

**Second Five-Year Review Report  
Universal Oil Products Superfund Site  
East Rutherford  
Bergen County, New Jersey**



**Prepared by:**

**United States Environmental Protection Agency  
Region 2  
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**139832**

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## **EXECUTIVE SUMMARY**

A second five-year review for the Universal Oil Products Superfund site, located in East Rutherford in Bergen County, New Jersey was completed. This review covers the final site remedy for soils, as well as an interim remedy for leachate (groundwater). Currently site soils have been remediated and the remedies are protective of the public health and the environment. Groundwater under the site is non-potable (NJDEP Class III-B) so there is not a threat to human health from any contaminants remaining in the groundwater at the site. Ongoing investigations for the adjacent surface water and wetlands will also include an evaluation of whether groundwater is impacting the surface water and groundwater.

## Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Universal Oil Products Site		
EPA ID (from WasteLAN): NJD 002005106		
Region: 2	State: NJ	City/County: East Rutherford/Bergen County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input checked="" type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input type="checkbox"/> Complete		
Multiple OUs? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Construction completion date:	
Are site related properties currently in use? <input type="checkbox"/> YES ALL <input checked="" type="checkbox"/> YES SOME <input type="checkbox"/> NO NONE <input type="checkbox"/> N/A GW		
REVIEW STATUS		
Lead agency: <input type="checkbox"/> EPA <input checked="" type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Doug Tomchuk		
Author title: Remedial Project Manager	Author affiliation: EPA	
Review period:** 09 / 28 / 2001 to 09 / 28 / 2006		
Date(s) of site inspection: 07 / 19 / 2006		
Type of review: <input checked="" type="checkbox"/> Post-SARA Statutory <input type="checkbox"/> Pre-SARA or post-SARA Policy <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> Regional Discretion		
Review number: <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify) <input type="checkbox"/> Actual RA Onsite Construction or RA Start at OU # _____ <input type="checkbox"/> Construction Completion		
Triggering action date (from WasteLAN): 09 / 28 / 2001		
Does the report include recommendation(s) and follow-up action(s)? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		
Does the remedy protect the environment? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		

\* ["OU" refers to operable unit.]

\*\* [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

## Five-Year Review Summary Form, cont'd.

### Issues, Recommendations and Follow-up Actions:

Other than recommendation No. 1, below, this report does not identify any issue or recommend any action at this site needed to protect public health and/or the environment that is not addressed by the remedy selected in the site decision documents as routinely operated, modified, maintained and adjusted over time.

1. Due to the recent construction of buildings in Area 2, a soil vapor intrusion study should be conducted to ensure that the cleanup goals remain protective for vapor intrusion.

### Protectiveness Statement:

The implemented remedy for OU-1 protects human health and the environment in the short-term by controlling the exposure pathways that could result in unacceptable risks; however, in order for OU-1 to be protective in the long-term, final institutional controls (deed notices) need to be implemented.

### Other Comments:

None.

## I. Introduction

This is the second five-year review for the Universal Oil Products Superfund site, which is located in East Rutherford in Bergen County, New Jersey. This review was conducted by U.S. Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Douglas Tomchuk. This review was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9601 et seq. and 40 C.F.R. 300.430(f)(4)(ii) and with the (*Comprehensive Five-Year Review Guidance*), *OSWER Directive 9355.7-03B-P* (June 2001). The purpose of five-year reviews is to assure that implemented remedies protect public health and the environment and that they function as intended by the decision documents. This document will become part of the site file. Reports pertinent to this five-year review are listed in Table 2 of the report.

The site has two operable units. OU1 consists of the upland portions of the site, subdivided into Areas 1, 1A, 2, and 5 (see Figure 1), and groundwater. OU2 consists of the area of the former waste lagoon, designated as Area 3, and the on-site stream channels (including Ackerman's Creek) and wetlands, designated as Area 4. Previous documents have separated Areas 3 and 4 into OU2 and OU3, respectively; however at this time they are currently being investigated together and will be addressed in one decision document.

The remedial action for OU1 was addressed in a 1993 Record of Decision (ROD), and 1998 ROD Amendment. Construction of the remedial action began in March 1996 and most of the physical construction work was completed by 1999. There are two Remedial Action Reports for OU1; one for Areas 1, 1A and 5, and the groundwater remedial action, and another for Area 2. The Area 2 Remedial Action Report recently (July 2006) had an Addendum submitted to describe remedial activities associated with the redevelopment that is taking place in Area 2. OU2 is currently under investigation.

A removal action was performed by the responsible parties with State oversight in 1990 for the lagoon (Area 3).

The UOP site is a state-lead site. The New Jersey Department of Environmental Protection (NJDEP) has overseen remedial activities at the site since 1982 under various Administrative Consent Orders. Current site work is being performed under a 1986 order.

The first five-year review was signed on September 28, 2001. This second five year review evaluates whether the remedial actions implemented at that time remain protective of human health and the environment, and provides updates on additional remedial actions that have occurred since that time and updates on the remedial investigations ongoing for OU2.

## **II. Site Chronology**

Table 1 summarizes the relevant site-related events from discovery of contamination to the writing of the second five-year review.

## **III. Background**

### **Site Location and Description**

The UOP Superfund Site consists of a 75-acre site located in the Borough of East Rutherford, Bergen County, New Jersey (Figure 1). While the site is in an urban/industrial area, a portion of the site is within the Hackensack Meadowlands District, which is administered in part by the New Jersey Meadowlands Commission. The site is divided into 6 areas (Areas 1, 1A, 2, 3, 4 and 5). Area 2 has been redeveloped, including a Lowes home center, a restaurant and a strip mall.

Nearby Berry's Creek has received contamination from the UOP site as well as other hazardous waste sites in the vicinity. Creek sediments are contaminated with mercury, polychlorinated biphenyls (PCBs) and other chemicals. Some fish in Berry's Creek and adjacent water bodies have been found to be contaminated with chemicals at levels that exceed U.S. Food and Drug Administration guidelines for human consumption. NJDEP consumption advisories are in place for several species of fish and for crabs. Berry's Creek will be the subject of further EPA and state investigations in the future.

### **Topography**

Conditions at the site are complex, and there are interactions among the site operable units and nearby Berry's Creek. The site is flat with elevations of 4 to 9 feet above mean sea level. The site is regularly subject to tidal flooding and is partly covered by a tidal salt marsh and a system of natural and artificial surface water channels. The main channel on the site is referred to as Ackerman's Creek, which drains into Berry's Creek, a tributary of the Hackensack River. Many flora and fauna are found in the vicinity of the site.

