

**Five-Year Review Report
Hertel Landfill Superfund Site
Town of Plattekill,
Ulster County, New York**

SDMS Document



106491

Prepared by:

**United States Environmental Protection Agency
Region 2
New York, New York**



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EXECUTIVE SUMMARY

A third five-year review for the Hertel Landfill Superfund site, located in the Town of Plattekill, Ulster County, New York, was completed. Based upon a review of the Record of Decision, Record of Decision Amendment, Remedial Action Reports, maintenance reports, and an inspection of the site, it has been concluded that the remedy at the site functions as intended by the decision documents and protects human health and the environment.

SITE IDENTIFICATION

Site name (from WasteLAN): Hertel Landfill Site

EPA ID (from WasteLAN): NYD0980780779

Region: 2

State: NY

City/County: Town of Plattekill/Ulster County

SITE STATUSNPL status: Final Deleted Other (specify)Remediation status (choose all that apply): Under Construction Operating CompleteMultiple OUs?* YES NO

Construction completion date:

Has site been put into reuse? YES NO N/A**REVIEW STATUS**Lead agency: EPA State Tribe Other Federal Agency

Author name: Monica Baussan

Author title: Remedial Project
Manager

Author affiliation: EPA

Review period:** 06/2005 to 4/2010

Date(s) of site inspection: 10/27/2009

Type of review:

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

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

Triggering action:

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

Triggering action date (from WasteLAN): 06/30/2005

Due date (five years after triggering action date): 06/30/2010

Five-Year Review Summary Form (continued)

Issues, Recommendations, and Follow-Up Actions

After reviewing the current conditions at the site, there are several recommendations for the next five-year review:

- Increase the number of wells in the upgradient well network in order to more robustly characterize the background conditions, primarily iron and manganese concentrations.
- Perform an assessment of iron and manganese conditions in the background and downgradient wells to more fully assess whether contaminants in downgradient monitoring and residential wells are site related or representative of naturally occurring conditions.
- Evaluate the performance of the gas venting system and the leachate collection system to determine if optimization is necessary.

Protectiveness Statement

The remedy for the Hertel Landfill Superfund Site protects human health and the environment in the short-term. Currently, there are no exposure pathways that could result in unacceptable risks and none are expected as long as the engineered, access and institutional controls selected in the decision documents continue to be properly monitored and maintained.

I. Introduction

The U.S. Environmental Protection Agency (EPA) Region 2 has conducted this five-year review pursuant to Section 121 (c) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended (CERCLA), Section 300.430(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan and OSWER Directive 9355.7-03B-P (June 2001). The purpose of a five-year review is to assure that the 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.

In accordance with Section 1.3.3 of the five-year review guidance, a subsequent statutory five-year review is triggered by the signing date of the previous five-year review report. For this site, the previous five-year review was signed in June 2005. The Remedial Action that triggered a five-year review at this site was the construction of the landfill cap which was completed in 1998. This is the third five-year review for the site. EPA, Region 2 conducted this five-year review of the remedy implemented at the Hertel Landfill Superfund site in the Town of Plattekill, Ulster County, New York. This review was conducted by the Remedial Project Manager (RPM) for the site and spans the period of June 2005 to April 2010. This report documents the results of the review.

The Hertel Landfill site remediation is addressed in one remedial phase or operable unit (OU). The original remedy selected by the EPA in the 1991 Record of Decision (ROD) included the construction of a permanent cap over the site landfill area and a system to collect leachate from the landfill waste, restricting site access, and developing and implementing a groundwater extraction and treatment system. The capping of the landfill area was completed in December 1998 and site access is currently restricted by fencing.

The site remedy was evaluated based on the 1991 ROD which also included a groundwater pump and treat system. The permanent cap and leachate collection system, as installed, have reduced the migration of contaminants sufficiently to improve site groundwater quality to the extent that the pump and treat system was no longer warranted or needed to ensure protection of public health and the environment. A ROD Amendment was signed in 2005 eliminating the groundwater pump and treat system from the remedy and adding a monitoring program of monitoring wells and residential wells in the vicinity and the implementation of institutional controls.

