Superfund Proposed Plan

U.S. Environmental Protection Agency, Region II

Route 561 Dump Site
Operable Unit 2
Gibbsboro, New Jersey

June 2016

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the Preferred Alternative to address contaminated soil, sediment and surface water at the Route 561 Dump Site portion of the Sherwin-Williams Site. The Route 561 Dump Site is located in Gibbsboro, New Jersey. The contamination is associated with the former Sherwin-Williams paint and varnish manufacturing plant located in Gibbsboro, New Jersey.

The Preferred Alternative calls for the excavation and capping, as necessary, of soil and sediment. Excavated material will be disposed of off-site. Surface water will be monitored. Institutional controls will be implemented as needed. Groundwater contamination will be evaluated as a separate Operable Unit (OU3) and addressed in a future Proposed Plan.

A comprehensive Remedial Investigation (RI) took place under a 1999 Administrative Order on Consent (AOC) with the Sherwin-Williams Company (Sherwin-Williams). The RI activities were conducted by Sherwin-Williams and were overseen by the U.S. Environmental Protection Agency (EPA). The RI included sampling of soil, sediment, surface water and groundwater throughout the Route 561 Dump Site in Gibbsboro, New Jersey. The results of this investigation identified areas within the Route 561 Dump Site where remedial action is required.

This Proposed Plan contains descriptions and evaluations of the cleanup alternatives considered for the Route 561 Dump Site. This Proposed Plan was developed by EPA, the lead agency, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA, in consultation with NJDEP, will select a final remedy for contaminated soil, sediment and surface water after reviewing and considering all information submitted

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MARK YOUR CALENDARS

PUBLIC COMMENT PERIOD
June 13 – July 12, 2016
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING
June 21, 2016 at 7:00 P.M.
EPA will hold a public meeting to explain the Proposed Plan and alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Gibbsboro Senior Center, 250 Haddonfield-Berlin Road, Gibbsboro, New Jersey 08026

For more information, see the Administrative Record 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. by appointment

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

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

Send comments on the Proposed Plan to:

Renee Gelblat, Remedial Project Manger
U.S. EPA, Region 2
290 Broadway, 19th Floor
New York, NY 10007-1866
Telephone: 212-637-4414
Email: gelblat.renee@epa.gov

EPA's website for the Route 561 Dump Site is:
www.epa.gov/superfund/route-561-dump

during the 30-day public comment period. EPA, in consultation with NJDEP, may modify the Preferred Alternative or select another response action presented in this Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan as part of its community relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund) 42 U.S.C. 9617(a), and Section 300.435(c)(2) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the Route 561 Dump Site Remedial Investigation and Route 561 Dump Site Feasibility Study (FS) reports as well as other related documents contained in the Administrative Record. The location of the Administrative Record is provided on the previous page. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the site-related Superfund activities performed by Sherwin-Williams, under EPA and NJDEP oversight.

SITE DESCRIPTION

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

Sherwin-Williams/Hilliards Creek Superfund Site:
The Sherwin-Williams/Hilliards Creek Superfund Site includes the Former Manufacturing Plant area, Hilliards Creek and Kirkwood Lake. The Former Manufacturing Plant area of the Sherwin-Williams/Hilliards Creek Superfund Site is approximately 20 acres in size and is comprised of commercial structures, undeveloped land and the southern portion of Silver Lake. The Former Manufacturing Plant area extends from the south shore of Silver Lake in Gibbsboro, New Jersey, and straddles the headwaters of Hilliards Creek. Hilliards Creek is formed by the outflow from Silver Lake. The outflow enters a culvert beneath a parking lot at the Former Manufacturing Plant and resurfaces on the south side of Foster Avenue, Gibbsboro. From this point, Hilliards Creek flows in a southerly direction through the Former Manufacturing Plant area and continues downstream through residential and undeveloped areas. At approximately one mile from its origin, Hilliards Creek empties into Kirkwood Lake. Kirkwood Lake is approximately 25 acres, located in Voorhees, New Jersey with residential properties lining its northern shore.

Route 561 Dump Site: The Route 561 Dump Site is located approximately 700 feet to the southeast of the Former Manufacturing Plant area. It includes retail businesses, a portion of a residential area, wooded vacant lots and a small creek. A fenced portion of the Route 561 Dump Site is located at the base of an earthen dam that forms Clement Lake. White Sand Branch is a small creek which originates at the dam and flows in a southwest direction for approximately 1,650 feet where it enters the fenced portion of the Burn Site. (Figure 2)

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

SITE HISTORY

The former paint and varnish manufacturing plant property in Gibbsboro, New Jersey, was developed in the early 1800s as a saw mill, and later as a grain mill. In 1851, John Lucas & Co., Inc. (Lucas), purchased the property and converted the grain mill into a paint and varnish manufacturing facility that produced oil-based paints, varnishes and lacquers. Sherwin-Williams purchased Lucas in the early 1930s and expanded operations at the facility. Historic features at the Former Manufacturing Plant included wastewater lagoons, above-ground storage tanks, a railroad line and spur, drum storage areas, and numerous production and warehouse buildings. The facility was closed in 1977 and was sold to a developer in 1981.

In 1978, after plant operations closed, NJDEP directed Sherwin-Williams to excavate and properly dispose of the waste material remaining in the lagoons. During the 1980s, NJDEP entered into several administrative orders with Sherwin-Williams to oversee the characterization of contaminated groundwater and a petroleum-like seep in the Former Manufacturing Plant area. During the 1990s, NJDEP discovered two additional source areas, the Route 561 Dump Site and the Burn Site. Contamination in both areas are attributable to historic dumping activities associated with the Former Manufacturing Plant.

In the mid-1990s, enforcement responsibilities for the Dump Site and the Burn Site were transferred from NJDEP to EPA. Under an AOC with EPA, Sherwin-Williams was directed to further characterize and delineate the extent of contamination associated with these areas and to fence them off to minimize the potential for human exposure. EPA proposed the Dump Site to the National Priorities List (NPL) in 1998[1]. The Burn Site was added to the NPL in 1999.

In 1998, EPA sampled the upper portions of Hilliards Creek and several residential properties. Contaminants (mainly lead and arsenic) were detected in these soil and sediment samples. The contaminants were similar to those detected at the Route 561 Dump Site and the Burn Site. As a result, a portion of Hilliards Creek was fenced off as portions of the Route 561 Dump Site and the Burn Site had been. EPA then entered into two additional AOCs with Sherwin-Williams in 1999. Under the first AOC, Sherwin-Williams conducted additional sampling of Hilliards Creek and Kirkwood Lake to further characterize the extent of contamination. This sampling, which concluded in 2003, included residential properties along Hilliards Creek and Kirkwood Lake. The second AOC, signed in September 1999, required Sherwin-Williams to conduct a Remedial Investigation/Feasibility Study (RI/FS) for the Route 561 Dump Site, the Burn Site and Hilliards Creek. The Sherwin-Williams/Hilliards Creek Site, which includes the FMP area, Hilliards Creek and Kirkwood Lake, was added to the NPL in 2008.

Due to the complexity of multiple sites and varying land uses, EPA is addressing the cleanup of the Sherwin-Williams sites in several phases called operable units. Operable Unit 1 (OU1) consists of the Residential Properties that are to be remediated in accordance with the Record of Decision which was signed in September 2015.

This Proposed Plan addresses Operable Unit 2 (OU2) soil, sediments and surface water of the Route 561 Dump Site. Operable Unit 3 (OU3) will address the groundwater beneath the Route 561 Dump Site. EPA expects that a remedy for OU3 will be selected after implementation of a remedy for OU2.

SITE CHARACTERISTICS OF THE ROUTE 561 DUMP SITE

The Route 561 Dump Site is composed of commercial, residential and undeveloped properties, wetlands and a small creek. It has been subdivided into areas based on the current use and zoning. These subdivisions are described below and shown on Figure 3.

Dump Site Fenced Area: This is an approximately 2.9-acre fenced area located along the east side of Route 561 (South Lakeview Drive) near the intersection with Kresson Road. The northern portion is characterized by a steep slope and the southern portion contains a wetland area. Under a 1997 removal order, Sherwin-Williams consolidated and capped waste in the northern portion of the Dump Site Fenced Area. The fenced area is inspected at least monthly and maintenance of the fence takes place as needed.

There are two residential properties located adjacent to the Dump Site Fenced Area. A portion of one residential property is located within the Dump Site Fenced Area.

[1] The *National Priorities List* (NPL) is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide EPA in determining which sites warrant further investigation. At some sites proposed for the NPL, EPA has entered into an enforcement agreement with a private party prior final placement on the NPL, whereby the private party agrees to proceed with Superfund investigations or cleanup at the site. In certain circumstances (including at the Dump Site), EPA has elected not to finalize the NPL listing as long as Superfund work proceeds in accordance with the enforcement agreement, but EPA maintains the site as "proposed" so that it can be quickly placed on the NPL if conditions change.

Northern Commercial Area: This area abuts the north side of the Dump Site Fenced Area. There is one building in the Northern Commercial Area that houses a number of retail businesses. A paved parking lot surrounds much of the building, and grassy areas form a buffer between Route 561 and the Northern Commercial Area.

