

THIRD FIVE-YEAR REVIEW REPORT  
COMBE FILL NORTH LANDFILL SITE  
MOUNT OLIVE TOWNSHIP MORRIS COUNTY, NEW JERSEY



Prepared By:  
U.S. Environmental Protection Agency  
Region II  
New York, New York

September 2009

## Five-Year Review Summary Form

### SITE IDENTIFICATION

**Site name (from WasteLAN):** Combe Fill North

**EPA ID (from WasteLAN):** NJD980530596

**Region:** 2

**State:** NJ

**City/County:** Mount Olive Township, Morris County

### SITE STATUS

**NPL status:**  Final  Deleted  Other (specify)

**Remediation status** (choose all that apply):  Under Construction  Constructed  Operating

**Multiple Ous?\***  YES  NO

**Construction completion date:** 3/31/1993

**Has site been put into reuse?**  YES  NO  N/A

### REVIEW STATUS

**Lead agency:**  EPA  State  Tribe  Other Federal Agency

**Author name:** Pamela J. Baxter, CHMM

**Author title:** Remedial Project Manager

**Author affiliation:** EPA

**Review period:\*\*** 6/2004 to 9/2009

**Date(s) of site inspection:** March 26, 2009 and June 10, 2009

**Type of review:**

- Post-SARA  Pre-SARA  NPL-Removal only  
 Non-NPL Remedial Action Site  NPL State/Tribe-lead  
 Policy  Regional Discretion

**Review number:**  1 (first)  2 (second)  3 (third)  Other (specify)

**Triggering action:**

- Actual RA Onsite Construction at OU #1  Actual RA Start at OU# 1  
 Construction Completion  Previous Five-Year Review Report  
 Other (specify)

**Triggering action date (from WasteLAN):** 6/10/2004

**Does the report include recommendation(s) and follow-up action(s) that directly effect protectiveness?**  yes  no

**Is the remedy protective of the environment?**  yes  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 (continued)**

### **Issues, Recommendations, and Follow-Up Actions**

The previous five-year review determined that the remedy was functioning as intended. The Site has ongoing operation, maintenance and monitoring activities. Overall, review of the Site monitoring information for the past five years indicates that the remedy is still operating as intended and that it continues to protect human health and the environment. Recommendations provided are intended to improve operations and maintenance activities. See Table 3.

### **Protectiveness Statement**

The remedy at the Site is protective of human health and the environment in the short term. The implemented remedial actions protect human health and the environment. Currently, there are no exposure pathways that could result in unacceptable risks.

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## **Executive Summary**

The remedy for the Combe Fill North Superfund Site, located in Mount Olive Township, New Jersey, included the installation of a clay cap; drainage system; and air, groundwater and surface water monitoring. The trigger for this third five-year review was the completion of the second five-year review in June 2004.

The assessment of this third five-year review found that the remedy is continuing to function as intended and is protective of human health and the environment in the short term.

## **I. Introduction**

This third five-year review for the Combe Fill North Superfund Site (Site), located in Mount Olive, Morris County, New Jersey, was conducted by the U.S. Environmental Protection Agency (EPA) Region 2, in accordance 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 at sites protect public health and the environment and that they function as intended by the decision documents. This report will become part of the Site file.

Since this is a Pre-SARA remedy, this Five-Year Review is being conducted as a matter of EPA policy. This Five-year Review is triggered by the second Five-Year Review Report, which was issued on June 10, 2004.

## **II. Site Chronology**

See Table 1 for the Site chronology.

## **III. Background**

### Physical Characteristics

The Combe Fill North Site is located on Gold Mine Road near the junction of U.S. Highways 206 and 46 and Interstate 80 in Mount Olive Township. The former landfill comprises 65 acres of the 103-acre property. A recently developed shopping center is located to the east, Gold Mine road is located to the south and wooded areas are located to the north and west of the Site.

### Land and Resource Use

Some of the land surrounding the Site is wooded; the developed areas are residential, retail and light industry nearby. Budd Lake is a developed resort and U.S. Route 46 is highly commercialized. Surface runoff drains into two small streams, north and west of the Site, that are tributaries to Wills Brook, which empties into the Musconetcong River. Approximately 103 acres of the property are considered to be suitable for restricted usage. Since there is no current owner of the Site, NJDEP is responsible for managing Site access and Site related activities. NJDEP has regulations requiring landfill disruption permit be obtained prior to intrusive activities being conducted on Site.

## History of Contamination

The Site was first operated as a municipal landfill beginning in 1966. Morris County Landfill, Inc. operated the landfill from 1969 until 1978. By deed dated September 18, 1978, the property was sold to Combe Fill Corporation, a wholly owned subsidiary of Combustion Equipment Associates. It reportedly accepted municipal, vegetative, and industrial (non-chemical) wastes and small amounts of dry sewage sludge. Reportedly, wastes were deposited in a marshy area and are below the water table.