II. Site Chronology

Table 1 (attached) summarizes the site-related events from discovery to the present.

III. Background

Site Location

The Hertel Landfill Superfund Site is located in the Town of Plattekill, Ulster County, New York, just south of U.S. Route 44/NY Route 55 and approximately midway between Bedell Avenue and Tuckers Corner Road.

Physical Characteristics

Wetlands border the site property to the north, south, and east, and a small unnamed stream crosses the southern and eastern portion of the site and flows adjacent to the landfill. The unnamed stream flows into Pancake Hollow Creek and then Black Creek and the Hudson River. An approximate 15-acre portion of the 80-acre site property was a waste disposal area that was established in 1963 as a private landfill accepting municipal and industrial waste.

A locked gate has been installed across the unpaved main access road near Route 44/55 and a six-foot high chain-link perimeter fence has been erected around the northern, western, southern, and southeastern boundaries of the landfill area. The gate and fence act to prevent unauthorized personnel from entering the site.

Geology/Hydrogeology

There are two aquifers beneath the site. The bedrock material is the Austin Glen formation and described as a greywacke and shale; variegated light blue to blue-grey fine- to medium-grained sandstone (greywacke) with occasional seams of shale having been observed. The rock has well-defined bedding planes and the upper few feet are slightly weathered. The overburden is a glacial till deposit consisting of a mixture of material (clay, silt, sand, gravel, and boulders) which widely range in size, shape, and permeability. Overlying the till deposit is a layer of light brown fine sand and silt.

Land and Resource Use

The site and the area surrounding the site are zoned residential. Approximately 1,350 people live within three miles of the landfill. There are about 500 people living within a mile of the site. Residents within the area obtain their drinking water from individual drinking water wells. No permanent structures are located on the site.

History of Contamination

The Hertel Landfill was established in 1963 as a private landfill accepting municipal and industrial waste. Approximately fifteen acres of the site property were used for disposal. In 1976, the Ulster County Department of Health (UCDOH) revoked the landfill permit for a variety of violations, among which were allegations of illegal industrial dumping. This UCDOH

action and a Town of Plattekill ordinance prohibiting the dumping of out-of-town garbage resulted in the permanent closing of the Hertel Landfill in March 1977.

Initial Response

Sampling and analysis of site groundwater in 1980 and 1982 revealed measurable amounts of several metals. Three leachate samples were collected in March and May 1981 by the New York State Department of Environmental Conservation (NYSDEC). Analyses of these samples detected phenols, organic compounds, and a number of metals. Based on these results, NYSDEC placed the Hertel Landfill Site on the New York State Registry of Inactive Hazardous Waste Disposal Sites. In 1983, the site was recommended for inclusion on the National Priorities List (NPL) by NYSDEC and in October 1984, the EPA proposed the Hertel Landfill site for inclusion on the NPL. In June 1986, the site was placed on the NPL.

In September 1992, EPA issued a Unilateral Administrative Order (UAO) to six Potentially Responsible Parties (PRPs), directing them to perform the remedial design/remedial action (RD/RA). Ford Motor Company (Ford) was the only PRP at the time to comply with the UAO. In 1994, Ford completed a pre-design investigation for the site which defined the extent of the landfill mass, modeled site groundwater dynamics and characterized soil, groundwater, surface water, and sediment contamination. The groundwater modeling predicted that a groundwater pump and treat system, if implemented, would have a negative impact on the wetlands immediately adjacent to the landfill, without achieving the goal of remediating groundwater contamination in the saturated zone.

In addition, Ford installed gas probes to monitor potential landfill gases generated by the decomposition of landfill material and, in 1995, installed a locked chain link fence to prevent unauthorized access to the landfill.

