Evor Phillips Leasing Company Superfund Site

Middlesex County, New Jersey

August 2008

EPA ANNOUNCES PROPOSED PLAN

This document describes the remedial alternatives considered for the contaminated soil at the Evor Phillips Leasing Company Superfund site and identifies the preferred remedy with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New Jersey Department of Environmental Protection (NJDEP). 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) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the soil contamination at the site and the associated human health and ecological risks that are summarized in this Proposed Plan are described in the December 1999 *Supplemental Remedial Investigation Report* (SRI Report) and March 2006 *Site-Specific Risk Assessment Report* (SSRA Report), respectively, and the remedial alternatives summarized in this Proposed Plan are described in the October 2006 *Focused Feasibility Study Report* (FFS Report) and August 2008 *Supplemental Feasibility Study Report for Soil* (SFS Report). EPA and NJDEP encourage the public to review all of these documents to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted at the site.

This Proposed Plan is being provided as a supplement to the above-noted documents to inform the public of EPA and NJDEP's preferred soil remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred alternative. EPA and NJDEP's preferred alternative consists of excavating four subsurface soil hot spots, excavating six discontinuous areas where contaminants in the surface soils exceed the cleanup objectives and consolidating these soils in the central portion of the site where contaminants in the surface soils exceed the cleanup objectives, off-site treatment/disposal of the excavated hot spot soil, backfilling the excavated areas, and placing a cover over the contaminated surface soils in the central portion of the site. The alternative also includes engineering and institutional controls.

MARK YOUR CALENDAR

August 18, 2008 - September 17, 2008: Public comment period related to this Proposed Plan.

September 9, 2008 at 7:00 P.M.: Public meeting at the Old Bridge Central Library, One Old Bridge Plaza, Municipal Center, Old Bridge, New Jersey.

The alternative described in this Proposed Plan is the preferred soil alternative for the site. Changes to the preferred alternative, or a change from the preferred alternative to another alternative, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected soil remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in the Proposed Plan and in the detailed analysis section of the RI/FS report because EPA and NJDEP may select a remedy other than the preferred alternative.

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NJDEP rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and this Proposed Plan have been made available to the public for a public comment period which begins on August 18, 2008 and concludes on September 17, 2008.

A public meeting will be held during the public comment period at the Old Bridge Central Library, One Old Bridge Plaza, Municipal Center, Old Bridge, New Jersey on September 9, 2008 at 7:00 P.M. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedy, and to receive public comments.

INFORMATION REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories:

Old Bridge Central Library
One Old Bridge Plaza
Municipal Center
Old Bridge, New Jersey 08857
(732) 721-5600, extension 5010

Hours: Monday - Friday, 9:30 A.M. to 9 P.M.
Saturday, 10 A.M. to 5 P.M.

New Jersey Department of Environmental Protection
Information Repository
401 East State Street, 5th Floor
Trenton, New Jersey 08625
(609) 633-1455

Hours: Monday - Friday, 8:30 A.M. to 5:00 P.M.

USEPA-Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308

Hours: Monday - Friday, 9:00 A.M. - 5:00 P.M.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

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SCOPE AND ROLE OF ACTION

In order to remediate Superfund sites, work is often divided into operable units. The first operable unit addressed the on-site groundwater as an interim action and the removal of buried drums and associated contaminated soil. The action described in this Proposed Plan represents the second operable unit for the site. The primary objectives of this action are to remediate the remaining contaminated soil at the site. The third and final operable unit for the site will address the on- and off-site groundwater.

SITE BACKGROUND

Site Description

The site, which is located in Old Bridge Township, is an unoccupied 6-acre plot of land located approximately one mile west of U.S. Route 9 and 1.5 miles northeast of U.S. Route 18 (see Figure 1, attached, for a site plan). The surrounding area is largely industrial. The site is bounded to the north and south by railroad tracks. The CPS/Madison National Priorities List (NPL) site is located approximately 800 feet southwest of the site. An oil recycling company is located to the east, a concrete and blacktop company to the northeast, a trucking company to the southeast. The Sayreville wellfield is located approximately ¼ mile west of the site and the Perth Amboy well field is located approximately one mile south of the site.

The site is zoned as Special Development (SD3), the purpose of which is to establish areas that will provide new development opportunities for large-scale service and light manufacturing uses with appropriate supporting facilities. Properties within one mile of the site include a mix of Essential Services, Residential, Environmentally Sensitive/Recreation, and SD3 properties.