In September 1978, ownership of the Site was transferred to the Combe Fill Corporation which operated the landfill until January 1981 when the New Jersey Department of Environmental Protection (NJDEP) denied an expansion request and operations ceased. Proper closure procedures were not implemented because Combe Fill Corporation filed for bankruptcy in September 1981. NJDEP issued several Notices of Violation to the landfill operators for improper intermediate landfill cover, which resulted in windblown debris on and off site, contact of solid waste with groundwater, and inadequate leachate control.

## Initial Response

EPA evaluated the Site in July 1982 under EPA's Hazard Ranking System (HRS), and the Site was proposed on the National Priorities List (NPL) on December 12, 1982 and was finally placed on the NPL on September 1, 1983. On November 21, 1983, NJDEP signed a Cooperative Agreement with EPA to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the Site. In August 1984, NJDEP initiated the RI/FS Study. Low concentrations of hazardous substances were found at the Site during the RI. Soil, leachate, surface water, sediments, and groundwater were sampled between December 1984 and July 1985.

## Basis for Taking Action

The RI chemical data indicated that contaminant concentrations at the Site were low and that there was no off-site migration. Soils at the Site were found to contain methylene chloride at 123 micrograms per kilogram (ug/kg); ethylbenzene and toluene were found in leachate at 21 micrograms per liter (ug/L) and 25 ug/L; and the hexachlorobenzene, phenol, and bis(2-ethylhexyl) phthalate were found in the groundwater at the Site at 3.3 ug/L, 56.6, and 49.5 ug/L. The draft RI/FS was completed in June 1986. A public meeting to present and discuss the results of the RI/FS and the recommended alternative was held on July 16, 1986. However, the

Site was covered with rocky, permeable soil and waste was known to exist in a shallow aquifer that is connected to a deeper aquifer that served more than 10,000 people within two miles of the Site. As a result, this population was considered potentially threatened by contaminants that could enter this source of drinking water.

#### IV. Remedial Actions

##### Remedy Selection

A Record of Decision (ROD) was signed by EPA on September 29, 1986 which selected the long-term solution for the Combe Fill North Landfill. Specifically, the ROD outlined the following activities:

- Grade and compact the 65-acre waste disposal area;
- Cover with 1 foot of common borrow material;
- Cap with 1 foot of clay;
- Cover with sufficient common borrow material to ensure that the clay cap is below the average frost penetration depth;
- Cover with 6 inches of topsoil;
- Plant a vegetative cover (grass seeding);
- Install a drainage system, including perimeter ditches and corrugated metal pipes;
- Install a methane venting system;
- Construct a security fence surrounding the Site; and
- Implement a quarterly groundwater and surface water monitoring program.

##### Remedy Implementation

In December 1987, a contract to provide the final Engineering Design for remediation of the Site was awarded to the design engineering firm of Lawler, Matusky & Skelly Engineers (LMS), by NJDEP, through a cooperative agreement with EPA. Field sampling was conducted during the winter of 1988. A preliminary design was prepared in the spring of 1988 and the final design reports, including specifications, permits and a construction operations plan were completed in May 1989.

Conti Construction Co. Inc. (Conti) was awarded the contract for remedial construction in October 1989. On-site construction started in December 1989 with a partial notice to proceed. Full Notice to Proceed was given in early February 1990. Detailed information on the remedial actions is available in the Remedial Action Report dated March 31, 1993.



## Maintenance and Monitoring

In 1991, NJDEP completed the construction of the remedies specified in the ROD and began operation and maintenance (O&M) of the Site and groundwater monitoring. NJDEP is responsible for conducting maintenance activities at the Site. Activities include inspecting the cap, swales, drainage channels, roadway, and fence line, mowing and weed whacking the landfill cap and fence line, and performing sampling and analysis for the long-term monitoring program.

The monitoring plan requires the monitoring of groundwater and air. Groundwater samples are collected annually from 16 monitoring wells. There are 2 upgradient and 11 downgradient perimeter wells, and 3 wells through the cap. The wells are sampled for Target Compound List of Analytes. Air monitoring was conducted quarterly on the gas vents until 2006 when NJDEP's Division of Air Quality/Bureau of Technical Services granted a reduction in sampling frequency to semi-annual events. In March 2008, NJDEP sought an additional modification to the air permit equivalent to update the method of calculating the air discharge amounts. The new permit equivalent was issued and the new air sampling plan is under review. It is anticipated that semi-annual sampling events will resume in October 2009.

Results of groundwater sampling events have indicated that metals are in exceedance of maximum contaminant levels (MCLs). Further details are discussed in the Data Review and Evaluation section of this report. NJDEP is still planning to install an off-site monitoring well to determine if contaminants are migrating off Site. Based on the evaluation of the sampling data, NJDEP will determine if further investigation is necessary.

