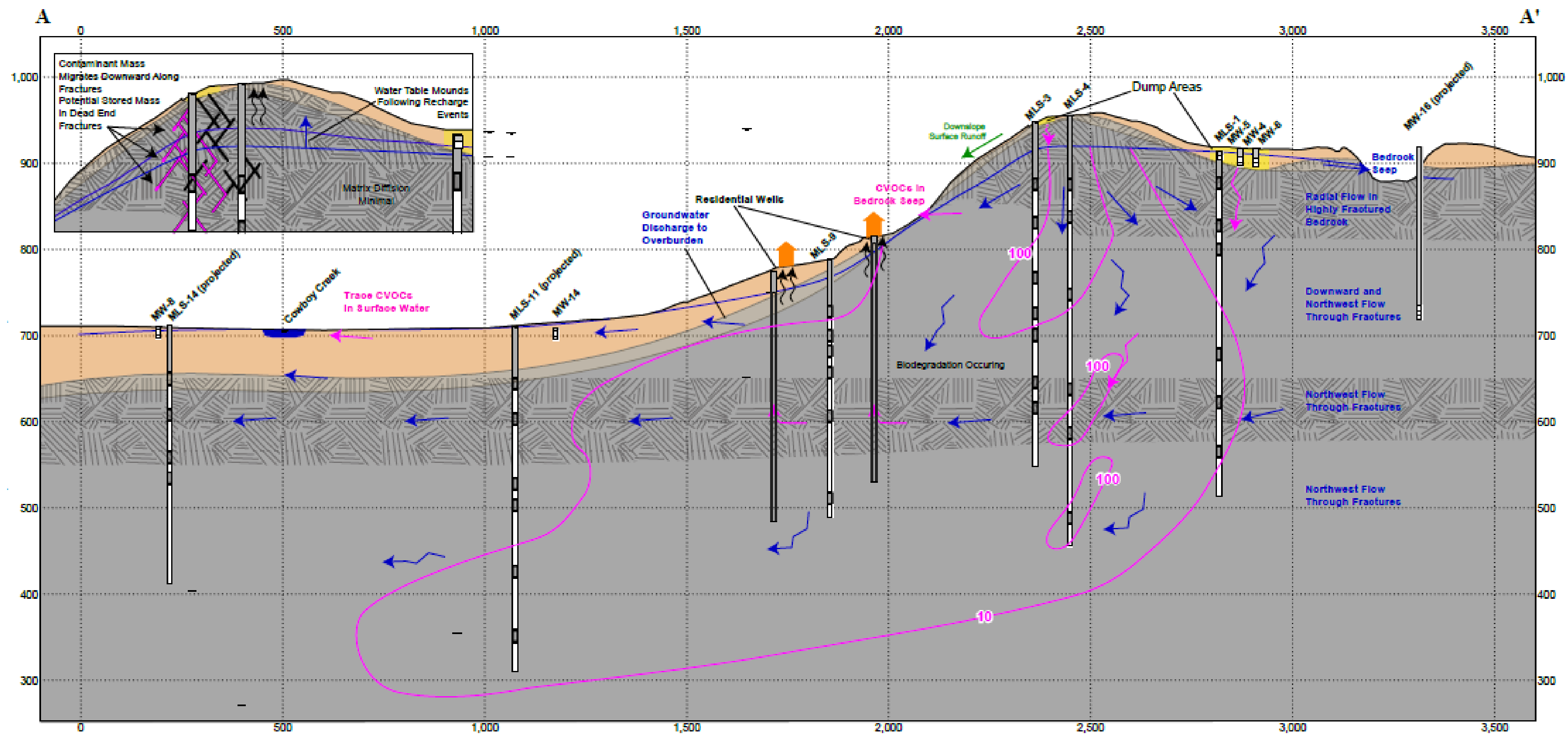
Analytical Results
Trichlorothene (TCE)
cis-1,2-Dichloroethene (cis-1,2-DCE)

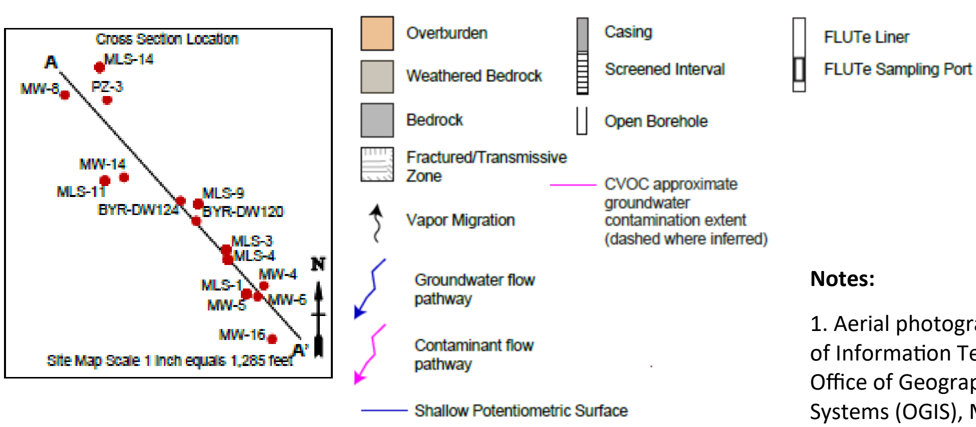
Notes:
1. All results in micrograms per liter
2. Aerial photograph from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), March/April 2012.

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU2 Record of Decision

FIGURE 7
Cross Section Groundwater Plume Map
November 2017

EPA Region 2 September 2019





Notes:

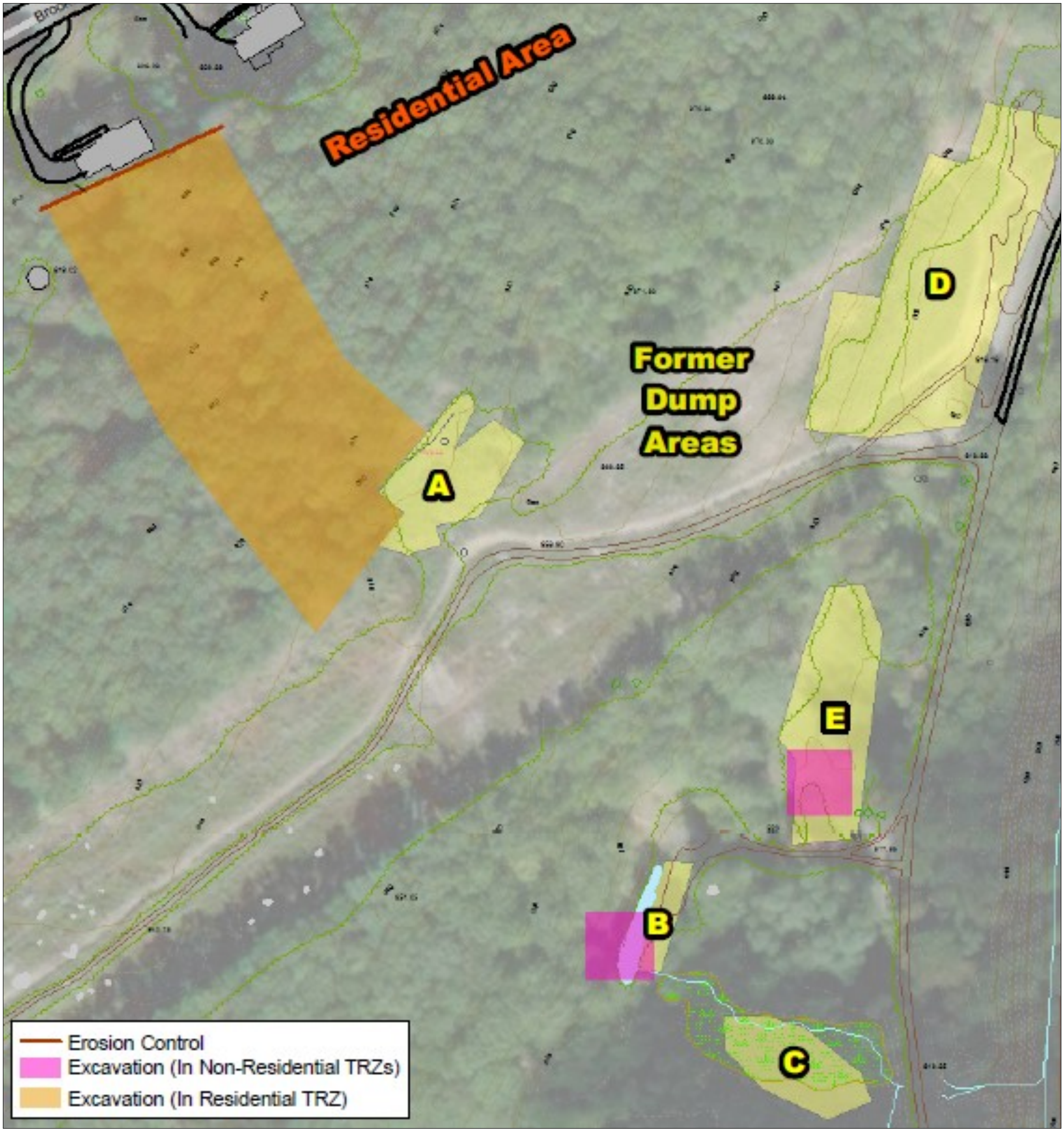
1. Aerial photograph from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), March/April 2012.

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU2 Record of Decision

FIGURE 8

Conceptual Site Model

EPA Region 2 September 2019



N.T.S.

Former Dump Areas

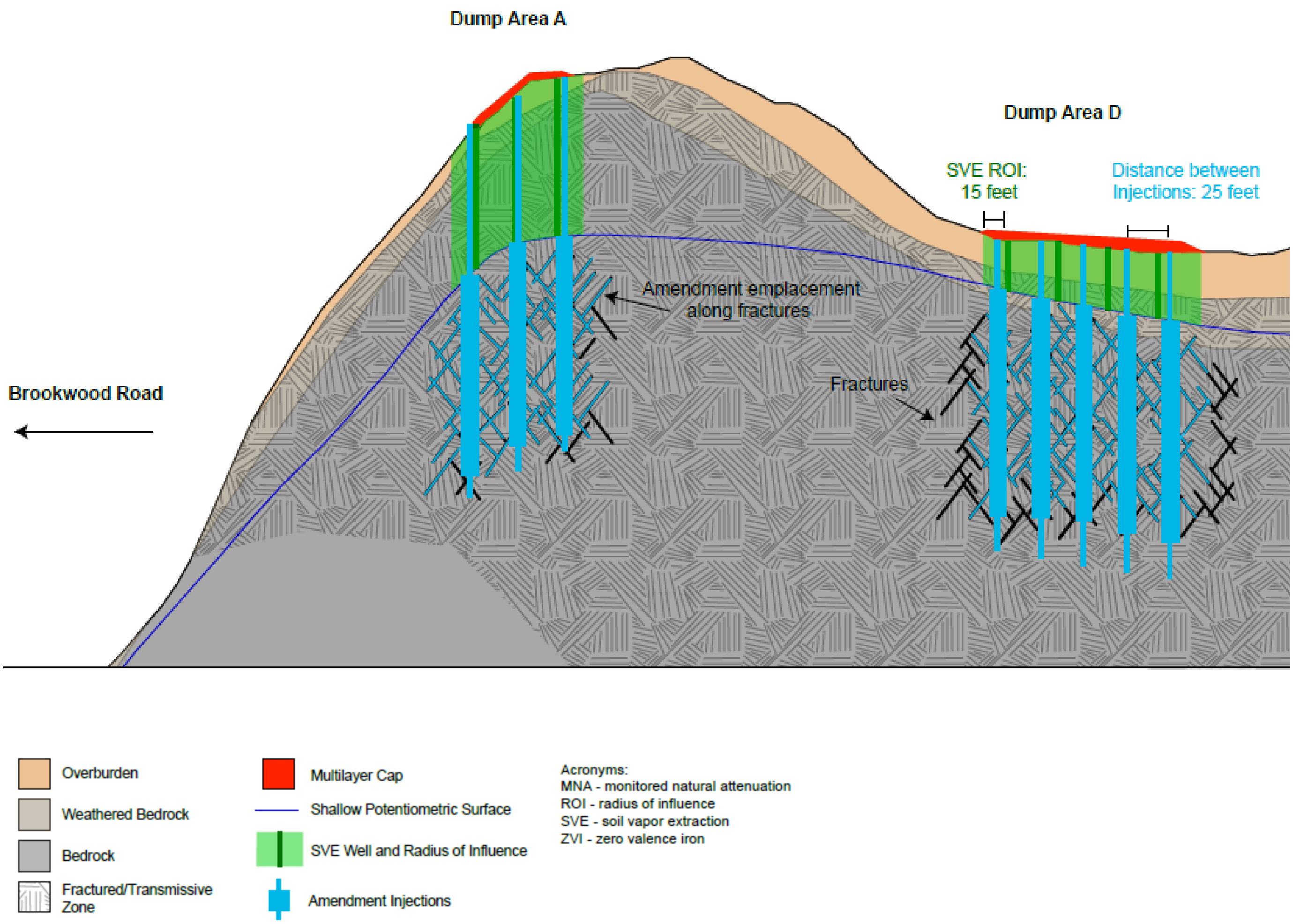
Topographic Contours
50 ft Contours
5 ft Contours

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU2 Record of Decision

FIGURE 9
Selected Soil Alternative (S-3)

EPA Region 2 September 2019

Notes:
1. TRZ - Target Remediation Zone
2. The non-residential TRZs are not to scale and are assumed to be 20 ft by 20 ft areas. TRZ extents will be confirmed in a pre-design investigation.
3. Aerial photograph from NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS), March/April 2012.



N.T.S.

Mansfield Trail Dump Site
Sussex County, Byram Township, New Jersey
OU2 Record of Decision

FIGURE 10
Selected Groundwater Alternative (GW-4)

EPA Region 2 September 2019

Notes:

1. Conceptual Design shown for Feasibility Purposes only. Modifications and refinements of specific design components will be made during the Remedial Design Phase.

APPENDIX II - Administrative Record

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

07/15/2019

REGION ID: 02

Site Name: MANSFIELD TRAIL DUMP
CERCLIS ID: NJN000206345
OUID: 02
SSID: A238
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
565420	7/15/2019	ADMINISTRATIVE RECORD INDEX FOR OU2 FOR THE MANSFIELD TRAIL DUMP SITE	2	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
395977	05/01/2016	REDACTED REVISED DATA EVALUATION SUMMARY REPORT, VOLUME 1 OF 2 TEXT FOR THE MANSFIELD TRAIL DUMP SITE	299	Report	(US ENVIRONMENTAL PROTECTION AGENCY)	(EES JV)
565375	02/26/2019	FINAL ECOLOGICAL RISK ASSESSMENT STEP 3A ANALYSIS FOR OU2 FOR THE MANSFIELD TRAIL DUMP SITE	300	Report	Rosenblatt,Anne (US ENVIRONMENTAL PROTECTION AGENCY)	(CDM SMITH)
565376	05/10/2019	REVISED FINAL HUMAN HEALTH RISK ASSESSMENT FOR OU2 FOR THE MANSFIELD TRAIL DUMP SITE	543	Report	Rosenblatt,Anne (US ENVIRONMENTAL PROTECTION AGENCY)	(CDM SMITH)
565377	05/10/2019	FINAL REMEDIAL INVESTIGATION REPORT FOR OU2 FOR THE MANSFIELD TRAIL DUMP SITE	274	Report	Rosenblatt,Anne (US ENVIRONMENTAL PROTECTION AGENCY)	(CDM SMITH)
565379	05/10/2019	FINAL REMEDIAL INVESTIGATION REPORT FOR OU2 - APPENDIX A-2 FOR THE MANSFIELD TRAIL DUMP SITE	3089	Report	Rosenblatt,Anne (US ENVIRONMENTAL PROTECTION AGENCY)	(CDM SMITH)
565380	05/10/2019	FINAL REMEDIAL INVESTIGATION REPORT FOR OU2 - APPENDICES B - J FOR THE MANSFIELD TRAIL DUMP SITE	1283	Report	Rosenblatt,Anne (US ENVIRONMENTAL PROTECTION AGENCY)	(CDM SMITH)
580487	06/27/2019	THE FINAL FEASIBILITY STUDY REPORT OU2 FOR THE MANSFIELD TRAIL DUMP SITE	236	Report		(CDM SMITH)
550162	7/15/2019	PROPOSED PLAN FOR OU2 FOR THE MANSFIELD TRAIL DUMP SITE	23	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX III - State Letter

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation and Waste Management Program
401 E. State Street
PO Box 420, Mail Code 401-06
Trenton, New Jersey 08625
Tel: (609) 292-1250
Fax: (609) 777-1914

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Commissioner

September 23, 2019

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

Re: Mansfield Trail Dump Superfund Site
Record of Decision Operable Unit 2
EPA ID# NJN000206345/DEP PI#253990

Dear Mr. Evangelista:

The New Jersey Department of Environmental Protection (DEP) has completed its review of the "Record of Decision, Mansfield Trail Dump Superfund Site, Operable Unit 2 – Contaminated Groundwater and Residual Soil Contamination, Byram Township, Sussex County, New Jersey" prepared by the U.S. Environmental Protection Agency (EPA) Region II in September 2019. The DEP concurs conditionally with the selected remedy to addresses site-wide contaminated groundwater and residual soil contamination.

The major components of the OU2 selected remedy, which has a total cost of $11.5 million, include:

- Capping and vapor extraction in the source area vadose zone;
- Treatment of groundwater contamination in the source area saturated zone through amendment injection;
- Monitored Natural Attenuation (MNA) in the distal groundwater plume;
- Excavation and off-site disposal of contaminated soil in the former dump areas;
- Excavation of residual soil contamination and restoration of affected residential properties;
- Installation of additional and maintenance of existing vapor intrusion mitigation systems; and,
- Institutional controls for capped areas and to prevent the installation of wells in the contaminated plume.

The Department cannot concur with EPA's selection of Monitored Natural Attenuation (MNA) as a remedy for this site since the timeframes to achieve the remediation goals are not reasonable. The Department does not consider MNA durations beyond an approximate 30- to 50-year timeframe to be viable alternatives or remedial actions. DEP believes that while degradation may have previously been observed to some degree in groundwater and anticipated to occur in the future, the timeframes included with the MNA selection are not reasonable. If modeling after pre-design work is completed, or if monitoring after the active measures for groundwater are implemented show a reasonable timeframe will be met, then DEP will reconsider its position; hence, the conditional concurrence for this portion of the OU2 remedy.