Vacant Lot and Vacant Lot Developed Area: These areas are on the west side of Route 561 across from the Northern Commercial Area and the Dump Site Fenced Area. There is an office complex and commercial buildings in the northeast portion of the Vacant Lot Developed Area, near the corner of Route 561 and Marlton Avenue. The Vacant Lot Developed Area is zoned commercial. In contrast, the Vacant Lot is undeveloped and is characterized by grassy and wooded areas and is zoned residential.

White Sand Branch: White Sand Branch originates at the base of the Clement Lake dam and flows southwest. White Sand Branch and its flood plain from Clement Lake to the fence line of the United States Avenue Burn Site are part of the Route 561 Dump Site.

Summary of Route 561 Dump Site Investigations

Pre-Remedial Investigation Activities

The investigations at the Route 561 Dump Site were conducted in phases. The first sampling of soil, sediment, surface water and groundwater was conducted by NJDEP in 1994. The samples were analyzed for: metals, cyanide, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs), pesticides, and polychlorinated biphenyls (PCBs). Subsequent sampling by EPA took place in 1997.

In November 1997, Sherwin-Williams entered into an AOC with EPA to conduct a Removal Action. Under the Removal Action, areas of highly contaminated soil within the Dump Site Fenced Area were consolidated into three areas which were covered with impermeable material and revegetated. In addition, a silt fenced and a new perimeter fence were installed.

In 1999, Sherwin-Williams and EPA signed another AOC to conduct a remedial investigation and feasibility study throughout the entire Sherwin-Williams/Hilliard's Creek Site, including the Route 561 Dump Site.

Summary of the Remedial Investigation

The full results of the Remedial Investigation can be found in the Route 561 Dump Site Remedial Investigation Report (May 2015) which is part of the Administrative Record.

Remedial investigation sampling of soil, sediment and surface water by Sherwin-Williams, under EPA oversight, began in 2005 and continued to 2010. Additional groundwater sampling was conducted in 2013 and supplemental sampling for the Baseline Ecological Risk Assessment took place in 2014.

The results of sample analyses were screened to determine if the levels of contamination posed a potential harm to human health and/or the environment. This was done by comparing the measured values of contaminants to the following standards that are protective of human health or ecological receptors.

The soil sample analytical results were compared to NJDEP's Residential Direct Contact Soil Remediation Standards (RDCSRS) referred to hereafter as residential cleanup goals, and the Non-residential Direct Contact Soil Remediation Standards (NRDCSRS), referred to hereafter as non-residential cleanup goals, depending on the zoning and land use. The sediment sample analytical results were compared to the lowest effect levels for ecological receptors and surface water results were compared to the New Jersey Surface Water Quality Standards (NJSWQS) for Fresh Water. In addition, a human health risk assessment and an ecological risk assessment were conducted to determine if levels of contaminants exceeded EPA's acceptable risk range. Explanations of the results of the human health and ecological risk assessments are explained in separate sections later in this document.

The results of the RI showed that lead and arsenic are the major contaminants of concern in all media tested throughout the Route 561 Dump Site. Other contaminants were also found and they were generally co-located with lead and arsenic.

Soil:

Soil samples were taken from over 200 sample locations from the ground surface to depths of approximately 34 feet.

Lead and arsenic were found most frequently and at the greatest concentrations above the NJDEP residential direct contact soil remediation standards. Other constituents that were found in the soil above the standard include antimony, thallium, cadmium, PAHs and PCBs. These other constituents were found less frequently and are co-located with lead and arsenic. Based on the sampling results and comparison of that data to the NJDEP residential direct contact soil remediation standards, lead and arsenic were identified as the main contaminants of concern in the soil.

The most highly contaminated soil was found in the southern portion of the Northern Commercial Area adjacent to the Dump Site Fenced Area, throughout the Dump Site Fenced Area and in the portions of Vacant Lot Developed Area nearest to Route 561. It is likely that there is contamination under Route 561 since soil contamination was found in samples on both sides of Route 561 between the Northern Commercial Area and the Developed Vacant Lot. Lead and arsenic exceedances were also found in the soil adjoining White Sand Branch outside the Dump Site Fenced Area.

Contamination in soil is relatively shallow, generally found less than 5 feet deep. The concentration of lead in soils range from less than the residential standard of 400 milligrams/kilogram (mg/kg) to over 80,000 mg/kg in the Northern Commercial Area and over 200,000 mg/kg in the Dump Site Fenced Area. The concentration of arsenic in soil ranges from less than the residential standard of 19 mg/kg to more than 14,000 mg/kg in Dump Site Fenced Area.

Sediment:

Sediment samples were taken from more than 20 locations in White Sand Branch from its source at the base of Clement Lake through the Dump Site Fenced Area to the fence that marks the boundary of the Burn Site.

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

Lead and arsenic exceedances were found in sediment throughout the Dump Site Fenced Area and White Sand Branch. The concentration of lead varies from below the lowest effect level for ecological receptors to over 41,000 mg/kg. The arsenic levels varied from below the lowest effects level for ecological receptors to 6,000 mg/kg. For both metals, the highest values were found in the Dump Site Fenced Area.

Surface Water:

Surface water samples were collected from eleven locations in the Dump Site Fenced Area and in White Sand Branch from the southern portion of the Vacant Lot to the fence boundary with the United States Avenue Burn Site. Analyses of the surface water showed exceedances of the NJSWQS for Fresh Water for aluminum, iron, cyanide, arsenic, lead, cadmium, mercury and nickel. As with the other media, lead and arsenic are the main contaminants of concern.

WHAT ARE THE "CONTAMINANTS OF CONCERN" (COCs)?

EPA has identified two metals as the primary contaminants of concern at the Route 561 Dump Site that pose the greatest potential risk to human health and the environment.
The primary contaminants of concern at the Route 561 Dump Site are lead and arsenic.

Lead: Lead was historically used as a pigment in paint. As a pigment, lead II chromate "chrome yellow" and lead II carbonate "white lead" being the most common. Lead is hazardous. At high levels of exposure lead can cause nervous system damage, stunted growth, kidney damage, and delayed development. Lead is considered a possible carcinogen.

Arsenic: Arsenic compounds began to be used in agriculture as ingredients in insecticides, rodenticides, herbicides, wood preservers and pigments in paints. Long-term exposure to high levels of inorganic arsenic (e.g. through drinking-water and food) are usually observed in the skin, and include pigmentation changes and skin lesions. Often, prolong exposure can lead to skin cancer. In addition to skin cancer, long-term exposure may lead to cancers of the bladder and lungs.

The concentrations of metals in surface water were compared to the NJSWQS for Fresh Water of 5.4 microgram/Liter (µg/L) for lead and 150 µg/L for arsenic. The total lead and total arsenic values varied from below the NJSWQS for Fresh Water to over 100,000 µg/L for total lead and over 20,000 µg/L for total arsenic. The highest concentrations in surface water were found in the section of White Sand Branch located in the Dump Site Fenced Area.

WHAT IS A "PRINCIPAL THREAT"?

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

PRINCIPAL THREATS

Although lead and arsenic in soil and sediment act as sources to surface water contamination and lead and arsenic in soil contribute to low levels of shallow groundwater contamination, these sources are not highly mobile and are not considered principal threat wastes at this Site.

SUMMARY OF SITE RISKS

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

WHAT IS RISK AND HOW IS IT CALCULATED?

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

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

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

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

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of Site risks for all COCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a “one in ten thousand excess cancer risk;” or one additional cancer may be seen in a population of 10,000 people as a result of exposure to Site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk.

For non-cancer health effects, a “hazard index” (HI) is calculated. The key concept for a non-cancer HI is that a “threshold” (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the Site.

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

For the ecological risk assessment, representative ecological receptors were identified for each exposure area. Measurement and assessment endpoints were developed during the BERA to identify those receptors and areas where unacceptable risks are present.

For the human health risk assessments, the Route 561 Dump Site was divided into 7 exposure areas as shown on Figure 3. These exposure areas include the Dump Site Fenced Area (DFA), Eastern Dump Site Area Northern Commercial Area, Western Commercial Area, Vacant Lot, White Sand Branch-East and White Sand Branch-West.

For the baseline ecological risk assessment, the Route 561 Dump Site was evaluated based upon three defined ecological exposure areas: East Dump Site Exposure Area (Dump Site Fenced Area and Eastern Dump Site Area), West Dump Site Exposure Area (undeveloped portion of the Vacant Lot and upland areas of White Sand Branch-West) and White Sand Branch (White Sand Branch itself and associated aquatic areas, from its origin in the Dump Site Fenced Area to its western boundary with the Vacant Lot).

Human Health Risk Assessment

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

COCs were selected by comparing the maximum detected concentration of each analyte with available medium-specific state and federal risk-based screening values. Screening of each COC was conducted separately for each media and exposure area.

Based on current zoning and land use assumptions in each exposure area, the current and future land use scenarios included the following exposure pathways and populations:

- Construction worker and utility worker in the Dump Site Fenced Area, Eastern Dump Sites Area, Northern Commercial Area, Western Commercial Area and Vacant Lot: incidental ingestion, dermal contact and inhalation of surface and subsurface soil and dermal contact with shallow groundwater for adults.

- Outdoor worker in the Dump Site Fenced Area, Northern Commercial Area, Western Commercial Area and Vacant Lot: incidental ingestion, dermal contact and inhalation of surface soil by adults.

- Recreator in the Vacant Lot and White Sand Branch-West: incidental ingestion, dermal contact and inhalation of surface soil, incidental ingestion and dermal contact with sediment as well as dermal contact to surface water by adolescents and adults.