Most of the buildings and facilities associated with previous site operations have been demolished and removed. Two buildings on the site support a groundwater extraction and treatment system.

The site slopes gently toward the southwest, with a slight depression in the southwestern part of the site.

A fence is located along the perimeter of the property.

Site History

The site was owned and operated by numerous entities since the early 1970s; prior to this time, little information is available. From the early 1970s to 1986, the site was used for industrial waste treatment and metal reclamation operations. Two treatment ponds were reportedly used at the site for the neutralization of acidic and caustic wastewater from 1972 or 1973 until their closure in 1975. A site operator may have been involved in waste oil recovery in 1973. Silver recovery operations, including incineration of film materials, were also conducted at the site during the 1970s and 1980s. A review of aerial photographs from the 1970s indicated the presence of drums and containers on the site, as well as two on-site impoundments which were reportedly used for wastewater neutralization. The site also contained nineteen horizontal furnaces which were used for the incineration of photographic film and printed circuit boards.

In the early 1970s, NJDEP, under a Consent Judgment, required the lessees at the site to install and operate liquid waste treatment facilities in compliance with NJDEP regulations. Due to a failure to comply with this requirement, NJDEP prohibited the use and operation of the on-site treatment ponds, and the treatment facilities were closed by NJDEP in 1975. The site was listed on the NPL in September 1983.

In 1983, the State excavated and removed from the site approximately 40 drums. Excavations performed by some of the potentially responsible parties (PRPs) from January 1996-May 1997 unearthed hundreds of buried waste containers and associated contaminated soil. From February to April 1997, EPA excavated 34 drums, approximately 300 laboratory-sized containers, and associated contaminated soil.

A remedial investigation and feasibility study (RI/FS) was conducted by the State from 1986 to 1992. The RI sampling results indicated that volatile organic compounds (VOCs), including dichloroethane and trichloroethylene (TCE), and heavy metals, such as copper, nickel, and zinc, had contaminated the groundwater. Based upon the results of the RI/FS, a ROD was signed by EPA in 1992, selecting an interim remedy which included the removal and disposal of buried drums and the extraction and treatment of the contaminated groundwater, followed by reinjection of the treated water. Subsequently, it was decided to discharge the treated water to a local wastewater treatment plant. This change was documented in a May 2002 Explanation of Significant Differences. Following negotiations with NJDEP, the PRPs provided assistance to NJDEP and its contractor in the design of the groundwater extraction and treatment system. Construction was completed by NJDEP's contractor in 1999.

An Administrative Consent Order was entered into by the State and several PRPs in 1996 related to the performance of an RI associated with the source of the contamination at the site, the demolition of the office buildings and furnaces, and the removal of buried drums and underground storage tanks. The RI effort culminated in the completion of an SRI Report in 1999.

In 2002, a number of PRPs entered into another Administrative Consent Order with NJDEP to conduct further investigation and remediation of the site. These efforts included additional investigation of the soils and the preparation of an SSRA Report in 2006 and a soil FFS Report in 2006. An SFS Report was completed by EPA in August 2008. The results of these efforts are summarized below.

It is anticipated that the ongoing groundwater investigation will be completed and a remedy decision related to the on- and off-site groundwater will be made in late 2009.

SITE HYDROLOGY/HYDROGEOLOGY

Site Hydrology

The nearest surface water bodies are the Sayreville recharge pond, which is located approximately 0.5 miles west of the site, and Pricketts Brook, a tributary to Tenants Brook. Both brooks are located approximately 1 mile to the south of the site. Tenants Brook flows to the South River, which is located approximately 2 miles to the west of the site. The nearest wetlands are associated with Pricketts Brook and the Sayreville recharge pond.

Surface water runoff from the site is limited due to the relatively flat topography, the presence of slight depressions, and the sandy soil underlying the site, which promotes infiltration of stormwater.