Although it does not appear that significant contamination is leaving the Site, EPA requested that a survey be conducted of private wells due to redevelopment in the area. Some new potable wells were identified in the vicinity and found to be potentially impacted by contamination of the landfill. NJDEP records indicated that the wells had been sampled by private contractors in 2001. However, at this time, although there may be exceedances of groundwater standards for gasoline products that are not Site related, there appears to be no groundwater quality exceedances of Groundwater Quality Standards or Maximum Contaminant Levels (MCLs) in the private wells that can be linked to the landfill.

NJDEP prepared annual reports through 2008 to summarize the year's activities and sampling results. The reports included a short

narrative describing proposed or completed scope(s) of work, sampling data summary tables, groundwater flow maps, and other pertinent information. Sampling data and quality control and quality assurance reports are located at the Mount Olive Department of Health office.

#### V. Progress Since Last Review

According to NJDEP's annual reports of 2006, 2007 and 2008, the following tasks were conducted:

##### Site Inspections, Maintenance, and Monitoring

2006 - NJDEP inspected the cap and structures during the year. No repairs were needed on the vents, fence, roadway, or waterways. Cracks on the cap and lower portion of the drainage swale on the north side of the cap continued to be monitored. The cracks were measured on April 6 and 20, 2006. They increased in number and length. Some depressions (subsidence) and/or cracks were also noted near some of the vents. In June 2006, a referral was sent from the Bureau of Operations, Maintenance and Monitoring (BOMM) to the Bureau of Design and Construction (BDC) to investigate, design, and/or repair cap integrity and crack development, passive vents, and the drainage side on the north side of the cap.

NJDEP's work included mowing and weed whacking the cap around surface structures and the fence line, and conducting minor repairs to the roadway. Mowing was completed in September and the weed whacking was completed in November. No roadway repairs were needed.

2007 - NJDEP inspected the cap. The broken vents were repaired and the swale on the north side had stabilized.

Mowing was completed in August and some weed whacking was completed in January 2008. Repairs to the Site access road were completed in September. The work included dressing and leveling the road with the placement of additional stone. No repairs were needed on the fence or drainage swales.

2008 - NJDEP inspected the cap and no cap repairs were needed on the vents, fence, or drainage swales. The cracks in the cap continue to be monitored, and were measured on April 30. Some cracks have disappeared and some have diminished.

The cap was mowed and weed whacked in August and September. Some repairs were needed on the cap and on the Site access road due to

drilling work conducted on the cap by a potential developer. Repairs to the cap and roadway were completed in October 2008. Cap repairs were made using topsoil, seed, fertilizer and straw, and roadway repairs required filling in various areas with additional stone.

#### Installation and Sampling of One New Off-Site Well

2006 - NJDEP planned to install a deep well (approximately 100 feet deep) off-site to the north side of the landfill, on the road shoulder of International Drive. The purpose of the well was to determine if contaminants are migrating off the Site and if a Classification Exception Area is needed.

As part of the October 2006 Subsurface Term Contract for BOMM, Handex Consulting and Remediation of New Jersey (Handex) installed 3 new monitoring wells on the north side of the cap, completed some surveying and worked on groundwater flow maps. The 3 new wells were installed in lieu of the one deep off site well because the property owner had not signed an access agreement.

NJDEP obtained a new Road Opening Permit and Access Agreement from the Township.

2007 - In May 2007, levels of concern of 1,4-dioxane were detected in several on-site monitoring wells. Monitoring well MW-13 contained the highest concentration of 290 ug/L. In an effort to improve groundwater flow maps for the site and to determine if the landfill was acting as the source of the 1,4-dioxane groundwater contamination, 3 monitoring wells were installed in the landfill upgradient of MW-13. In addition, NJDEP still planned to install a deep off-site well. The Road Opening Permit expired in June 2007. NJDEP discovered that AIG Baker, a consultant and engineering company, and not the Township of Mount Olive, owned the land at International Drive where the deep well is to be installed. In April 2007, NJDEP sent a letter requesting access to install and sample a well but AIG Baker did not respond. Instead of installing the deep well as planned, NJDEP had Handex install 3 new wells on the cap in September. The 3 new wells were sampled by Handex in November and December 2007 and there were exceedances of 1,4-dioxane. In November 2007, MW-22, MW-23, and MW24 had concentrations of 610 ug/l, 24 ug/l, and 80 ug/l, respectively. In December 2007, MW-22, MW-23, and MW-24 had concentrations of 360 ug/L, non-detect (ND), and 130 ug/L, respectively. Both in November and December, the type of analysis used was volatile organic compound (VOC) scanning. At this time, there were no standards promulgated for 1,4-dioxane.