The future land-use scenarios included the following exposure pathways and populations:

- Resident in the Eastern Dump Site, Vacant Lot/White Sand Branch-East and White Sand Branch-West: incidental ingestion, dermal contact and inhalation of surface soil, ingestion, dermal contact and inhalation of vapors potentially emitted from site wide groundwater, incidental ingestion and dermal contact with sediment and dermal contact with surface water by a child and adult.

- Recreator in the Dump Site Fenced Area and Eastern Dump Sites Area: incidental ingestion, dermal contact and inhalation of surface soil, incidental ingestion and dermal contact with sediment as well as dermal contact to surface water by adolescents and adults.

For contaminants other than lead, two types of toxic health effects were evaluated in the risk assessment: cancer risk and noncancer hazard. Calculated cancer risk estimates for each receptor were compared to EPA's target risk of $1x10^{-6}$ (one-in-one million) to 1×10^{-4} (one-in-ten thousand). The calculated noncancer hazard index (HI) estimates were compared to EPA's target threshold value of 1. Exposure to lead was evaluated using appropriate blood lead modeling. Results of the modeling was compared to EPA's risk reduction goal to limit the probability of a child's (or that of a group of similarly exposed individual's) blood lead concentration exceeding 10µg/dL to 5% or less.

Summary of the Human Health Risk Assessment

This section provides an overview of the human health risks from the major COCs. A complete discussion of all risks from the Route 561 Dump Site can be found in the Human Health Risk Assessment which is contained in the Administrative Record.

The results of the HHRA for the Route 561 Dump Site identified lead, arsenic, and cyanide as COCs based on cancer and/or noncancer risk estimates.

Arsenic was shown to be a COC in soil, sediment and surface water throughout the Route 561 Dump Site. The risk assessment found arsenic was the major risk driving chemical for the cancer and/or noncancer risk estimates. Although arsenic was determined to be a risk driver to several receptor groups evaluated in the HHRA, the exact receptor group exceeding EPA's threshold criteria varied with exposure area and media. Below, summarized by media, are the receptor groups in each exposure area in which arsenic was identified as a COC.

- Soil: Arsenic in surface and subsurface soil drove the majority of the risk to the construction worker in the Dump Site Fenced Area, Northern Commercial Area, Western Commercial Area and the Vacant Lot. In addition, exposure to arsenic in surface soil drove the majority of the risk to: the outdoor worker on the Dump Site Fenced Area and Vacant Lot; resident on the Eastern Dump Site, Vacant Lot and the Western portion of White Sand Branch; adolescent recreator on the Dump Site Fenced area; and an adult recreator on the Dump Site fenced area and Vacant Lot exposure areas.

- Sediment: Exposure to arsenic in sediment drove the majority of the risk posed to the adolescent and adult recreators in the Dump Site Fenced Area and to a future child resident in the Vacant Lot.

- Surface Water: Arsenic in surface water drove the majority of the risk to the adolescent recreator in the Dump Site Fenced Area.

Lead was identified as a risk-driving chemical throughout the site except for the Western Commercial Area. Specifically, the HHRA showed that lead exposure exceeds EPA's risk level for construction workers, outdoor workers, and an adult recreator in the Dump Site Fenced Area, a construction worker in the Northern Construction Area, and a future child resident in the Eastern Dump Site Area, Vacant Lot, and the Western portion of White Sand Branch.

Cyanide was identified as a COC in the soil of the Dump Site Fenced Area and Vacant Lot exposure areas for the adolescent recreator and construction worker.

Table 1 shows a summary of the quantitative estimates of total cancer risk and noncancer hazard for each receptor evaluated in the HHRA.

Based on the result of the HHRA, remedial actions are necessary to protect human health from actual or potential releases of hazardous substances.

Ecological Risk Assessment

A baseline ecological risk assessment was conducted to evaluate the potential for ecological risks from the presence of contaminants in surface soil, sediment, surface water and groundwater. Media concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors by habitat type.

Exposure to both terrestrial wildlife in the upland exposure areas (East Dump Site Exposure Area and West Dump Site Exposure Area) through ingestion of contaminated soil and biota, and exposure of aquatic wildlife to contaminants in the White Sand Branch Exposure Area through ingestion of contaminated sediment, surface water and biota were evaluated. Biological data were collected (benthic invertebrates, fish and soil invertebrates) to assist in understanding site-specific bioaccumulation rates and subsequent exposure to upper trophic level receptors. In addition, COC concentrations and biological responses (sediment toxicity and benthic community diversity) were evaluated to understand potential community level impacts associated with sediment COCs. The drivers of ecological risk were lead, arsenic, chromium and cyanide.

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

Summary of the Baseline Ecological Risk Area

The BERA provided evidence that COCs, primarily arsenic, lead and copper, in both aquatic and terrestrial environments within several portions of the Route 561 Dump Site potentially pose unacceptable ecological risk to wildlife receptors. Overall, wildlife risks are driven by elevated concentrations detected in localized portions of the three exposure areas, primarily in soil and sediment in the central portion of the Dump Site Fenced Area and in White Sand Branch and its immediate vicinity. Insectivorous wildlife (the American Robin and Short-Tailed Shrew) were identified as the wildlife receptors with the highest predicted exposures and hazard quotients in the terrestrial area of the Dump Site. Similarly, the Spotted Sandpiper was identified as the receptor with the highest exposure and hazard quotient associated with the aquatic community in White Sand Branch.

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

Based on the full risk assessment, it is EPA's current judgment that the Preferred Alternatives identified in this Proposed Plan are necessary to protect public health or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

The following remedial action objectives (RAOs) for contaminated media address the human health and ecological risks at the Route 561 Dump Site:

Soil

- Prevent potential current and future unacceptable risks to human and ecological receptors resulting from uptake of soil contaminants by plants, ingestion of contaminated soils and food items by humans and ecological receptors, and direct contact with contaminated soils.

- Minimize migration of site-related contaminants in the soil to sediment, surface water and groundwater.

Sediment

- Prevent potential current and future unacceptable risks to human and ecological receptors resulting from uptake of sediment contaminants by plants, ingestion of contaminated sediments by humans and ecological receptors and direct contact with contaminated sediments.

- Minimize migration of site-related contaminants from the sediment to surface water.

RAOs were not developed for surface water. By addressing the soil and sediment, EPA expects that the risks posed by dermal contact to surface water will be addressed.

To achieve RAOs, EPA has selected soil and sediment cleanup goals for the major COCs. The soil cleanup goals for the COCs are consistent with New Jersey human health direct contact standards or ecological risk-based goals.

The Route 561 Dump Site consists of active commercial properties, as well as undeveloped commercial and residential zoned properties which contain ecological habitat. To meet the RAOs, specific soil cleanup goals listed below apply to different areas or land uses of the Site.

Soil ecological cleanup goals are based on the most sensitive terrestrial wildlife receptors and apply to the top foot of soil at all properties in the Route 561 Dump Site that contain ecological habitat. Specifically, the ecological cleanup goals would apply to the top foot of soil on all properties except the Vacant Lot Developed Area and the Northern Commercial Area.

For undeveloped commercially zoned properties that contain ecological habitat, ecological cleanup goals would also apply to the top foot of soil and non-residential cleanup goals, apply through the remaining soil depth.

Residential zoned properties contain ecological habitat. As a result, the ecological cleanup goals apply to the top foot of soil and residential cleanup goals apply through the remaining soil depth.

The more stringent of the human health risk-based cleanup goals and the ecological cleanup goals apply to the sediment in White Sands Branch.

The sediment cleanup goal for arsenic is the human health direct contact cleanup goal of 19 mg/kg since this value is lower than the ecological cleanup goal of 21 mg/kg.

Site-specific impact to groundwater levels for unsaturated soil will be determined during remedial design. Saturated soil that contains arsenic at levels exceeding 100 mg/kg are considered source areas to groundwater contamination.

The soil cleanup goals for lead vary based on the land use of each property. The sediment cleanup goal for lead is the ecological cleanup goal that is based on the most sensitive wildlife receptor.

The cleanup goals for the Route 561 Dump Site are as follows:

Soil:

Arsenic:

- Non-residential cleanup goal: 19 mg/kg
- Residential cleanup goal: 19 mg/kg
- Ecological cleanup goal: 19 mg/kg

Lead:

- Non-residential cleanup goal: 800 mg/kg
- Residential cleanup goal: 400 mg/kg
- Ecological cleanup goal: 213 mg/kg

Sediment:

Arsenic:	19 mg/kg
Lead:	235 mg/kg

SUMMARY OF REMEDIAL ALTERNATIVES

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

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

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

The time frames below are for construction and do not include the time to negotiate with the responsible parties, design a remedy or the time to procure necessary contracts. Five-year reviews will be conducted as a component of the alternatives that would leave contamination in place above levels that allow for unlimited use and unrestricted exposure.

For all soil and sediment alternatives, the Present Worth Cost includes the periodic present worth cost of five-year reviews.

Soil Alternatives:

Note: Soil alternatives 4 and 5 are in the Feasibility Study but were not carried forward by EPA into this Proposed Plan.

Alternative 1 - No Action

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

The NCP requires that a “No Action” alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated soil at the Route 561 Dump Site.