For other aspects of the OU2 remedy at the Mansfield site, DEP concurs with the selected soil removal actions, remediating remaining areas that an earlier removal action did not address. For the groundwater action included in OU2, the selected remedy incorporates further treatability and on-site pilot studies during a pre-design phase to effectively determine the best mix of capping and in-situ treatment that will reduce contaminant levels in the source areas to meet preliminary remedial goals in groundwater in a reasonable timeframe. DEP agrees that these additional studies should be conducted. Further, if the pre-design work does not demonstrate the ability for an in-situ amendment, in conjunction with the other elements of the selected remedy, to reduce mass in the bedrock fractures to an extent that allows for groundwater preliminary remedial goals to be achieved in a reasonable timeframe within the impacted residential area, then both agencies should discuss next steps prior to full implementation.

DEP appreciates the opportunity to participate in the decision-making process to select an appropriate remedy for this site. Further, DEP looks forward to future cooperation with EPA during remedial actions for OU2 to ensure protection of residents from contaminated drinking water and vapor intrusion, and long-term restoration of the area's groundwater resource.

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

Sincerely,

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

C: Kenneth J. Kloo, Director, Division of Remediation Management, DEP
Edward Putnam, Assistant Director, Publicly Funded Response Element, DEP
Frederick A. Mumford, Section Chief, Publicly Funded Response Element, DEP
Kim O'Connell, Chief, New Jersey Remediation Branch, EPA Region II
Anne Rosenblatt, Remedial Project Manager, NJRB, EPA Region II

APPENDIX IV - Responsiveness Summary

RESPONSIVENESS SUMMARY
Mansfield Trail Dump Superfund Site
Byram, New Jersey

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for the Mansfield Trail Dump Superfund Site's (“Site”) Operable Unit 2 (“OU2”) preferred remedy, and EPA's responses to those comments. All comments summarized in this document have been considered in EPA's final decision for the selection of remedial alternatives for the Site.

This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS
This section provides the history of community involvement and interests regarding the Site.

II. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES
This section contains summaries of oral comments received by EPA at the public meeting, EPA's responses to these comments, as well as responses to written comments received during the public comment period.

III. ATTACHMENTS

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

Attachment A contains the Proposed Plan that was distributed to the public for review and comment;
Attachment B contains the public notices that appeared in the NJ Herald;
Attachment C contains the transcript of the public meeting; and
Attachment D contains the written comments received by EPA during the public comment period.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

EPA has worked closely with local residents, public officials, and other interested members of the community since the New Jersey Department of Environmental Protection (“NJDEP”) requested assistance with the Site in the early 2000s. The Site was added to the NPL in March 2011. EPA then completed a removal action, which included excavation and off-site disposal of contaminated soil and source material from February to May of 2012. A Record of Decision for OU1 (“OU1 ROD”) selecting installation of a waterline and residential connections for residential properties with potable wells impacted with site-related contamination was issued in September 2017. On July 15, 2019, EPA released the Proposed Plan and supporting documentation for the OU2, sitewide groundwater and residual soil contamination remedy. The Proposed Plan and index for the Administrative Record were made available to the public online, and the Administrative Record files were made available at the EPA Administrative Record File Room, 290 Broadway, 18th Floor, New York, New York; and the Sussex County Library Louise Childs Branch, 21 Sparta Road, Stanhope, New Jersey.

On July 15, 2019, EPA published a Public Notice in the NJ Herald newspaper that provided information about the public comment period, the public meeting for the Proposed Plan, and the availability of the Administrative Record for the Site. EPA also published a press release on July 15, 2019, to announce the release of the Proposed Plan. The public comment period closed on August 13, 2019.

A public meeting was held on July 23, 2019, at the Byram Township Municipal Building at 10 Mansfield Drive, Stanhope, New Jersey. The purpose of this meeting was to inform residents, local officials, and interested members of the public about the Superfund process, present details about EPA's remedial plan, receive comments on the Proposed Plan, and respond to questions from area residents and other interested parties.

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

Part 1: Verbal Comments

This section provides a summary of verbal comments received from the public during the public comment period and EPA's responses.

A. SUMMARY OF QUESTIONS AND EPA'S RESPONSES FROM THE PUBLIC MEETING CONCERNING THE MANSFIELD TRAIL DUMP SITE – July 23, 2019

A public meeting was held on July 23, 2019, at the Byram Township Municipal Building. In addition to a presentation of the investigation findings, EPA presented the Proposed Plan and preferred alternatives for the Site, received comments from meeting participants, and responded to questions regarding the remedial alternatives under consideration. A transcript of the public meeting is provided in Attachment C.

A summary of comments raised by the public following EPA's presentation are categorized by relevant topics and presented below:

General Comments

> ***Comment 1:*** *One commenter asked what was meant by institutional controls and whether these controls were maintained by the state or local government.*
>
> **EPA response:** Institutional controls provide a mechanism for documenting and informing future users of an area or site of contamination that remains at that location and/or restricting use at the Site. A classification exemption area ("CEA") is normally put

in place by the state as a mechanism to provide notice that constituent standards for a given aquifer classification are not or will not be met in a localized area due to natural water quality or anthropogenic influences, and to suspend use of the aquifer. In some scenarios where a CEA is needed and the aquifer use includes potable use, a well restriction area ("WRA") designation is also needed. A deed notice is usually required when contaminated soil is going to be left in place above residential standards and/or when a cap that will need future maintenance is left in place.

Comment 2: *A commenter asked how water runoff and drainage associated with the remedy would be dealt with.*

EPA response: Additional water runoff caused by new drainage pathways from either soil excavation or capping in the former dump areas will be taken into account during design of the remedy. Although not stated at the meeting, EPA expects that drainage swales would be constructed along with the engineered caps in order to prevent excess runoff. If additional infrastructure will be needed, it will be included in the design and implemented during remedial action.

Comment 3: *A commenter asked in what order the remedy for OU1 and OU2 would be implemented.*

EPA response: The OU1 design is already underway so it is anticipated that the OU1 remedy will be implemented before the OU2 remedy. The OU2 Remedial Design is expected to begin in Fall 2019 and will progress concurrently with implementation of the OU1 remedy.

Comment 4: *A commenter asked how the contaminants were naturally attenuating,*

EPA response: Natural attenuation occurs when natural processes, such as biodegradation or chemical reactions for example, decrease concentrations of contaminants in soil or groundwater over time. Certain characteristics of the Site and of Site contaminants can help determine if these processes are occuring. During the Remedial Investigation, data were collected to determine if these processes were occuring in the bedrock groundwater aquifer at the Site. The data indicated that degredation and destruction is occuring at the Site, along with a slight general decline in concentrations in residential wells over time.

Comment 5: *A commenter asked what was meant by no action warranted for ecological receptors.*

EPA response: Based on the ecological risk assessment that was performed using Site data and Site exposure scenarios, no unacceptable risks to ecological receptors were found at the Site. A list of ecological receptors including animals that would be expected to be exposed to Site related contamination were analyzed as part of the ecological risk assessment.

Comment 6: *A commenter asked if EPA would be cleaning up to NJDEP or EPA standards.*

EPA response: For this remedy, the more stringent of the state and federal drinking water standards are used as remedial goals for contaminants of concern in Site groundwater. EPA used the NJDEP residential direct contact soil remediation standards as the remediation goals for soil.

Comment 7: *A commenter asked if monitoring of the area soil and groundwater was ongoing.*

EPA response: Residential wells are being monitored in accordance with the OU1 ROD. Site-wide groundwater will be monitored in the long term as part of the OU2 remedy to ensure that Remedial Action Objectives are achieved. The extent of the soil excavation portion of the OU2 remedy will be further refined during Remedial Design.

Comment 8: *A commenter asked about the reasoning for capping only certain dump areas.*

EPA response: The dump areas to be capped as a portion of the OU2 groundwater remedy were identified based on groundwater concentrations directly below and surrounding the dump areas. EPA considers specific dump areas to be acting as sources of contamination to the Site based on continuing detection of elevated groundwater concentrations in these areas. In addition, the soil portion of the OU2 remedy provides for the contaminated soil in the residential and dump areas to be excavated and disposed offsite.

Comment 9: *A commenter asked about the current health impacts at the Site and what they were based on.*

EPA response: Risk at the Site is mainly due to the potential for contaminated groundwater to be consumed. The baseline human health risk assessment calculates risk at the Site using the conservative assumption that a resident is using the groundwater as their primary drinking water source without any treatment. It is important to note, however, that residents in the area whose wells have been impacted by contaminated groundwater have point of entry treatment systems (POETS) installed. Those homes impacted by contaminants volatizing off of the groundwater have vapor intrusion mitigation systems in place. Therefore, there is no current exposure to contaminated groundwater at the Site.

Part 2: Other Written and Verbal Comments Received During the Public Comment Period

Written comments were received from various people and organizations during the public comment period. They are included below, followed by EPA's responses. Responses are divided into sections, as needed, for clarity.

1. An email was submitted and is included in Attachment D. The email contained concerns as to organization and possible preferential treatment of members within the Community Advisory Group ("CAG") and made a request for a copy of the letter that was submitted as part of the public comment period. The email asked for EPA to define the role of the CAG guidelines and how they would apply to members of the CAG. The letter requested is attached as Attachment D.

EPA Response: The CAG is intended to be made up of representatives of diverse community interests, and to provide a forum for community members to discuss Site-related issues both amongst themselves and with EPA and NJDEP representatives. The CAG meetings give EPA the opportunity to provide Site updates as well as hear community concerns throughout the Superfund process.

2. A letter was submitted for the record by a member of the public and is attached as Attachment D. The letter asked that EPA continue to move forward with remediation of the Site as quickly as possible to alleviate the burden of the homeowners in the area.

EPA Response: EPA is committed to advancing the cleanup of the Site and will continue to seek input from the community throughout the process.

3. A commenter called in asking who owns the lots where the former dump areas are located.

EPA Response: Currently, the properties containing the former waste disposal trenches are owned by two parties: the estate of Anna McConnell (who, along with her husband Dennis J. McConnell owned the Site when it was in operation) and the Hopatcong Land Development Company, Inc., which purchased part of the Site from the McConnells in 1990.

Attachment A
Proposed Plan

Superfund Program U.S. Environmental Protection Agency

Mansfield Trail Dump Superfund Site

Byram Township, New Jersey

Proposed Plan July 15th, 2019

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the Preferred Alternative to address groundwater and residual soil contamination at the Mansfield Trail Dump Superfund Site (site) located in Byram Township, Sussex County, New Jersey (Figure 1). This action for groundwater and soil is referred to as Operable Unit 2 (OU2). Impacted potable wells at the site were addressed as part of OU1.

The Environmental Protection Agency's (EPA) Preferred Alternative to address the contaminated groundwater and soil at the site is Alternative S3-GW4, which includes excavation of residual contaminated soil, capping and vapor extraction (VE) of the source area vadose zone, in situ treatment of the source area saturated zone[1], and monitored natural attenuation (MNA) of the distal groundwater plume.

This Proposed Plan includes a summary of all cleanup alternatives evaluated for OU2 at the site. This document is issued by EPA, the lead agency for the site. EPA, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency, will select a final remedy for the contaminated groundwater aquifer and soils at the Site after reviewing and considering all information submitted during a 30-day public comment period. EPA, in consultation with NJDEP, may modify the Preferred Alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

MARK YOUR CALENDARS

Public Comment Period
July 15th, 2019 to August 13th, 2019.
EPA will accept written comments on the Proposed Plan during the public comment period.

Public Meeting
July 23rd, 2019 at 7:00 P.M.
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Byram Township Municipal Building at 10 Mansfield Drive, Stanhope, New Jersey.

EPA's website for the Mansfield Trail Dump site: https://www.epa.gov/superfund/mansfield-trail

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

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

Sussex County Library Louise Childs Branch
21 Sparta Road
Stanhope, New Jersey 07874
(973) 770-1000
Please refer to website for hours:
http://sussexcountylibrary.org/

[1] The source area *vadose zone* comprises the unsaturated subsurface above the water table – both unconsolidated materials and the upper bedrock - and the source area *saturated zone* is comprised of the subsurface within the water table which occurs in the deeper bedrock.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) and section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan. This Proposed Plan summarizes information that can be found in greater detail in the OU2 Feasibility Study report, Remedial Investigation report, Data Evaluation Summary report and other documents contained in the Administrative Record file for this site.

SITE DESCRIPTION

The site consists of former waste disposal trenches and impacted soil in a wooded area and associated groundwater contamination. EPA believes that the site was used as a dump for septic wastes and other wastes from the late 1950s through at least the early 1970s.

The site was added to the National Priorities List (NPL) in March 2011 and consists of two OUs covering long-term remedial work.

OU1 addresses private drinking water wells impacted by site contaminants. A ROD for OU1 was issued in September 2017 and the remedy is currently in design. OU2 addresses shallow and deep groundwater contamination and residual soil contamination.

SITE HISTORY

Residential Area

In May 2005, the Sussex County Department of Health and Human Services and NJDEP became aware of trichloroethylene (TCE) contamination, at levels greater than the NJDEP's groundwater quality standards (NJ GWQS) and the New Jersey maximum contaminant level (MCLs) for TCE of 1.0 micrograms per liter (ug/L), in residential wells serving homes on Brookwood and Ross Roads and notified residents about the contamination. NJDEP subsequently installed Point-of-Entry Treatment Systems (POETS) on impacted residential properties to provide safe drinking water. By June 2005, POETs were installed on 13 residential wells that were known to be contaminated with TCE at concentrations in excess of state drinking water standards. Further sampling of the residential wells in the Brookwood and Ross Roads neighborhood conducted by NJDEP in March 2006 indicated the presence of TCE concentrations that ranged from 3.9 to 70 µg/L. Currently, 19 homes are known to be impacted and were equipped with POETS to remove the contamination. Monitoring of residential wells is being performed as part of the OU1 remedy. Impacted homes will be connected to an existing water supply as part of the OU1 remedy, which is currently in the design phase. Vapor intrusion (VI) investigations conducted by NJDEP from 2006 to 2008 in the residential area also lead to the installation of vapor mitigation systems on five affected residences. Upgrades to systems were made as needed.

Initial Dump Area Investigations

NJDEP first identified the former waste disposal trenches at the site in 2009 during an effort to determine the source of the TCE contamination detected in the nearby residential wells. Further investigation conducted by NJDEP and EPA in December 2009 and May 2010 resulted in the discovery of disposal trenches that were designated Dump Areas A, B, C, D and E (Figure 1). The Dump Areas consisted of contaminated soil and sludge-like-waste from unknown origins. NJDEP installed two groundwater monitoring wells in 2009 and sampling showed elevated concentrations of TCE, 1,2-dichloroethylene (1,2-DCE), and vinyl chloride. Soil samples in the dump areas indicated the presence of TCE, cis-1,2-dichloroethylene (cis-1,2-DCE), benzene, ethylbenzene, toluene, and xylene (BTEX) compounds, as well as various chlorinated benzene compounds. EPA collected soil and sludge-like-waste, groundwater (on-site monitoring wells), and residential well samples from February to May 2010. EPA also installed a background monitoring well (MW-3) south of NJDEP's monitoring wells (MW-1 and MW-2) (Figure 3). Analytical results documented the presence of TCE and other volatile organic compounds (VOCs) above NJ GWQSs, MCLs or background conditions in these on-site wells. The TCE groundwater plume was found to begin at the former dump areas and extend downgradient toward the Brookwood and Ross Road residential area (see Figure 2).

During May and June 2010, EPA collected soil, groundwater, and composite waste samples from test borings advanced throughout the Site using Geoprobe™ direct-push technology. Analytical results of soil and waste samples collected during the delineation of the dump areas indicated the presence of significantly elevated concentrations of VOCs, polychlorinated biphenyls (PCBs) and various chlorinated benzene compounds throughout the site. In March 2011, based on the impacted on-site and residential areas outlined above, the site was added to the NPL.

Removal

From February 21 to May 30, 2012, EPA performed a removal action to address hazardous waste material at the site. As part of the action, EPA delineated impacted areas, characterized waste, excavated and disposed of contaminated soil, conducted post-removal confirmation sampling, and backfilled and graded each excavation. EPA excavated contaminated soil from Dump Areas A, B, D and E (see Figure 2). Dump Area C was not excavated because the delineation sampling did not reveal contaminant concentrations exceeding NJDEP soils screening levels. Approximately 11,170 tons of non-hazardous soil and debris and 383 tons of hazardous soil were removed from the site and transported to an EPA approved Resource Conservation and Recovery Act (RCRA) Subtitle D and Subtitle C disposal facilities.

Remedial Investigation

From August 2013 to December 2015, EPA performed the first phase of remedial investigation activities at the site. Ten multilevel system (MLS) groundwater wells and eleven conventional (screened or open-hole) groundwater wells were installed. Wells in the shallow and deep groundwater aquifer were sampled between March 2014 and December 2015. During this phase EPA also collected overburden soil samples, subsurface soil samples, rock core samples, groundwater samples, soil gas and indoor air samples. Samples were taken from both the former dump area and the downgradient residential neighborhood.

A second phase of remedial investigation was performed between 2017 and 2018. Additional groundwater monitoring wells were installed at the site including three MLS wells and two conventional wells. This phase also included surface water sampling, sediment sampling, soil sampling, and three rounds of groundwater sampling. A detailed description of both phases of the investigation is included in the 2019 Remedial Investigation Report.

SITE CHARACTERISTICS

Setting/ Geology/ Hydrology

The site is bordered to the east by a steep, narrow valley where an abandoned railroad bed, a bike trail and a waterway, Cowboy Creek, are located. Cowboy Creek flows north to Lubbers Run and the Musconetcong River. Both Lubbers Run and the Musconetcong River are used for recreation, including fishing, boating, and hiking. Segments of the Musconetcong River downstream of the site are federally designated as a Wild and Scenic River. The groundwater at the site is classified as a NJDEP Class II-A aquifer as described in N.J.A.C. 7:9C Ground Water Quality Standards.

The geology along the top and flanks of the ridge at the site consists of a thin (five feet or less) surficial layer of unconsolidated soil (overburden) overlying bedrock. The upper five to 10 feet of the bedrock is extremely weathered and the deeper bedrock is consolidated, fractured metamorphic and igneous rock (gneiss and pyroxene syenite) with low primary porosity, and thus, a low potential for diffusion of contaminants into the rock matrix. The overburden is thicker in the residential area below the ridge with a maximum thickness of 40 feet. The bedrock underlying the overburden in this area is also fractured igneous and metamorphic rock (gneiss and pyroxene syenite).