### **Geology/Hydrogeology**

Groundwater at the site exists in two units. The upper unit consists of a layer of fill on top of an organic layer called meadow mat. This unit is isolated horizontally by the on-site surface waters and is generally brackish. In 1996, in response to a petition by the PRPs, New Jersey designated this shallow aquifer at the site as Class III-B, non-potable and hydraulically connected to a saline water body. A deeper aquifer is separated from the shallow aquifer by approximately 100 feet of varved clay. The vertical hydraulic gradient in the area tends to be upward.

Because the groundwater is not considered potable, this review does not need to assess the

protectiveness of the remedy with respect to groundwater. As part of OU2, it will be evaluated whether groundwater is contributing to contamination of the wetlands and creeks in Area 4 of the site.

### **Land and Resource Use**

The UOP property is surrounded by undeveloped tidal marshes, highways, and commercial and light industrial properties. The closest residential area is approximately one-half mile to the west. The site is zoned for commercial and industrial development.

Area 2 has been redeveloped, including a Lowes, a restaurant and a strip mall. Areas 1, 1A and 5 are fenced to restrict public access. The on-site landfill in Area 5 that was constructed as part of the remediation has an additional fence. Other areas on-site with lower levels of contamination were capped with clean soil to prevent direct contact threats. Area 4 is a wetland that is relatively inaccessible due to the mud and phragmites, a common wetland plant. Area 3 is a lagoon, which is only accessible through Area 4 or along the train tracks.

The New Jersey Transit Pascack Valley Line crosses the site between Area 2 and the rest of the site. The New Jersey Sports and Exhibition Authority (NJSEA) is planning an extension of the rail line from the Pascack Valley Line to the Meadowlands Sports Complex. The rail line will cross Areas 1, 1A, 3, 4 and 5, cross over Berry's Creek, cross Walden Marsh and connect to a rail center that will be constructed at the Meadowlands Sports Complex. Construction is scheduled to begin in Fall 2006.

Groundwater is not used at the site, and the groundwater has been classified as Class III-B, which is considered non-potable because of its hydraulic connection to a saline water body. Investigations on the potential impact of site groundwater contaminants to adjacent creeks and wetlands will be included as part of the OU2 investigations.

There were no federally listed or proposed threatened or endangered species found at the site.

### **History of Contamination**

The site was developed in 1932 and was originally used as an aroma chemical laboratory. Facilities were later expanded to handle chemical wastes and solvent recovery operations. Two waste water holding lagoons were used as holding areas for the facility wastewater. UOP acquired the property and facilities in 1960. Use of the waste treatment plant and waste water lagoons ceased in 1971. All operations at the facility ceased in 1979. In 1980, all site structures were demolished except for concrete slabs and a pipe bridge over the railroad tracks. During the years of operation, both the wastewater lagoons and the routine handling of raw materials and wastes resulted in the release of various hazardous substances to the soils and shallow groundwater.



## **Initial Response**

The Universal Oil Products site was placed on the National Priorities List (NPL) on September 8, 1983.

Investigations conducted by the potentially responsible party (PRP) with state oversight, completed in May 1985, provided sufficient information for NJDEP to direct the PRPs to perform a removal action for contamination at the waste lagoons (Area 3). Contaminated media in the lagoons included water, waste sludges, and sediments. The removal action was conducted in 1990 by the PRP with state oversight pursuant to a May 23, 1986 Administrative Consent Order (ACO). The ACO required excavation of all contaminated materials comprising the two waste lagoons, and disposal of the materials off site. The lagoons were dredged or excavated to the underlying clay. No backfill was placed. This action was completed in August 1990.

## **Basis for Taking Action**

The site was included on the NPL in 1983. A Remedial Investigation and Feasibility Study found that soils at the site were contaminated with polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and lead, and that the groundwater at the site was contaminated with VOCs.

## **Contaminants**

The groundwater on the site was found to be contaminated with various VOCs, including benzene, chlorobenzene, 1,2-dichloroethene, trichlorethene, 1,1,2,2-tetrachloroethane and toluene. The maximum concentration of total VOCs in groundwater was 210 parts per million (210 ppm). The soil was contaminated primarily with PCBs, PAHs, VOCs and lead. Maximum concentrations found on site were: greater than 2,000 ppm PCBs, 1,474 ppm PAHs, 2,108 ppm total VOCs, and 14,100 ppm lead.

## **IV. Remedial Actions**

### **OU1 Remedy Selection**

#### **Operable Unit One - Upland soils and leachate**

OU1 includes the upland areas of the UOP site (i.e. Areas 1, 1A, 2, and 5; see Figure 1). OU1 addresses contaminated soils and groundwater in upland areas. OU1 was addressed in a September 1993 ROD, a 1998 ROD Amendment and a 1999 Explanation of Significant Differences, as explained below. The 1993 ROD addresses all known soil contamination and contaminated groundwater (termed "leachate" in the ROD) in the upland areas of the UOP site. However, because part of the OU1 soil remedy calls for on-site containment, upon completion of

the remedy, the ROD requires a determination whether the remedy is protective of surface water and sediment quality in waterbodies adjacent to OU1 (i.e., Ackerman's Creek), and groundwater. Therefore, the remedy is considered an interim remedy.

The interim remedy selected for OU1 and documented in the September 1993 ROD consisted of the following:

For PCB/PAH-contaminated soils:

- The ROD requires the excavation and on-site treatment by thermal desorption of approximately 6,800 cubic yards of highly contaminated soil. Contaminated soils with PCB concentrations greater than 25 ppm or PAH concentrations greater than 29 ppm must be treated to below 10 ppm PCB and below 20 ppm PAH, placed on site, and covered. Soil cover must be at least 2 feet in depth.
- The ROD requires soil cover for contaminated soils with PCB concentrations less than 25 ppm (4.9 acres). All soils above remediation goals (Table 1) must be covered. Soil cover must be at least 2 feet in depth.
- The ROD requires institutional controls (deed restrictions) to prevent direct contact with remaining contamination.

For VOC-contaminated soils:

- The ROD requires excavation and on-site treatment by thermal desorption of approximately 7,000 cubic yards of soil with VOC concentrations above remediation goals, and placement of treated soils on site.

For lead-contaminated soils:

- The ROD requires soil cover/impermeable cap (3.7 acres) for all soil above remediation goals.
- The ROD requires institutional controls (deed restrictions) to prevent direct contact with remaining contamination.

For VOC-contaminated leachate (groundwater):

- The ROD requires leachate collection from trenches and pits; on-site treatment of an estimated 5.6 million gallons of leachate; and discharge of treated effluent to groundwater. Remediation goals are shown in Table 1.