Site Hydrogeology

The geology at the site consists of Old Bridge Sand ranging in thickness from approximately 90 feet thick at the southwestern end of the site to approximately 120 feet at the northeastern site. Discontinuous lenses of gray clays and silty clays are also found intermittently throughout the Old Bridge Sand unit beneath the site. The unconsolidated deposits of the Old Bridge Sand at the site are predominantly composed of light-gray/light-brown, fine- to medium-grained sands; orange, yellow, brown, and light-red, fine- to coarse-grained sands; and light-brown, fine, silty sands and silts. Coarse-grained sands tend to be more prevalent in the lower half of the Old Bridge Sand unit at this site. A relatively continuous silty sand unit, less than 10 feet thick, is evident beneath the site at approximately 50- to 70-feet depths below ground surface (bgs). The top of the silty sand layer is approximately 60 feet bgs in the southwest area of the site. Anthropogenic fill material, consisting of brown/black silt, sand, gravel, and cinder/ash, is present from ground surface to depths of approximately 10 feet bgs in the middle of the site. A distinct but discontinuous silt/clay deposit (consisting of dark-gray clay up to 13 feet in thickness) is present in the mid-section of the site from approximately 15 to 30 feet bgs. The Old Bridge sand/silty sand/clay at the site is continuously underlain by gray/dark-gray clays and silts of the Woodbridge Clay confining unit. The Woodbridge Clay is an effective regional confining unit that separates the underlying Farrington Aquifer from the Old Bridge Aquifer.

Groundwater in the upper 50 feet of the saturated aquifer flows to the southwest, which is consistent with the regional flow. The hydraulic gradient gradually increases southwestward from 0.003 foot/foot at the Site to 0.005 and 0.006 foot/foot at CPS/Madison to a maximum of 0.01 foot/foot southwest of Madison.

RESULTS OF THE SOIL REMEDIAL INVESTIGATION

NJDEP has determined that although it adopted new soil remediation standards on June 2, 2008, as allowed by the regulation, "other federal or state advisories, criteria, or guidance" (which are used as "To-Be-Considered" [TBC] criteria) that are currently in place will be used for all remedial actions proposed before December 2, 2008. Two relevant TBCs are the New Jersey Soil Cleanup Criteria (SCC)[1] and EPA's Preliminary Remediation Goals (PRGs)[2].

From the late 1980s through 2005, 104 surface soil (down to a two-foot depth) samples (collected from surface soil samples and 29 borings) and 220 subsurface soil samples (collected from 38 soil borings and 73 test pits) were collected throughout the site. Based upon the results of this sampling, it has been determined that a number of constituents in the soil are at concentrations exceeding the SCC and/or PRG.

The predominant contaminants are semi-volatile organic compounds (SVOCs) and inorganics present in surface soils (two-foot depth) and subsurface soils (greater than two-foot depth) located in an approximately 1.5-acre area in the center of the site to a depth of approximately six feet and six discontinuous areas located near the eastern boundary of the site (a combined area of approximately 0.1 acres). In addition, four subsurface, unsaturated zone (above the water table) VOC hot spots were identified in the center of the site (three of the hot spots have contamination to approximately 7 feet and one hot spot has contamination to approximately 11 feet). Two of these hot spots also have elevated concentrations of SVOCs. Elevated concentrations of VOCs are not present in surface soils.

Table 1, below, summarizes the soil contaminants, the soil contaminants' maximum concentrations, and the soil contaminants' respective non-residential direct contact SCC and PRG. With the exception of arsenic, where the higher background concentration (23 mg/kg) will be used, the more stringent of the SCC or PRG will be used as the cleanup objective for each contaminant. The cleanup objectives that will be used for the site are highlighted in bold in the table.

Table 1
COMPARISON OF SOIL CONCENTRATIONS AND NON-RESIDENTIAL DIRECT CONTACT CLEANUP OBJECTIVES

Contaminant of Concern	Maximum Concentrations Detected (mg/kg)	Direct Contact SCC (mg/kg)	PRG (mg/kg)
Arsenic	74	**20**	1.6
Benzo(a)anthracene	6.9	4	**2.1**
Benzo(b)fluoranthene	19	4	**2.1**
Benzo(a)pyrene	6.5	0.66	**0.21**
Beryllium	319	**94***	6,900
Bis(2-ethylhexyl) phthalate	**190**	**210**	**120**
Copper	12,700	**600**	41,000
Hexachlorobutadiene	22	**21**	22
Lead	1,900	**600**	N/A
Methylene chloride	26	210	**54**
PCBs	6	2	**0.74**
Thallium	6.3	**2**	66
Toluene	1,300	**1,000**	46,000
Zinc	2,000	**1,500**	310,000

*Note: The SCC for beryllium is a site-specific alternative remediation criterion.