2008 - In 2008, NJDEP issued an interim groundwater quality criterion for 1,4-dioxane of 3 ug/L. This concentration is significantly below the levels of 1,4-dioxane detected in the on-site monitoring wells. In May 2008, MW-13 was sampled and had a concentration of 280 ug/L and the 3 new monitoring wells, MW-22, MW-23, and MW-24, had concentrations of 520 ug/L, ND, and 11 ug/L, respectively. The concentrations were significantly lower since base neutral, which is a more accurate analysis, was used instead of VOC scanning. NJDEP still planned to install a deep off-site well. In May 2008, NJDEP and AIG Baker, the owner of the property on International Drive, signed an access agreement for the well installation and sampling. Handex was already contracted to install, sample, and survey the well. However, insufficient funds remained in the purchase order to do that work after the 3 wells were installed on the cap. Handex then submitted a new estimate based on replacement prices. NJDEP requested new funds. NJDEP needs to obtain a new Road Opening Permit from the Township.

2009 - NJDEP is still negotiating with Handex to install the deep off-site monitoring well.

#### Passive Vent Sampling and Groundwater and Seep/Monitoring Well Sampling

2006 - In the Second Five-Year Review Report, EPA recommended reducing the sampling of the passive vents from quarterly to annually. The request to alter the air permit equivalent was approved on January 4, 2006. The permit equivalent expired on May 8, 2008. The vents were sampled on April 11, 2006 and October 13, 2006.

The annual monitoring well sampling event was completed on May 16 and 17, 2006. NJDEP and EPA selected some potential seep and surface water locations during a joint Site inspection. On October 4, 2006, 8 locations, both on and off the cap were sampled. Some of the proposed locations changed during the sampling episode due to field conditions. The results showed the presence of phthalates and other base neutral compounds at one surface water location, SW-7.

2007 - The vents were sampled on April 23, 2007 and October 16, 2007. The annual monitoring well sampling event for 13 existing wells was completed on May 15 and 16, 2007. The 3 new monitoring wells were sampled on November 8, 2007 and December 11, 2007.

On November 8, 2007, Handex resampled SW-7 for semi-volatiles. Phthalates were detected and also was detected in laboratory blanks. The SW-7 was sampled again for confirmation.

2008 - In accordance with the approved air permit equivalent modification, the vents were sampled twice during the year, April 15, 2008 and October 7, 2008. Results of the 2 air sampling events in 2008 showed emissions below the current permit limit. Back in October 2007, the amount of emission exceeded the permit equivalent limit of 3.0 pounds per hour. A request to NJDEP's air permit group was submitted in March 2008 to alter the permit equivalent limits, and discussions continued throughout the year.

The annual monitoring well sampling was completed May 6 - 7, 2008 and all 16 wells were sampled during this event. On May 6, 2008, SW-7 was resampled. Again, phthalates were detected and were also detected in laboratory blanks. The Quality Assurance and Quality Control (QA/QC) information for the surface water sampling is contained in the QA/QC report for the monitor wells. NJDEP determined that no further sampling at the SW-7 location is needed.

#### Survey of Potable Wells in the Area

2006 - An NJDEP/Office of Community Relations search to find local potable wells that might be impacted by the landfill was completed. An area of about one square mile around the Site was searched for new well permits, and a field visit was done to check the physical locations. One new group of homes called the "Fieldview Development" consists of 21 houses serviced by private wells. The development is located 2,300 feet southeast of the Site.

2007 - NJDEP investigated whether groundwater sampling from the Fieldview Development was conducted.

2008 - NJDEP found that groundwater sampling had already been conducted in this Development. NJDEP was given the sampling results and determined that sampling conducted in the Development was adequate.

#### Groundwater Flow Maps

2006 - A procurement package was sent to Handex that included preparation of groundwater flow maps as part of the Scope of Work. Handex worked on creating these maps in the next year.

2007 - During the year, Handex worked on creating the flow maps, but did not complete them. NJDEP directed Handex to wait for the information from the sampling of the 3 new wells installed on the cap and to include it in the report.

2008 - The report was completed and included all information through the May 2008 sampling event. NJDEP plans to update the report about every 2 years.

#### Potential Purchase of the Property

2006 - During the course of the year, NJDEP coordinated with two groups who were interested in purchasing and developing the Site. Throughout the year, there were discussions and meetings with an unknown purchaser represented by the law firm of Pitney and Hardin. Their client was interested in constructing retail stores and a parking lot on the property. In October, the Township of Mount Olive held a bid and sold the tax certificate for the property since there was tax lien on the property. NJDEP ceased negotiations with Pitney and Hardin, due to the sale of the tax certificate by Mount Olive Township. The tax certificate had been purchased by RG Goldmine, LLC. NJDEP has been coordinating with Langan Engineering & Environmental Services as RG Goldmine's representative. Langan planned to do a wetland survey and NJDEP provided access to the Site. A general meeting with Langan, RG Goldmine LLC, EPA, and various Bureaus of NJDEP, was held on May 31, 2006. Langan requested permission to conduct geotechnical and environmental investigations.