The remedial action described in the ROD addresses all known soil contamination, and leachate that serves as a source of groundwater contamination in the OU1 upland areas. As discussed above, the selected remedial alternative for OU1 is considered to be an interim remedy: a final action for groundwater will be selected after the effectiveness of the OU1 remedy is evaluated.

The 1993 remedy was amended in 1998 due to inefficiencies in the operation of the thermal desorption unit. This unit was also the source of odor complaints from workers at an adjoining property. A December 1998 ROD Amendment called for the excavation and off-site disposal of soils remaining on the site with PCB/PAH concentrations above the remediation goals. Soil with

PCB levels at or above 50 ppm would be sent to a TSCA landfill and soils with PCB levels above 2 ppm and below 50 ppm would be sent to a RCRA Subtitle D landfill.

In addition, an Explanation of Significant Differences (ESD) in April 1999 changed the remedy technology for VOC-contaminated soils from thermal desorption to Thermally Enhanced Vapor Extraction (TEVE).

The PRP proposed several adjustments to the remedy, including lowering the thermal treatment goal for PCBs to less than 2 ppm, and placement of all treated materials beneath a multimedia cap. As these would provide additional protection, they were accepted by NJDEP and EPA.

A seep/sewer investigation determined that relatively high levels of VOCs were present in the on-site sewer system and were discharging to Ackerman's Creek. Therefore, NJDEP required, in addition to the remedial action specified in the ROD, that all sewers be cleaned of sediment or removed. Site storm water is regulated under NJDEP Authorization to Discharge Storm Water (NJ0088323), dated August 17, 1995.

### **OU1 Remedy Implementation**

Remedial construction under the 1993 ROD began in 1996. As of the date of the December 1998 ROD amendment, approximately 8,200 tons of the 14,400 tons of PCB/PAH contaminated soil on the site had been treated by thermal desorption. The soil that was treated, as well as less contaminated PCB/PAH soil, was placed on site in a containment area along with lead-contaminated soil. The on-site containment area is located primarily in Area 5 of the site.

Because of the problems with the thermal desorption system, the PRP chose to investigate other treatment options for the VOC-contaminated soils. In June 1998, a pilot test was conducted on the remaining 2,000 cubic yards of VOC-contaminated soil using a TEVE system. Final soil sample results demonstrated that TEVE successfully treated the VOC-contaminated soils to the remediation goals.

Remedial Action Reports addressing OU1 were submitted by the PRP in November 1997, for Area 2, and in August 2000, for Areas 1, 1A and 5 (See Figure 1).

The Remedial Action Report for Area 2 documented work completed including excavation of approximately 9,300 cubic yards of PCB/PAH contaminated soil and approximately 300 cubic yards of VOC contaminated soil; thermal treatment of approximately 4,000 cubic yards of excavated soils; placement of excavated soils above remediation goals but below thermal treatment goals within the on-site multi-media containment area; installation of groundwater collection trenches and collection and treatment of approximately 2 million gallons of groundwater. NJDEP and EPA found several deficiencies in the implementation of the remedial action, which the PRP was required to address. Among these were findings of high PCB levels in post-excavation soil samples along the railroad right-of-way, requiring further delineation, excavation, and off-site disposal. In September 2001, the PRP submitted a revised Remedial

Action Report for Area 2 which addressed the actions it took in response to the NJDEP and EPA concerns.

According to the Remedial Action Report for Areas 1, 1A and 5, work completed includes: excavation of approximately 27,000 cubic yards of soils primarily contaminated with PCBs and PAHs, approximately 13,000 cubic yards of VOC-contaminated soil, and 15,000 cubic yards of lead-contaminated soil; thermal treatment of approximately 10,500 cubic yards of excavated soil; installation of groundwater collection trenches and collection and treatment of approximately 4.8 million gallons of groundwater; placement of excavated soils above remediation goals but below thermal treatment goals within the on-site multi-media containment area; and, construction of the multi-media cap over excavated soils. The Remedial Action Report for Areas 1, 1A, and 5 has not been approved pending resolution of questions with respect to the groundwater remedy.

As a result of the requirements resulting from the seep/sewer investigation, all process, sanitary and storm sewers on site were cleaned or excavated. All manholes were sealed. Sediment removed from all sewers, as well as all excavated materials, were placed within the on-site containment area. As necessary to meet remediation goals, sediments were thermally treated along with the excavated upland soils prior to placement in the containment area.

Under the interim remedy, the site will be kept secure and hazardous substances at the site will be contained and prevented from leaving the properties via engineering controls, including the cap. According to the Remedial Action Reports, all upland site perimeters are enclosed by a security fence. Access to the site via the unfenced portion of the site perimeter is limited by the marshes and tidal channels. In addition, the containment area is enclosed by a fence to prevent unauthorized access. A monitoring program was implemented to determine the effectiveness of the remedy. Information pertaining to the monitoring is included in the Remedial Action Reports. Further investigation will be necessary to determine remedial actions necessary for the remaining portions of the UOP site (see below). The interim remedy is designed to provide protection of human health and the environment through on-site containment of wastes. The aquifer is designated as Class III-B, and is unsuitable for drinking. The NJDEP requires approval of water supply wells and will not allow groundwater on the site to be used as a drinking water supply. NJDEP has required the establishment of deed notices for areas of the site where contamination remains.

### **OU 1 Operation and Maintenance**

Honeywell conducts routine maintenance of the site including mowing and grubbing the capped area, and filling any areas that may show signs or erosion or rodent holes. Inspections are conducted quarterly and include the capped area, drainage structures, security fences and locks, monitoring wells, and concrete foundation caps. There are no process operations currently ongoing.

## **V. Progress Since the Last Review**

A major portion of the work on the UOP site occurred prior to the previous five-year review. After a lengthy review/revision process on the work plan for Area 4 sampling, which was nearing completion, Honeywell changed its approach to include a better understanding of the hydrological processes taking place in the wetlands and surface water prior to chemical sampling. This work was started in 2005. The remainder of the RI/FS work was then planned for 2006. That work was later divided into work that would be conducted prior to the construction of the rail line to the Meadowlands Sports Complex, and work that would be conducted subsequent to that construction (after Fall 2006). Data collection for OU2 will continue into 2007.

Concurrent with Honeywell's OU2 remedial investigations, NJSEA has worked with NJDEP, EPA and other interested parties to develop an Interim Remedial Measure Work Plan to address soil contamination near the planned railroad right-of-way. Prior to approving the Interim Remedial Measure Work Plan for the construction of the railroad across the UOP property, data was collected to evaluate the contaminant levels that would be within the railroad right-of-way. In areas where contamination was present, NJSEA would be required to remove soil or sediment to the clean clay layer that is located approximately 4 feet below the ground surface. Construction for the rail line should begin in Fall 2006.