Table 2, below, summarizes the maximum soil contaminant concentrations and their protection of groundwater cleanup objectives. Three compounds, bis(2-ethylhexyl)phthalate, methylene chloride, and toluene (highlighted in bold), which are only located in the hot spots described above, exceed their respective protection of groundwater cleanup objectives.

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1 NJDEP Non-Residential Direct Contact Soil Cleanup Criteria and NJDEP Impact to Groundwater Soil Cleanup Criteria are soil remediation goals developed to be protective of commercial/industrial workers and groundwater, respectively. See *Technical Requirements for Site Remediation, Remediation Standards*, N.J.A.C. 7:26D.

2 *Regional Screening Levels for Chemical Contaminants at Superfund Sites*, EPA, May 20, 2008.

Table 2 COMPARISON OF SOIL CONCENTRATIONS AND PROTECTION OF GROUNDWATER CLEANUP OBJECTIVES		
Contaminant of Concern	Maximum Concentrations Detected (mg/kg)	Protection of Groundwater SCC (mg/kg)
Arsenic	74	N/A*
Benzo(a)anthracene	6.9	500
Benzo(b)fluoranthene	19	50
Benzo(a)pyrene	6.5	100
Beryllium	319	N/A*
Bis(2-ethylhexyl)phthalate	**190**	**100**
Copper	12,700	N/A*
Hexachlorobutadiene	22	100
Lead	1,900	N/A*
Methylene chloride	**26**	**1.0**
PCBs	6	50
Thallium	6.3	N/A*
Toluene	**1,300**	**500**
Zinc	2,000	N/A*

*Note: Impact-to-groundwater criteria for inorganics have not been developed.

SUMMARY OF RISKS ATTRIBUTABLE TO SOIL

As part of the investigation of the site, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land and groundwater uses. The baseline risk assessment includes a human-health risk assessment (HHRA) and an ecological risk assessment.

The baseline risk assessment for the site soils was conducted in 1992, prior to the interim remedial actions. To evaluate the risks after completion of the interim remedial actions, a SSRA for soil was completed in March 2006. The SSRA evaluated the conditions on the site following three removal actions, in order to determine the cancer risks and noncancer hazards associated with exposure to soils under current and likely future land use. In addition, the SSRA provides technical support for selecting a final soil remedy.

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.

The cancer risk and noncancer health-hazard estimates in the SSRA are based on current reasonable maximum exposure scenarios and were developed by taking into account various health protective estimates about the frequency and duration of an individual's exposure to chemicals selected as COPCs, as well as the toxicity of these contaminants. Cancer risks and noncancer health HIs are summarized below.

A screening-level ecological risk assessment was also conducted as part of the SSRA.

Human Health Risk Assessment

The site is currently zoned Special Development (SD3), which is a designation to establish areas that will provide new development opportunities for large-scale services and light manufacturing uses. Future land use is expected to remain the same. As was noted above, the SSRA analyzes the potential adverse human-health effects caused by exposure to hazardous substances in the absence of any actions to control or mitigate these exposures under current and likely future land uses. A four-step human health risk assessment was used for evaluation site-related cancer risks and noncancer health hazards. The steps are Hazard Identification of COPCs, Exposure Assessment, Toxicity Assessment, and Risk Characterization (for an explanation of each step, see the text box, "What is Risk and How is it Calculated").

The statistical evaluation of soil data collected at the site identified benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, arsenic, copper, lead, silver, and vanadium as COPCs. Of these, only arsenic and benzo(a)pyrene were associated with excess lifetime cancer risk estimates that exceeded the benchmark identified in the "What is Risk and How it is Calculated" text box.

The SSRA evaluated health effects that could result from exposure through direct contact with residual contamination in soils for current trespassers, and future industrial and commercial workers and construction workers. Direct contact exposures include incidental ingestion of and dermal contact with soils and inhalation of fugitive dust generated by wind and inhalation of volatiles from soil. A complete discussion of the exposure pathways and estimates of risk can be found in the SSRA in the information repository.

In the absence of any remediation or controls, the excess lifetime cancer risk for current on-site trespassers is 2×10^{-6}, with arsenic as the most significant contributor. The excess lifetime cancer risk for future industrial workers exposed to site soils is 9×10^{-6}, with arsenic and benzo(a)pyrene as the most significant contributors to the cumulative risk. Both of these values, which are associated with exposure to residual contamination, exceed the lower end of the acceptable risk range of 1×10^{-6}.