Alternative 2 – Institutional Controls and Monitoring

Capital Cost:	*$268,402*
Annual O&M Cost:	*$4,960*
Present Worth Cost:	*$458,908*
Time Frame including O&M:	*30 years*

This alternative would use Institutional Controls, such as deed notices, to prevent exposure to site contaminants and monitoring to assess any change in contaminant conditions over time. The existing fence around the Dump Site Fenced Area would be maintained, but no other physical barriers would be installed. Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

Alternative 3 –Capping and Institutional Controls

Capital Cost:	*$6,390,196*
Annual O&M Cost:	*$39,600*
Present Worth Cost:	*$6,982,546*
Construction Time Frame:	*5 months*

This alternative would use soil or asphalt covers as the primary method to prevent exposure to contaminants in site soils. In the parking lots of the commercial properties, asphalt would be maintained as an engineering control to prevent contact with underlying soil where contamination levels exceed the non-residential cleanup goals.

In all other areas of the Site, two feet of soil would be excavated to allow the installation of a two foot thick soil cap to prevent contact with soils that exceed the soil cleanup goals.

Approximately, 12,000 cubic yards of soil would be excavated to accommodate a cap. The excavated soil would be transported to an appropriate disposal facility.

Institutional controls, such as a deed notice, would be required on all properties where residential soil standards are not met. Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

Alternative 6 – Excavation, Capping and Institutional Controls

Capital Cost:	*$11,551,458*
Annual O&M Cost:	*$28,600*
Present Worth Cost:	*$12,016,239*
Construction Timeframe:	*8 months*

In this alternative, soil in the Northern Commercial Area and Vacant Lot Developed Area that exceed the non-residential cleanup goals, would be removed to approximately two to four feet, or deeper where utilities are located. Soil below the excavated depth that exceed the cleanup goals would be capped with either an impermeable cap or clean soil. Remaining unsaturated soil that exceed site-specific impact-to-groundwater values would receive an impermeable cap. The impermeable cap would be expected to minimize surface water percolation through the soil thereby reducing the impact on groundwater. An area of saturated soil located beneath the Northern Commercial Area adjoining Route 561 that is a source of groundwater contamination would be removed. Soil removal in this portion of the Northern Commercial Area is estimated to extend to 14 feet. Removal of saturated soil that acts as a source of groundwater contamination would also result in areas of deep excavation, between four to twelve feet, in the northern and central portions of the Dump Site Fenced Area

Parking lots of the commercial areas where soil contamination remaining at depth exceeds the non-residential cleanup goals, would be capped with asphalt. The unpaved areas would receive a soil cap. The pavement of Route 561 will function as a cap.

Institutional controls, such as a deed notice, would be required for all commercial properties and Route 561 where residential standards are not met. Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

On residential properties adjoining White Sands Branch, the first foot of soil would be excavated to meet the ecological cleanup goals and soil exceeding the residential cleanup goals would be removed to depth. Since it is anticipated that no soil exceeding the residential cleanup goals would remain on residential properties, no institutional controls would be required.

Approximately 23,000 cubic yards of soil would be removed under this alternative.

Alternative 7 -- Excavation and Institutional Controls

Capital Cost:	*$17,485,771*
Annual O&M:	*$0*
Present Worth Cost:	*$17,618,871*
Construction Timeframe:	*10 months*

At commercial properties, this alternative would result in the excavation of all accessible soil containing contaminants at concentrations that exceed the residential cleanup goals, specifically the Northern Commercial Area, Vacant Lot Developed Area, Vacant Lot and the commercial portion of the Dump Site Fenced Area. Contaminated soil beneath Route 561 and the commercial buildings would not be removed.

For residential properties within the White Sand Branch flood plain, all soils exceeding the residential cleanup goals would be removed. Any remaining soil that exceed ecological cleanup goals in the top foot of soil outside the footprint of the residential soil cleanup goal excavation would also be removed.

Approximately 37,000 cubic yards of soil would be removed under this alternative.

Since all the accessible contaminated soils would be removed from excavated areas, no capping would be necessary in the excavated areas. Route 561, and the commercial buildings would function as a cap.

Institutional controls, such as a deed notice, would be required on all properties where residential standards are not met. Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

Common Elements: Surface Water

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

Sediment Alternatives:

Note: Alternative 4 contains elements of Alternative 5 as described in the Feasibility Study.

Alternative 1 – No Action

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

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no action would be taken to remediate the contaminated sediment at the Route 561 Dump Site.

Alternative 2 – Institutional Controls and Monitored Natural Recovery

Capital Cost:	*$70,323*
Annual O&M Cost:	*$46,200*
Present Worth Cost:	*$739,215*
Timeframe including O&M:	*30 years*

Under this alternative, no removal or capping of sediment would be conducted and exposure to contaminants would not be prevented. Periodic monitoring would be performed to determine if contaminant concentrations in surface sediment were declining to a level that is protective of ecological receptors. Institutional controls, such as a deed notice, would be required since contaminants remain above unrestricted levels. Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

Alternative 3 – Excavation and Capping

Capital Cost:	*$2,023,809*
Annual O&M Cost:	*$26,400*
Present Worth Cost:	*$2,470,841*
Construction Timeframe:	*2 months*

Under this Alternative, up to one foot of sediment containing contaminants at concentrations exceeding the ecological cleanup goals would be removed from the small streams and White Sand Branch within the Dump Site Fenced Area to the fence at the Burn Site located west of Berlin-Haddonfield Road. In areas where one foot of sediment is removed to meet the ecological cleanup goals, natural sedimentation would be allowed to restore the stream to its previous elevation. A cap would be installed on areas of the stream where levels of contaminants exceeding the cleanup goals remain after excavation. The cap would consist of six inches of sand, covered by three inches of stone that would act as an armoring layer. Natural sedimentation would then fill in above the armoring layer and reestablish the previous elevation of the stream. Approximately 448 cubic yards of sediment would be removed under this alternative.

A minimum of five years of sampling would take place to confirm that restoration was successful and that contaminant levels remain below the cleanup goals.

Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

Alternative 4 – Excavation

Capital Cost:	*$1,927,968*
Annual O&M Cost:	*$46,200*
Present Worth Cost:	*$2,006,034*
Construction Timeframe:	*2.5 months*

This alternative consists of removal of all sediment with site-related contaminants exceeding ecological cleanup goals from the small streams within the Dump Site Fenced Area and the 1,050-foot section of White Sand Branch extending from the Dump Site Fenced Area to Berlin Haddonfield Road. No capping of sediments would be necessary since all sediment exceeding the cleanup goals would be removed. Areas where sediment is removed would be backfilled with clean material and the area restored.

Levels of contaminants in surface water exceeded the NJSWQS in White Sand Branch between Berlin Haddonfield Road and the Burn Site fence, however only one deep sediment sample exceeded the sediment cleanup goal in this section of the creek. Sediment in this 650-foot section of White Sand Branch would undergo additional sampling during design to determine if sediment removal is needed in this section of White Sand Branch.

It is estimated that 765 cubic yards of sediment would be removed under this alternative. A minimum of five years of monitoring would be conducted to ensure that the concentration of contaminants in the sediments remain below the cleanup goals. Because no

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.

contamination would remain above unrestricted levels, five-year reviews would not be required.

EVALUATION OF ALTERNATIVES

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

Evaluation of Soil Alternatives

1. Overall Protection of Human Health and the Environment

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

Alternative 2 would protect human health by restricting access to the contaminated soil through use of institutional controls, but such controls would not be protective of ecological receptors. It also would not address the source of groundwater contamination or prevent migration of soil contaminants to the surface water.

Alternatives 3, 6 and 7, provide an increasing progression of control of contaminated soil through a combination of excavation and capping. However, alternative 3 would not completely control migration of soil contaminants at depth to groundwater since only shallow soil would be removed.

Alternative 6 and 7 would be more protective of human health and the environment than Alternative 3 because sources of groundwater contamination in deep saturated soil would be removed from the Northern Commercial Area and the Dump Site Fenced Area. A combination of removal and capping of soil under Alternatives 6 and 7, combined with institutional controls, would prevent exposure to contaminants. Although Alternative 7 removes more soil than Alternative 6, it does not remove all contaminated soil to allow for unrestricted use and as previously mentioned, institutional controls would be required.

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

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

Alternative 1 and Alternative 2 would not meet chemical-specific ARARs.

Alternatives 6 and 7 would be in compliance with chemical-specific ARARs by removing contaminated soil both in the shallow and deep zones and through capping.

Action-specific ARARs would be met by Alternatives 3 through 7 during the construction phase by proper design and implementation of the action including disposal of excavated soil at the appropriate disposal facility.

3. Long-Term Effectiveness and Permanence

Alternatives 1 and 2 would not provide long-term effectiveness or permanent protection to ecological receptors, groundwater or surface water because the soil contaminants would remain uncontrolled.

Alternative 3 does not provide as great a degree of long-term effectiveness and permanence in controlling sources of groundwater contamination when compared to Alternatives 6 and 7 because deep saturated soil contamination that acts as a source to groundwater contamination will not be removed from the Northern Commercial Area or the Dump Site Fenced Area and some contamination would be left in subsurface soil adjoining White Sand Branch.

By removing contaminants exceeding the cleanup goals from the White Sand Branch flood plain, and removing contaminated soil to a deeper depth beneath the commercial properties, Alternative 6 would achieve a greater degree of long-term protectiveness and permanence than Alternative 3. In addition, Alternative 6 would require capping on portions of the Dump Site Fenced Area and parking lots of commercial properties.