Along the ridge, the overburden and the shallow bedrock is mostly unsaturated, with the depth to groundwater approximately 60 to 80 feet below ground surface (ft bgs). In the residential area west and north of the site, the depth to groundwater ranges from approximately 12.5 ft bgs near the ridge to 15.5 ft bgs toward the west northwest.

Groundwater flow occurs primarily in the weathered shallow bedrock and through interconnected fractures in the deeper consolidated bedrock aquifer. Groundwater moves from the higher-elevation former dump areas to the north-northwest and discharges to surficial seeps and the overburden in the lower areas or flows deeper into the bedrock system. Shallow groundwater may discharge from seeps in the exposed bedrock face along the downward slope toward the northeast. Groundwater at intermediate depths may discharge in seeps further downgradient or into the wetland area. Bedrock groundwater continues to flow towards the northwest as the fracture network becomes more confined. The hydraulic conductivity of the bedrock measured at the site ranges from less than 0.001 ft/day to 23 ft/day (or a transmissivity of 345 square feet/day).

Groundwater Contamination

Groundwater was sampled by the EPA in 2014, 2017, and 2018. The highest concentrations of contaminants in groundwater at the site are seen in the shallow bedrock aquifer directly beneath the former dump areas. The areas beneath Dump Area A and D will be referred to as the source area for the purposes of this remedy.

Because of the complex fracture network in bedrock, contamination may be present in discontinuous fractures potentially in the dense non-aqueous phase liquid (DNAPL)[2] phase both in the vadose and saturated portions of the bedrock and may be sorbed to soil that has infilled these fractures. Contamination trapped in fractures can act as a source over time from the flushing action of groundwater table fluctuations or rainwater infiltration.

In April and August 2014, bedrock cores were collected in areas with the highest contaminant concentrations and analyzed to determine if contaminant mass has diffused into the rock matrix. The results indicate that the concentrations in the rock matrix are low and that any minor contaminant mass in the bedrock matrix does not appear to provide a source of contamination to groundwater.

During the rock core sampling and analysis, the full length of each core was visually observed for the presence of nonaqueous phase liquid (NAPL). NAPL was identified within a rubble zone at approximately 68 ft bgs in the upper trench of Dump Area A (CB-3). Additional work will be conducted in the predesign investigation (PDI) to further investigate any NAPL in the subsurface.

Contaminants present in the dissolved phase in the groundwater at the site consist primarily of TCE and cis-1,2-DCE. The distribution of cis-1,2-DCE is similar to that of TCE; however, cis-1,2-DCE was observed at concentrations largely below the state and federal drinking water standards of 70 µg/L. The highest TCE concentrations underlying the former dump areas in the shallow bedrock (approximately 65–80 ft bgs) on the ridge are 320 ug/L and 130 µg/L in the deepest bedrock monitoring well port (approximately 460–475 ft bgs). TCE concentrations decline in the overburden and bedrock aquifers downgradient of the ridge in the residential and Cowboy Creek areas (distal plume) and range from 1.6 ug/L to 36 ug/L, where detected.

Other VOCs detected at elevated concentrations in groundwater include 1,1,1-TCA, 1,1-DCA, and chlorobenzene. 1,4-dioxane is widespread and was detected in 36 of 42 groundwater samples during the third RI sampling event. Concentrations of 1,4 dioxane are generally below standards, with a maximum recorded concentration of 7.3 µg/L, exceeding NJ GWQS of 0.4 µg/L. Lead, which is present in shallow soil, exceeded NJ GWQS of 5 µg/L in groundwater in two of four samples in the third sampling event, with a maximum concentration of 9.5 µg/L.

Data collected at the site indicate natural attenuation mechanisms are actively attenuating groundwater contaminant concentrations. Evidence for natural attenuation at the site includes:

1) a downward trend is observed in residential well concentrations prior to the 2012 excavation, 2) Compound Specific Isotope Analysis (CSIA) indicates that degradation is occurring in groundwater between the shallowest ports of the source zone wells (e.g., where mass may be discharging to groundwater from the vadose zone source) and the downgradient wells, 3)

[2] A dense non-aqueous phase liquid or DNAPL is a denser-than-water liquid that is immiscible in or does not dissolve in water readily.

microbiology sample results indicate that the principal zone of reactivity for destructive attenuation appears to be under and directly adjacent to the former dump areas, 4) CSIA and microbial data indicate that both microbial reductive dehalogenation and aerobic cometabolic degradation of TCE are biodegradation mechanisms actively attenuating groundwater concentrations at the site, and 5) dilution and dispersion are also actively attenuating groundwater concentrations at the site as evidenced by declining concentrations from the ridge to the distal plume.

Residential Wells and Vapor Intrusion

Based on sampling conducted by residents and NJDEP, 19 residential wells in the site area were found to contain TCE concentrations above the NJ GWQS of 1 µg/L. EPA performed several rounds of residential well sampling as part of the remedial investigation. NJDEP continues to monitor and maintain eligible POETS at impacted residences under the state Spill Compensation Fund. A Record of Decision was signed in 2017 to provide a waterline to assure a source of potable water to impacted residences at the site. Design of this remedy is currently ongoing.

Vapors migrating from the groundwater plume extending beneath the residential area have the potential to act as a source of indoor air contamination. After initial sampling completed by NJDEP in 2006, five vapor mitigation systems were installed at impacted residences. Multiple rounds of sub-slab and indoor air samples collected at residences associated with the residential wells (from 2011 to 2019) were analyzed since then. Recent sub-slab and indoor air concentrations at residential properties indicate that installed mitigation systems are effective.

Soil, Sediment and Surface Water Contamination

The highest concentrations of contaminants in soil were found to be confined to the upper two feet in an area north of Dump Area A, then continuing downslope into the rear (southern) portion of a residential property on Brookwood Road. In the residential area PCBs were detected in soil in 20 out of 38 samples at a maximum concentration of 2.8 milligrams per kilogram (mg/kg) (Aroclor 1254) and detected at 23 out of 92 samples in the former dump areas at a maximum of 2.4 mg/kg (Aroclor 1260). The EPA residential soil screening level for both Aroclor 1254 and Aroclor 1260 is 0.24 mg/kg. Lead was detected at a maximum of 1,460 mg/kg, exceeding the state residential soil standard of 400 mg/kg in 7 out of 38 samples in the residential area and 1 out of 92 samples in the former dump areas.

The slope where the highest concentrations of PCBs are found is generally steep and only has a few feet of overburden soil above the bedrock surface. The extent of contamination is confined to the slope with samples collected in the residence's backyard. Samples from the adjacent properties were below the EPA residential soil screening level. This data and topography suggest PCB-containing materials were dumped in or around Dump Area A and have migrated via surficial runoff or movement of fine-grained materials down the steep slope and onto a portion of the residential property. Some very limited areas of soils with elevated PCBs were found in former dump areas B and E. PCBs were not detected in other site media including sediments, surface water, or groundwater during the 2014 or 2017 investigations.

Sampling in the residential area soil and sediments did not reveal any VOCs above the federal and state standards. Concentrations of polyaromatic hydrocarbons (PAHs) in soil exceeded screening criteria in 2 of 82 samples in the former dump areas and in 1 of the 16 samples in the residential area during the 2014 investigation. PAH data suggest only minor isolated impacts related to site dumping. The highest concentrations of PAHs found in the former railroad bed area are likely related to the rail ties or other processes that left behind these materials and are not site-related.

The lead and chromium data from the media other than soil do not suggest significant impacts related to site dumping, but rather natural background conditions. In sediment, lead and chromium (trivalent in dump waste and in groundwater samples) were detected at concentrations up to 76.8 mg/kg and 16.1 mg/kg, respectively, but all detections were below levels naturally found in the area. PAHs exceeded the federal and state standards and background in one sediment sample adjacent to a former railroad bed. However, the PAH concentrations observed in this sample were an order of magnitude higher than those found in site soil, suggesting non-site related impacts from rail ties or other processes. Three pesticides (gamma-chlordane, 4,4'-DDE, and 4,4'-DDT) were detected in the same sample, but the low concentration suggests the contamination in the sediment sample is likely non-site related. No other site-related contaminants were detected in sediment.

In surface water, TCE was detected at 0.15 µg/L at one location (SW-03), below the state and federal criteria for surface water quality for fresh water (1 µg/L and 2.5 µg/L respectively). Other site-related contaminants were similarly detected at low concentrations (1,4-dioxane at up to 0.12J µg/L and lead at up to 6.1 µg/L). Shallow aquifer seep sampling was also performed in the residential area where seeps had been observed after large rain events. TCE and cis-1,2-DCE were detected in the results from the groundwater seep, TCE exceeded state and federal screening criteria at a maximum concentration of 34 µg/L. Since there is a direct pathway from groundwater to surface water, by remediating the contaminated groundwater, site-related contamination in surface water (primarily the TCE and 1,4-dioxane from groundwater discharge) are expected to be addressed.

Principal Threat Waste

The NCP, which governs EPA cleanups, at 40 C.F.R. § 300.430(a)(1)(iii), states that EPA expects to use "treatment to address the principal threats posed by a site, wherever practicable" and "engineering controls, such as containment, for waste that poses a relatively low long-term threat" to achieve protection of human health and the environment. This expectation is further explained in an EPA fact sheet (OSWER #9380.3-06FS), which states that principal threat wastes are 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. Low-level threat wastes are source materials that generally can be reliably contained and that would present only a low risk in the event of exposure.

The concept of principal threat and low-level threat waste is applied on a site-specific basis when characterizing source material. Source material is defined as material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, air, or act as a source of direct exposure.

Site soil, contaminated with lead and PCBs, is not considered a principal threat waste as it is not considered source material and is not highly mobile. Groundwater is not considered principal threat waste. The completed removal action addressed source material which was principal threat waste within the dump areas. Residual DNAPL, though not detected in the RI or observed in the confirmation samples from the removal action, may still be present in the subsurface in low-transmissivity fractures in this underlying bedrock and could potentially act as a source of contamination to groundwater. The mobility of any residual source material would be limited if it is present in low-transmissivity fractures.

SCOPE AND ROLE OF THE ACTION

This Proposed Plan presents the Preferred Alternative for the final action to addresses residual soil contamination and contaminated groundwater (OU2) at the site. A ROD issued by EPA in 2017 selected an action to provide potable water to impacted residents through connection to a public water supply (OU1). The OU1 remedy is currently in the design phase.

SUMMARY OF SITE RISKS

Human Health Risks

The baseline human health risk assessment (HHRA) for the site quantified risks and hazards to human health associated with exposure to media present in OU2. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (see adjoining box "What is Risk and How is it Calculated").

The HHRA included evaluation of risks to potential receptors, including utility workers and trespassers in the former dump area, recreational users of the bike trail, nearby residents, recreational users of Cowboy Creek, and future construction workers in the former dump area if the site is redeveloped.

Elevated potential risks/hazards were identified for future residents exposed to untreated groundwater from the most contaminated area of the site and current/future exposure to surface soil in the residential area. Cancer risks for future residents exceeded EPA's target risk range of 1 x 10^{-4} (one-in-ten thousand) to 1 x 10^{-6} (one-in-one million), primarily due to groundwater used as tap water. The estimated excess lifetime cancer risks for vinyl chloride and TCE in groundwater are 4 x 10^{-3} and 5 x 10^{-4} respectively. Noncancer hazards for future residents were driven primarily by TCE, and to a lesser extent cobalt and cis-1,2-DCE, in groundwater. The calculated hazard index (HI) for residential exposure to groundwater is 111 for both an adult and child, which exceeds EPA's hazard threshold (HI of 1). Risks due to lead exposure from contaminated soil and groundwater were evaluated using the Integrated Exposure Uptake Biokinetic (IEUBK) model, which predicted 41% of children age 12-72 months could have blood lead concentrations above the reference value of 5 µg/dL. Lead concentrations at the site represent an elevated risk exceeding EPA's risk reduction goal of 5%.

Potential risks/hazards associated with soil in the former dump area and bike trail area and with sediment and surface water in cowboy creek were not elevated. Although the property containing the former dump areas is currently zoned as residential, current and anticipated future use of the property is expected to remain non-residential. When conservatively assuming residential exposures in the former dump areas, the cancer risk and noncancer HI for adult residents are at or below EPA's risk thresholds. The total noncancer HI for child residential receptors to soil in the former dump areas is 2 and exceeds EPA's target of 1, however no hazard quotient for an individual chemical or target organ exceeds 1 and therefore noncancer health effects would be unlikely.

The HHRA included a screening evaluation of potential health risks from future exposure to vapors migrating from contaminated groundwater into houses via vapor intrusion. This exposure pathway is currently incomplete because mitigation systems are in place for residences that were affected by vapor intrusion. Based on vapor intrusion screening, TCE and chloroform present in the vadose zone below houses are elevated relative to human health screening levels. Therefore, vapor intrusion may also be a source of risk to receptors at the site if mitigation systems are removed or not maintained, or if the shallow groundwater plume migrates below houses that do not have mitigation systems.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

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

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk. For noncancer health effects, a "hazard index" (HI) is calculated. The key concept for a noncancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as chemicals of concern, or COCs, in the final remedial decision document, or Record of Decision.

Ecological Risk Assessment

A screening level ecological risk assessment (SLERA) was conducted for the site to determine the potential for risk to ecological receptors based upon exposure to contaminants in soil, surface water, and sediment. Site media were screened against values protective of ecological receptors and food chain modeling was conducted to determine risks to trophic level receptors. The results of the SLERA identified contaminants of potential ecological concern (COPECs) and therefore the risk assessment process continued on to a Step 3a analysis. The objective of the Step 3a analysis was to determine if chemicals of potential COPECs identified in the SLERA pose risk under more realistic conservative assumptions. During the Step 3a, refined exposure point concentrations were calculated based upon 95% UCL values and background inorganic results were considered. Screening of soil, sediment and surface water media contaminants indicated exceedances of screening values. Further, food chain modeling was conducted using more realistic exposure frequency and ingestion variables. The results of the Step 3a evaluation indicated fewer risks from exposure to chemicals detected in site media when compared to the SLERA. Overall, food chain modeling results indicated no risk to terrestrial soil receptors based upon the calculation of lowest observed adverse effect level (LOAEL) hazard quotients. In the aquatic environment, risk was identified to the invertivorous bird (the spotted sandpiper) from exposure to zinc. However, based upon a comparison of the range of site sediment zinc concentrations to background sediment zinc concentrations it is unclear whether zinc sediment concentrations are site related. In addition, a preliminary remedial goal for zinc was calculated based upon risk to the spotted sandpiper. This value was less than site background concentrations and therefore it was determined that action to address zinc in sediment was not warranted.

The Preferred Alternative identified in the Proposed Plan, or one of the other active measures considered in this Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) were developed for soil and groundwater. The remediation of contaminated soil and groundwater is expected to decrease site related contaminant concentrations in vapor to meet remediation goals for indoor air.

The RAOs for contaminated soil are:

- Reduce or eliminate exposure of human receptors to contaminated soil at concentrations exceeding remedial goals.
- Prevent or minimize contaminated soil from serving as a source of contamination to sediment, surface water, and groundwater.

The RAOs for contaminated groundwater are:

- Restore the impacted aquifer to its most beneficial use as a source of drinking water by reducing contaminant levels to the remedial goals
- Prevent or minimize unacceptable risk from exposure (via direct contact, ingestion, or inhalation) to contaminated groundwater attributable to the site
- Minimize the potential for further migration of groundwater containing site contaminants at concentrations greater than remedial goals
- Prevent or minimize contaminated groundwater from serving as sources of current and future vapor intrusion.

Achieving the RAOs relies on the remedial alternatives' ability to meet final remediation goals derived from Preliminary Remediation Goals (PRGs), which are based on such factors as Applicable or Relevant and Appropriate Requirements (ARARs), risk, and background. EPA and NJDEP have promulgated MCLs and NJDEP has GWQSs which are enforceable, health-based, protective standards for various drinking water contaminants. In this Proposed Plan, EPA selected the more stringent of the MCLs and GWQSs as the PRGs for COCs in site groundwater. EPA used the more stringent of the NJDEP residential direct contact soil remediation standards and the NJDEP impact to groundwater soil screening levels as the PRGs for the unsaturated soils.

The Lists of PRGS for groundwater and soil may be found in Tables 1 and 2 respectively. PRGs may be further modified through the evaluation of alternatives and are used to select the clean-up goals in the Record of Decision.

The suitable sub-slab contaminant-screening criteria and indoor air concentration requiring mitigation were based on EPA's vapor intrusion screening levels (VISLs) guidance for residential properties. However, the VISLs are frequently updated based on evolving toxicity information. Therefore, the screening criteria may be subject to change. The latest screening criteria for vapor intrusion will be used to evaluate vapor intrusion data collected in the future.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA, Section 121(b)(1), 42 U.S.C. Section 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. CERCLA, Section 121(d), 42 U.S.C. Section 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. Section 9621(d)(4).

In accordance with the Superfund program, a preliminary screening evaluation of the soil and groundwater remedial alternatives was completed to assess whether alternatives could be screened out prior to a detailed evaluation. The alternatives that were screened out were removed from consideration and not evaluated as part of the detailed analysis of alternatives. Additional details on the rationale for screening out technologies are mentioned in the FS.

Eight alternatives were retained for a detailed evaluation against the seven National Contingency Plan (NCP) evaluation criteria. Three alternatives were retained to address contaminated soil and five alternatives were retained to address contaminated groundwater. The sections below present a summary of the alternatives that were retained and evaluated. The Present-Worth Costs are based on a 30-year timeframe in accordance with EPA guidance.

The time frames presented below for construction do not include the time for pre-design investigations, remedial design, or contract procurements. Detailed descriptions of the remedial alternatives for OU2 can be found in the FS report.

<u>Institutional Controls</u>

Institutional controls are administrative and legal controls that help to minimize the potential for human exposure to contaminants. Institutional controls may include a classification exception area/well restriction area (CEA/WRA) for groundwater and a deed notice for capped areas. These institutional controls limit future use of the site soil and groundwater and are common components of each of the alternatives.

Soil Alternatives

<u>Alternative S-1 – No Action</u>

The No Action Alternative is presented, as required by the NCP, and provides a baseline for comparison with other alternatives. No remedial actions would be implemented as part of the No Action Alternative. Furthermore, this alternative would not involve any monitoring of groundwater or institutional controls.