2007 - NJDEP received and approved a Memorandum of Agreement (MOA) from RG Gold Mine, LLC, which was effective on July 25, 2007. On August 2007, Langan, on behalf of R.G Gold Mine, submitted a Minor Landfill Disruption permit application to NJDEP. On September 4, 2007, NJDEP signed an agreement with RG Gold Mine, LLC, which allowed access to the Site. On November 21, 2007, NJDEP issued a Sanitary Landfill Minor Disruption Approval. Site work included borings by geoprobe and hollow stem auger, excavation of test pits, and installation of temporary wells. Work began on November 27, 2007. Langan also did surveying, including a wetlands survey. Langan's fieldwork continued into 2008.

2008 - Langan made repairs to the cap and road, and waste disposal activities were completed in the fall of 2008. NJDEP provided technical guidance on sampling protocols for the waste. Langan submitted a Due Diligence Geotechnical Engineering Report and a Preliminary Environmental Investigation Report to NJDEP and EPA in October 2008. An Investigation Report was submitted (in January

2009) to NJDEP, Bureau of Landfill and Hazardous Waste Management, to satisfy permit requirements. Waste sampling and disposal information was also included in the report.

## VI. Five-Year Review Process

### Administrative Components

The five-year review team consisted of Ms. Pamela J. Baxter, CHMM, Remedial Project Manager (RPM); Ms. Lora Smith, Ph.D., Risk Assessor; Mr. Grant Anderson, Hydrogeologist; Ms. Mindy Pensak, Ecological Risk Assessor; Ms. Jeanette Abels, NJDEP; and Mr. Greg Giles, NJDEP.

### Community Involvement

EPA's Community Involvement Coordinator for the Combe Fill North Superfund Site is Ms. Patricia Seppi. An announcement was published in the Mount Olive Chronicle, the area newspaper, on June 4, 2009, notifying the community of the initiation of the five-year review process. The notice indicated that upon completion of the third five-year review, the document would be available to the public at the Mount Olive Public Library located at 140 Wolfe Road, Budd Lake, New Jersey 07828. In addition, the notice included the RPM's name, address and telephone number for questions related to the five-year review process of the Combe Fill North Landfill Site in general.

### Document Review

The documents, data, and information which were reviewed in completing this five-year review are summarized in Table 2 (attached).

### Data Review and Evaluation

According to the ROD remedy, groundwater samples should be collected quarterly. However, with respect to monitoring well sampling frequency, NJDEP decided to reduce groundwater sampling to semi-annually beginning in 1997 and annually in 2002, based on previous groundwater sampling events. Upon review of the Groundwater Summary Tables (January 26, 2009), it appears that landfill wells MW-22, MW-23, and MW-24 and downgradient deep well MW-13 were either at the MCL for benzene or exceeded it between November 2007 and May 2008. When screening against the NJ Ground Water Quality Criteria (NJGWQC), MW-13 also had high detections of 2-butanone between 1988 and 1993; yet, in recent years, 2-butanone

was not detected in this well. No MCL currently exists for 2-butanone. MW-23 is the only well in the monitoring program to exceed the NJGWQC for chlorobenzene and has done so for the last three sampling rounds. No wells exceeded the MCL for chlorobenzene. No MCL currently exists for 1,4-dioxane; however, 1-4 dioxane in the downgradient well MW-13 up to 290 (ug/L) indicates that it may be leaching from the landfill. Only secondary MCLs exist for both manganese and iron (cosmetic/aesthetic effects). Iron is believed to be naturally occurring as red seeps discovered previously were reportedly oxidized iron from the soils. The high manganese levels are also possibly a reflection of background conditions since upgradient wells MW-5A (deep) and MW-8 (shallow) had historically high manganese concentrations (up to 47,300 ug/L in MW-8, December 1996). It also appears that a majority of the manganese contamination is in the shallow portion of the aquifer. Continued groundwater monitoring will ensure protectiveness of human health and the environment. As in the past, there does not appear to be consistent plume of contaminants emanating from the landfill.

While a municipal water supply is available to residents living near the Site, several residences have private wells with historic VOC contamination. A new housing development called Fieldview Development is approximately 0.5 mile south east of the Site. The last five-year review, in addition to the last two annual reports, included a recommendation to determine whether previous sampling at the development is adequate to meet the data quality objectives established at the Site or whether NJDEP should collect our samples from these wells. Further, the shallow aquifer beneath the Site is connected to the deeper aquifer which serves groundwater to over 10,000 people within two miles of the Site. There are plans to install a downgradient well to determine if contamination is migrating off the Site (Annual Report for 2008).