The UOP site is contained within the Berry's Creek Study Area, which is a separate but related CERCLA study. Notice letters were sent out in March 2006 for the Berry's Creek Study Area to a group of PRPs, related to the performance of an RI/FS for Berry's Creek. Negotiations are underway.

## **VI. Five-Year Review Process**

### **Administrative Components**

The five-year review team consisted of Douglas Tomchuk (EPA-RPM), Ed Modica (EPA-Hydrogeologist), Michael Sivak (EPA-Risk Assessor), Dave Kluesner (Community Involvement Coordinator) and Gwen Zervas (NJDEP Project Manager).

### **Community Notification and Involvement**

EPA notified the community of its initiation of the five-year review process by publishing a notice in the Newark Star-Ledger on August 7, 2006. The notice indicated that EPA would be conducting a five-year review of the remedy at the Universal Oil Products Site to ensure that the remedy remains protective of public health and is functioning as designed. The notice included the RPM's address and telephone number for questions related to the five-year review process. In addition, the notice indicated that once the five-year review was completed, the results would be made available to the public at the following locations:

East Rutherford Municipal Building  
1 Everett Place  
East Rutherford, NJ 07073

East Rutherford Memorial Library  
143 Boiling Springs Avenue  
East Rutherford, NJ 07073

The RPM did not receive any comments in response to the August 7, 2006 notice that was placed in the Star Ledger.

### **Document Review**

A list of the documents that were reviewed in the preparation of this review can be found in Table 2.

### **Data Review**

*Sediments and Surface Water:* Most of the chemical data since the last five-year review was collected as part of the Meadowlands railroad project. These data have not been included in this five-year review for OU1 because they are primarily from locations in Areas 3 and 4, which are part of OU2.

*Soil:* Soil data collected for the site has primarily been associated with the redevelopment of Area 2. The soil was removed if it was geotechnically unsuitable, or may have been contaminated based on odor or photoionization detector readings. The soil was later sampled for proper disposal, as either hazardous or non-hazardous waste. The data is summarized in the Addendum to the Remedial Action Report for Area 2, July 2006.

*Groundwater:* Groundwater data was collected prior to the abandonment and removal of wells and collection trenches that occurred during the development of Area 2. The data is provided in the Technical Letter Report for Groundwater Sampling and Well Abandonment Activities, Area 2, April 2005. No concentrations of site contaminants of concern were found to exceed the NJDEP Surface Water Quality Standards.

### **Site Inspection**

A site inspection related to the five-year review was conducted on July 19, 2006. Those in attendance included: Douglas Tomchuk (EPA-RPM); Michael Sivak (EPA-Risk Assessor); and Ed Modica (EPA- Hydrogeologist).

Activities included a walk and/or drive through of the site, including the redeveloped portion (Area 2), Areas 1 and 1A, visual inspection of the landfill and stockpiles in Area 5 and the lagoon (Area 3). Area 4 was viewed from Area 2, the railroad tracks and Murray Hill Parkway.

## **Interviews**

EPA Region 2 staff met with the NJDEP project manager, Gwen Zervas, NJDEP technical coordinator, Steve MacGregor, the Honeywell project manager Rich Galloway, and the Honeywell consultants Kate Cole and Andy Hopton of CH2MHILL during the site visit. No formal interviews were conducted for this review.

## **VII. Remedy Assessment**

### **Question A: Is the remedy functioning as intended by the decision documents?**

The remedial objectives as set forth in the 1993 ROD addressed contaminated soils and sewer sediment in Areas 1, 1A, 2, and 5 through thermal desorption for highly contaminated soils, soil cover for less contaminated soils, and institutional controls. Specifically, the ROD stipulated that soils highly contaminated with PCB and carcinogenic PAHs (cPAHs) were to be excavated and treated on-site by thermal desorption. The ROD allowed for successfully treated PCB/cPAH-contaminated soils to be returned to excavations as backfill. (A 1998 ROD amendment changed the remedy for PCB/cPAH-contaminated soils from on-site thermal treatment to off-site disposal.) Soils contaminated at levels greater than those stipulated in the remedial goals but less than the thermal treatment goals were to be placed under a cap. Soils that were highly contaminated with VOCs were excavated and stockpiled for thermal treatment. Soils contaminated with VOCs at levels greater than the remedial goal but less than thermal treatment goal placed on site and covered. Lead-contaminated soils were placed beneath a cap. Engineering controls (capping and fencing) were installed to prevent contact with surficial soils.

Groundwater contaminated by leaching of surface water through VOC-contaminated soil in Areas 1, 1A, and 2 (referred to as leachate in the ROD) was collected and treated on-site. The ROD provided for an interim remedy for groundwater that would treat a specified amount of groundwater. An aggregate quantity of approximately 5.6 million gallons of shallow groundwater was collected in a series of collection trenches and treated at an on-site temporary water-treatment facility. Subsequent to the ROD, the shallow groundwater encompassing the Site was designated as a Class III-B aquifer (non-potable and hydraulically connected to saline water body). The primary consequence of the groundwater reclassification was to remove drinking water standards from the list of site Applicable or Relevant and Appropriate Requirements (ARARs). However, the receptor of site groundwater is Berry's Creek by way of tidally influenced Ackerman's Creek. Consequently, in 1996, discharge limits used during the remedial action were established that were protective of nearby surface water bodies.

With respect to the protectiveness of the remedy, the cap appears to be in good working order and functioning as designed; the integrity of the cap material does not appear to have been compromised. Infiltration of recharge into contaminated soil beneath the cap is largely impeded by the relatively impermeable geosynthetic clay liner and drainage swales designed into the cap.

Furthermore, as discussed in question C, additional removal of contaminated soils, adherence to stricter thermal treatment goals, and replacement of excavated material with clean backfill are measures that enhanced the protectiveness of the remedy. Accordingly, soils contaminated with unacceptable levels of PCBs, PAHs, and lead are contained by a cap and controlled by engineering controls that prevent contact with surficial contamination.

It is not clear if surface water bodies in the Site area are fully protected from groundwater potentially contaminated by leachate beneath cap or from possible residual contamination remaining that may have remained in soils or groundwater (see response to Question C). Groundwater data is needed to demonstrate that the levels of contamination in the shallow groundwater are acceptable in the area downgradient of the former water treatment plant, the cap, and the backfilled areas. As discussed previously, the OU2 RI/FS plans to address this question.

**Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?**

The baseline human health risk assessment was conducted in 1989. Since it is likely that some exposure assumptions and toxicity data have changed since that time, this Five Year Review focused on evaluating the cleanup levels to determine whether or not they remain protective of human health. Table 3 shows the cleanup goals identified in the 1993 ROD. The only cleanup goal for soil contaminants that has changed is the goal for 1,1,2,2-tetrachloroethane (1,1,2,2-TCA). As presented in the table, the soil cleanup goal is 21 mg/kg. Currently, the New Jersey Soil Cleanup Criteria for 1,1,2,2-TCA are 70 ppm for nonresidential direct contact and 1 ppm for impact to groundwater, which is less than the current cleanup goal. However, if 1,1,2,2-TCA is not detected in the groundwater, the cleanup goal may be considered protective pending the results of the OU2 RI/FS. All other soil cleanup goals remain protective.

Groundwater cleanup goals identified in the 1993 ROD are 10 mg/l for total VOCs and 1 mg/l for individual VOCs. According to Chapter 7:9C of the New Jersey Ground Water Quality Standards under N.J.S.A 58:10A-1 et seq. and 58:11A-a et seq., groundwater quality criteria for Class III-B waters "shall be determined on an area by area basis in response to case by case needs, in the context of applicable regulatory programs. In each case, the criteria shall be no more stringent than necessary to ensure that there will be no: 1. Impairment of the existing uses of ground water; 2. Resulting violation of Surface Water Quality Standards; 3. Release of pollutants to the ground surface, structures or air in concentrations that pose a threat to human health; and 4. Violation of constituent standards for downgradient classification areas to which there is a significant potential for migration of ground water pollutants." With consideration of the shallow depth to groundwater, the redevelopment of Area 2, and the current information associated with vapor intrusion from groundwater contamination, the cleanup goals for VOCs are likely to require additional review to ensure that the cleanup goals remain protection (see Section VIII, Recommendations).



**Questions C: Has other information come to light that could call into question the protectiveness of the remedy?**

During the implementation of the remedy, proposed modifications to ROD-specified soil excavation quantities and treatment goals have been adopted. These changes are expected to have a positive impact on the protectiveness of the remedy because more contaminated material was removed from the Site and because treatment goals were rendered more stringent and more protective:

Volumes of excavated soil exceeded the estimated volumes set forth in the ROD because the mass excavation of lead impacted soil increased as a result of changes in the cap profile, because storm and process sewers were abandoned by excavating the soils around the sewers and down to confining clay, and because mass excavation of PCB/cPAH increased as a result of post-excavation chase in Areas 1, 1A, and 5.

In 1997, the PRP proposed that successfully treated PCB/cPAH soils would not be used as on-site backfill but be placed beneath the cap or disposed off-site. Excavations were backfilled with imported clean fill. Additionally, the thermal treatment goal for total PCBs was lowered to <2 ppm (compared to <10 ppm as stated in the ROD) and 7 individual cPAH thermal treatment goals were established in addition to the 20 ppm goal for total cPAHs.

Beginning in 2005, beneficial use and development activities in Area 2 have resulted in the removal of approximately 50,000 cubic yards of soil and replacement with clean structural fill. An additional impervious cover is to be provided to the soils by additional soil, asphalt, and concrete capping.

According to the Remedial Action Report for Areas 1, 1A, and 5, soil excavation was stopped when wetlands were encountered that were not part of the excavated areas delineated in the ROD. PCB, cPAH, and/or lead contamination were present in multiple post-excavation samples adjacent to the wetlands. These results raised the concern that OU1 areas adjacent to the wetlands may be or may have been re-contaminated by tidal flooding. Consequently, contamination in areas excavated as part of OU1 remediation adjacent to wetlands (Area 4) should be delineated and further remediated as necessary as part of the OU2 RI/FS effort.

According to the ROD, the Interim Remedy for groundwater was designed to protect the surface water of Ackerman's Creek; however, shallow groundwater samples taken to monitor site groundwater showed contamination levels above delineation criteria established in the ROD at the end of monitoring period, and that some VOCs, PCBs and lead exceeded surface water quality standards in site groundwater. Thus, investigations conducted as part of the OU2 RI/RS should address site-wide groundwater quality.

As stated in the response to Question B, the redevelopment of Area 2 has introduced commercial buildings to the site. It is not known if the cleanup goals for groundwater would be protective for site-specific vapor intrusion. For example, generic groundwater screening concentrations for 1,1,2,2-TCA range from 0.004 mg/l ("New Jersey Vapor Intrusion Guidance", NJ DEP, October

2005) to 0.112 mg/l ("Evaluating the Vapor Intrusion into Indoor Air", EPA 530-F-02-052) November 2002), while the groundwater cleanup goal is 1 mg/l. Additional information should be collected to ensure that these goals remain protective (see Recommendations).

### **Technical Assessment Summary**

This review addresses only OU-1. The remedy for OU-1 is an interim remedy that treated contaminated soil, removed contaminants off-site or contained those contaminants on-site. This review finds that the contaminants that remain on-site are covered, surface soils are suitable for unrestricted human and environmental exposures and areas with sub-soil contamination are fenced. The implemented remedy is functioning as intended by the decision documents.

### **VIII. Recommendations and Follow-Up Actions**

Other than recommendation No. 1, below, this report does not identify any issue or recommend any action at this site needed to protect public health and/or the environment that is not addressed by the remedy selected in the site decision documents as routinely operated, modified, maintained and adjusted over time.

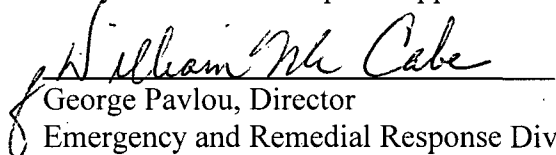
1. Due to the recent construction of buildings in Area 2, a soil vapor intrusion study should be conducted to ensure that the cleanup goals remain protective for vapor intrusion.

### **IX. Protectiveness Statement**

The implemented remedy for OU-1 protects human health and the environment in the short-term by controlling the exposure pathways that could result in unacceptable risks; however, in order for OU-1 to be protective in the long-term, final institutional controls (deed notices) need to be implemented.

### **X. Next Review**

The third five-year review for the OU1 should be completed before September 2011, which is five years from this report's approval date.