Alternative 7 offers the greatest degree of long-term permanence by removing almost all contaminants and relying the least on capping.

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

All of the soil alternatives involve removal and/or capping of soil. There is no treatment of the contaminants in any of the alternatives and therefore, no reduction in toxicity. Removal of the contaminated soil would decrease the volume of contaminants at the site and capping would decrease contaminant mobility. The excavated material would be transferred to a landfill without treatment and therefore the overall reduction of toxicity mobility or volume through treatment would not be achieved.

Alternatives 1 and 2 would not reduce the toxicity, mobility or volume of soil contaminants since no material will be removed or capped.

The amount of contamination removed or capped increases progressively from Alternatives 3 to 7. Alternative 7 would leave the least amount of contamination on the site, but would not reduce the toxicity mobility or volume of contaminants any more than the other alternatives.

5. Short-Term Effectiveness

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

Alternatives 1 and 2 do not present any short-term risks to site workers or the environment because they do not include any active remediation work.

Under Alternatives 3 through 7, potential adverse short-term effects to the community include increased traffic, noise, road closures and, at times, limited access to businesses.

Risks to site workers, the community and the environment include potential short-term exposure to contaminants during excavation of soil. Potential exposures and environmental impacts associated with dust and runoff would be minimized with proper installation and implementation of dust and erosion control measures and monitoring. Portions of the site, such as the Dump Site Fenced Area and White Sand Branch, consist of large areas of wetlands. Under Alternatives 3 through 7, it would be necessary to remove trees and vegetation as well as disrupt the small streams and associated wildlife.

Alternatives in which the largest quantity of soil is removed would have the greatest area of impact, would require the longest period of time to complete, and would have the highest potential for short–term adverse effects. Alternatives 3, 6 and 7 would take 5, 8, and 10 months respectively to complete. Among Alternatives 3 through 7, Alternative 3 would take the shortest time to achieve protection of human health and the environment and would, therefore, have the lowest potential for short-term adverse effects.

6. Implementability

Because Alternatives 1 and 2 would not entail any construction, they would be easily implemented.

Alternatives 3 through 7 have common implementability issues related to the removal of contaminated soil and installation of the caps. These include short-term traffic disruption on Route 561 and to local businesses. The amount of disruption depends on the location of the contaminated soil, the amount of soil removed and the amount of time it takes for removal.

The increased volume of soil removal associated with Alternative 6 increases the implementation difficulties compared to Alternative 3.

In Alternative 6, deep excavations to remove groundwater source areas in the Northern Commercial Area and Dump Site Fenced Area present implementability challenges, while shallow excavations on other areas of commercial properties i.e. to a depth of approximately two to four feet for soil, would be relatively less challenging. Soil removal from the commercial areas could be implemented in a phased manner to reduce disruption of businesses.

Alternative 7 presents the greatest challenges to implement because it requires removing the deepest areas of contamination. In the Northern Commercial Area excavation would extend over 20 feet in depth. In the Vacant Lot Developed Area removal of contamination would require excavation adjacent to a building to a depth 10 feet.

In general, the amount of soil to be removed and area to be capped increases from Alternatives 3 to 7. Therefore, alternative 3 is the easiest to implement and alternatives 6 and 7 would be more difficult to implement.

7. Cost

The total estimated present worth costs increase with the amount of material removed. The estimated cost are $459,000 for Alternative 2, $6,982,000 for Alternative 3, $12,016,000 for Alternative 6, and $17,619,000 for Alternative 7. Alternative 1 has no cost.

Evaluation of Sediment Alternatives

1. Overall Protection of Human Health and the Environment

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

Alternative 2 would use institutional controls to protect human health by restricting access to the contaminated sediment during the time it takes for natural recovery. However, institutional controls would not be protective of ecological receptors because they do not control access by wildlife. In addition, the amount of time to achieve natural recovery would be unacceptably long.

Alternative 3 would be protective because one foot of contaminated sediment would be removed and the remaining contaminated sediment would be capped.

Alternative 4 would be protective because sediment contamination above the cleanup goals would be removed.

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

Sediment cleanup goals are risk-based and, therefore, there are no chemical-specific ARARs. Alternatives 3 and 4 which require remedial action would comply with action and location specific ARARs that apply to remediation and filling in floodplains, work in wetland areas, waste management, and storm water management.

3. Long-Term Effectiveness and Permanence

Alternatives 1 and 2 would allow existing contamination, and ecological exposures and risks to continue while natural recovery occurs. Natural recovery alone will not reduce surface sediment concentrations to levels that are protective of ecological receptors.

The cap associated with Alternative 3 would be installed in the small streams within the Dump Site Fenced Area and White Sand Branch between Clement Lake and Berlin-Haddonfield Road. This alternative would be effective in maintaining protection of human health and the environment in the capped section of the water body. Such protectiveness would be permanent as long as the cap remains in place.

Alternative 4 would remove all sediment contamination from the small streams within the Dump Site Fenced Area and White Sand Branch between Clement Lake and the Berlin-Haddonfield Road. Alternative 4 would be more effective and have a higher degree of permanence than Alternative 3 since all contaminated sediment would be removed under Alternative 4.

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

The major contamination in sediment at the Site is due to the presence of metals. All the alternatives involve removal and/or capping of the sediment. There is no treatment of the contaminants and, therefore, no reduction of toxicity. Removal of the contaminated sediment would decrease the volume and capping would decrease the mobility of any contamination at the site. The excavated sediment would be transferred to a landfill without treatment.

Alternatives 1 and 2 would not reduce the toxicity mobility or volume of sediment contaminants. Between the two alternatives that involve sediment excavation, Alternative 3 would remove the least amount of sediment and would include sediment capping. Alternative 4 addresses the same stretch of White Sands Branch as Alternative 3, however more volume of sediment would be removed under Alternative 4 through deeper excavation.

5. Short-Term Effectiveness

Alternatives 1 and 2 do not present any short-term risks to the community, site workers or the environment because these alternatives do not include any active remediation work.

Alternatives 3 and 4 involve excavation and thus have potential for short-term adverse effects. Potential risks posed to site workers, the community and the environment during implementation of each of the sediment alternatives could be due to wind-blown or surface water transport of contaminants. Any potential impacts associated with dust and runoff would be minimized through proper installation and implementation of dust and erosion control measures. The areas would be monitored throughout the construction.

The potential risk of sediment releases could increase over the current conditions, due to removal of existing vegetation that currently minimizes sediment movement. There is little difference in the implementation time from the shortest (two months) to the longest (two and a half months three months). Therefore, Alternatives 3 and 4 are equal in terms of short-term effectiveness.

6. Implementability

Sediment Alternatives 1 and 2 would not include any construction, and therefore they would be easily implemented.

Alternatives 3 and 4 require sediment removal and face similar implementability challenges. Such challenges include access to low lying saturated areas, control of surface water flow, controlling intrusion of groundwater into excavation areas, streambed stabilization and wetland restoration.

The implementability challenges increase with the length of White Sand Branch to be remediated and volume of sediment to be removed. Alternative 3 calls for the least amount of sediment removal and therefore presents the least amount of implementability challenges among the alternatives. In contrast, Alternative 4 poses the greatest implementability challenges since it requires the largest remediation area and involves deeper removal of sediment.

7. Cost

The total estimated present worth costs of Alternatives 2, 3, and 4 are $739,000, $2,268,000 and $2,006,000. Alternative 1 has no cost.

PREFERRED ALTERNATIVE

The preferred soil alternative for cleanup of the Route 561 Dump Site is Alternative 6, Excavation, Capping and Institutional Controls. For the sediment, the preferred alternative is Alternative 4, Excavation. As discussed above, the surface water will be monitored to determine the effectiveness of the implemented soil and sediment remedies. Together, these three elements comprise EPA's Preferred Alternative.

Soil:
The Preferred Soil Alternative 6 (Figure 4) involves excavation, capping, and off-site disposal of soil. The major components of the Preferred Soil Alternative include:

- Excavation, transportation and disposal of 23,000 cubic yards of contaminated soil;
- Installation of engineering controls (asphalt caps in parking lots, vegetated soil covers in the Dump Site Fenced Area;
- Restoration and revegetation of White Sand Branch flood plain; and
- Institutional controls, such as a deed notice, to prevent exposure to residual soil that exceed levels that allow for unrestricted use.

Soil in the Northern Commercial Area and Vacant Lot Developed Area that exceed the non-residential cleanup goals, would be removed to approximately two to four feet, or deeper where utilities are located. Soil below the excavated depth, that exceed the cleanup goals, would be capped with either an impermeable cap or clean soil. Areas of unsaturated soil that exceed site specific impact to groundwater values, would receive an impermeable cap. Saturated soil at depth that are a source of groundwater contamination would be removed. Soil removal in the Northern Commercial Area is estimated to extend to 14 feet in a small area on the southern portion of the property.

Parking lots of the commercial areas where soil contamination exceeds the non-residential cleanup goals at depth would be capped with asphalt while other unpaved areas would receive a soil cap. Excavation of soil in the Dump Site Fenced Area would range from two feet, to allow for cap installation, to 12 feet in depth to achieve soil source control to groundwater.

On residential properties adjoining White Sands Branch, the first foot of soil would be excavated to meet the ecological cleanup goals and soil exceeding the residential cleanup goals would be removed to depth. Since it is anticipated that no soil exceeding the residential cleanup goals would remain on residential properties, no institutional controls would be required.