Surface water samples were collected intermittently since the mid-1990s and according to the ROD remedy should also be collected quarterly. Phthalates and other semi-volatile organic compounds (SVOCs) have been detected at SW-7 historically. The most recent surface water sampling occurred in November 2007 at one location, SW-7. Only 5 compounds were analyzed and were not different from the blank. A review of the November 2007 SW-7 sample data shows that the sample was analyzed for the full SVOC suite of compounds. Only 5 compounds were detected; four of the compounds were also detected in the sample blank, and as such were negated. The only compound that should be considered detected from this sample is butylbenzylphthalate. This compound was detected at a concentration significantly below the NJGWQC. Surface water is a concern at the



Site, since runoff from the Site flows into the surrounding streams to the north and west.

As discussed in section 5, starting in May 2007, levels of concern of 1,4-dioxane were detected in several on-site monitoring wells. The highest concentration detected in MW-13 was 290 ug/L. At the time, NJDEP did not have a groundwater quality criterion for 1,4-dioxane. NJDEP decided to install 3 new monitoring wells on the cap in September 2007 to determine if the landfill was acting as a source of the 1,4-dioxane contamination. The 3 new wells were sampled in November and December 2007 and there were exceedances of 1,4-dioxane. In November 2007, MW-22, MW-23, and MW-24 had concentrations of 610 ug/l, 24 ug/l, and 80 ug/l, respectively. In December 2007, MW-22, MW-23, and MW-24 had concentrations of 360 ug/L, ND, and 130 ug/L, respectively. Both in November and December 2007, the type of analysis used was VOC scanning. At that time, there were no standards promulgated for 1,4-dioxane. In 2008, an interim groundwater quality criterion concentration for 1,4-dioxane of 3 ug/L was issued. In May 2008, MW-13 was sampled and had a concentration of 280 ug/L and the 3 new monitoring wells, MW-22, MW-23, and MW-24, had concentrations of 520 ug/L, ND, and 11 ug/L, respectively. The concentrations were significantly lower since base neutral, which is a more accurate analysis, was used instead of VOC scanning. A deep off-site well will be installed to determine if contamination is migrating off the Site.

Soil vapor intrusion (SVI) is evaluated when soils and/or groundwater are known or suspected to contain VOCs. Several VOCs in groundwater exceeded the respective vapor intrusion screening criteria at the most protective value (cancer risk:  $1 \times 10^{-6}$ ) identified in the draft Evaluating the Vapor Intrusion into Indoor Air guidance document. However, for benzene, 2-butanone, chlorobenzene and 4-methyl-2-pentanone, the detected concentrations fall within the acceptable risk range ( $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ ). No screening values exist for 1,2-dichloroethene and, as a result, no conclusion regarding vapor intrusion potential could be drawn for this chemical. Continued monitoring of VOCs will aid in decision-making regarding the need to install vapor mitigation systems in new construction at the Site in the future. Currently, since no buildings exist on or in the immediate vicinity of the Site, the vapor intrusion pathway is incomplete.

#### Site Inspection

EPA and NJDEP conducted a Site visit on March 26, 2009. In attendance were Ms. Pamela J. Baxter, CHMM, RPM; Ms. Lora Smith, Ph.D., Risk Assessor; Mr. Grant Anderson, Hydrogeologist; Ms.

Jeanette Abels, NJDEP-Operations Manager; Mr. Greg Giles, NJDEP-Hydrogeologist; and Mr. Thomas O'Neill, NJDEP-Supervisor. Ms. Baxter and Mr. Giles were present during a second Site visit conducted on June 10, 2009.

Various Site issues were discussed, including the observation of several cracks and animal burrowing holes in the cap cover area. Also discussed were the areas that had test pits conducted. Additional inspection of the test pit areas was conducted and photographs were taken during the second Site visit.

During the June 10, 2009 Site visit with EPA and NJDEP, it was observed that an area of the cap had standing water. This is the area that stone was placed to help drain the swale on the cap. EPA takes into consideration that there has been an unusual amount of rainfall for the season. However, there is limited vegetation on that portion of the cap and this area may still have ponding issues. NJDEP has recently agreed to reseed the area. Please see attached photos.

## **VII. Technical Assessment**

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

Yes, the remedy continues to function as intended in the ROD, exposures to contaminated soils associated with direct contact, inhalation, and ingestion pathways were eliminated with the installation of the landfill cap. However, shortly after the cap was placed over the landfill, cracks were observed as a result of differential settling, some as deep as the clay layer. According to an NJDEP memorandum to the Site file dated September 17, 2008, every cap crack and depression area has been inspected biennially, beginning in 2002. During the recent Site visit, several cracks and depressions were observed and these were reportedly new. Although minor cracks exist in the cap, it continues to prevent the aforementioned exposures and limits infiltration of precipitation or any other surface water to the landfill waste. Maintenance and repairs of the cap continue to ensure protectiveness of the remedy. In 1995, water was observed to be ponding on the cap. A drainage system (4 drainage swales) was installed to encourage runoff and prevent damage to the cap. One of the four drainage swales was malfunctioning but has now stabilized; all are monitored regularly (NJDEP memo, March 2007). In 2004, seeps were observed to be occurring on the landfill surface and were red/orange in color. A possible source of the seeps coming off the landfill surface may be the oxidation of pyrite

contained in the clay used to cap the landfill. No seeps were observed during the recent Site visit. A fence was installed as part of the remedy to prevent exposure of individuals to the Site. During a recent Site visit, the fence was examined and remains intact. There was no evidence of trespassing.