Capital Cost:	$0
O&M Cost:	$0
Present-Worth Cost:	$0
Estimated Construction Time Frame:	0 years

<u>Alternative S-2 – Capping</u>

Alternative 2 includes the capping of the contaminated soil in a residential area and targeted excavation of residual contaminated soil in the former dump areas to eliminate exposure pathways to receptors.

A Preliminary Design Investigation (PDI) would further delineate the soil contamination and confirm the extent of the cap. The cap would include erosion control fabric for stabilization on the steep slope and new drainage pathways would be incorporated into the cap to allow for surface runoff from the dump areas upgradient to discharge safely and in a controlled manner. Limited excavation would be performed in the former dump areas where contaminant levels were identified as not meeting PRGs. This would prevent any future migration of contaminants in soil through surface runoff. After excavation and appropriate disposal, confirmation sampling would be conducted to verify that soil concentrations meet remedial goals.

Operation and maintenance would include regular inspection to ensure the cap is stable and intact over time. Engineering controls including diversion structures and temporary fencing may also be needed in the remediation areas. Institutional controls in the form of a deed notice would be implemented to restrict disturbance to the soil cover and intrusive activities near a residential area for the duration of construction and O&M of the cap. Since CERCLA wastes would be left on the site above levels that allow for unlimited use and unrestricted exposure, five-year reviews would be conducted to monitor the contaminants and evaluate the need for future actions.

Capital Cost:	$ 1,796,000
Present Worth of O&M Cost:	$ 54,000
Present-Worth Cost:	$ 2,467,000

Estimated Construction Time Frame: 9 months

Alternative S-3 – Excavation and Off-Site Disposal

Alternative 3 includes the excavation and off-site disposal of contaminated soil in the residential and former dump areas. A PDI would further delineate the soil contamination to confirm the extent of excavation. It is assumed excavation would be conducted with a combination of small excavation equipment and hand excavation. After excavation and appropriate disposal, confirmation sampling would be conducted to verify that soil concentrations meet PRGs. If confirmation sampling reveals additional contamination, further excavation would be performed in the area where the contamination is identified.

After site soil is confirmed to meet PRGs, excavated areas would be backfilled with imported clean fill and topsoil, compacted, and graded. Drainage pathways, if previously disturbed during excavation activities, would be restored to original conditions.

Capital Cost:	$ 2,399,000
Present-Worth Cost:	$ 2,399,000

Estimated Construction Time Frame: 10 months

Groundwater and Bedrock Vadose Zone Alternatives

Common Elements

For Groundwater Alternatives GW-2 through GW-5 a PDI would be performed to refine the vertical and horizontal extents of the areas requiring remediation. Surface water monitoring and vapor monitoring in the residential area would also be performed to ensure contaminated groundwater is not impacting surface water and residents are protected from potential vapor intrusion. Maintenance of existing VI mitigation systems and installation of new systems would be completed as necessary. Monitoring of the residential wells within the distal plume will be conducted through the OU1 remedial action. Therefore, the OU2 remedial action would coordinate with OU1 remedial action. Monitoring requirements for sub-slab and indoor air will be developed during the design phase. In all alternatives site restoration would be completed as necessary to original conditions after construction activities are completed. Institutional controls, such as a CEA/WRA, would be required to prevent the installation of wells in the contaminated groundwater plume, at least while the remedy is being implemented. A deed notice would be required for capped areas (which do not include any residential properties). Where CERCLA wastes are left in place above levels that allow for unlimited use and unrestricted exposure, a five-year review is required to monitor the contaminants and evaluate the need for future actions.

Alternative GW-1 – No Action

As with the soil alternatives, regulations governing the Superfund program generally require that the “no action” alternative be evaluated to establish a baseline for comparison. Under this alternative, EPA would take no action to address contaminated groundwater within the OU2 Study Area to prevent human exposure and restore the groundwater aquifer.

Capital Cost:	$0
O&M Cost:	$0
Present Worth Cost:	$0
Estimated Construction Time Frame:	0 years

Alternative GW- 2 – Capping of Source Area Vadose Zone and MNA of Source Area Saturated Zone and Distal Plume

Under this alternative, the contaminated source area bedrock vadose zone would be capped to reduce infiltration of rainwater, thus limiting the migration of vadose zone contamination into groundwater. Monitored natural attenuation would be implemented for the groundwater contamination in the source area and the distal plume. An extensive monitoring program would be conducted to evaluate groundwater contaminant concentrations over time to ensure that attenuation mechanisms, such as biodegradation, are reducing concentrations at an acceptable rate throughout the plume. The cap would require long term O&M.

Capital Cost:	$ 2,167,000
Present Worth of Cap O&M Cost:	
Year 1 to 5:	$ 194,000
Year 6 to 10:	$ 103,000
Year 11 to 30:	$ 126,000
Present Worth of Monitoring:	$ 1,564,000
Total Present Worth Cost:	$ 4,154,000
Estimated Construction Time Frame:	11 months

Alternative GW- 3 – Capping and SVE of Source Area Vadose Zone and MNA of Source Area Saturated Zone and Distal Plume

The contaminated source area bedrock vadose zone would be capped as described in Alternative 2, while vapor extraction would be implemented to actively treat any residual contamination in the source area bedrock vadose zone.

Vapor extraction removes contaminant vapors from the subsurface for treatment above ground. Vapors would be extracted from the bedrock vadose zone above the water table by applying a vacuum. The cap would serve as an impermeable barrier to enhance the performance of the vapor extraction system and to prevent rainwater from infiltrating into the treatment zone. A pilot study would be conducted prior to implementation to determine design parameters for the vapor extraction system. Vapor extraction wells would be installed within the confirmed extent of the source area vadose zone and vapor monitoring points would be installed to track the progress. Extracted vapor would be treated prior to discharge. The system is expected to be run for approximately 5 years.

Monitored natural attenuation would be implemented in the distal plume. An extensive monitoring program would be conducted to evaluate groundwater contaminant concentrations over time to ensure that attenuation mechanisms, such as biodegradation, are reducing concentrations at an acceptable rate.

If vapor extraction is effective in substantially reducing mass in the subsurface, a multilayered cap with associated long-term O&M, may not be needed. Long-term O&M of a multilayered cap is currently included in the cost estimates and, therefore, costs may decrease if it is found to be unnecessary.

Capital Cost:	$ 4,078,000
Present Worth of Cap O&M Cost:	
Year 1 to 5:	$ 194,000
Year 6 to 10:	$ 103,000
Year 11 to 30:	$ 126,000
Present Worth of Monitoring:	$ 1,564,000
Present Worth Cost:	$ 6,528,000
Estimated Construction Time Frame:	23 months

Alternative GW- 4 – Capping and Soil Vapor Extraction (SVE) of Source Area Vadose Zone, In Situ Treatment of Source Area Saturated Zone, and MNA of Distal Plume

For this alternative vapor extraction and capping would be implemented as described in Alternative 3 for the contaminated source area bedrock vadose zone. In situ treatment would also be conducted to treat the shallow bedrock groundwater plume in the source area, including the injection of amendments such as zero valent iron or bioaugmentation amendments. This type of amendment would be decided on during the remedial design and selected based on ability to treat contaminants in the aquifer.

A treatability study would be conducted to determine the amendment that would be the most effective for the site contaminants and complex geologic setting. The amendment would be designed to have long-term interaction with groundwater contamination in bedrock fractures for sustained reactivity.

Performance monitoring would be conducted throughout operation of active treatment. MNA would be implemented for groundwater contamination in the distal plume as described in Alternative GW-3.

Capital Cost:	$ 6,410,000
Present Worth of Cap O&M Cost:	
Year 1 to 5:	$ 194,000
Year 6 to 10:	$ 103,000
Year 11 to 30:	$ 126,000
Present Worth of Monitoring:	$ 1,564,000
Present Worth Cost:	$ 9,106,000
Estimated Construction Time Frame:	30 months

Alternative GW- 5 – Capping, Dual Phase Vapor Extraction (DPE) of Source Area Vadose and Saturated Zones, and MNA of Distal Plume

Alternative GW-5 includes combined vapor and groundwater extraction in a dual-phase extraction (DPE) remedy to treat both the contaminated vapors in the source area bedrock vadose zone and the groundwater plume in the source area. DPE includes vapor extraction to draw both contaminated vapors and groundwater from the subsurface, with subsequent treatment at the surface to remove contaminants.

Capping and vapor extraction would be implemented as described in Alternative GW-3. Design parameters for a DPE system would be obtained through the performance of a pilot study during the design phase. Vapor monitoring points would be installed to track the performance of the vapor extraction system. Extracted vapor and groundwater would be treated prior to discharge. Depending on groundwater extraction rates, treated water might be discharged to the aquifer or to public sewer systems. MNA would be implemented for groundwater contamination in the distal plume as described in GW-3.

Capital Cost:	$ 4,837,000
Present Worth of Cap O&M Cost:	
Year 1 to 5:	$ 194,000
Year 6 to 10:	$ 103,000
Year 11 to 30:	$ 126,000
Present Worth of Monitoring:	$ 1,564,000
Present Worth Cost:	$ 7,872,000
Estimated Construction Time Frame:	22 months

THE NINE SUPERFUND EVALUATION CRITERIA

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

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

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

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

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

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

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

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

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

EVALUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. The criteria are described in the box above. This section of the Proposed Plan profiles the relative performance of each alternative against seven of the nine criteria, noting how it compares to the other options under consideration. The evaluation criteria are discussed below. A detailed analysis of each alternative can be found in the FS.

Overall Protection of Human Health and the Environment

The No Action Alternatives (GW-1, S-1) for both soil and groundwater are not protective of human health and the environment, because they do not reduce contamination, or include groundwater monitoring to determine the fate and transport of the plume over time and are without any means to evaluate the time until remediation goals are met. Future exposure to soil and groundwater contamination could result in unacceptable and uncontrolled risks to the public.

The remaining two soil alternatives are protective of human health and the environment. Soil Alternative S-2 uses capping to prevent exposure to contaminated soil and S-3 uses excavation and off-site disposal to achieve the same result.

The remaining groundwater alternatives are protective of human health and the environment. Groundwater Alternatives GW-2 through GW-5 have components of natural attenuation with long-term monitoring for groundwater contamination in the distal plume. Alternatives GW-3 through GW-5 include vapor extraction for addressing remaining contamination in the source area vadose zone. GW-4 and GW-5 include additional active treatment of groundwater contamination in the shallow bedrock aquifer.

Because S-1 and GW-1 (No Action) are not protective of human health and the environment, they were eliminated from consideration under the remaining evaluation criteria.

Compliance with ARARs

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

For soil, the New Jersey residential direct contact soil remediation standard for PCBs is identified as an ARAR, and the PRG for PCBs. Alternatives S-2 and S-3 would meet the chemical-specific ARAR since PCB contaminated soil would be contained or removed from the site. Location-specific and action-specific ARARs would be met by complying with all substantive requirements that apply to the actions, such as handling of remediation waste and storm water management.

EPA and NJDEP have promulgated MCLs, which are enforceable standards for various drinking water contaminants (and are chemical-specific ARARs). If any state standard is more stringent than the federal standard, then compliance with the more stringent ARAR is required. As groundwater within site boundaries is a source of drinking water, the more stringent of the federal MCLs, NJ MCLs, and NJ GWQS are evaluated as ARARs. In GW-2, MNA alone would restore the aquifer to meet ARARs but in an unreasonable time frame (greater than 500 years). All alternatives that involve active groundwater treatment, GW-3, GW-4, and GW-5, would restore the aquifer to cleanup standards in less time than Alternative GW-2. Air treatment for emissions from treatment plants to meet Clean Air Act and applicable NJDEP ARARs may be required for GW-3, GW-4, and GW-5, and could be met.

Long Term Effectiveness and Permanence

Soil Alternative S-2 relies on adequate inspection and maintenance to prevent erosion or damage of the cap from re-exposing contaminated soil, particularly in the steep slope areas. Alternative S-3 would have the least residual risk since all contaminated soil above PRGs would be removed from the site. Control measures would not be necessary for Alternative S-3, indicating that S-3 has greater long-term protectiveness compared to Alternative S-2.

Alternatives GW-2 through GW-5 would all provide long-term effectiveness and permanence to varying degrees. The magnitude of residual risk is greatest for GW-2 since no active removal or destruction of contaminants would occur. GW-2 would rely on the cap to prevent infiltration of rainwater that could mobilize VOC mass stored in the vadose zone. GW-3, capping and vapor extraction, would be next highest in residual risk since active treatment would be limited to the vadose zone. GW-4 and GW-5 would provide a higher degree of long-term effectiveness because groundwater would be treated in addition to the vadose zone.

The adequacy and reliability of the caps for GW-2 through GW-5 would rely on routine inspection and maintenance and the maintenance of the institutional controls. Without adequate inspection and maintenance, erosion or damage to the cap would allow precipitation to enter the vadose zone adding to the mobilization of contaminants in the vadose zone and groundwater. The requirement for maintaining the integrity of caps for GW-2 is the most significant since there would be no additional treatment. The active treatment components (vapor extraction, in situ treatment, and DPE) under GW-3 through GW-5 are reliable technologies. However, the adequacy of controls would need to be determined during the design through PDI and pilot studies since the site has complex geology (e.g., a complicated fracture network with dead-end fractures) and potential non-aqueous phase liquids (NAPLs). Alternative GW-4 provides greater long-term effectiveness compared to Alternative GW-5 because it is expected to result in a greater reduction in contaminant mass migrating from source area bedrock fractures into groundwater, therefore, resulting in restoration of the aquifer in a shorter time frame.

In the FS, a model was used for comparison purposes to estimate the length of time it would take each alternative to restore the aquifer to PRGs. Time estimates would be further refined during the design phase, with additional investigations and pilot testing. Due to the complex geology, Alternatives GW-2, GW-3 and GW-5 are expected to take over 200 years for full restoration of aquifer. In Alternative GW-4 the distal plume aquifer, in the vicinity of the impacted residential wells located downgradient of the source area, is expected to reach PRGs within 30 years and the shallow contaminated bedrock aquifer in the source area within 150 years.

Reduction in Toxicity, Mobility or Volume (TMV) through Treatment

Neither Alternative S-2 nor S-3 reduce toxicity mobility or volume through treatment. Alternative S-2 would reduce the mobility of the contaminants through capping but the toxicity and volume of contamination would not change. Alternative S-3 would reduce the mobility and volume of contamination since all contaminated soil would be transported off-site for disposal.

Capping under Alternatives GW-2 through GW-5 would reduce the infiltration of the rainwater, thereby reducing the mobility of the VOCs in the vadose zone. MNA, vapor extraction, amendment injections, and DPE under alternatives GW-2 through GW-5 are all treatment technologies and all have capability of reducing the toxicity and volume of VOCs. Although implementing any technology in the fractured bedrock geology at the site presents significant challenges, alternative GW-4 would achieve reduction of toxicity and volume the fastest because the transmissive fractures where contamination flux is the greatest could be identified during a pre-design investigation using borehole geophysics and transmissivity testing, and a long-lasting amendment would be injected into these features. Over time, the amendment in the transmissive features would be used to treat contaminant mass moving out of fractures before the contamination has a chance to move downgradient. Pilot testing of the ability to place amendment in the very thin fractures at the site would be needed.

Short Term Effectiveness

Soil Alternatives S-2 and S-3 would both impact local traffic along Brookwood Road during the short-term if equipment requires access through a residential area to implement the work. S-3 would have the greatest requirements for transportation of contaminated materials for off-site disposal, but this could be done via the road along the dump areas rather than on Brookwood Road through the residential community. S-2 would require the largest quantity of import materials; this also could be done from the dump areas. Construction would generate noise and dust during the day, which would be controlled to minimize impact to the residential community. The duration of on-site construction would be longest for S-3, which reflects the most short-term impact to the community. Stormwater management would need to be considered for both S-2 and S-3.

Groundwater Alternative GW-2 would have low to moderate impact in the non-residential area where the remediation would take place due to the construction of the cap and periodic maintenance. GW-3 would have low to moderate impacts similar to GW-2 for the cap and a small area of vapor extraction wells. Alternatives GW-4 and GW-5 would have moderate impacts because of the need for drilling to install and operate the injection (GW-4) or DPE system (GW-5), which would continue for several years. The operation of the vapor extraction system (GW-4) and DPE system (GW-5) is estimated to continue for five years each.

Implementability

Alternative S-3 is implementable because equipment and experienced vendors for excavation and backfilling are readily available. Limited entry to the residential area would make excavation slightly difficult. S-2 has the highest complexity in design, implementation, and long-term monitoring since it involves the design and construction of a cap along a steep slope. The cap installation of over an acre may trigger stormwater management requirements such as installation of a stormwater retention pond. This could be problematic since there is no suitable space for the pond. Additionally, a long-term inspection and maintenance plan would need to be developed for S-2 to maintain the cap to ensure continued protection of human health and the environment. Stormwater management would need to be considered for S-3 but to a lesser extent as excavation would not increase runoff at the residential area as much as capping under S-2 would. There are no O&M requirements under S-3. A deed notice would be required for S-2 to prevent disturbance of the cap; no such deed restriction would be required for S-3.

Of the active alternatives, alternative GW-2 would be the easiest to implement since the capping work would be conducted on the surface, with minimal constructability concerns. GW-3, GW-4, and GW-5 share a common implementability concern due to difficulty of addressing contamination in the fractured rock subsurface: the complexity of the fracture network with variations in transmissivity of fractures means that it would potentially be difficult to effectively identify and target the transmissive fractures for each technology. Alternatives GW-2 through GW-5 may trigger the need to install a stormwater retention pond due to disturbance of ground surface and/or installation of an impermeable cap. The vapor extraction system, in situ treatment, and DPE components of Alternatives GW-3 through GW-5, respectively, are estimated to require operation for five years

In the case of GW-5, given the low storativity of the fractured bedrock aquifer and the observed large fluctuation in the potentiometric surface, it may be difficult to operate a long-term groundwater extraction system effectively in order to extract and treat mass coming out of fractures in the bedrock. In Alternative GW-4, the amendment injected into the saturated zone of bedrock would remain in the subsurface for a longer period of time and therefore have more interaction with contaminants. It is expected that GW-4 would be able to reduce mass migrating from fractures in the bedrock in the source area to a greater degree and faster than GW-5.

Cost

The present-worth costs for all alternatives are calculated using a discount rate of 7 percent. Costs are calculated based on each alternative's estimated timeframes to achieve soil remedial action objectives. The estimated capital, annual O&M, and present-worth costs for each of the alternatives are presented in the following table.