  
George Pavlou, Director  
Emergency and Remedial Response Division

9-29-06 Date

**Table 1**  
Chronology of Site Events

Event	Date
Trubeck Laboratories developed the uplands portion of the site and operated an aroma and fragrance laboratory there.	1932 to 1979
Trubeck began operating a solvent recovery facility	1955
Trubeck constructed a wastewater treatment plant	1956
Started to utilize two on-site wastewater lagoons	1959
Universal Oil Products (a division of Signal Companies) acquired the property and facilities	1963
The wastewater treatment plant and wastewater lagoons ceased operations	1971
All remaining operations at the facility were closed	1979
UOP became a division of the Signal Companies	1979
All structures, except for the concrete building slabs and the pedestrian bridge across the NJ Transit tracks, were demolished	1980
The UOP site was added to the National Priorities List (NPL)	1983
An Administrative Consent Order (ACO) was issued by NJDEP for conducting investigations at the UOP site	1983
Allied Corporation merged with Signal Companies to form AlliedSignal	1984
A second ACO was issued for completing investigations and to conduct a feasibility study	1986
EPA released the Record of Decision of OU1 which addressed uplands soils and leachate. Called for thermal desorption for highly contaminated soils and placement of those treated soils into an onsite cap. Soil cover for less contaminated soils, collection and treatment of leachate (groundwater).	1993
ROD Amendment released by EPA. Treatment option for PCB/PAH contaminated soils was changed from vapor extraction to off-site disposal	1998
Pilot studies were conducted on treating VOC contaminated soils with thermally enhanced vapor extraction	1998

Event	Date
EPA issued an Explanation of Significant Differences which changed the treatment for VOC contaminated soils from thermal desorption to thermally enhanced soil vapor extraction.	1999
AlliedSignal became Honeywell International, Inc.	1999
First five-year review was issued.	2001
NJDEP approved completion of remedial activities for Area 2.	2004
Development of Area 2 initiated. Construction of home center, restaurant and strip mall. During construction, approximately 50,000 cubic yards of contaminated material was excavated and disposed of off-site or stockpiled predominantly on Area 5.	2005
Soil originally from Area 2, stockpiled on-site, being taken away for off-site disposal.	2006

**Table 2**

*Documents Reviewed:*

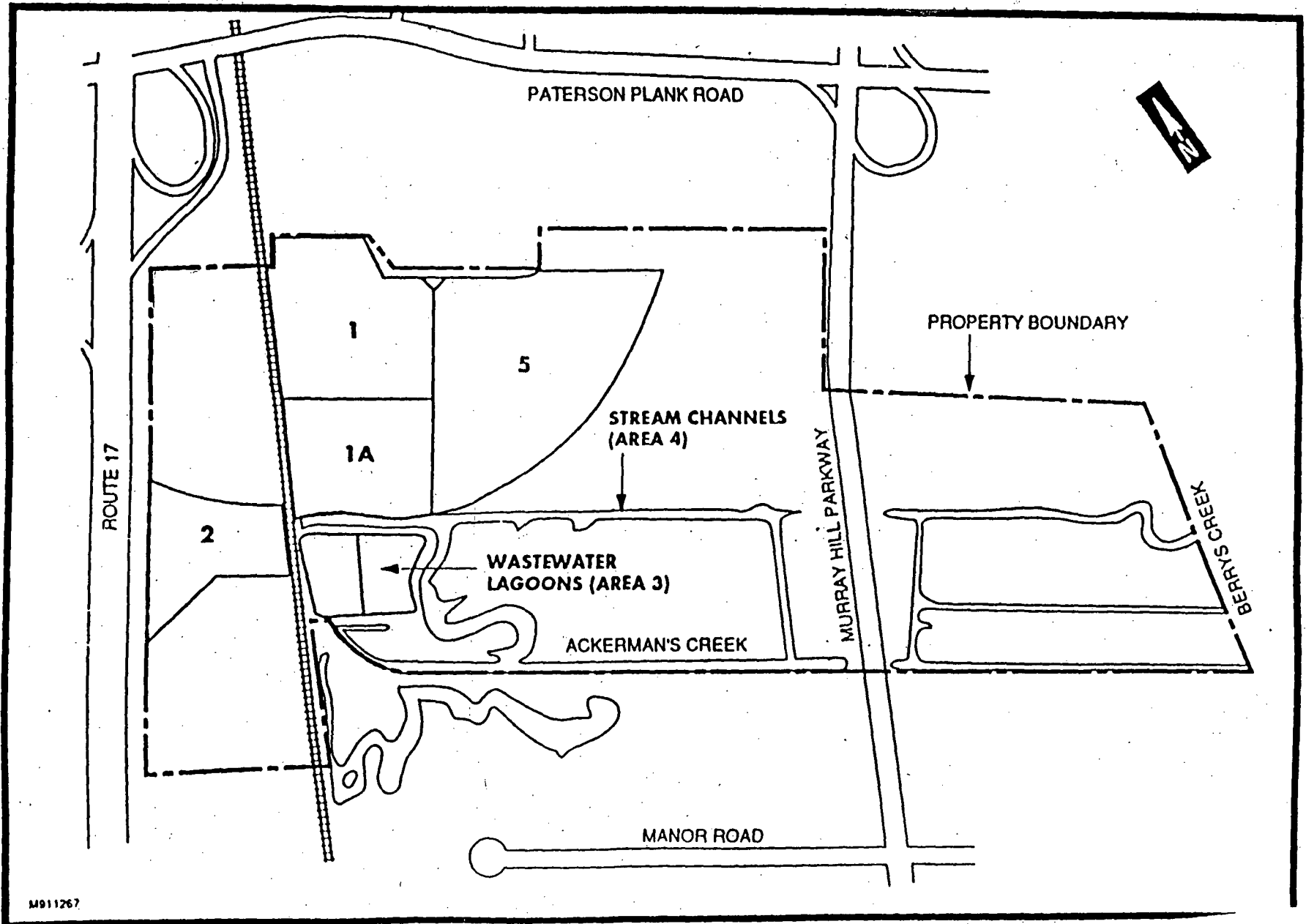
Record of Decision, September 1993  
ROD Amendment, December 1998  
Explanation of Significant Differences, April 1999  
Addendum to the Remedial Action Report for Area 2, July 2006  
Amended Remedial Action Report for Area 2, July 2001  
Remedial Action Report for Areas 1, 1A and 5, August 2001  
First Five-Year Review Report, September 2001  
Final Interim Remedial Measure Work Plan, August 2006  
Technical Letter Report for Groundwater Sampling and Well Abandonment Activities, April 2005  
Executive Summary – Review of Existing Information and Reports – UOP Area 2, December 2003  
Quarterly Reports

Table 3: Cleanup Goals: OU1 ROD

Contaminant	Cleanup Goal
Soil	(mg/kg)
Benzo(b)fluoranthene	4
Benz(a)anthracene	4
Benzo(a)pyrene	0.66
Benzo(k)fluoranthene	4
Chrysene	40
Dibenz(ah)anthracene	0.66
Indeno(1,2,3-cd)pyrene	4
PCBs	2
Lead	600
VOCs	1000
1,1,2,2-Tetrachloroethane	21*
Groundwater	(mg/l)
Total VOCs	10
Individual VOCs	1

\*The current New Jersey Soil Cleanup Criteria for 1,1,2,2-TCA include 70 mg/kg for nonresidential direct contact and 1 mg/kg for impact to groundwater. Please see the response to Question B for additional information.