A test pit investigation was conducted by the potential developer from the fall of 2007 to the winter of 2008 and there is a concern that no differential compaction was conducted. The integrity of the cap should be evaluated in the test pit areas. NJDEP will continue to monitor to ensure proper performance of the cap.

Based upon the document review of the cap inspections and the monitoring (surface water) data, it appears that the remedy is functioning as intended.

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

There have been no physical changes to the Site that would adversely affect the protectiveness of the remedy.

Land use assumptions, exposure assumptions and pathways, and remedial action objectives considered in the decision documents remain valid. Although specific parameters may have changed since the time the risk assessment was completed, the process that was used remains valid.

Based upon review of the available data, there does not appear to be any complete exposure pathways for ecological receptors. The remedial action objectives used at the time of the remedy selection are still valid and protective of the environment.

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

No other information has come to light that could question the protectiveness of the remedy.

#### **VIII. Issues/Recommendations and Follow-up Actions**

The remedy assessment summary from the last five-year review was:

- The Site cap and drainage systems appear effective;

- The fence around the Site is intact and in good condition;
- Groundwater monitoring wells are functional; and
- There is no evidence of trespassing, vandalism or damage at the Site.

The previous five-year review determined that the remedy was functioning as intended. The Site has ongoing operation, maintenance and monitoring activities. Overall, review of the Site monitoring information for the past five years indicates that the remedy is still operating as intended and that it continues to protect human health and the environment. Recommendations provided in previous sections are intended to improve operations and maintenance activities. See Table 3.

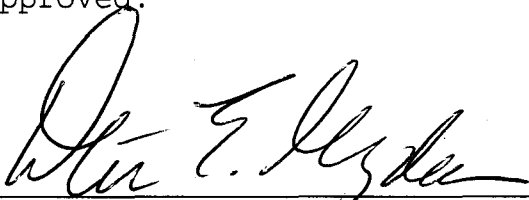
**IX. Protectiveness Statement**

The remedy at the Site is protective of human health and the environment in the short term. The implemented remedial actions protect human health and the environment. Currently, there are no exposure pathways that could result in unacceptable risks.

**X. Next Five-Year Review**

EPA will conduct another Five-Year review by September 2014.

Approved:

  
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Walter E. Mugdan, Director  
Emergency and Remedial Response Division

9/18/2009  
Date

Table 1 Chronology List

TABLE 1 - Chronology of Site Events	
Event	Date(s)
A citizen's group conducted groundwater sampling activities around the Site	1979
Combe Fill North was placed on the National Priorities List	December 1982
Notice letters were sent to Potentially Responsible Parties. None of the acknowledged recipients offered to undertake the study	September 26, 1983
EPA entered into a cooperative agreement with New Jersey Department of Environmental Protection (NJDEP) to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the Site	November 21, 1983
NJDEP initiated the RI/FS study	August 1984
EPA issued Record of Decision (ROD) to install a clay cap cover and a drainage system	September 29, 1986
NJDEP issued Remedial Design Report	May 1989
Conti was awarded the remedial construction contract	October 1989
NJDEP issued a full Notice to Proceed	February 1990
Substantial completion of construction activities	May 24, 1991
Final completion of construction activities	July 1, 1991
Completion of Remedial Action activities	March 31, 1993
First five-year Review completed	September 30, 1999
Survey work of ponded areas began	August 2000
NJDEP conducted a soil gas pilot study	2000
NJDEP's contractor started erosion repairs to the Site	October 2000
Commencement of second five-year review	February 2004
NPL Deletion	May 19, 2004
Second five-year review issued	June 10, 2004

TABLE 1 - Chronology of Site Events

Event	Date(s)
NJDEP and EPA met with potential developer	May 31, 2006
Potential developer conducted test pits and field work on the landfill	November 27, 2007 - Jan 2008
Passive Vent Sampling	April 15, 2008
Third five-year review Site visit	March 26, 2009
Third five-year review second Site visit	June 10, 2009

Table 2 Documents, Data, and Information Reviewed in completing  
the Five-Year Review