Alternative	Capital Cost	Total Present-Worth Cost
S-1	$0	$0
S-2	$1,796,000	$2,467,000
S-3	$2,399,000	$2,399,000
GW-1	$0	$0
GW-2	$2,167,000	$4,154,000
GW-3	$4,078,000	$6,528,000
GW-4	$6,410,000	$9,106,000
GW-5	$4,837,000	$7,872,000

State/Support Agency Acceptance

EPA's preferred remedy as presented in this Proposed Plan is under review by the State of New Jersey.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the Record of Decision, the document that formalizes the selection of the remedy for the site.

PREFERRED ALTERNATIVE

Soil Remedy

The Preferred Alternative for achieving remedial action objectives for contaminated soil is Alternative S-3, which includes excavation of residual soil contamination in the residential and former dump areas. The exact extent of soil contamination will be determined based on sampling to be performed during the remedial design phase. Limited soil in the former dump areas and a residential area will be excavated and disposed of off-site in an EPA approved RCRA Subtitle D or C facility. The excavations will be backfilled with certified clean fill material. Confirmation sampling will also be conducted to verify the remedy meets PRGs.

Alternative S-3 prevents risks from direct contact to contaminated media, minimizes leaching of contaminants to groundwater, and limits erosion of contaminated soil by excavating contaminated soil above cleanup goals. This alternative will eliminate the need for long-term monitoring or institutional controls and will not limit future use of the areas after completion of the remedial action.

Groundwater Remedy

The Preferred Alternative for achieving remedial action objectives for contaminated groundwater and source area bedrock vadose zone contamination at the Mansfield Trail Dump site is Alternative GW-4. The primary components of Alternative GW-4 are capping and vapor extraction of the source area bedrock vadose zone, in situ treatment of the source area saturated zone through the addition of amendments, and MNA of the distal plume.

The contaminated source area bedrock vadose zone will be capped to reduce infiltration of rainwater, thus limiting the migration of vadose zone contamination into groundwater. Vapor extraction wells will be installed to actively treat any residual contamination in the vadose zone. The cap would also serve as an impermeable barrier to enhance the performance of the SVE system, which is expected to be run for approximately 5 years.

In situ treatment will be conducted to remediate the contaminated groundwater in the source area bedrock zone. Pilot studies would be performed as part of the remedial design phase to determine which amendment would be the most effective for the site contaminants and complex geologic setting. Monitored natural attenuation will be implemented in the distal plume. An extensive monitoring program will be conducted to evaluate groundwater contaminant concentrations over time to ensure that attenuation mechanisms, such as biodegradation, are reducing concentrations at the expected rate.

Institutional controls will be required to prevent the installation of wells within the contaminated groundwater plume, until groundwater is restored to its beneficial use, and a review of the remedy every five years would also be required. Furthermore, potential groundwater users are protected by being provided with a public water supply as part of the OU1 remedy.

As previously stated, implementability concerns due to a fractured rock subsurface will require design phase investigations and pilot studies. EPA will perform preliminary design investigations to further delineate the soil excavation boundaries and the extent of bedrock vadose zone contamination. A pilot study will be performed during the design phase to test amendments and injection techniques in the saturated bedrock aquifer.

Basis for the Remedy Preference

The Preferred Alternatives were selected over the other alternatives because they are expected to achieve substantial and long-term risk reduction through treatment and are protective of human health and the environment. The Preferred Alternative for soil would prevent risks from direct contact to contaminated media and minimize leaching of contaminants to groundwater, and limit erosion of contaminated soil through excavation of contaminated soil above cleanup goals, thereby eliminating the need for long-term monitoring or institutional controls, such that future use of the areas after completion of the remedial action need not be restricted.

The Preferred Alternative for groundwater would reduce risk within a reasonable time frame, as compared to the other groundwater alternatives, with greater long-term effectiveness, reducing mass migrating from fractures in the bedrock in the source area to a greater degree and faster than Alternative GW-5 at a comparable cost, and it will provide a long-term reliable remedy.

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to any remedial alternative selected for the site.

COMMUNITY PARTICIPATION

EPA encourages the public to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted there. The dates for the public comment period, the date, location and time of the public meeting, and the locations of the Administrative Record files, are provided on the front page of this Proposed Plan. Written comments on the Proposed Plan should be addressed to the Remedial Project Manager, Anne Rosenblatt, at the address provided. EPA Region 2 has designated a public liaison as a point-of-contact for the community concerns and questions about the federal Superfund program in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands. To support this effort, the Agency has established a 24-hour, toll-free number that the public can call to request information.

For further information on Mansfield Trail Dump Superfund site, please contact:

Anne Rosenblatt
Remedial Project Manager
(212) 637-4347
rosenblatt.anne@epa.gov

Patricia Seppi
Community Relations Coordinator
(212) 637-3639
seppi.patricia@epa.gov

Written comments on this Proposed Plan should be addressed to Ms. Rosenblatt.

U.S. EPA Region 2
290 Broadway 19th Floor
New York, New York 10007-1866

The public liaison for EPA Region 2 is:
George H. Zachos Regional Public Liaison
Toll-free (888) 283-7626, or (732) 321-6621