All individual noncancer HIs and the collective sum are less than unity (*i.e.,* in the acceptable range).

It should be noted that site data were also compared with the SCCs, which, as was noted above, are remediation goals developed by NJDEP to be protective of commercial and industrial workers. This comparison identified several COPCs with contaminant concentrations in soils that exceeded the SCC criteria in at least one discreet location, including arsenic, copper, lead, silver, vanadium, benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

As previously discussed, VOC concentrations in soils were identified above levels that are protective of groundwater, and residual concentrations of metals and SVOCs are also of concern. The excess lifetime cancer risks indicate that there is potential risk from direct exposure to site soils. Specifically, for commercial and industrial workers, exposure to residual contamination in soils results in an estimated excess lifetime cancer risk that exceeds the lower end of the acceptable risk range of 1×10^{-6}. In addition, the concentrations of several COPCs are in excess of the SCCs.

Vapor intrusion is not currently considered a human-health concern at the site because one of the existing on-site buildings is unoccupied and is expected to remain unoccupied and the other building, which houses the groundwater treatment system, is only occasionally occupied. Due to the potential for vapor intrusion as a result of the levels of volatile organic chemicals in the groundwater, future development at the site may require that any buildings that are constructed include an appropriate subslab depressurization system or other vapor mitigation technology to prevent any vapors from impacting indoor air.

Ecological Risk Assessment

The site is, primarily, a vacant, sandy lot with disturbed soils, which support some herbaceous plant growth with limited habitat value. Wildlife habitat and wildlife use of the site are limited, as well. Surface water features are absent from the site and the surrounding area and there are no off-site migration pathways. In order to determine whether there were potential contaminants of concern to ecological receptors, soil data were screened against the PRGs for ecological endpoints as established by Oak Ridge National Laboratory (ORNL, 1997) for food chain impacts. Further, copper and zinc were screened for phytotoxicity.

Screening of site soil data to identify contaminants of potential ecological concern (COPECs) associated with potential food chain exposures indicated that copper concentrations were greater then the most conservative criterion for the white-tailed deer and PCB concentrations were greater than the most conservative criterion for the white-footed mouse. However, a comparison of the 95% upper confidence limit results for copper and PCBs indicated average hazard quotient values (ratios of the exceedance sample result to the criterion) were well below the threshold of 1. Based upon these calculations, these COPECS are unlikely to cause ecological impacts.

The screening of copper and zinc against phytotoxicity screening values indicate that while zinc concentrations in surface soil do not appear to pose a risk to plants, copper concentrations exceed the criterion (600 mg/kg) in several locations. The spatial distribution of these elevated concentrations appears random, so potential phytotoxicity would be expected to be sporadic and limited.

Summary of Human Health and Ecological Risks

The results of the risk assessment indicate that levels of arsenic and benzo(a)pyrene detected in site soils exceed the lower end of the acceptable carcinogenic risk range for trespassers and future industrial workers. In addition, the phytotoxicity screening value for copper in site soils is exceeded.

Based upon the results of the RI and the risk assessment, EPA has determined that actual or threatened releases of hazardous substances from the site, if not addressed by the preferred remedy or one of the other active measures considered, may present a current or potential threat to human health and the environment.

REMEDIAL ACTION OBJECTIVES

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

The following remedial action objectives were established for the site:

- Prevent human and ecological contact with contaminated soils;
- Prevent migration of contaminated soils via surface water runoff and erosion; and
- Minimize or eliminate contaminant migration from soils to the groundwater.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, 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 §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the site can be found in the FS report.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

The alternatives are:

Alternative 1: No Further Action

Capital Cost:	$0
Annual Operation and Maintenance (O&M) Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no further action remedial alternative does not include any physical remedial measures (beyond those remedial and removal actions already completed) that address the soil contamination at the site.

Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative 2: Hot Spot Excavation and Containment of Contaminated Surface Soil

Capital Cost:	$543,000
Annual O&M Cost:	$5,000
Present-Worth Cost:	$605,000
Construction Time:	6 months

Under this alternative, six discontinuous areas located near the eastern boundary of the site, where contaminants in the surface soils (down to a two-foot depth) exceed the cleanup objectives (an estimated 300 cubic yards), would be excavated and consolidated in the central portion of the site where contaminants in the surface soils exceed the cleanup objectives. The actual extent of the excavation and the volume of the excavated soil would be based on pre- and post-excavation confirmatory sampling. The excavated areas would be backfilled with certified clean fill.