Record of Decision, EPA, September 29, 1986

Fact Sheet, November 1989

Five-Year Review Report, September 1999

Second-Year Review Report, June 2004

NJDEP Annual Reports - 2004, 2006, 2007, 2008

Table 3 Recommendations and Follow-Up Actions

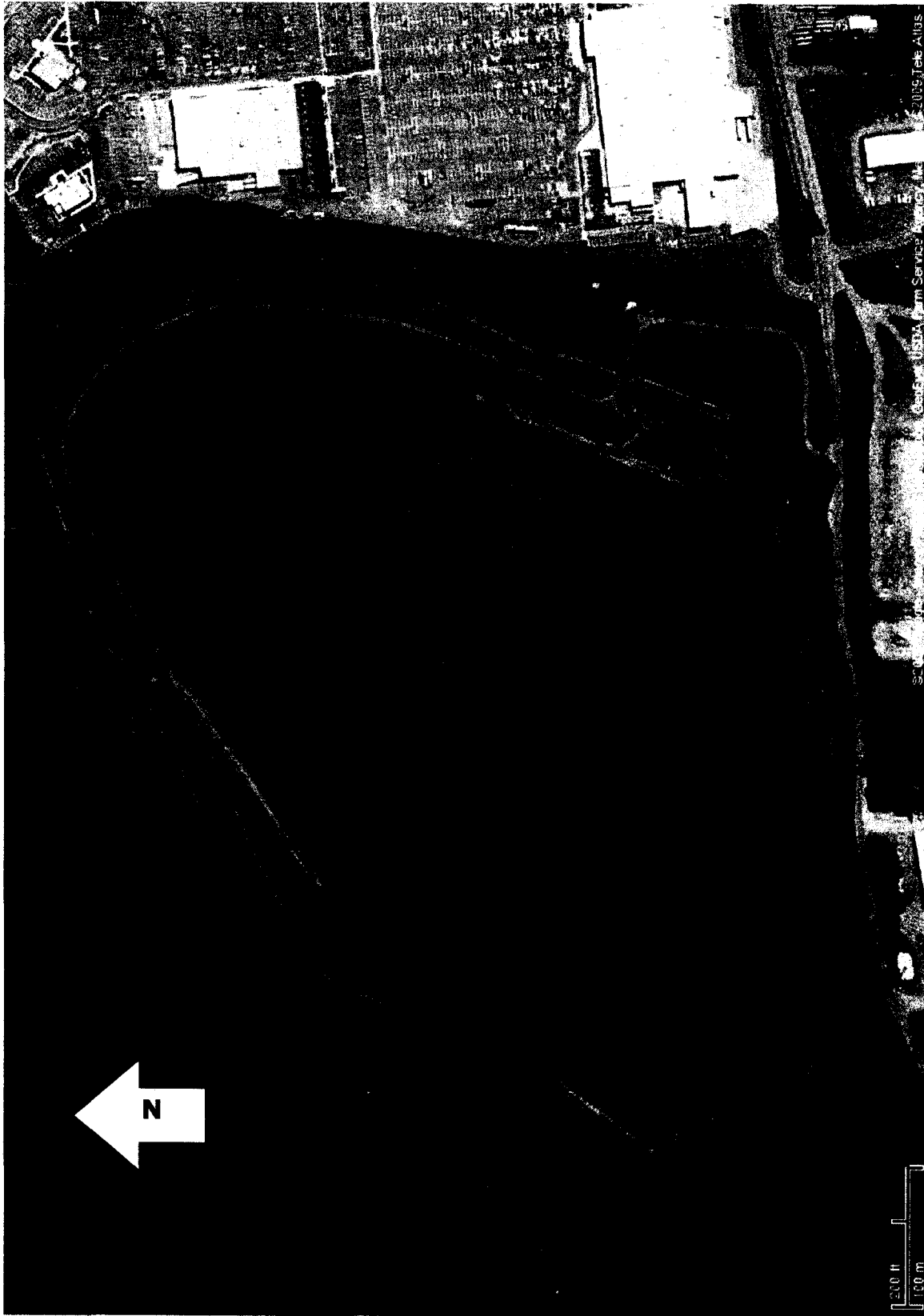
Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
				Current	Future
Surface water sampling should be conducted on a semi-annual basis. NJDEP needs to further investigate SW-7 phthalate contamination.	NJDEP	EPA	9/30/2010	No	Yes
Need to follow-up with NJDEP regarding the installation of the off-site monitoring well.	NJDEP	EPA	9/30/2010	No	Yes
The integrity of the cap in the test pit areas conducted by the potential developer needs to be evaluated.	NJDEP	EPA	9/30/2010	No	Yes



Site Maps



Map 1:  
Site Location,  
Gold Mine Road,  
Budd Lake, Mount  
Olive, NJ 07828.



Map 2: Site, Block 4100, Lot 10 on the Township of Mount Olive tax map

Site Photographs



Standing water on landfill cap - June 10, 2009



Continuation of standing water on landfill cap - June 10, 2009