Figure 1





0 175 350  
Feet

Aerial Photograph - June 2006  
UOP SITE

## Site Inspection Checklist

I. SITE INFORMATION	
Site name: Universal Oil Products	Date of inspection: July 19, 2006
Location and Region: East Rutherford, NJ Region 2	EPA ID: NJD002005106
Agency, office, or company leading the five-year review: USEPA	Weather/temperature: Sunny 85°F
<b>Remedy Includes:</b> (Check all that apply) <input checked="" type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Monitored natural attenuation <input checked="" type="checkbox"/> Access controls <input type="checkbox"/> Groundwater containment <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Vertical barrier walls <input checked="" type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____ _____ _____	
<b>Attachments:</b> <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached	
II. INTERVIEWS (Check all that apply)	
1. <b>O&amp;M site manager</b> <u>Rich Galloway</u> <u>Mngr. Remediation Eng.</u> <u>7/19/06</u> <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. <u>973-455-4640</u> Problems, suggestions; <input type="checkbox"/> Report attached <u>Site status good</u> _____ _____	
2. <b>O&amp;M staff</b> <u>Kate Cole/ Andy Hopton</u> <u>CH2MHILL</u> <u>7/19/06</u> <div style="display: flex; justify-content: space-between; margin-left: 100px;"> <span>Name</span> <span>Title</span> <span>Date</span> </div> Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____ _____	



3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency NJDEP  
Contact Gwen Zervas Project Manager 7/19/06 609-633-7261  
Name Title Date Phone no.  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency NJDEP  
Contact Steve MacGregor Technical Coordinator 7/19/06 609-633-1347  
Name Title Date Phone no.  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name Title Date Phone no.  
Problems; suggestions;  Report attached \_\_\_\_\_

Agency \_\_\_\_\_  
Contact \_\_\_\_\_  
Name Title Date Phone no.  
Problems; suggestions;  Report attached \_\_\_\_\_

4. **Other interviews (optional)**  Report attached.


III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1.	<b>O&amp;M Documents</b> <input type="checkbox"/> O&M manual <input type="checkbox"/> As-built drawings <input type="checkbox"/> Maintenance logs Remarks _____ Did not check _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date X N/A X N/A X N/A
2.	<b>Site-Specific Health and Safety Plan</b> <input type="checkbox"/> Contingency plan/emergency response plan Remarks _____	X Readily available <input type="checkbox"/> Readily available	X Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks _____ Did not check _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date X N/A
4.	<b>Permits and Service Agreements</b> <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date X N/A X N/A X N/A <input type="checkbox"/> N/A
5.	<b>Gas Generation Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date X N/A
6.	<b>Settlement Monument Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date X N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____ Last Groundwater monitoring occurred in 2005 for Area 2.	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date X N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
9.	<b>Discharge Compliance Records</b> <input type="checkbox"/> Air <input type="checkbox"/> Water (effluent) Remarks _____	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A <input type="checkbox"/> N/A
10.	<b>Daily Access/Security Logs</b> Remarks _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A

**IV. O&M COSTS**

1. **O&M Organization**  
 State in-house                       Contractor for State  
 PRP in-house                               Contractor for PRP  
 Federal Facility in-house               Contractor for Federal Facility  
 Other \_\_\_\_\_

2. **O&M Cost Records**  
 Readily available               Up to date  
 Funding mechanism/agreement in place  
 Original O&M cost estimate \_\_\_\_\_  Breakdown attached
- Total annual cost by year for review period if available
- |            |          |            |   |
|------------|----------|------------|---|
| From _____ | To _____ | _____      | <input type="checkbox"/> Breakdown attached |
| Date       | Date     | Total cost |   |
| From _____ | To _____ | _____      | <input type="checkbox"/> Breakdown attached |
| Date       | Date     | Total cost |   |
| From _____ | To _____ | _____      | <input type="checkbox"/> Breakdown attached |
| Date       | Date     | Total cost |   |
| From _____ | To _____ | _____      | <input type="checkbox"/> Breakdown attached |
| Date       | Date     | Total cost |   |
| From _____ | To _____ | _____      | <input type="checkbox"/> Breakdown attached |
| Date       | Date     | Total cost |   |

3. **Unanticipated or Unusually High O&M Costs During Review Period**  
 Describe costs and reasons: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**V. ACCESS AND INSTITUTIONAL CONTROLS**  Applicable  N/A

**A. Fencing**

1. **Fencing damaged**               Location shown on site map       Gates secured               N/A  
 Remarks \_\_\_\_\_ Fencing in good shape \_\_\_\_\_  
 \_\_\_\_\_

**B. Other Access Restrictions**

1. **Signs and other security measures**               Location shown on site map       N/A  
 Remarks \_\_\_\_\_  
 \_\_\_\_\_

**C. Institutional Controls (ICs)**

1. **Implementation and enforcement**  
Site conditions imply ICs not properly implemented  Yes  No  N/A  
Site conditions imply ICs not being fully enforced  Yes  No  N/A

Type of monitoring (e.g., self-reporting, drive by) \_\_\_\_\_

Frequency \_\_\_\_\_

Responsible party/agency \_\_\_\_\_

Contact \_\_\_\_\_

Name	Title	Date	Phone no.
------	-------	------	-----------

Reporting is up-to-date  Yes  No  N/A

Reports are verified by the lead agency  Yes  No  N/A

Specific requirements in deed or decision documents have been met  Yes  No  N/A

Violations have been reported  Yes  No  N/A

Other problems or suggestions:  Report attached

Deed restrictions not yet in place. More information in Addendum to Area 2 Remedial Action Report.