Soil Alternative 6 was chosen because it has fewer uncertainties in addressing the source areas compared to Alternative 3 and will provide an equivalent degree of protection as Soil Alternative 7.

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

The Preferred Soil Alternative would achieve cleanup goals that are protective for residential use on floodplain soils adjoining White Sand Branch but would not achieve levels that would allow for unrestricted use on commercial properties and therefore, institutional controls, such as a deed notice would be required on commercial properties. Five-year reviews would be conducted since contamination would remain above levels that allow for unlimited use and unrestricted exposure.

Sediment:
The Preferred Sediment Alternative 4 (Figure 5) includes excavation of sediment with contaminant levels greater than the cleanup goals from small streams within the Dump Site Fenced Area and the headwaters of White Sand Branch to Berlin-Haddonfield Road. The major components of the Preferred Sediment Alternative include:

- Construction of a stream diversion system to allow access to sediments;
- Excavation, transportation and disposal of 765 cubic yards of contaminated sediment;
- Dewatering and processing of excavated sediment;
- Stream bank and revegetation and restoration.

Approximately two feet of sediment would be removed from the northern, central and southern portions of the small streams within the Dump Site Fenced Area and White Sand Branch extending to the Burn Site fence. One sediment sample exceeded the sediment cleanup goal for lead in the deep sediment downstream of Berlin-Haddonfield Road and immediately upstream of the Burn Site fence. In addition, there are also exceedances of lead in sediment of White Sand Branch within the Burn Site near the fence bordering the Route 561 Dumps Site. Under Sediment Alternative 4, additional sampling during design would determine the extent of sediment excavation in this furthest downstream reach of White Sand Branch.
After remediation of sediment, the stream banks, riparian zone and wetlands would be monitored for a period of five years to assure successful restoration of these areas.

The Preferred Sediment Alternative was selected over other alternatives because it is expected to achieve substantial and long-term risk reduction through off-site disposal of sediment by reducing contaminant levels in White Sand Branch. The Preferred Sediment Alternative 4 reduces risk within a reasonable timeframe, at a cost comparable to the other alternatives and provides for long-term reliability of the remedy.

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

The Preferred Alternatives are believed to provide the best balance of tradeoffs among the alternatives based on the information available to EPA at this time. EPA believes the Preferred Alternatives would be protective of human health and the environment, would comply with ARARs, would be cost-effective and would utilize permanent solutions. The selected alternatives may change in response to public comment or new information.

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

State Acceptance

The state of New Jersey concurs with the preferred alternatives of sediment and soil removal including off-site soil disposal. However the state cannot concur with the capping and institutional control component of the preferred soil alternative unless property owners provide their consent to the placement of a cap and a deed notice.

Community Acceptance

Community acceptance of the Preferred Alternatives will be evaluated after the public comment period ends and will be described in the Decision Document. Based on public comment, the Preferred Alternatives could be modified from the version presented in this proposed plan. The Decision Document formalizes the selection of the remedy for a site that has not been listed on the National Priorities List.

COMMUNITY PARTICIPATION

EPA provided information regarding the cleanup of the Route 561 Dump Site through meetings, the Administrative Record file for the Route 561 Dump Site and announcements published in the local newspaper. EPA encourages the public to gain a more comprehensive understanding of the site and the remedial investigation activities that have been conducted at them.

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

For further information on EPA's Preferred Alternative for the Route 561 Dump Site contact:

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Table 1: Summary of Total Cancer Risks and Noncancer Hazard by Exposure Area

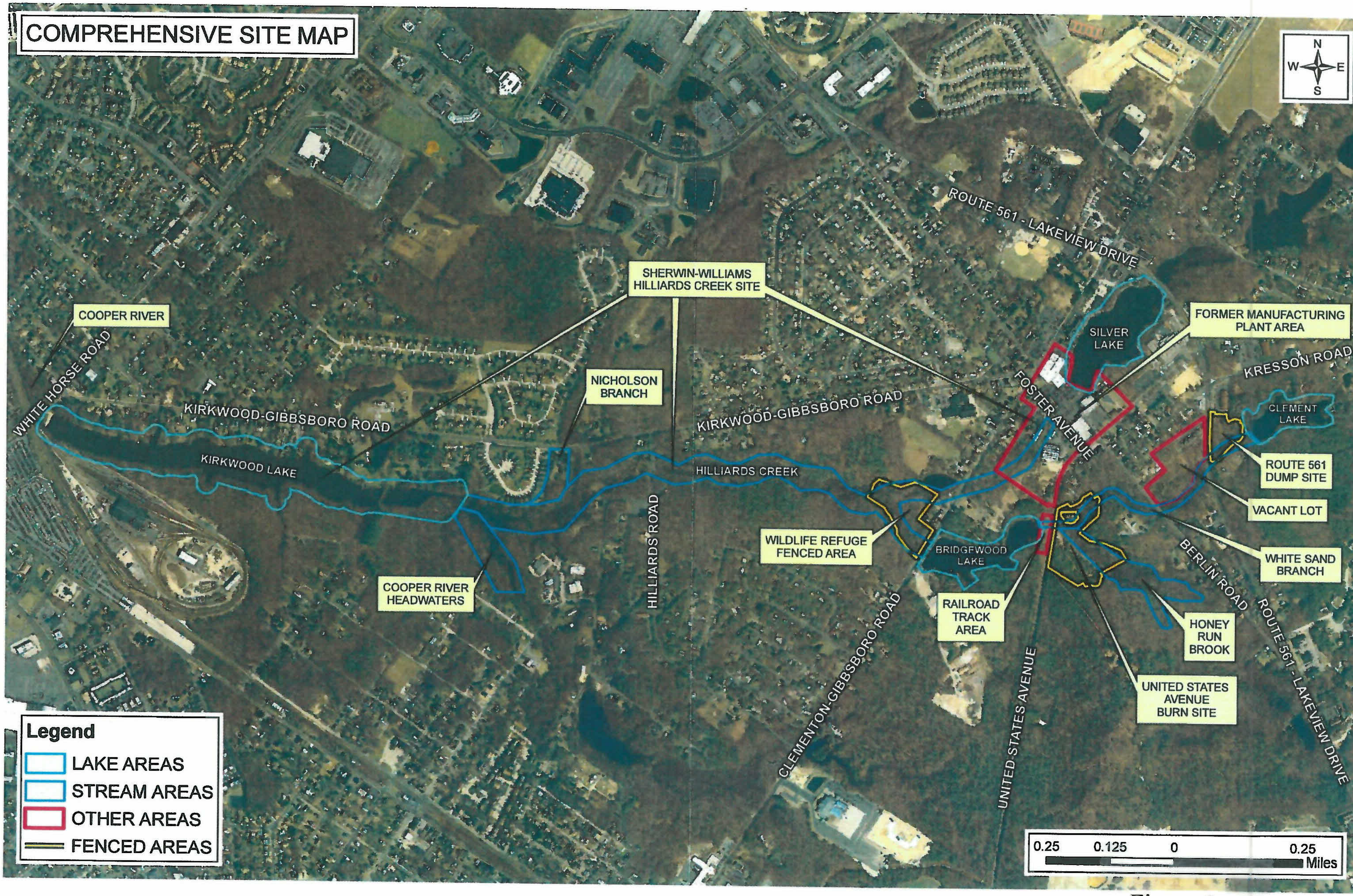
Exposure Area	Utility Worker		Construction Worker		Outdoor Worker		Resident		Adolescent Recreator		Adult Recreator	
	Cancer Risk	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index	Cancer Risk	Noncancer Hazard Index
Dump Site Fenced Area (DFA)	6.E-05	0.5	6.E-05	**13**	**7.E-04**	**6**	**1.E-03**	**44**	**6.E-04**	**12**	**1.E-03**	**8**
Eastern Dump Site (EDS)	2.E-06	0.02	2.E-06	0.4					9.E-06	0.3	1.E-05	0.2
Northern Commercial Area (NCA)	4.E-05	0.3	4.E-05	**8**	2.E-05	0.2						
Western Commercial Area (WCA)	2.E-05	0.1	2.E-05	**3**	1.E-04	0.9						
Vacant Lot* (VL)	1.E-05	0.09	1.E-05	**2**	**2.E-04**	2	**2.E-03**	**71**	1.E-04	2	**2.E-04**	1.4
Western White Sands Branch (WSB-W)							**1.E-03**	**47**	2.E-05	0.4	2.E-05	0.2

Notes:

Bold and shaded in gray- Cancer risk estimates exceeded 1 x 10^{-4} or Hazard Index of 1 (when seprated by targer organ/effect)

Blank Entries- Receptor not evaluated in this exposure area

* Risks and hazards from sediment and surface water in the Eastern portion of White Sands Branch (WSB-E) were quantitatively evaluated as part of the VL exposure area.