The remedial pre-design investigation, which formed the basis of the design of the landfill cap, was approved by EPA in September 1996. Thereafter, initial work for the construction of the cap began with the removal of vegetation growing over the landfill area, as well as the implementation of erosion control measures. In February 1997, EPA issued a second UAO to eight additional PRPs, directing these parties to cooperate and participate in the site cleanup with Ford and with Golden Books Publishing Co., Inc. (formerly Western Publishing Co., Inc.), which had come into compliance with the first UAO. In September 1998, EPA entered into a Consent Decree settlement ("RD/RA Consent Decree") with eleven PRPs, all of which had been recipients of one of the two previously issued UAOs, for continued performance of the RD/RA and recovery of EPA's and NYSDEC's site costs. At the same time, EPA entered into a second Consent Decree settlement with eight other PRPs to recover site costs. EPA entered into two additional cost recovery Consent Decree settlements with a total of five other PRPs, including F.I.C.A., a partnership that was the successor to Dutchess Sanitation Services, Inc.

Construction of the landfill cap was completed by the PRPs in December 1998. The landfill cap and leachate collection system are being monitored and maintained by the PRPs as set forth in

the RD/RA Consent Decree and the EPA-approved Operation and Maintenance Manual. In accordance with the EPA-approved monitoring plan for the site, post-closure monitoring is currently occurring on a biannual basis, and post-closure maintenance is being implemented and reported on a quarterly basis to EPA. In general, the surface water, sediment, and groundwater quality have improved.

Basis for Taking Action

EPA conducted a Remedial Investigation/Feasibility Study (RI/FS) of the site between 1989 and 1991. The scope of the investigation included geophysical surveys, soil gas screening, test pit excavations, soil borings, and monitoring well installation. Samples were collected from surface water, sediment, groundwater, surface soils, subsurface soils, and leachate seeps. The results of the RI revealed the presence of low levels of volatile organic compounds (VOCs) and metals at concentrations above background levels in groundwater, surface water, sediment, and soil samples. In September 1991, based on the results of the RI/FS, EPA issued a ROD for the site. During the RI/FS, a risk assessment was performed. The focus was on the potential health effects that could result from a direct contact with groundwater under current and future exposures through ingestion, inhalation, and dermal absorption of the groundwater. The chemicals of potential concern (COPCs) identified in the groundwater were arsenic, chromium, and manganese. The ROD selected a remedial action which included the construction of a multi-layer cap over the landfill portion of the site, construction of a gas-venting system and a leachate collection system, implementation of a comprehensive groundwater monitoring program for the site, and installation of a groundwater extraction and treatment system to control leachate migration. The capping of the landfill area was completed in December 1998, construction of the gas-venting system and leachate-collection was completed and site access was restricted.

In 2003, an updated risk assessment was performed to evaluate potential risks from exposure to the contaminated groundwater at the landfill and downgradient. Based upon the results of this reassessment and the risk assessment, site-related exposures were found to be at acceptable levels. The site remedy of the 1991 ROD was then reevaluated. EPA determined that actual or threatened releases of hazardous substances from the site do not present a potential threat to human health and that no further action, other than long-term monitoring, implementation of institutional controls, and continued operation and maintenance of the landfill cap and leachate collection system, was necessary.

The permanent cap and leachate collection system, as installed, was determined to have reduced the migration of contaminants sufficiently to improve site groundwater quality to the extent that the installation of a groundwater extraction and treatment system was no longer warranted or needed to ensure protection of public health and the environment. A ROD Amendment was approved in 2005 modifying the 1991 ROD by eliminating the groundwater extraction and treatment system from the remedy and adding a long-term monitoring program and the implementation of institutional controls.

IV. Remedial Actions

Remedy Selection

The remedy selected in the 1991 ROD included:

- Capping of the landfill in accordance with the NYCRR Part 360 closure requirements for New York State solid waste landfills.
- Restricting site access, construction of fencing around the perimeter of the landfill area.
- Implementation of a groundwater extraction and treatment system.
- Implementation of a groundwater monitoring program including additional sampling and analysis of residential wells.

Given the improvements in site groundwater quality over the past several years, EPA re-evaluated the active groundwater extraction and treatment remedy specified in the 1991 ROD. The remedial action objectives for the groundwater remedy are to:

- (1) protect human health by ensuring that future residents are not exposed to contaminated groundwater; and
- (2) reduce the further contamination of the wetlands in the area, and the migration of contaminants in groundwater.