In addition, an estimated 600 cubic yards of contaminated subsurface soil (two VOC- and two VOC/SVOC-contaminant hot spots) would be excavated. The actual extent of the excavation and the volume of the excavated soil would be based on pre- and post-excavation confirmatory sampling. The excavated areas would be backfilled with the excavated surface soil from the discontinuous areas (see above) and certified clean fill.

All of the excavated soil from the VOC/SVOC-contaminated hot spots and any hazardous debris that is located on the surface or is commingled with the excavated soil would be characterized and transported for disposal (treatment may be required) at an off-site RCRA-compliant facility. All nonhazardous debris would be disposed of at a nonhazardous waste landfill, as necessary.

A surface cover (*e.g.*, asphalt, soil, and/or crushed stone) would be placed over an estimated 1.5 acres in the center of the site and the consolidated soils to prevent exposure to contaminants in site soils that exceed the cleanup objectives. While the nature of the surface cover would be determined during the remedial design phase[3], it would need to comply with Resource Conservation and Recovery Act (RCRA) Subtitle D permeability (*i.e.,* compaction) requirements. To be consistent with future redevelopment plans for the site, it may be necessary to expand the boundaries of the area that would be covered so as to provide an invariable surface elevation.

Before placing the surface cover over the contaminated areas, a readily-visible and permeable subsurface demarcation delineating the interface between the contaminated native soils and the cover would be installed. The covered area would be graded and seeded.

Under this alternative, institutional controls in the form of a deed notice would be used to prohibit residential use of the property and restrict any excavation below the cover unless the excavation activities and the plan for the disposition of the excavated soils are approved by EPA.

It is estimated that this effort would be completed in six months.

Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat such wastes.

Alternative 3: Excavation and Off-Site Treatment/Disposal

Capital Cost:	$6,500,000
Annual O&M Costs:	$0
Present-Worth Cost:	$6,500,000
Construction Time:	3 months

Under this alternative, an estimated 15,000 cubic yards of soil, consisting of six discontinuous areas located near the eastern boundary of the site (down to a two-foot depth) and 1.5 acres [4] in the center of the site (down to a depth of 6 feet) where contaminants exceed the human

3 For cost estimating purposes, it was assumed that the cover would consist of two feet of certified clean soil.

4 This is the same 1.5-acre area footprint that is discussed in Alternative 2.

health protection objectives would be excavated. In addition, an estimated 600 cubic yards of subsurface soil (two VOC- and two VOC/SVOC-contaminant hot spots) exceeding the threat-to-groundwater cleanup objectives would be excavated. All of the excavated soil would be transported off-site for treatment/disposal. The actual extent of the excavation and the volume of the excavated soil would be based on pre- and post-excavation confirmatory sampling. The excavated areas would be backfilled with certified clean fill, graded, and revegetated.

All excavated material, as well as any hazardous debris that is located on the surface or is commingled with the excavated soil, would be characterized and transported for disposal (treatment may be required) at an off-site RCRA-compliant facility. All nonhazardous debris would be disposed of at a nonhazardous waste landfill, as necessary.

This alternative would not require a five-year review since it would allow unrestricted use and unlimited exposure.

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely short-term effectiveness, long-term effectiveness and permanence, reduction of toxicity, mobility or volume, implementability, cost, compliance with applicable or relevant and appropriate requirements, overall protection of human health and the environment, and state and community acceptance. The evaluation criteria are described below.

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

- Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

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

- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

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

- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

- Cost includes estimated capital and operation and maintenance (O&M) costs, and net present worth costs.

- State acceptance indicates whether, based on its review of the RI/FS and Proposed Plan, the State concurs with, opposes, or has no comment on the selected remedy at the present time.

- Community acceptance will be assessed in the -ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

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

Overall Protection of Human Health and the Environment

Since Alternative 1 (no further action) would not address the risks posed through each exposure pathway, it would not be protective of human health and the environment.

Alternatives 2 and 3 would be significantly more protective than Alternative 1, in that the risk of incidental contact with waste by human and ecological receptors would be reduced by containing and/or excavating the contaminated soils.