COMPREHENSIVE SITE MAP
N
W
E
S
ROUTE 561 - LAKEVIEW DRIVE
SHERWIN-WILLIAMS
HILLIARDS CREEK SITE
COOPER RIVER
WHITE HORSE ROAD
SILVER LAKE
FORMER MANUFACTURING
PLANT AREA
KRESSON ROAD
NICHOLSON BRANCH
FOSTER AVENUE
KIRKWOOD-GIBBSBORO ROAD
KIRKWOOD-GIBBSBORO ROAD
CLEMENT LAKE
KIRKWOOD LAKE
HILLIARDS CREEK
ROUTE 561
DUMP SITE
VACANT LOT
WILDLIFE REFUGE
FENCED AREA
BRIDGEWOOD LAKE
WHITE SAND
BRANCH
BERLIN ROAD
COOPER RIVER
HEADWATERS
HILLIARDS ROAD
CLEMENTON-GIBBSBORO ROAD
RAILROAD
TRACK
AREA
HONEY
RUN
BROOK
ROUTE 561 - LAKEVIEW DRIVE
UNITED STATES AVENUE
UNITED STATES
AVENUE
BURN SITE
Legend
LAKE AREAS
STREAM AREAS
OTHER AREAS
FENCED AREAS
0.25
0.125
0
0.25
Miles

Figure 1

Legend

- Northern Commercial Area
- Vacant Lot Developed Area
- Vacant Lot
- White Sand Branch
- Fence Boundary
- 15-Inch Diameter Culvert From Parking Lot
- Soil Cap Area
- Perennial Stream Channel
- Intermittent Stream Channel

Note
The Dump Site fence boundary on the base map was updated on June 30, 2011.

WESTON SOLUTIONS SM

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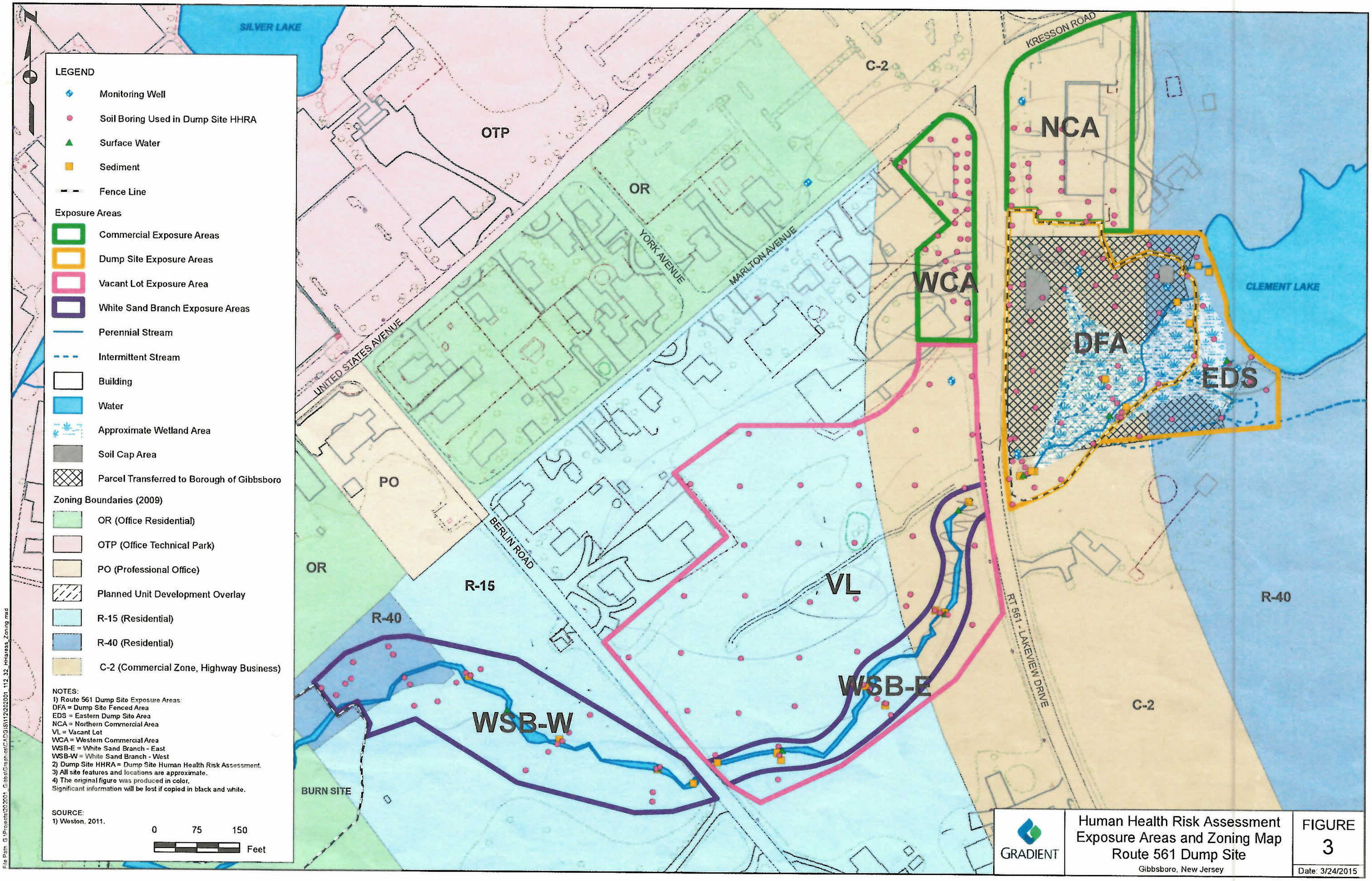
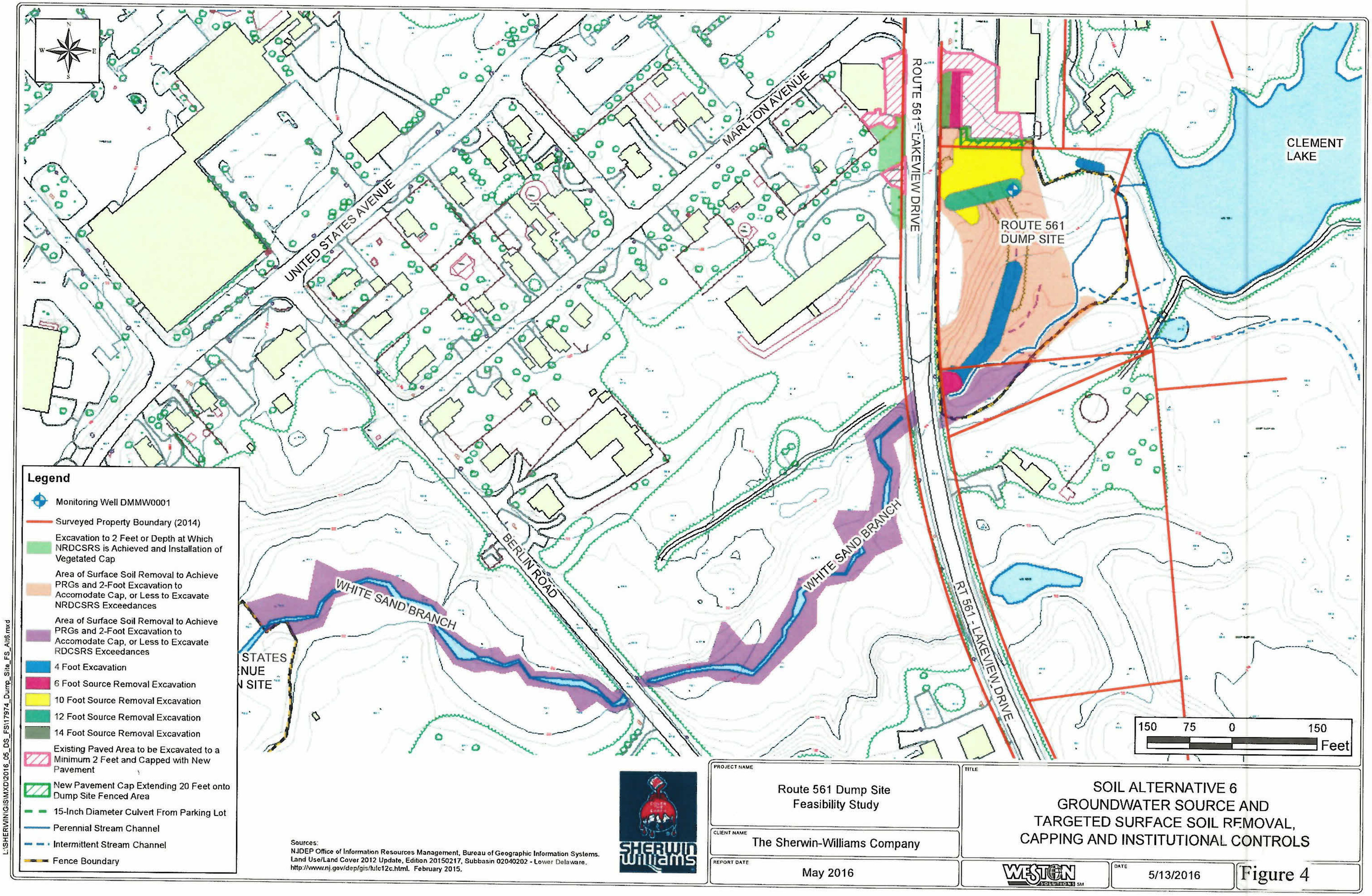
SHERWIN WILLIAMS