U.S. EPA Region 2
2890 Woodbridge Avenue, MS-211
Edison, New Jersey 08837-3679

FIGURE 1: SITE MAP

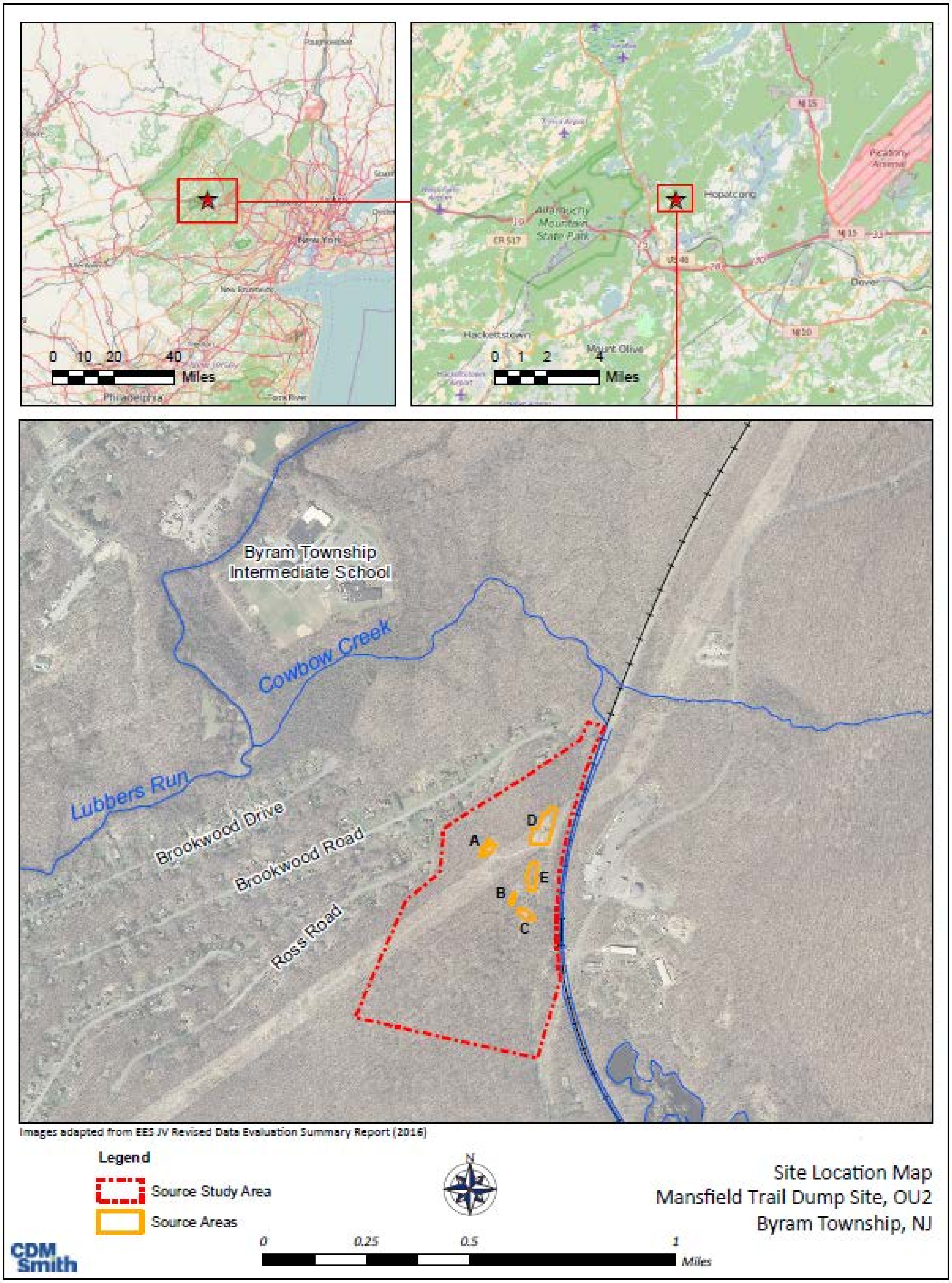


FIGURE 2: SITE PLAN

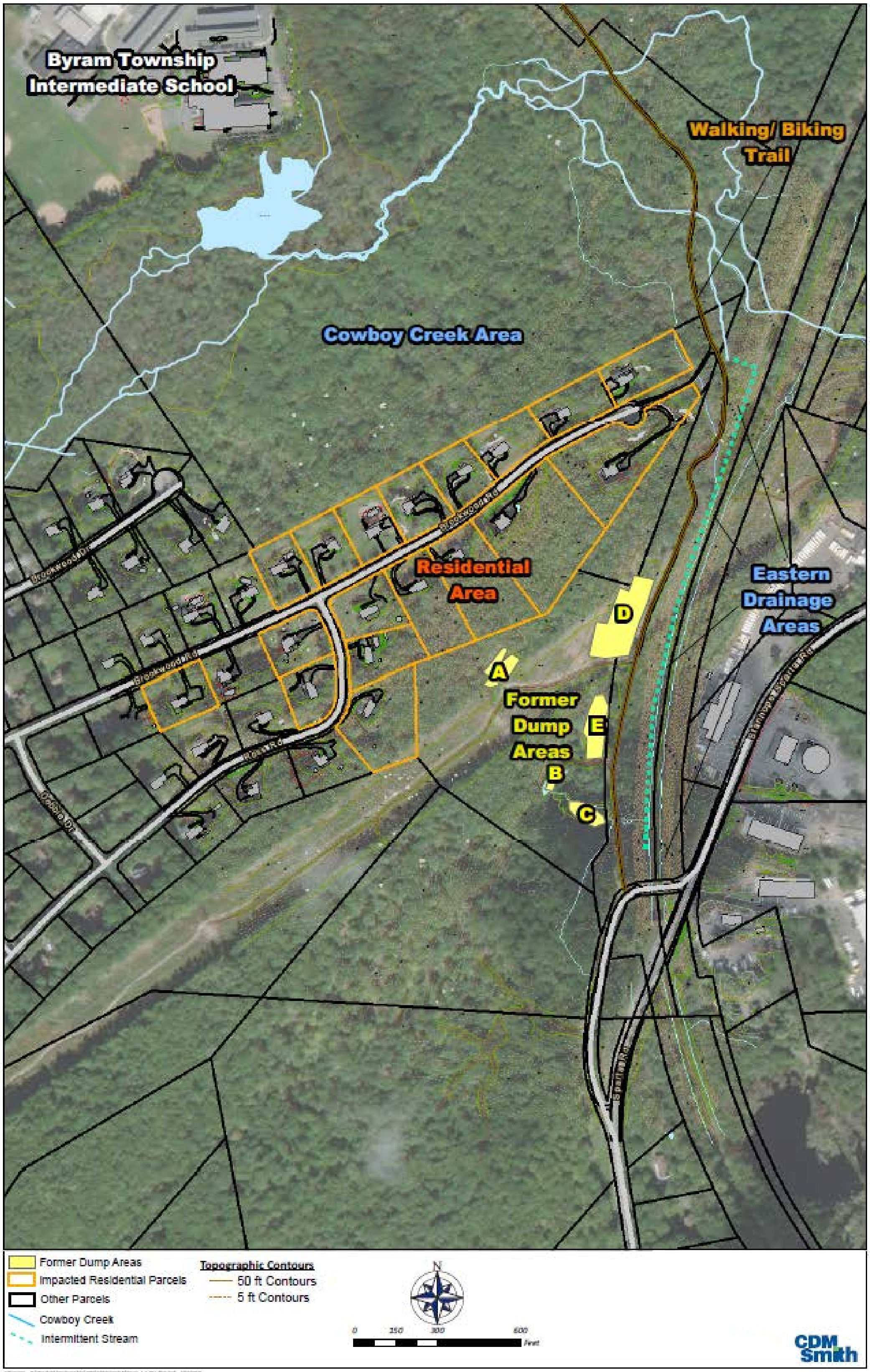


FIGURE 3: MONITORING WELL LOCATIONS

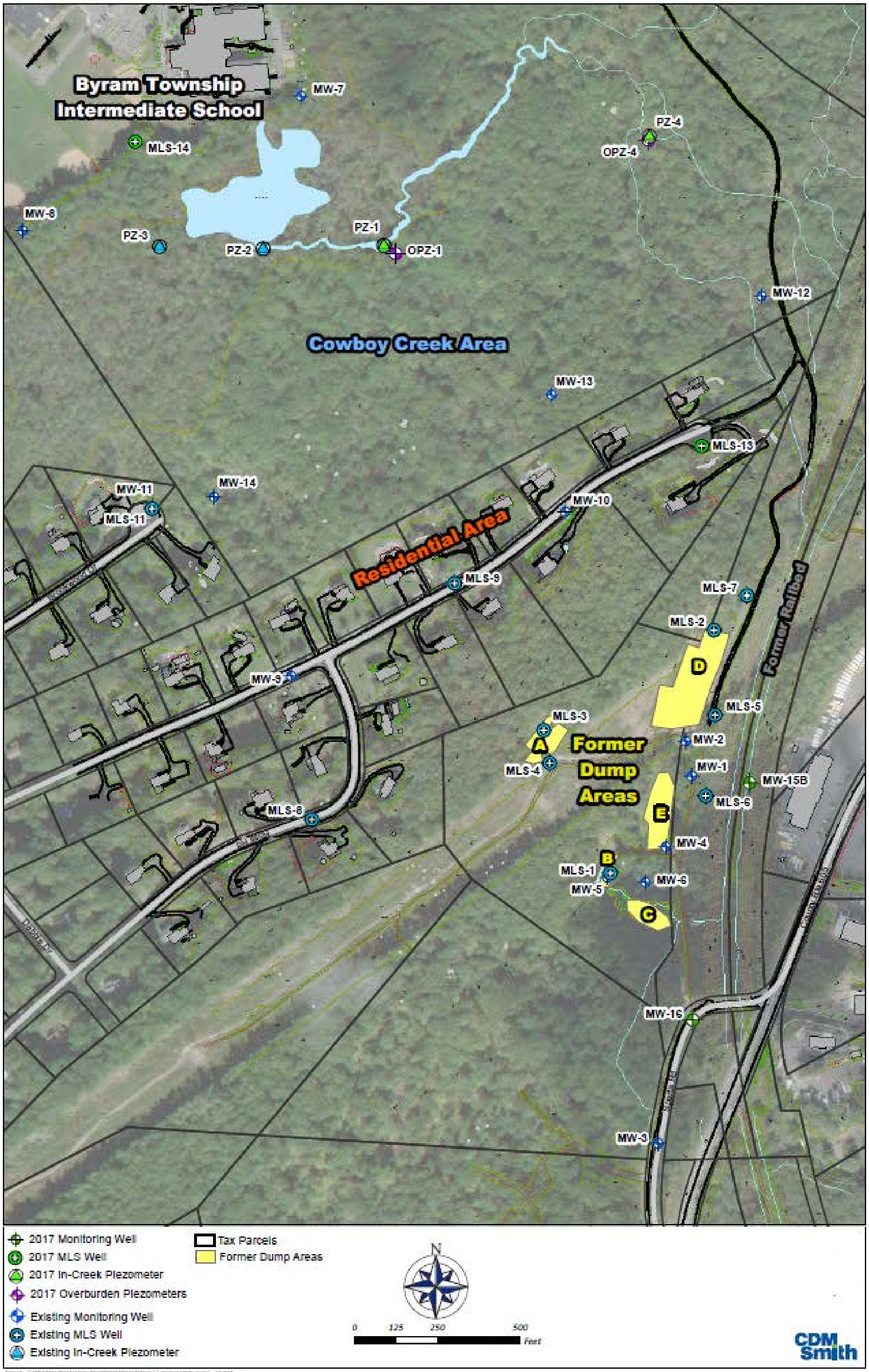


FIGURE 4: PLUME MAP

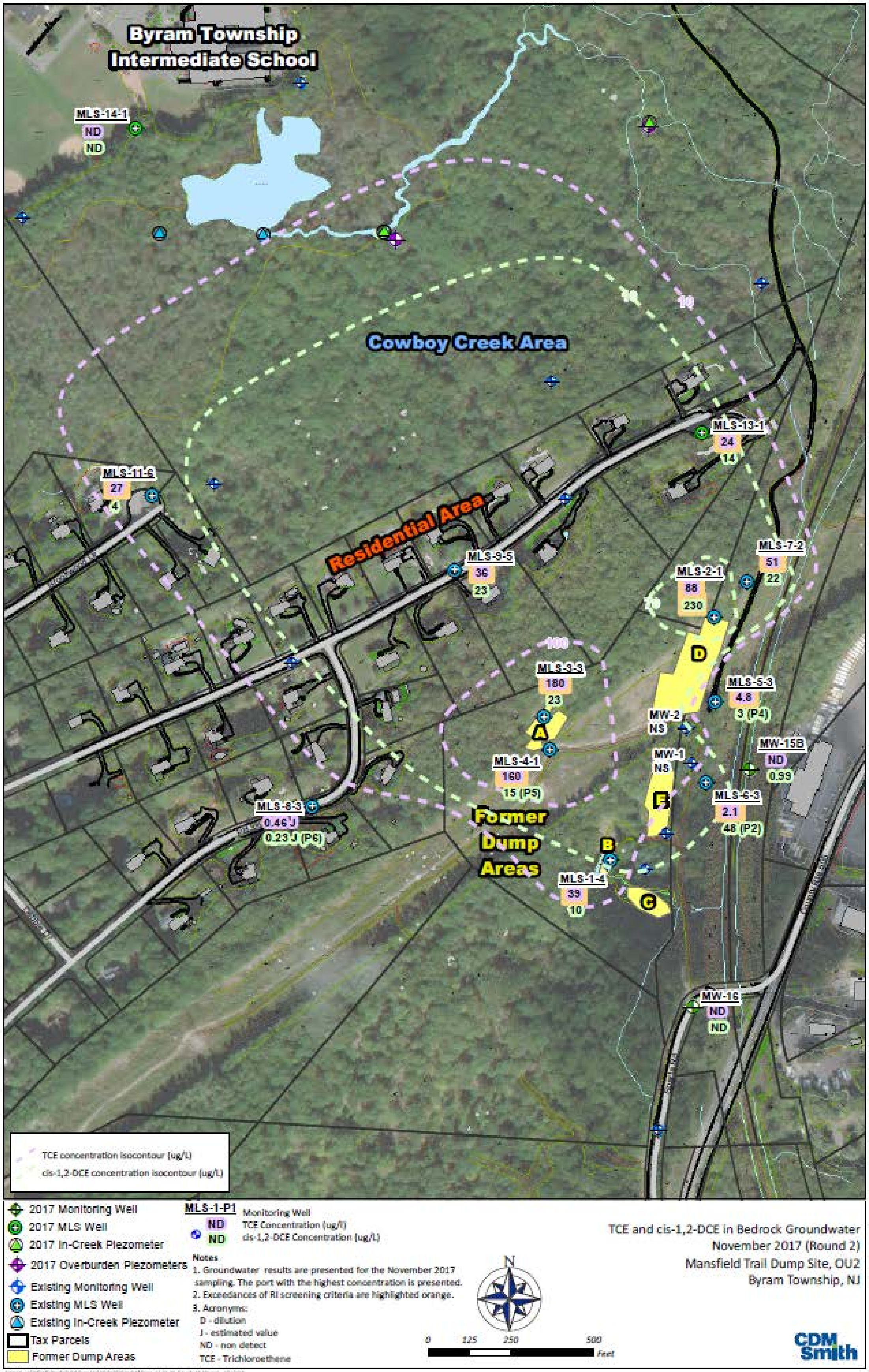


TABLE 1: SOILS PRELIMINARY REMEDIATION GOALS

Chemical Name	Unit	NJDEP Residential Direct Contact Soil Remediation Standards [1]	NJDEP Default Impact to Groundwater Soil Remediation Standards [2]	Background Threshold Value [3]	Preliminary Remediation Goals
Volatile Organic Compounds (VOCs)					
Polychlorinated Biphenyls (PCBs)					
PCBs [4]	mg/kg	0.2	NA	NA	0.2
Inorganics					
Lead [5]	mg/kg	400	NA	155.2	400

Notes:

[1] NJDEP 2012. Residential Direct Contact Health-Based Criteria and Soil Remediation Standards. Last amended September 18, 2017; http://www.nj.gov/dep/rules/rules/njac7_26d.pdf

[2] NJDEP 2008. Guidance Document, Development of Site-Specific Impact to Groundwater Soil Remediation Standards Using the Soil-Water Partition Equation, Version 2.0. November 2013; http://www.nj.gov/dep/srp/guidance/rs/igw_intro.htm

[3] Background threshold values (BTVs) displayed are surface soils BTVs developed by EES JV for SVOCs and metals based on a statistical evaluation of background analytical results using EPA's ProUCL, version 5.0 and EPA's Technical Guide - Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations, September 2013.

[4] PCBs Maximum Concentrations Observed is based on combined concentrations of detected aroclors at any one location.

[5] EPA Region 2 recently indicated lead concentrations at residential properties (in addition to meeting the 400 mg/kg maximum concentration PRG) shall be subject to meeting a 200 mg/kg property wide average cleanup goal.

mg/kg = milligrams per kilogram

NA = not applicable

NJDEP = New Jersey Department of Environmental Protection

BTV = background threshold value

PRG = preliminary remediation goal

TABLE 2: GROUNDWATER PRELIMINARY REMEDIATION GOALS

Chemical Name	Unit	National Primary Drinking Water Standards (EPA MCLs) [1]	NJ Groundwater Quality Standards [2]	NJ Drinking Water Standards [3]	Preliminary Remediation Goals [4]
Volatile Organic Compounds (VOCs)					
1,1,1-Trichloroethane	µg/L	200	30	30	30
1,1-Dichloroethane	µg/L	NL	50	50	50
1,1-Dichloroethene	µg/L	7	1	2	1
1,4-Dioxane	µg/L	NL	0.4	NL	0.4
Chlorobenzene	µg/L	100	50	50	50
cis-1,2-Dichloroethene	µg/L	70	70	70	70
Trichloroethene	µg/L	5	1	1	1
Vinyl Chloride	µg/L	2	1	2	1
Inorganics					
Lead	µg/L	15	5	15	5

Notes:

(1) EPA 2009. National Primary Drinking Water Standards (EPA 816-F-09-004, May 2009);
http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf.

(2) NJDEP 2010. New Jersey Ground Water Quality Standards Class IIA (N.J.A.C. 7:9C, July 22, 2010, readopted without change on March 4, 2014);
https://www.nj.gov/dep/rules/rules/njac7_9c.pdf.

(3) NJDEP 2009. New Jersey Drinking Water Standards (February 10, 2009);
http://www.nj.gov/dep/standards/drinking%20water.pdf.

(4) Preliminary Remediation Goals (PRGs) were selected from the lowest of the EPA MCLs, NJ Groundwater Quality Standards, and NJ Drinking Water Standards.

µg/L = micrograms per liter

EPA = United States Environmental Protection Agency

MCL = Maximum Contaminant Level

NJ = New Jersey

NJDEP = New Jersey Department of Environmental Protection

NL = not listed

Attachment B
Public Notice

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

INVITES PUBLIC COMMENT ON THE PROPOSED PLAN

FOR THE MANSFIELD TRAIL DUMP SUPERFUND SITE

BYRAM TOWNSHIP, NEW JERSEY

The U.S. Environmental Protection Agency (EPA) announces the opening of a 30-day comment period on the preferred plan to address the contaminated groundwater and soil at the Mansfield Trail Dump Superfund Site located in Byram Township, Sussex County, New Jersey. The preferred remedy and other alternatives are identified in the Proposed Plan.

The comment period begins on July 15, 2019. As part of the public comment period, EPA will hold a public meeting on July 23, 2019 at the Byram Township Municipal Bldg. at 7.p.m. located at 10 Mansfield Drive, Stanhope, N.J. The Proposed Plan is available electronically at the following address:

https://www.epa.gov/superfund/mansfield-trail-dump

Written comments on the Proposed Plan, postmarked no later than close of business August 13, 2019, may be emailed to Rosenblatt.anne@epa.gov or mailed to Anne Rosenblatt, US EPA, 290 Broadway, 19th Floor, New York, NY 10007-1866.

The Administrative Record files are available for public review at the following information repositories:

The Sussex County Library, Louise Childs Branch, 21 Sparta Rd. Stanhope, N.J. or at the USEPA – Region 2, Superfund Records Center, 290 Broadway, 19th Floor, New York, NY 10007-1866.

For more information, please contact Pat Seppi, EPA's Community Liaison, at 646.369.0068 or seppi.pat@epa.gov

Attachment C

Public Meeting Transcripts

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

- x
RE: MANSFIELD TRAIL DUMP SUPERFUND :
SITE OPERABLE UNIT 2 (OU-2) PROPOSED : PUBLIC HEARING
REMEDIAL ACTION PLAN. BYRAM TOWNSHIP :
NEW JERSEY :
- x

Municipal Building
10 Mansfield Drive
Byram Township, New Jersey

July 23, 2019
Commencing 7:03 p.m.

B E F O R E:

MS. KIM O'CONNELL, Branch Chief
MS. PATRICIA SEPPI, Commiunity Involvement Coordinator
MS. ANNE ROSENBLATT, Remedial Project Manger for the Site
MS. ABBY STATES, Human Health Risk Assessor for the Site
MR. MARK HERZBERG, Community Relations Coordinator, State DEP

ALSO IN ATTENDANCE:

MR. LARRY JORDAN
Project Manager, CDM Smith

WALTER J. PERELLI, CCR, RMR, CRR
Certified Court Reporter
Lic. No. X100785

I N D E X

MS. SEPPI: Why don't we go ahead and get started. I appreciate you being here on time. And if anybody else walks in, then we'll just have to catch them up. But in the meantime let's get going.

So first of all, I want to thank you for attending our meeting tonight. Let's go around and do some introductions, if we could. Let's start with EPA, with Kim.

MS. O'CONNELL: Oh. I'm Kim O'Connell. I am Manager in the Superfund Program at the EPA.

MS. ROSENBLATT: Anne Rosenblatt, Remedial Project Manager for the site.

MS. SEPPI: Abby.

MS. STATES: I'm Abby States. I'm the Human Health Risk Assessor for the site.

MS. SEPPI: I'm Pat Seppi. I'm the Community Involvement Coordinator for the site.

And DEP?

MR. HERZBERG: Mark Herzberg, Community Relations for New Jersey DEP.

MS. SEPPI: And we also have a representative from CDM.

MR. JORDAN: Yes. I'm Larry Jordan. I was the Project Manager for the Feasibility Study at Mansfield.

MS. SEPPI: Okay. And also, Kellie, I just want to introduce you if you don't mind. Or why don't you introduce yourself.

MS. DOUCETTE: Yes. Kellie Doucette, I'm the District Director. I work with Congresswoman Mikie Sherrill in the 11th District.

MS. SEPPI: We appreciate you being here.

Why don't we go around too, and since we have a few minutes, we'll let the people in the audience also introduces themselves.

Mr. Shah.

MR. SHAH: Jitendra Shah, 75 Brookwood Road.

MS. SEPPI: Jeanne.

MS. MORAN: Jeanne Moran, resident, 7 East Waterloo Road.

MS. SEPPI: Okay. Yes.

MR. MORAN: Jack Moran, 7 East Waterloo Road.

MS. SEPPI: That was a good voice.

(Laughter.)

MR. DOLCE: I'm Joe Dolce, 65 Brookwood Road.

MS. CORISTON: Mandy Coriston, 908 Duck Pond Road, Newton. I'm a reporter with Straus News.

MS. SEPPI: Thank you.

MS. SHIMAMOTO: Lisa Shimamoto, 55 Brookwood Road. I'm also on the Planning Board, so I'm here for that.

MS. SEPPI: Linda.

MS. NATIELLO: Linda Natiello, 4 Ross Road. Resident.

MS. SEPPI: Resident.

Mary.

MS. SCHNEIDER: Mary Schneider, 64 Brookwood Road.

MS. SEPPI: And, Scott?

MR. OLSON: Scott Olson. I'm a Council member for Byram Township.

MS. SEPPI: I would just like to say a special thank you to Scott and to Doris Flynn who have worked with us. They've been so cooperative in helping us to set up these meetings in these rooms. And I would like to say thank you to the members of our Community Advisory Group who are here tonight. I know a couple are on vacation and couldn't be here, which is a shame. So I said to Linda, sometimes the way things work with our timing -- we have to have these meetings in the summer, you know -- the time isn't always good, but I'm glad to see some representatives.

We have a very educated, informed Community Advisory Group and they've really added a lot to this whole process, even when we tell them things they probably don't want to hear, but...

So the reason we're here tonight is to present EPA's preferred remedy for the groundwater and the soil to clean up the site. The comment period, I hope you're all aware, started July 15th and ends on August 13th. All the comments from tonight will be a part of the record, and then after tonight if you think of anything else you can certainly always send it in to Anne.

The public participation becomes very important because we really look forward to reading your comments, and then all those comments will be put together at the end in what's called a Responsive Summary, and it will be an addendum to our Record of Decision, which is the final legal document about how we will proceed.

We have Walter Perelli tonight, he's our Certified Court Reporter who is going to be telling us we're not speaking loud enough tonight.

(Laughter.)

Just one other thing I wanted to mention. If possible, if you could hold your questions to the end, that would be helpful. I mean, I know sometimes you think of something you want to ask, but a lot of times those questions get answered during the presentation.

So I think with that I'll turn it over to Anne.

MS. ROSENBLATT: Okay. Thanks again for coming.

I'm just going to kind of give you a quick agenda of what we're going to be going over today. Just a quick intro and background on the site, which a lot of you are familiar with, but just to give you a brief run-through; a summary of the investigations we've been doing; an assessment of risk summary; a feasibility study review, and we'll look at some of the results from that; and then I'll explain the preferred remedy that EPA has selected; and after that we'll talk about the path forward; and then we'll take questions and comments.

So like Pat said, we're here tonight to discuss the proposed plan. And we have started the public comment period so this is really the portion where I explain to you what our preferred remedy is. And we're here to take comments, but like she said, we can take comments up to August 13th. So you can call me, you can email me, however you want to submit your comments, that works as well.

(Utilizing a PowerPoint Presentation.)

This is just a quick run-through of the Superfund process again. You might have seen this with the last Operable Unit Record of Decision, but it just gives you kind of the breakdown on how the Superfund process works.

We start with a preliminary assessment and site inspections; we go into the listing on the National Priorities List; then the RI, the Remedial Investigation; the Feasibility Study; the Proposed Plan, which we're in right now; and then we'll have the Record of Decision after that. And then we go into the Remedial Design; the Remedial Action; and after that we'll get to the construction and completion, but that's down the road.

The site history.

So as you all know, the initial release was back in the 1950s through the 1970s. It was waste that was dumped up on the ridge line. The initial identification of the contamination was found around 2005 by the Department of Health and the DEP in residential wells. After that, EPA started some initial investigation in 2010, and into 2011, and had it listed on the NPL. Our investigation started shortly thereafter, and EPA concluded a Source Removal Action back in 2012 to remove most of the waste in the ridge line in the former dump areas.

In 2016, we put out the Data Evaluation Summary report which was just a compilation of all the data that we had collected. And now we're getting towards today, which was the RI which was finalized this year and we're putting out that proposed plan for the final remedy of the site.

So just a few maps of where the site is.

You can see 206 over on the left of the larger map. The former dump areas are up on the ridge line which is outlined in the red.

MS. SEPPI: They can't see it.

MS. ROSENBLATT: You guys know where this is though.

And then this is Brookwood Road and the residences along Brookwood Road.

So, the way that EPA decided to go about the site was, initially we did the Removal Action back in 2012 to remove the waste, and then we broke up the site into Operable Unit 1 and 2. And 1 was the impacted wells, and we selected a remedy for that which I'll go over in a little bit later, but that was to address the residential contamination right away because we knew that this was going to be kind of a longer, more complex remedy for restoration of the groundwater aquifer, and so we pushed that to the second Operable Unit which we're here to talk about tonight.

So, I've talked about this before, but because of the fractured bedrock setting and the geology at the site, we know that this is going to be kind of a drawn out remediation process just because of the complexity of the geology. You can see the ridge line is mostly made up of fractured bedrock -- and I can use this. Here, the blue line here is the water table, and right here is the residential road and some of the residential wells (indicating). So we have extensive monitoring wells around the area to try to get a handle on what's going on in the groundwater aquifer, but because of the fractures in the bedrock it's really hard to know exactly where all the groundwater is flowing and where the contamination might be.

So just another quick overview.

Generally, groundwater flows northwest of the site. The surface runoff is northwest towards the residential area, and then the deeper bedrock aquifer is also flowing towards the northwest.

So, the OU-1 remedy, the Record of Decision was signed back in 2017, and it selected a water line for the impacted residents. So that would include an installation of a water main down the road and connections to the residential properties.

So, the first step that EPA takes in moving towards a remedy decision is to do a risk assessment. And what we do is to try to characterize the risk to human health and the environment at the site. And this is based on the type of contamination, the amount of contamination, and the exposure with receptors, human and ecological receptors. And so from the human health risk assessment as part of this part of the site, we found that the risk stresses for groundwater were vinylchoride, TCE, and cis-1, 2-DCE, or trichloroethylene or cis-1, 2-dichloroethane. And so the risk drivers for soil were lead and also PCBs, but PCBs were just detected above the New Jersey standards. They were outside of EPA's risk range.

For the screening level ecological risk assessment, which is kind of our first baseline eco risk assessment that we do, we found that we needed to do a little bit additional work to figure out what the risks to ecological receptors were for the area. And so that we do by completing a Step 3A, which is not too important what that is, but at the end the conclusion was that there was no action warranted for ecological receptors.

So the conception site model -- you've seen this a couple of times before -- I have it up there also if you want to take a closer look at it after the presentation. Generally, the ridge is up here (indicating). You have surface runoff moving away from the ridge. You also have groundwater flowing down because of rainwater infiltration, and you have the contamination which starts up near the former source areas and moves down towards the residential wells in the groundwater aquifer. Generally, again, this is a cross-section. So it's moving northwest away from the ridge.

So, EPA puts together remedial action objectives for each of our remedies, and these are specific goals for the cleanup and to ensure protection of human health and the environment.

For soil, the RAOs are to reduce or eliminate exposure to human receptors to contaminated soil at concentrations exceeding remedial goals and to prevent or minimize the contaminated soil from serving as a source of contamination to other media. And I'm not going to go through all of these, but the RAOs for contaminated groundwater achieve the same sort of goals: Preventing and minimizing the spread of the groundwater and reducing exposure.

So I just wanted to quickly go through kind of the target remediation zones that we're looking at for the site. It's a little complex because of the geology, and I just wanted to explain that we're going to be talking about certain areas that we're focusing our remedial technologies on, and one of them is going to be called the Vadose Zone, the source area Vadose Zone. And that is just the area underneath some of these former dump areas where you have fractured bedrock, you have some soil, a little bit of soil on top but mostly fractured bedrock that is above the saturated zone or where the groundwater is. So above the water table there's this Vadose Zone in the fractured bedrock. And then you are also going to have the source area Saturated Zone which would be, again, underneath some of these former dump areas but further down vertically; so within the bedrock, or within the bedrock water table. So there's going to be water flowing through that area.

And this I think is a better depiction because you can see the fractures in the bedrock. You have this Vadose Zone up here, and then you have this Saturated Zone underneath where there is groundwater running through it. And we can talk about that more later if you have questions, and I'll show you a little bit more to explain.

And then the down-gradient distal plume is anything moving away from the ridge. It's generally the deeper groundwater aquifer.