Under Alternative 2, institutional and engineering controls would prohibit residential use of the property and limit the intrusiveness of future activity that could occur on the site.

Compliance with ARARs

NJDEP has determined that although it adopted new soil remediation standards on June 2, 2008, as allowed by the regulation, “other federal or state advisories, criteria, or guidance” (which are used as TBC criteria) that are currently in place will be used for all remedial actions proposed before December 2, 2008. Two relevant TBCs are the SCC and EPA's PRGs.

A cover is an action-specific ARAR for site closure. Therefore, only Alternative 2 would satisfy this action-specific ARAR (it is not relevant to Alternatives 1 and 3).

The cover under Alternative 2 would need to comply with RCRA Subtitle D permeability (*i.e.,* compaction) requirements.

Since Alternatives 2 and 3 would both involve the excavation of contaminated soils, they would require compliance with fugitive dust and VOC emission regulations. In addition, these alternatives would be subject to state and federal regulations related to the transportation and off-site treatment/disposal of wastes.

Long-Term Effectiveness and Permanence

Alternative 1 would not provide reliable protection of human health and the environment over time. Alternatives 2 and 3 would be more effective over the long-term than Alternative 1 because they would cover and/or remove the contaminated soil.

The institutional and engineering controls associated with Alternative 2 would provide an additional element of effectiveness in preventing exposure of human receptors to contaminated soil.

Under Alternatives 2 and 3, covering and/or excavating the contaminated soil would substantially reduce the residual risk of exposure to untreated waste on the site by isolating it from contact with human and ecological receptors. The adequacy and reliability of the cover to provide long-term protection from the waste remaining at the site should be excellent.

The cover under Alternative 2 would require routine inspection and maintenance to ensure long-term effectiveness and permanence. Routine maintenance, as a reliable management control, would include mowing, fertilizing, reseeding and repairing any potential erosion or burrowing rodent damage.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 would not actively reduce the toxicity, mobility, or volume of contaminants through treatment.

Excavation of the contaminated soils under Alternatives 2 and 3 would prevent further migration of and potential exposure to these materials. In addition, under these alternatives, if treatment of the excavated contaminated soils is necessary, these alternatives would satisfy the preference for treatment.

Short-Term Effectiveness

Alternative 1 does not include any physical construction measures in any areas of contamination and, therefore, does not present a risk to the community as a result of their implementation. Alternative 2 involves soil excavation, implementing engineering controls (subsurface demarcation), and constructing a cover. Alternative 3 involves excavating contaminated soils. While both Alternatives 2 and 3 present some risk to on-site workers through dermal contact and inhalation, these exposures can be minimized by utilizing proper protective equipment. The vehicle traffic associated with the cover construction and the off-site transport of contaminated soils could impact the local roadway system and nearby residents through increased noise level. Under Alternatives 2 and 3, disturbance of the land during construction could affect the surface water hydrology of the site. There is a potential for increased stormwater runoff and erosion during excavation and construction activities that would be properly managed to prevent excessive water and sediment loading.

Alternatives 2 and 3 would require the off-site transport of contaminated soil (approximately 40 truck loads and 1,000 truck loads, respectively), which may pose the potential for traffic accidents, which in turn could result in releases of hazardous substances.

Since no actions would be performed under Alternative 1, there would be no implementation time. It is estimated that it will take 6 months to excavate the soil hot spots and install the cap under Alternative 2 and 3 months to excavate the contaminated soil under Alternative 3.

Implementability

Alternative 1 would be the easiest to implement, as there are no activities to undertake.

Effecting institutional and engineering controls under Alternative 2 are actions that can be readily implemented. These actions are technically and administratively feasible. Excavating and relocating the contaminated soil, transporting materials to an off-site treatment/disposal facility and/or installing a cover (Alternatives 2 and 3), although more difficult to implement than the no further action alternative, can be accomplished using technologies known to be reliable and can be readily implemented. Equipment, services and materials for this work are readily available. These actions would also be administratively feasible.

Cost

The present-worth costs for Alternatives 1 through 3 are calculated using a discount rate of 7 percent and a 30-year time interval. The estimated capital, annual O&M, and present-worth costs for each of the alternatives are presented in the table below.