2. **Adequacy**  ICs are adequate  ICs are inadequate  N/A

Remarks \_\_\_\_\_

**D. General**

1. **Vandalism/trespassing**  Location shown on site map  No vandalism evident

Remarks \_\_\_\_\_

2. **Land use changes on site**  N/A

Remarks Redevelopment of Area 2 almost complete \_\_\_\_\_

3. **Land use changes off site**  N/A

Remarks \_\_\_\_\_

**VI. GENERAL SITE CONDITIONS**

- A. Roads**  Applicable  N/A

1. **Roads damaged**  Location shown on site map  Roads adequate  N/A

Remarks \_\_\_\_\_

<b>B. Other Site Conditions</b>			
Remarks _____ _____ _____ _____			
<b>VII. LANDFILL COVERS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<b>A. Landfill Surface</b>			
1.	<b>Settlement (Low spots)</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input checked="" type="checkbox"/> Settlement not evident
2.	<b>Cracks</b> Lengths _____    Widths _____    Depths _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Cracking not evident
3.	<b>Erosion</b> Areal extent _____ Remarks _____ Some erosion on temp storage areas for Area 2 soils.	<input type="checkbox"/> Location shown on site map Depth _____	<input checked="" type="checkbox"/> Erosion not evident
4.	<b>Holes</b> Areal extent _____ Remarks _____ Holes filled during quarterly inspections	<input type="checkbox"/> Location shown on site map Depth _____	<input checked="" type="checkbox"/> Holes not evident
5.	<b>Vegetative Cover</b> <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established <input type="checkbox"/> Trees/Shrubs (indicate size and locations on a diagram) Remarks _____		<input checked="" type="checkbox"/> No signs of stress
6.	<b>Alternative Cover (armored rock, concrete, etc.)</b> Remarks _____	<input type="checkbox"/> N/A	
7.	<b>Bulges</b> Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Height _____	<input checked="" type="checkbox"/> Bulges not evident

8.	<b>Wet Areas/Water Damage</b> <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input checked="" type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____ <input type="checkbox"/> Location shown on site map    Areal extent _____	
9.	<b>Slope Instability</b> <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map Areal extent _____ Remarks _____ _____	<input checked="" type="checkbox"/> No evidence of slope instability	
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay	
2.	<b>Bench Breached</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay	
3.	<b>Bench Overtopped</b> Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay	
<b>C. Letdown Channels</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b> Areal extent _____    Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of settlement	
2.	<b>Material Degradation</b> Material type _____    Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of degradation	
3.	<b>Erosion</b> Areal extent _____    Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of erosion	
4.	<b>Undercutting</b> Areal extent _____    Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of undercutting	

5.	<b>Obstructions</b> Type _____ <input type="checkbox"/> No obstructions <input type="checkbox"/> Location shown on site map Areal extent _____ Size _____ Remarks _____
6.	<b>Excessive Vegetative Growth</b> Type _____ <input type="checkbox"/> No evidence of excessive growth <input type="checkbox"/> Vegetation in channels does not obstruct flow <input type="checkbox"/> Location shown on site map Areal extent _____ Remarks _____
<b>D. Cover Penetrations</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Gas Vents</b> <input type="checkbox"/> Active <input checked="" type="checkbox"/> Passive <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ Did not inspect. Looked in good condition. _____
2.	<b>Gas Monitoring Probes</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____
3.	<b>Monitoring Wells (within surface area of landfill)</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____
4.	<b>Leachate Extraction Wells</b> <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> Evidence of leakage at penetration <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____
5.	<b>Settlement Monuments</b> <input type="checkbox"/> Located <input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A Remarks _____

<b>E. Gas Collection and Treatment</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Gas Treatment Facilities</b> <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
2.	<b>Gas Collection Wells, Manifolds and Piping</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____		
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____		
<b>F. Cover Drainage Layer</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____		
2.	<b>Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____		
<b>G. Detention/Sedimentation Ponds</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Siltation</b> Areal extent _____                      Depth _____ <input type="checkbox"/> N/A <input type="checkbox"/> Siltation not evident Remarks _____		
2.	<b>Erosion</b> Areal extent _____                      Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____		
3.	<b>Outlet Works</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____		
4.	<b>Dam</b> <input type="checkbox"/> Functioning <input type="checkbox"/> N/A Remarks _____		



<b>H. Retaining Walls</b> <input type="checkbox"/> Applicable <b>X</b> N/A		
1.	<b>Deformations</b> Horizontal displacement _____ Rotational displacement _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Deformation not evident Vertical displacement _____
2.	<b>Degradation</b> Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Degradation not evident
<b>I. Perimeter Ditches/Off-Site Discharge</b> <b>X</b> Applicable <input type="checkbox"/> N/A		
1.	<b>Siltation</b> Areal extent <u>small</u> Depth _____ Remarks <u>Some areas have siltation. Likely due to soils being stockpiled from Area 2 rather than from landfill.</u>	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Siltation not evident
2.	<b>Vegetative Growth</b> <input type="checkbox"/> Vegetation does not impede flow Areal extent _____      Type _____ Remarks _____	<input type="checkbox"/> Location shown on site map <b>X</b> N/A
3.	<b>Erosion</b> Areal extent _____      Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <b>X</b> Erosion not evident
4.	<b>Discharge Structure</b> Remarks _____	<input type="checkbox"/> Functioning <input type="checkbox"/> N/A
<b>VIII. VERTICAL BARRIER WALLS</b> <input type="checkbox"/> Applicable <b>X</b> N/A		
1.	<b>Settlement</b> Areal extent _____      Depth _____ Remarks _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident
2.	<b>Performance Monitoring</b> <input type="checkbox"/> Performance not monitored Frequency _____ <input type="checkbox"/> Evidence of breaching Head differential _____ Remarks _____	Type of monitoring _____

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	<b>Collection Structures, Pumps, and Electrical</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	<b>Spare Parts and Equipment</b> <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

<b>C. Treatment System</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Treatment Train</b> (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____ _____		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
4.	<b>Discharge Structure and Appurtenances</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
5.	<b>Treatment Building(s)</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks _____ _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____		
<b>D. Monitoring Data</b>			
1.	Monitoring Data <input type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality		
2.	Monitoring data suggests: <input type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining		

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning
		<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance
		<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Good condition
			<input type="checkbox"/> N/A
Remarks _____			
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
___ Containment remedies are functioning effectively. Lots of activities on site not related to OU1 remedy, including, a pilot study for PCB degradation (1 dumpster of soil, plus some equipment), stockpiles of non-hazardous soil from Area 2 awaiting removal to landfill, and completion of redevelopment construction on Area 2. Some sampling activities for OU2 RI/FS were also ongoing.			
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_____			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.			
___ Grass is cut on landfill, groundhog holes filled regularly, fences are in good shape. Asphalt pad is in good shape as well.			
_____			
_____			
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_____			

**C. Early Indicators of Potential Remedy Problems**

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None

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**D. Opportunities for Optimization**

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None

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