Okay. So this is the slide that just lays out all of our groundwater alternatives and our soil alternatives that were put into the Feasibility Study to analyze and to start figuring out which one would be the best for the site, the most applicable.

So like I said before, we have three different distinct areas for the groundwater: There's the Source Area Vadose Zone; the Source Area Saturated Zone; and the Dilute Plume Saturated Zone.

So this is just the area underneath those dump areas that does not have groundwater flowing through it; this is area that is underneath the water table, underneath the former dump areas where there is groundwater; and then this is moving away from the ridge line and in the bedrock aquifer.

And so our first alternative for both the soil and the groundwater is no action. We always compare our alternatives to a baseline, which would be do nothing.

The second alternative for groundwater would just be to cap the source area, the Vadose Zone. So this would be putting a cover on top of particular dump areas on the ridge line to prevent infiltration of groundwater through the contaminated fractures in the ridge line. And I have some more depictions so we can talk about it a little bit more. And then in the Source Area Saturated Zone and the Dilute Plume Saturated Zone, we would be doing monitored natural attenuation, which we will talk about also.

Groundwater 3 is similar, but adding SVE, which would be a soil vapor extraction system up in that Vadose Zone; and Source Area 4 would be the capping and the SVE, and then also adding an amendment injection into the saturated area underneath the sources; and then the fifth groundwater alternative is to do capping on top of those former dump areas and then adding a dual-phase extraction system, which would be the SVE plus the groundwater extraction component into that Saturated Source Area.

For the soils we looked at three alternatives: The first being the baseline, no action; the second being capping, which would be a soil cover to prevent exposure; and then excavation of the contaminated soils.

And so now I'm going to just go through these a little bit in more depth and show you some things that are more helpful for understanding what it actually means.

So Groundwater 2 would be the capping and monitored natural attenuation. And you can see here these red and yellow areas are capped, and it would be on top of former Dump Area A and D. And the idea of the cap is to reduce the water infiltrating through that area, so minimizing the spread of the contamination further down-gradient. And the idea down-gradient of this would be to do monitoring and natural attenuation. Which means that it doesn't mean that we're doing nothing, it means that we're monitoring and we're also, you know, checking to see if the natural processes, biological, chemical reactions that are happening in the subsurface are degrading the contaminants over time. And so that would involve lots of extensive monitoring. And we already have some significant evidence that these processes already are happening, and so that's why it would be something that we would select as a remedy here.

For Groundwater 3, we have that same

capping, which you can't see because it's covered up by these vapor extraction wells in those areas as well. And so what would happen here would be that you would be applying a vacuum to that area. You'd be like sucking up the contaminated vapors from that Vadose Zone and pulling out the vapors and treating them off-site.

Groundwater 4 is the same as 3 and 2. You would have -- this cross-section is good for understanding because you can see the caps are on top here. You'd have the SVE here and this Vadose Zone, and then you would have injections down below the water table into the fractures beneath the Source Area, and again, down-gradient would be monitored natural attenuation. The idea of the injections is to inject an amendment that would be decided during a pilot testing or during the design phase, and the idea would be to break down or degrade the contaminants that are down in the fractures below the water table.

And so for Groundwater 5, again, similar SVE and capping above the water table, but beneath the water table, instead of injections you would have groundwater extraction wells. So similar to a pump-and-treat, if you've heard of that. You would be extracting groundwater to try to treat the contamination that way.

Okay. So to look at our soil remedial alternatives. Again, so 1 would be no action. So baseline;

2 is capping in the areas where there is contaminated soil just to prevent exposure to any contaminated soil; and then

3 would be excavation.

And as you can see, the soil contamination is very limited to certain residential areas, and then there would be some minor soil contamination in the former dump areas that would be further delineated during the design phase.

So some of the common elements.

All these remedies would be long-term groundwater monitoring; residential vapor sampling, the vapor infusion sampling that we do at the residential homes; and maintenance of the mitigation systems that are installed. Each of the remedies would involve a pre-design investigation. So getting a little more information about the subsurface and doing pilot testing and testing out, you know, how these technologies are really going to work.

Next would be the remedial design, which is putting together the plan for going forward;

Institutional controls, which is really just limiting new well installation or limiting access to the site would be also applied;

Site restoration, anything that we do on the site physically would be -- the site would be restored to how it was previously; and then

Also five-year site reviews would be done on the site.

So EPA uses nine criteria to evaluate the alternatives. The first three are the threshold criteria -- or the first two are the threshold criteria, which is just to evaluate if they protect human health and the environment and their compliance with applicable regulations;

The next five are the primary balancing criteria; and

The last two are the modifying criteria.

So, EPA's preferred alternative for the site is Alternative Groundwater 4, which is the capping, the SVE, and the amendment injections and the MNA down-gradient, and then Alternate S-3, which would be excavation of soil contamination.

Some of the remedy considerations, some of the things that we thought about when we were evaluating the different alternatives was the complex geology of the site. We knew that there were going to be long time frames for each of the alternatives. This is complex geology. It's hard to get to all of the contamination that's there. And EPA believes that this alternative would be the most effective and the quickest way to reduce contamination in the ridge line, therefore, you know, protecting the down-gradient. We know that pilot testing is going to be necessary to ensure that these technologies are effective in the subsurface.

So the next steps are to take public comments up until August 13th. The Record of Decision will finalize our decision on which alternative that we'll be using as a remedy, and responding to the public comments that we got as part of the response from the summary. Next would be remedial design, which would involve pilot testing, and putting together the design, and then implementation of the remedy, and construction.

MS. SEPPI: Okay.

MS. ROSENBLATT: That's it.

MS. SEPPI: Thank you.

Okay. So now it's time for public comments.

I would ask if you do have a comment or a question, please come up to the mic as we want everybody to be able to hear it. And if you would start by just again telling Mr. Perelli your name -- you don't have to give your address -- just your name, that would be fine.

Does anyone have a question or a comment?

MR. MORAN: Yes

MS. SEPPI: Jack.

MR. MORAN: Jack Moran, 7 East Waterloo Road.

MS. SEPPI: Jack, would you go to the mic. Thank you.

MR. MORAN: The question I had was in reference to institutional controls. Can you elaborate on what exactly you mean, by what institution? Is there a panel or a group of people that is regulating this? And what exactly are the controls? Are they legal? Are they -- I know it mentioned deed restrictions.

MS. ROSENBLATT: Yes.

MR. MORAN: If somebody wanted to, you know, get an exemption from them or question them, how you would -- you know, I would like to know more about what you mean by "institutional controls."

And, Mark Herzberg, does that involve the

DEP as well? And if you don't know, can you get back to us on that?

MS. ROSENBLATT: Yes. So an example would be a classified exemption area where you are -- it's through the State normally, and you signify these areas as places where you should install wells because there's no contamination there. Something like that. And deed notices are also a type of institutional control.

MS. O'CONNELL: The institutional control would depend on what remedy we're selecting. So in the case of our preferred alternative, there would be no deed restriction on any residential area. That soil would be remediated. There may be a deed restriction on the property where the cap is to make sure in the deed the cap is there. And if that property ever changed hands --

MS. ROSENBLATT: Yeah.

MS. O'CONNELL: -- it would be in the deed to know that there was still some waste there that was capped out. And the EPA -- it's mostly a well restriction. It would be an area around the plume to notify any well driller who was applying for a permit that there may be a restriction on wells, a well either couldn't be put in or maybe it could be put in but it would have to be at a certain depth to assure it wasn't tapping into the contaminated plume.

MR. MORAN: What if somebody wanted an exemption from that, who would they contact?

MS. O'CONNELL: The Agency would work with the State to establish the classification exemption area. So we would do that as part of our remedy.

MS. ROSENBLATT: Yes.

MS. O'CONNELL: We would require a deed notice. I'm not even sure who holds the deed to those capped areas on the Trail.

MS. ROSENBLATT: Yes.

MS. O'CONNELL: But we would try to go to the property owner and get the deed in there. So we would implement these institutional controls as part of the remedy.

Then, you know, in five years a well-driller comes out and says, oh, I want to put a well here and it's within the area of the plume, a flag would go up there.

MR. MORAN: And then what alternative would they have?

MS. O'CONNELL: Well, it depends. I mean, it's possible they could still put in a well, but not into the contaminated area. If they could put a well in deeper or more shallow, it really depends on where they want to put it.

MR. MORAN: If there was a protocol in place to --

MS. O'CONNELL: There would be a restriction on putting a well and screening it within the contaminated area, of course.

MR. MORAN: I just didn't know if there was an edict that said you can't --

MR. HERZBERG: It's usually less of that and more of a notification going forward --

MR. MORAN: Okay.

MR. HERZBERG: -- that you should take certain precautions: You should go to a certain depth; you should double-case, you should --

MR. MORAN: Okay.

MR. HERZBERG: You know, so you can't turn around and say, oh, I didn't know.

MR. MORAN: Okay. Is it done by a state regulation or a local municipal ordinance?

MS. O'CONNELL: The State establishes the classification.

MR. MORAN: So, not a local municipal ordinance?

MS. O'CONNELL: In this particular case

the EPA is implementing the remedy. We would work with the State and submit an application. And the State controls the waters. They would establish an area. It's usually where the plume is, and --

MS. ROSENBLATT: Yeah.

MS. O'CONNELL: -- some buffer zone to --

MR. HERZBERG: It usually functions as a notification to the town so that their appropriate entities would be aware of that, so that if something comes through the planning board process it gets flagged. It's something that then the State well-permitting section gets flagged. So it's meant to, again, prospectively flag --

MR. MORAN: I can understand the notification end of it. But it's more the end. Is there a remedy for someone if they want to challenge it or get an exemption?

MR. HERZBERG: Well, again, it's not necessarily a prohibition so there's not necessarily a remedy for being prohibited.

MR. MORAN: Well, if you're going through the planning board, usually you need variances to be approved to overcome things that are restricted. That's why I'm asking.

MS. O'CONNELL: If the developer wanted to come in and develop an area that was impacted by the plume, it would flag up. You know, we certainly wouldn't want him to put in 30 wells into a contaminated aquifer. And then other options, you know, the developer could explore public water, or if there's any other place to put -- you know, other options would be explored.

MR. MORAN: The reason I asked is, there is talk that's conceptual at this point of a community going in very close to where the dump site is in Stanhope. And then you would talk about also infrastructure, water lines, pump stations, water towers. Would they be prevented from going there?

And we're also thinking of Stanhope as a water source. Would that prevent them from putting pipes through that area, that contaminated area if they were ever to supply water to those contaminated homes?

And that was part of the other thing. If you're preventing any, you know, disturbance of that area and you want to have a water supplier, one of them is Stanhope which is right there and it would go through that area, it would seem to be you have a remedy to supply water and you're considering Stanhope and they would have to supply the water through that area.

MS. O'CONNELL: Yeah. There would be a restriction of digging through the capped area or damaging the cap in any way. That would be in a deed notice. Just on those areas there would be ways to go around that, I would imagine. They're not enormous areas --

MR. MORAN: I wondered if it would affect your other remedy if you chose Stanhope.

And then going forward, you're talking about an area where you're losing the commercial value if you can't obviously disturb the area and you can't dig a well, and if they're not hooked up to public water you can't have a home or residence. So you're -- it's a loss of ratables for the town. So that was another --

MS. O'CONNELL: I mean, the long-term goal is to restore this aquifer. But this is very long term. It's not going to be quick to restore the aquifer.

MR. MORAN: It is long-term, yes.

MS. O'CONNELL: Here it is the ultimate goal --

MS. ROSENBLATT: Yes.

MS. O'CONNELL: -- to the remedy, and we expect it to happen, but it will be decades really.

MR. MORAN: Okay. A second question that had to do with the capping is, I would assume this would be impermeable, so the water would run off. How would you deal with the drainage and runoff issues with that?

MS. ROSENBLATT: That's something we would have to take into account during the design.

MR. MORAN: You know, there's lot of drainage issues up there.

MS. ROSENBLATT: Yes, we do.

MR. MORAN: And they're in the process of redoing the roads up there and putting in the drainage. So it sounds like if you altered the water levels you could --

MS. ROSENBLATT: Yeah. Yeah. No, it would definitely need to be taken into account during the design, yeah.

MR. MORAN: Were there any other items that were eliminated? I was just curious about the Feasibility Study. I know they were talking about pumping the water in and heating it and removing it at one point in time. Was that one of the items looked at and eliminated?

MS. ROSENBLATT: So we look at a really broad list of technologies that are possibilities.

MS. SEPPI: Could you hold on one second.

(Interruption by a member of the public speaking loudly in the audience.)

MS. SEPPI: Okay. Thank you.

MR. MORAN: We were talking about alternative remedies.

MS. ROSENBLATT: Yes. The technologies, yes. So that's all included in the FS online. There's a full list. A lot them get screened. I think you have the proposed plan there. It's online in the Feasibility Study.

MR. MORAN: It's on a different link?

MS. ROSENBLATT: Yeah.

So it goes through, you know, all of the possible technologies that would be used. And they're screened out based on applicability, you know, feasibility. So they don't even get put into the alternatives

MR. MORAN: That's all the questions I had for now. Thank you.

MS. SEPPI: Thank you, Jack.

MS. ROSENBLATT: Thanks.

MS. SEPPI: Anyone else have a question?

I wanted to remind you also that this presentation, Anne will send it to me tomorrow and we'll post it on our web page. So if you want to go back and look at it you'll have it there too. Because I know a lot of the information was -- it's important to know but it's difficult to understand. So we'll do that. And then I'll send out a note to everybody so you'll know that it's online and you can go in and check it out.

MS. ROSENBLATT: Yeah.

MS. SEPPI: And a lot of the figures are from the Feasibility Study too, so that goes more into depth on some of these alternatives.

MS. SEPPI: Next question.

MR. DOLCE: Joe Dolce.

So my question is on the chain of events.

So this discussion was all about long-term restoration of the soil and the water.

MS. ROSENBLATT: Yeah.

MR. DOLCE: And we also have the more immediate solution of bringing in some type of city water. Right?

MS. ROSENBLATT: Yes.

MR. DOLCE: So which is happening first? And what will be -- if this is happening before the other, what is the impact going to be of all this disturbance of all the water and the ground on the wells that we're currently using, and bringing -- even though they have the POET systems on there. There's filters on there. They get clogged. There's all sorts of other things that happen.

MS. ROSENBLATT: Yes.

MR. DOLCE: So if this is happening before the other, how is that going to be addressed?

MS. ROSENBLATT: So, they're going concurrently. I will say that this is going to have to go through design. So that will take about 18 to 24 months. And then after that we'll need to get funding just like we had to do for the OU-1 remedy, go to the Priority Panel, get funding. So the actual construction of this is down the road a bit.

And as you know, the OU-1 remedy, the water line is already in design so we're a little bit ahead on that one. We realize that there's some feedback there and that, you know, any of the -- the injections or some of these remedies are going to impact the water aquifer which is currently being used.

So that's something that we're going to be looking at during pilot testing and during the design process so just to make sure that there's no impacts to the residential area from whatever the remedy that we do is.

MS. O'CONNELL: The water line will go in first.

MR. DOLCE: I think that's the answer I was looking for.

MS. O'CONNELL: We'll implement the water line. Exactly when it will go in, it will go in first. We've secured that funding for it.

MR. DOLCE: Okay.

MS. O'CONNELL: We're completing our design. There's contracting, but we hope to start that within about a year or so.

MS. ROSENBLATT: Yeah. Yeah.

MR. DOLCE: All right. I'm just thinking if it impacts our well with all this movement --

MS. O'CONNELL: That will go first.

MR. DOLCE: You were talking about removing -- removal of contaminated soil. But wasn't that already done? So where is there -- wasn't everything all scraped off and 80 million tons of material was removed, or some number, some ridiculous number?

MS. ROSENBLATT: So the removal took away, you know, the majority of the waste that was in the dump areas. Some of the waste that we found during our remedial investigation, the contaminant soil looks to be runoff. It was taken away in various ways probably through the rain and runoff down the ridge line. So it was just some residual contamination that we found that we wanted to address through the risk assessments we found that we needed to address.

MR. DOLCE: So actually some of the contaminated soil that became loose during the excavation flowed down because you sent it into residential areas so it's on people's property now?

MS. ROSENBLATT: Everybody that has contaminated soil on their property was already informed, and it's a very confined area. It's pretty -- it's very adjacent to the Dump Area A, one of the dump areas. So it's -- you know, who is to say when it ran off from there? But it's possible it was before the removal was done.

MR. DOLCE: Okay. That's what you're talking about anyway.

MS. ROSENBLATT: Yeah. Yeah.

MR. DOLCE: And then my other question is: You were talking about naturally reducing. So maybe you can explain that a little bit more.

MS. ROSENBLATT: For the monitoring and natural attenuation.

MR. DOLCE: You said that even now --

MS. ROSENBLATT: Yeah.

MR. DOLCE: -- it's going through a natural process of being eliminated. So I was just trying to get some clarification as to what was going on, what that meant --

MS. ROSENBLATT: Yeah. So --

MR. DOLCE: -- anaerobic bacteria, what's reducing --

MS. ROSENBLATT: So in the subsurface in the bedrock fractures there's biological processes and chemical processes happening that slowly would degrade the contaminants that are in the groundwater. So that's something that -- it doesn't happen everywhere. But based on the geology, based on what's in the subsurface in certain areas they can degrade naturally. And so that it's something that sometimes is enhanced with some injections. There's, you know, microbial organisms that can be injected to sort of speed that process up. But this is something that happens naturally even without enhancements.

MR. DOLCE: So you already found some mitigation based on this occurring as well as the removal --

MS. ROSENBLATT: Yeah.

MR. DOLCE: -- of the contamination?

Because I know in past conversations you said nothing is changed, nothing is changed, nothing is changed. So now you're saying something has changed?

MS. ROSENBLATT: I don't know if we said that nothing's changed. I think we've noticed a decline in concentrations generally.

MR. DOLCE: Well, I know you had said that none of the wells have changed, it's really much the same. Flowing is going change. They're all the same ratings they were required.

MR. HERZBERG: No. Though I think more that there's been a gradual decline in the levels that we've seen in the potable wells, the drinking water wells.

MR. DOLCE: My last question -- I know I'm taking up time here.

MS. ROSENBLATT: That's okay.

MR. DOLCE: You said that it did not warrant ecological receptors. What does that mean?

MS. ROSENBLATT: So that means that there was -- there was not unacceptable risk to take any ecological receptors. So there no basis for taking an action based on the ecological. So we clean up areas, media, and areas where we find unacceptable risk, whether it's to human health or to ecological risk --

or ecological receptors, and we didn't find any unacceptable risk to ecological receptors.