Alternative	Capital Cost	Annual O&M Cost	Total Present-Worth Cost
1	$0	$0	$0
2	$543,000	$5,000	$605,000
3	$6,500,000	$0	$6,500,000

As can be seen by the cost estimates, Alternative 1 (No further action) is the least costly remedy at $0. Alternative 3 (excavation) is the most costly remedy with a present-worth cost of $6,500,000. The present-worth cost for Alternative 2 (cover and hot spot excavation) is $605,000.

State Acceptance

NJDEP concurs with the preferred soil alternative.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following review of the public comments received on the various reports and the Proposed Plan.

PREFERRED ALTERNATIVE

Based upon an evaluation of the various alternatives, EPA and NJDEP recommend Alternative 2, hot spot excavation and containment of contaminated surface soil, as the preferred alternative to address the contaminated soil (see Figure 2, attached, for a description of the preferred remedy). Specifically, this would involve the following:

- Excavation of six discontinuous areas located near the eastern boundary of the site, where contaminants in the surface soils (down to a two-foot depth) exceed the cleanup objectives (an estimated 300 cubic yards). The excavated soil would be consolidated in the central portion of the site where contaminants in the surface soils exceed the cleanup objectives. The actual extent of the excavation and the volume of the excavated soil would be based on pre- and post-excavation confirmatory sampling. The excavated areas would be backfilled with certified clean fill.

- Excavation of an estimated 600 cubic yards of contaminated subsurface soil (two VOC- and two VOC/SVOC-contaminant hot spots). The actual extent of the excavation and the volume of the excavated soil would be based on pre- and post-excavation confirmatory sampling. The excavated areas would be backfilled with the excavated surface soil from the discontinuous areas (see above) and certified clean fill.

- All of the excavated soil from the VOC/SVOC-contaminant hot spots, as well as any hazardous debris that is located on the surface or is commingled with the excavated soil, would be characterized and transported for disposal (treatment may be required) at an off-site RCRA-compliant facility. All nonhazardous debris would be disposed of at a nonhazardous waste landfill.

- A surface cover (*e.g.*, asphalt, soil, and/or crushed stone) would be placed over an estimated 1.5 acres in the center of the site and the consolidated soils to prevent exposure to contaminants in site soils that exceed the cleanup objectives. While the nature of the surface cover would be determined during the remedial design phase, it would need to comply with RCRA Subtitle D permeability (*i.e.,* compaction) requirements. To be consistent with future redevelopment plans for the site, it may be necessary to expand the boundaries of the area that would be covered so as to provide an invariable surface elevation.

- Before placing the surface cover over the contaminated areas, a readily-visible and permeable subsurface demarcation delineating the interface between the contaminated native soils and the cover would be installed.

- The covered area would be graded and seeded.

- Institutional controls in the form of a deed notice would be used to prohibit residential use of the property and restrict any excavation below the cover unless the excavation activities and the plan for the disposition of the excavated soils are approved by EPA.

Due to the potential for vapor intrusion as a result of the levels of volatile organic chemicals in the groundwater, future development at the site may require that any buildings that are constructed include an appropriate subslab depressurization system or other vapor mitigation technology to prevent any vapors from impacting indoor air.

Because this alternative would result in contaminants remaining on-site above health-based levels, CERCLA requires that the site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

<u>Basis for the Remedy Preference</u>

Through off-site treatment/disposal of contaminated soils, Alternatives 2 and 3 would satisfy CERCLA's 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.

Excavating the VOC-contaminated soil hot spots under Alternatives 2 and 3 would provide the same protection to the groundwater. Although Alternative 3 would remove all of the contaminated soil that poses a threat to human health and the environment, it would provide the same level of protection as Alternative 2, which would rely upon excavation of the soil hot spots and a surface cover in combination with engineering controls and institutional controls. Alternative 3 is, however, significantly more expensive than Alternative 2. Therefore, EPA believes that Alternative 2 would effectuate the soil cleanup while providing the best balance of tradeoffs with respect to the evaluating criteria.

The preferred alternative is believed to provide the greatest protection of human health and the environment, provide the greatest long-term effectiveness, be able to achieve the ARARs more quickly, or as quickly, as the other alternatives, and is cost-effective. Therefore, the preferred alternative would provide the best balance of tradeoffs among alternatives with respect to the evaluation criteria. EPA and NJDEP believe that the preferred remedy would be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. If treatment of the VOC-contaminated soils is necessary, the preferred alternative would also meet the statutory preference for the use of treatment as a principal element.