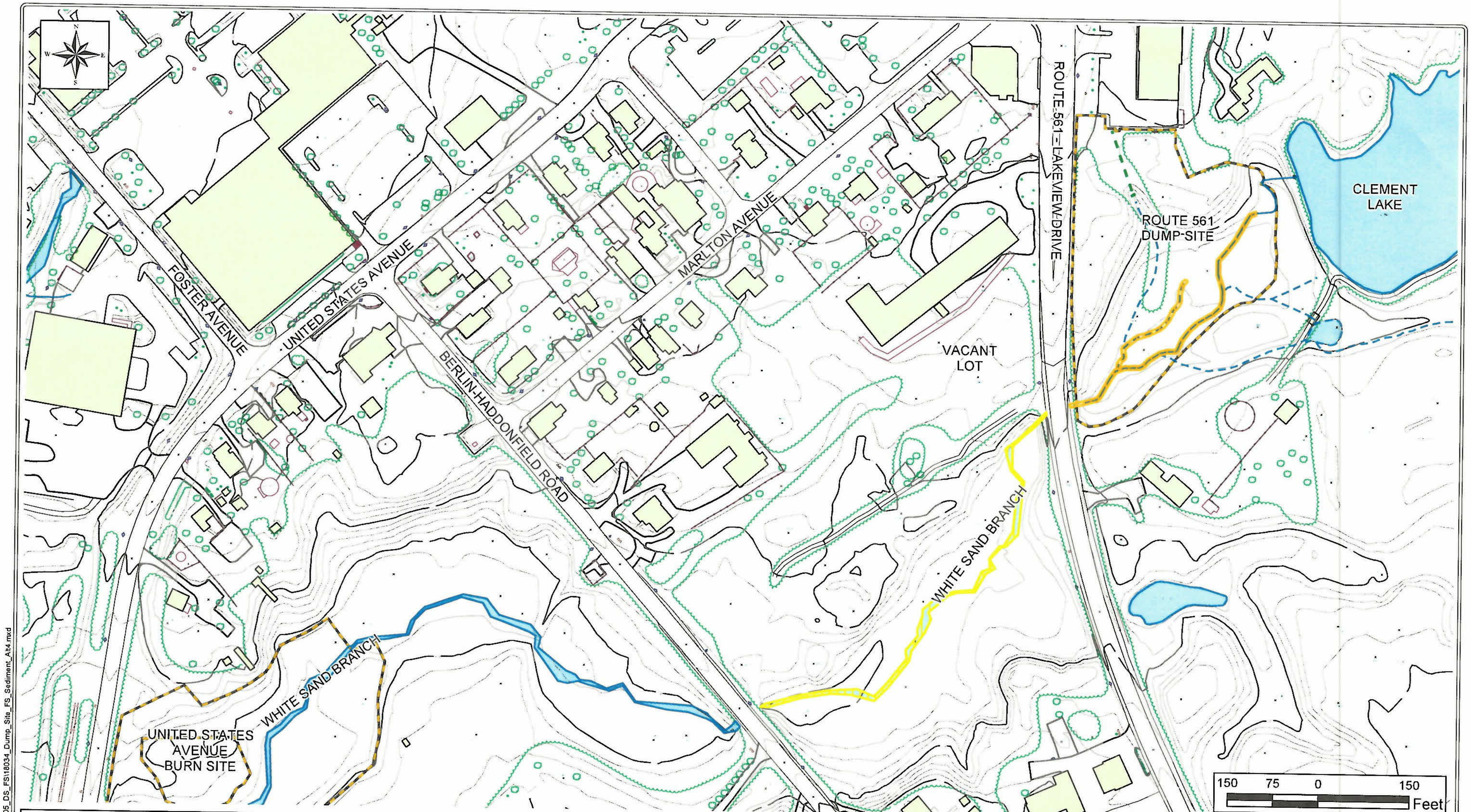
REPORT DATE	May 2016
DRAWING	17952_DS_VL_WSB_Key_Map.mxd
PATH	L:\SHERWIN\GIS\MXD\2016_04_DS_FS
REVISION No.	0
WORK ORDER No.	20076.022.083.0008
PROJECT MANAGER	S. Jones
CHECKED BY	A. Fischer
CONTRACT No.	
DELIVERY ORDER NO.	
DRAWN/MODIFIED BY	K. Heulitt
DATE CREATED	5/2/2016
CLIENT NAME	The Sherwin-Williams Company
PROJECT NAME	Route 561 Dump Site Feasibility Study
DRAWING TITLE	ROUTE 561 DUMP SITE KEY MAP
FIGURE	2
SCALE	1 " = 75 '
DATE	5/13/2016



LEGEND
Monitoring Well
Soil Boring Used in Dump Site HHRA
Surface Water
Sediment
Fence Line
Exposure Areas
Commercial Exposure Areas
Dump Site Exposure Areas
Vacant Lot Exposure Area
White Sand Branch Exposure Areas
Perennial Stream
Intermittent Stream
Building
Water
Approximate Wetland Area
Soil Cap Area
Parcel Transferred to Borough of Gibbsboro
Zoning Boundaries (2009)
OR (Office Residential)
OTP (Office Technical Park)
PO (Professional Office)
Planned Unit Development Overlay
R-15 (Residential)
R-40 (Residential)
C-2 (Commercial Zone, Highway Business)
NOTES:
1) Route 561 Dump Site Exposure Areas:
DFA = Dump Site Fenced Area
EDS = Eastern Dump Site Area
NCA = Northern Commercial Area
VL = Vacant Lot
WCA = Western Commercial Area
WSB-E = White Sand Branch - East
WSB-W = White Sand Branch - West
2) Dump Site HHRA = Dump Site Human Health Risk Assessment.
3) All site features and locations are approximate.
4) The original figure was produced in color.
Significant information will be lost if copied in black and white.
SOURCE:
1) Weston, 2011.
0
75
150
Feet
SILVER LAKE
CLEMENT LAKE
KRESSON ROAD
UNITED STATES AVENUE
YORK AVENUE
MARLTON AVENUE
BERLIN ROAD
RT 561 - LAKEVIEW DRIVE
OTP
OR
C-2
PO
R-15
R-40
BURN SITE
NCA
WCA
DFA
EDS
VL
WSB-E
WSB-W
GRADIENT
Human Health Risk Assessment
Exposure Areas and Zoning Map
Route 561 Dump Site
Gibbsboro, New Jersey
FIGURE
3
Date: 3/24/2015



CLEMENT LAKE
ROUTE 561 DUMP SITE
ROUTE 561 - LAKEVIEW DRIVE
RT 561 - LAKEVIEW DRIVE
MARLTON AVENUE
UNITED STATES AVENUE
BERLIN ROAD
WHITE SAND BRANCH
WHITE SAND BRANCH
STATES
NUE
SITE
150 75 0 150
Feet
Legend
Monitoring Well DMMW0001
Surveyed Property Boundary (2014)
Excavation to 2 Feet or Depth at Which NRDCSRS is Achieved and Installation of Vegetated Cap
Area of Surface Soil Removal to Achieve PRGs and 2-Foot Excavation to Accomodate Cap, or Less to Excavate NRDCSRS Exceedances
Area of Surface Soil Removal to Achieve PRGs and 2-Foot Excavation to Accomodate Cap, or Less to Excavate RDCSRS Exceedances
4 Foot Excavation
6 Foot Source Removal Excavation
10 Foot Source Removal Excavation
12 Foot Source Removal Excavation
14 Foot Source Removal Excavation
Existing Paved Area to be Excavated to a Minimum 2 Feet and Capped with New Pavement
New Pavement Cap Extending 20 Feet onto Dump Site Fenced Area
15-Inch Diameter Culvert From Parking Lot
Perennial Stream Channel
Intermittent Stream Channel
Fence Boundary
L:\SHERWIN\GIS\MXD\2016_05_DS_FS\17974_Dump_Site_FS_Alt6.mxd
Sources:
NJDEP Office of Information Resources Management, Bureau of Geographic Information Systems.
Land Use/Land Cover 2012 Update, Edition 20150217, Subbasin 02040202 - Lower Delaware.
http://www.nj.gov/dep/gis/lulc12c.html. February 2015.
SHERWIN WILLIAMS
PROJECT NAME
Route 561 Dump Site
Feasibility Study
CLIENT NAME
The Sherwin-Williams Company
REPORT DATE
May 2016
TITLE
SOIL ALTERNATIVE 6
GROUNDWATER SOURCE AND
TARGETED SURFACE SOIL REMOVAL,
CAPPING AND INSTITUTIONAL CONTROLS
WESTON SOLUTIONS
DATE
5/13/2016
Figure 4



Legend

- 2 Foot Excavation Depth
- 2.5 Foot Excavation Depth
- 15-Inch Diameter Culvert From Parking Lot
- Perennial Stream Channel
- Intermittent Stream Channel
- Fence Boundary

Sources:
NJDEP Office of Information Resources Management, Bureau of Geographic Information Systems. Land Use/Land Cover 2012 Update, Edition 20150217, Subbasin 02040202 - Lower Delaware. http://www.nj.gov/dep/gis/lulc12c.html. February 2015.

L:\SHERWIN\GIS\MXD\2016_05_DS_FS\18034_Dump_Site_FS_Sediment_Alt4.mxd

PROJECT NAME: Route 561 Dump Site Feasibility Study	TITLE: SEDIMENT ALTERNATIVE 4 REMOVAL OF ALL SEDIMENT WITH CONTAMINANTS GREATER THAN PRGs
CLIENT NAME: The Sherwin-Williams Company	
REPORT DATE: May 2016	WESTON SOLUTIONS — DATE: 5/13/2016 — Figure 5