MR. DOLCE: Did you have a presentation from the State maybe four years ago, maybe even longer, where a woman came in, a scientist, and said that some wells, it was high enough, over a hundred, that you could have had -- women who were pregnant could have impacted fetal hearts I believe it was?

MS. ROSENBLATT: There's human health impacts, and so that's why we're taking action on the groundwater aquifer.

MS. SEPPI: You should explain what an "ecological receptor" is.

MS. ROSENBLATT: An ecological receptor, you know, it could be mammals, land mammals, it could be aquatic animals in the -- you know, there's the creek out here. So we look at any type of species that would be in this area. And there's a whole risk assessment process. It's complicated. I couldn't go too far into it. Abby could talk to you about it more. But it evaluates what the risk based on the exposure, based on the contaminants, based on the levels that we found to those receptors. And after doing that whole process we found that there was no unacceptable risk to the ecological receptors in the area.

MR. DOLCE: Okay. So after the capping and that's all done, and we're putting in -- we'll call it city water -- so that area is safe. Is what you're saying? Right?

MS. O'CONNELL: So the human health risks come from drinking contaminated groundwater, which is being addressed in the short-term by the POET systems but it will be addressed in the long-term, so that people will not be exposed to contamination after -- you know, they're not now, but they'll be a permanent protection on human health. The ecological receptors are not at risk. The residual contamination there is not posing any risk to animals or the food chain right now. We look at both because we protect human health and the environment.

MR. DOLCE: Right. Okay.

MS. O'CONNELL: So in this particular case human health is the driver. And so to cut off their pathway to exposure is to provide a potable drinking water source that's permanent. We will attempt to seal those wells and cut that off. And the rest of the remedy with the cap and the amendments is really to try to -- is an aggressive attempt to restore the groundwater here.

So the ultimate goal is full restoration of groundwater. But that will take decades. That will be a very long-term remedy because it's groundwater, because of the geology. But that's the long-term plan. The short-term plan is to get everybody off -- everybody onto the public potable water supply who is impacted.

MR. DOLCE: Okay. I'm good. Thank you.

MS. ROSENBLATT: Okay.

MS. SEPPI: Thank you, Joe.

MS. ROSENBLATT: Thanks.

MS. SEPPI: Any other questions?

MR. MORAN: I have one other.

Jack Moran, 7 East Waterloo Road.

You did show a slide about certain standards. I believe it was latter PCB where one of them was above the NJDEP standard but not the EPA.

What does that mean, that you don't only remedy --

MS. ROSENBLATT: No.

MR. MORAN: -- to the EPA standard or to the DEP standard?

MS. ROSENBLATT: Yes. So generally we thought the more stringent of the standards. That referred to the PCBs I believe in the soil. And what we found was that there was no -- the risk posed by

PCBs to human health was not unacceptable, but because it was above the standards, we will take an action to remove that contamination.

MR. MORAN: So in this case you will take the stringent DEP standard into account over the EPA one?

MS. ROSENBLATT: Yes. So, yeah, it's not --

MR. MORAN: It's as simple as that?

MS. ROSENBLATT: Yeah.

MR. MORAN: Okay. The other question I had, had to do with in the future if there's other homes that are found to be contaminated, the soil, the same remedy would be applied to them. I think there was one where it was elevated but not above a threshold which would allow a POET or other system to go in.

Will that continue to be monitored as far as homes in that, what do you call it, just the plume area?

MS. ROSENBLATT: Yeah. You're talking about residential potable wells?

Yes, that's part of the OU-1 remedy and those are going to be monitored in the interim until we're able to put in the water line, yes.

MR. MORAN: I meant the ground -- not just the water line, I meant as well as for the soil.

MS. ROSENBLATT: Soils.

Yeah, we did a pretty extensive sampling and so we feel like we have a pretty good handle on where the exact soil contamination is. But during our investigation if we were to find additional elevated soil, we would -- yes, we would remove it.

MR. MORAN: Is that program still going where you're testing other wells in the area surrounding the area --

MS. ROSENBLATT: Currently we're not doing more investigation on the soils, but we will be doing a pre-design investigation to further delineate those areas that need to be excavated, and so that's when --

MS. O'CONNELL: Also, this remedy includes long-term monitoring of groundwater. Even resident --

MR. MORAN: That's what I was getting at.

MS. O'CONNELL: I mean, we'll shut down some residential wells, but there's a pretty extensive well network. Part of this plan is to knock down the source area where the most contaminated groundwater is aggressively, and then monitor long-term. We expect to see a downward trend as time goes on. And that will be a long time, and we will be doing groundwater monitoring of the whole plume area to make sure we know

where it is, where it isn't, if it -- you know, we
don't expect it to spread, but if it was spreading, we
would --

MR. MORAN: Yes. I know there were homes that were quite far from that that were being monitored and I didn't know if that was still going on.

MS. ROSENBLATT: Yes, it's still going on.

MR. MORAN: That was it. Thank you.

MS. ROSENBLATT: Thanks.

Yes.

MR. HERZBERG: Do I have to get up?

MS. SEPPI: Wait a minute. I don't think we're allowed to ask questions. We're supposed to have the answers.

All right. Go ahead.

MR. HERZBERG: Mark Herzberg.

I just was curious. There seems to be some difference of how you are approaching different dump areas. So you're talking about excavations and some you're talking about capping. Can you just elaborate a little bit upon what --

MS. ROSENBLATT: Yeah. So there's only two dump areas where we think the concentrations are high enough in the groundwater beneath them to think that there would be some residual mass in the Vadose

Zone.

So A and D would be the areas where we would be doing these active treatments. The cap would be there, the SVE wells and injections would be in those two areas.

MS. O'CONNELL: The other areas were excavated. We excavated waste from there but we are not seeing significant groundwater contamination under there. We don't think they're continuing to act as a source.

MS. ROSENBLATT: Yes.

MS. O'CONNELL: But there were the areas with the pink squares on there -- I think Mark was asking about -- I think that was in the other map where there is going to be a little bit of excavation --

MS. ROSENBLATT: That's for the soils, yes.

MS. O'CONNELL: For the soils.

MS. ROSENBLATT: Yes. So that's considered part of the soils mediation, so that would be -- we found a couple --

MR. HERZBERG: Small areas.

MS. ROSENBLATT: -- small areas --

MR. HERZBERG: Yeah.

MS. ROSENBLATT: -- where there were

exceedances that we had to excavate.

MS. SEPPI: That's in one.

MR. HERZBERG: Did some of them have to do with also what the removal folks would have been looking at in terms of levels that they don't do also?

MS. ROSENBLATT: Yes. So the removal program has different standards than us. So when they did the removal they would use different levels as their criteria than we would. So that might be part of it, yeah.

MR. HERZBERG: Okay. Thank you.

MS. ROSENBLATT: Those again would be delineated as part of the design, so it's just to confirm.

MS. SEPPI: Scott, did you have a question?

MR. OLSON: Yes. I'm going to be your best friend.

(Laughter.

MR. OLSON: I am going to hand you a copy of a letter.

Scott Olson 191 Glenside Trail. I'm also a Council member here in town and I've been involved with this for 15 years. A happy fifteenth anniversary. It's been going along a long time, but I'm very happy with the work that's been done.

Donna Griff asked me since she can't be here tonight -- she's attending a wake for a relative -- to read a letter for her, so I would like to do that.

Her letter reads:

"I'm sorry I'm unable to attend tonight's meeting, as I'm attending a wake for a relative.

"I had hoped to listen to tonight's presentation before commenting on the methods chosen, and I will make sure to provide written comment on the plan to Anne before the August 13th deadline.

"I asked Scott to read this note into the record for me, as it's important to stress this point.

"It is my hope that the EPA will allow greater consideration to the comments and opinions of those residents directly impacted by this site, and not those of people living outside the site with agendas of their own.

"This is not about a short-term fix, or bringing water lines to our home. I am very much supportive of that process as it is taking place. This is about the cleanup of the entirety of the pollution that remains below our homes.

"We, the 20 homeowners living within this site, have had to deal with this issue now for 15 years. The health and well-being of our females has been threatened. Our property values been impacted.

"I urge the EPA to continue moving forward as quickly as possible with this mediation to help make us 'whole.' We've had to deal with the thought of 'What's next?' for far too long.

"I, for one, am appreciative of the way the EPA staff have always shown consideration for those of us mostly impacted by the site. It is my hope that they will continue with that priority, and ignore outside interests who do not have the safety and well-being of my family, and my neighbors, in mind,

"Thank you for listening.

"Donna Griff."

And I agree with Donna in a lot of ways, that there's a lot that still needs to be done. I'm very appreciative of everybody who has been doing it and the work that you guys have done. I'm very appreciative that the Congresswoman has a representative here and she's taken a great interest in this. So it goes to show how much concern there is for the job being done.

And I want to thank the people who have been involved so far, Lou Daguardia, Kristin Giacalone, Diego Garcia, Pat Seppi, and Anne Rosenblatt, and put that on the record that you've done a fine job. I really appreciate the work you've done. And it's been a pleasure to work with you as a member of the Township.

The Township Council and the Township government has always been supportive of these residents. And I think it's more that we maintain a good relationship. Whenever you guys need something, we're more than happy to help. And same thing; if we have questions, you've always been happy to answer us. So I just wanted to reiterate what Donna said, and I hope this priority and this mind-set continues. So thank you all.

MS. O'CONNELL: Thank you.

MS. SEPPI: Thank you, Scott. Thank you. We appreciate that.

Other questions?

Mary, I can't believe you don't have --

MS. SSCHNEIDER: I know, it's a first.

(Laughter.)

MR. OLSON: Oh, one more thing I forgot.

There was some question about the water availability in the planning board and restrictions and that type of thing. One of the requirements of any new development in town that takes place for the application to be deemed complete is they have to prove a source of drinkable water. So with that as the planning board safeguard, if they can't prove they can get water they're going to have to go through a process where they can. Going to the DEP I would assume would be the next responsible step where they have to get approval for a withdrawal permit if it's a large development, or if it's a private well it still needs to have a withdrawal permit.

And I think from the maps that I've looked at, the plume in the area that's going to be most affected is going to be in Byram. There doesn't seem to be anything that's moving in Stanhope in that direction. So the area unfortunately that is being impacted or potential for impact is also undevelopable as it's town-owned property by the school and it's considered for them open space, so it's not anything that is going to be developed in the future. But I just wanted to clear that up. The planning board in town will have that jurisdiction.

MS. ROSENBLATT: Okay.

MS. SEPPI: Thank you.

So if there aren't any more questions we'll end the meeting. We certainly appreciate everybody being here. If you want to come up and take a look at the post boards that we have here, or we'll also be here for a little while longer. I wanted to -- yes?

MRS. MORAN: I'll come up.

Jeanne Moran, 7 East Waterloo Road.

Could you review a little bit about the health impact? I know it's done on present standard, and could you just explain what you think is the greatest one, the least, and how you intend to keep an eye on that since it's based obviously on the present?

MS. STATES: Yeah. I guess I just want a little more clarity about what your question was asking.

MS. ROSENBLATT: The groundwater, the health risks from the groundwater contamination?

MRS. MORAN: Yes.

MS. ROSENBLATT: To impacted residents?

MRS. MORAN: What was stated in there about levels of carcinogens from this and impact and age groups and everything. I didn't quite understand.

MS. STATES: Yeah. So the basis for taking action is based on -- so the reasons for taking action on the site is exposure to drinking water through residential exposure to drinking water. Excuse me. So the primary contaminant concern is TCE. So that's trichloroethylene.

And I could go on and on. I guess if you have specific questions I can answer them.

MR. MORAN: So, in other words, it's based mainly on just the drinking water?

MS. STATES: Yeah. It's based --

MR. MORAN: And what would come from that that has contaminants in it and no other fact, other than maybe air.

MS. STATES: So our risk assessment quantitatively evaluated exposure to the drinking water and then we qualitatively evaluated exposure that would come from the air through vapor intrusion. So our risk numbers that comes from residential exposure to the most contaminated drinking water at the site if there were no POETS in place. And so --

MR. MORAN: Okay. That's what I didn't understand.

MS. STATES: Okay.

MR. MORAN: The POETS take it away, but at the time you put the POETS in you used those figures that were existing in that particular home?

MS. ROSENBLATT: Yes.

MRS. MORAN: Okay.

MS. STATES: So currently there is no risk from the drinking water because the POETS are in place. But so our basis for taking action is as if they were not in place, the contamination would still be available in the drinking water.

MRS. MORAN: And then those potential risks would exist?

MS. STATES: Exactly.

MR. MORAN: Okay. That's what I wasn't sure of, but I thought I would just get it clear.

Thank you.

MS. STATES: I'm happy to talk to you afterwards too if you have more questions.

MS. SEPPI: Okay. Any other questions?

All right. So don't forget, we'll have this presentation posted on the web page and I'll send out a note to everybody so you'll know.

If you haven't signed in, I would appreciate if you would do so, so we can just keep track of who was here this evening.

Anything else that you can think of?

MS. ROSENBLATT: No. Yeah, feel free to email me or call me with questions or concerns.

MR. MORAN: Jack Moran. Last question. Sorry.

Did I miss it? Was there an S-3 and a G-4? Were they separate, or was this all in one as far as your methods of --

MS. ROSENBLATT: So we chose one for groundwater and one for soil. S-3 was soil.

MR. MORAN: Okay. Do you go --

MS. ROSENBLATT: S-4 is for groundwater.

MR. MORAN: I thought you just went to the ground --

MS. SEPPI: S-3, because the excavation I believe --

MR. MORAN: Okay.

MS. SEPPI: -- for the soil.

Right?

MS. ROSENBLATT: Yes.

MS. SEPPI: Any more last questions?

MS. ROSENBLATT: We're going to hang out too, so you can come up.

MS. SEPPI: Thank you again, everybody

Enjoy the rest of the summer.

(At 8:02 p.m., the hearing is concluded.)

ooOoo

C E R T I F I C A T E

I, WALTER J. PERELLI, a Notary Public and Certified Court Reporter of the State of New Jersey, do hereby certify that the foregoing is a true and accurate transcript of the proceedings as taken stenographically by and before me at the time, place and on the date hereinbefore set forth.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney or counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested in the action.

S/WALTER J. PERELLI

WALTER J. PERELLI, CCR, RMR, CRR
License No. X100785
Notary Public of New Jersey
My Commission expires January 29, 2021

Dated: July 31, 2010

Attachment D
Written Comments

From:	Jeanne Moran
To:	Rosenblatt, Anne
Subject:	My input during the 30 day comment period for the Mansfield Trail Dump Superfund site OU2/ROD ending August 13, 2019.
Date:	August 12, 2019 6:52:52 PM
Attachments:	MANSFIELD PRAP OU2 NEWS RELEASE FINAL APPROVED JULY 15.docx

Respectfully submitted for the record by Jeanne Moran:

I attended the public meeting/ hearing for the OU2 ROD held on July 23, 2019 at the Byram Township Municipal Building. During the public comment period a letter submitted by Donna Griff, a CAG member, was read on her behalf by Byram Township Councilman, Scott Olson who is the town liaison for the Mansfield Trail Dump Superfund site. He stated his reason for reading the letter was the absence of Donna Griff who was unable to attend the meeting for personal reasons. This letter contained innuendo and incendiary content directed at the EPA as well as two specific CAG members. Does the EPA show favoritism toward CAG TCE members concerns vs. CAG community water company concerns? No comment was made at the hearing by EPA representatives to reassure those present for the record that the EPA represents all issues and concerns with equal consideration. In my opinion the letter was read at the meeting for the purpose of maximizing public consumption since the public comment period did not end until August 13, 2019. The reporter from the Township Journal, Mandy Coriston, only published this comment in her article covering the meeting. She told me it was a powerful statement. However, to my knowledge Mandy Corison did not contact Donna Griff for a comment regarding her powerful statement. The quotes made by the Township Journal published in Vol. 22, No. 32, August 8th to the 14th are as follows: “We, the 20 (households), have been living on the site for 15 years,” Griff’s note read in part. “This isn’t about drinking water. This is about the health and safety of my family. I hope the EPA will allow for more weight from the voices of the affected residents, and not those who may not have our best interests at heart.”

The only two members of the CAG who have been water company representatives are (myself) Jeanne and Jack Moran. We are the only two CAG members who do not have TCE in their drinking water. My attempts to obtain the letter from EPA representatives Anne Rosenblatt , Pat Seppi and Chris Lyon have been ignored to date. My interest in obtaining the letter was to review the content so as to respond with quoted accuracy in my public written comments made herein.

In my opinion Councilman Olson has continually overreached in his involvement and role as a liaison by showing favoritism towards TCE CAG members and by disparaging and marginalizing the two CAG members that represented their water company as to being considered as the chosen waterline. We are no longer acting in that capacity on the CAG since Suez now owns our former EBEPOA water company but only as possibly affected Suez Water New Jersey customers.

Please define the role that the EPA CAG guidelines state should apply, if a town appoints a liaison to an EPA CAG.

Written comments may be mailed or emailed to:
Anne Rosenblatt, Remedial Project Manager
U.S. EPA, 290 Broadway, 19th Floor
New York, NY 10007
Tel. (212) 637-4308
rosenblatt.anne@epa.gov

I'm sorry I'm unable to attend tonight's meeting, as I'm attending a wake for a relative.

I had hoped to listen to tonight's presentation before commenting on the methods chosen, and I will make sure to provide written comment on the plan to Anne before the August 13 deadline.

I ask Scott to read this note into the record for me, as I feel it is important to stress this point.

It is my hope that the EPA will allow greater consideration to the comments and opinions of those residents DIRECTLY impacted by this site, and not those of people living outside the site with agendas of their own.

This is NOT about a short term fix, or bringing water lines to our homes. I am very much supportive of that process as it is taking place. This is about the clean-up of the entirety of the pollution that remains BELOW our homes.

We, the 20 homeowners living WITHIN this site, have had to deal with this issue now for 15 years. The health and well-being of our families has been threatened. Our property values have been impacted.

I urge the EPA to continue moving forward as quickly as possible with this remediation, to help make us 'whole'. We've had to deal with the thought of "What next?" for far too long.

I, for one, am appreciative of the way the EPA staff have always shown consideration for those of us most impacted by this site. It is my hope that they will continue with that priority, and ignore any outside interests who do not have the safety and well-being of my family, and my neighbors, in mind.

Thank you for listening.

Donna Griff