In 2005, EPA approved a ROD Amendment for the site. The major components of the modification to the selected remedy include:

- Elimination of the groundwater extraction and treatment system portion of the 1991 selected remedy;
- Implementation of a long-term monitoring program where groundwater, surface water, sediment samples, and residential well water will be collected and analyzed on an annual basis to ensure that the remedy remains protective of human health and the environment; and
- Maintenance of site access restrictions, and implementation of institutional controls to prohibit any use of the site that would impair the effectiveness of the landfill cap and leachate collection system and to prohibit any digging of wells or extraction of groundwater in or immediately adjacent to the landfill cap.

Remedy Implementation

The multi-layer cap was constructed over the landfill portion of the site in 1998. The cap is a multi-layered design that complies with title 6 NYCRR Part 360 and covers approximately 13 acres of the landfill. In addition to the cap, a fence has been installed at the site. The gas venting system and leachate collection system were constructed and are operational. The gas venting system and leachate collection system are maintained and monitored by the site contractor.

In 2005, EPA issued a ROD Amendment eliminating the groundwater extraction and treatment system. The groundwater remedy is currently in place. The current groundwater monitoring program includes sampling of approximately 21 groundwater monitoring wells located at the site and analyzed for organic and inorganic compounds as well as nine residential/potable wells located downgradient of the site. During the review of the groundwater data from 2005-2009, several site-related contaminants were observed to have increased in the on-site wells as well as in downgradient monitoring wells. It should also be noted that iron, copper and manganese have also been detected above their relevant criteria in several residential potable wells. As discussed in more detail below, it cannot be determined at this time if the concentrations of these analytes detected in the potable wells are site-related. The residents' potable wells will continue to be sampled annually and an investigation will be initiated to determine if the potable wells downgradient are potentially impacted by site-related contamination.

Institutional Controls Implementation

The 2005 ROD Amendment specified that institutional controls would be put in place to prohibit any use of the site that would impair the effectiveness of the landfill cap and leachate collection system, and to prohibit any digging of wells or extraction of groundwater in or immediately adjacent to the landfill cap. Institutional controls would also be put in place to insure continued access to the site by EPA and the State of New York.

EPA has been working with PRPs since the first five-year review to develop and implement appropriate institutional controls. Two critical prerequisites for the institutional controls -- determining the grantee or grantees for the environmental easement that will establish the site property restrictions, and establishing the technical basis for a well-exclusion buffer area around the site -- have been underway since the first five-year review and are nearing completion. In late 2009, the PRPs submitted a report that provides the technical basis for the well-exclusion buffer. Thereafter, identification of the environmental easement grantee(s) and establishment of the well-exclusion buffer by the PRPs, and the subsequent full implementation of the institutional controls, are expected to follow. An institutional control implementation plan was submitted by the PRPs in March 2010 and is under review.

System Operations, Maintenance and Monitoring

The landfill cap and leachate collection system are being monitored and maintained by the PRPs as set forth in the Remedial Design/Remedial Action Consent Decree and the EPA-approved Operation and Maintenance Manual. In accordance with the EPA-approved monitoring plan for the site, post-closure monitoring is currently occurring on a biannual basis, and post-closure maintenance is being implemented and reported on a quarterly basis to EPA. The current groundwater monitoring program includes sampling of approximately 21 groundwater monitoring wells located at the site and analyzed for organic and inorganic compounds as well as nine residential/potable wells located downgradient of the site. Monitoring wells are sampled semi-annually for organic and inorganic compounds and residential wells are sampled annually.

The gas venting systems appear to function as designed. Monitoring reports indicate that measurements taken at vents do not exceed air quality standards. The cover system and slopes appear to be well maintained.

V. Progress since Last Five-Year Review

The previous five-year review found that the implemented remedy protected public health and the environment and there were no issues or follow up recommendations identified during that review. As noted above, actions towards the implementation of institutional controls have been initiated and are expected to be implemented in 2010.

VI. Five-Year Review Process

Administrative Components

The five-year review team consisted of Monica Baussan (Remedial Project Manager), Edward Modica (Hydrogeologist), and Julie McPherson (Human Health Risk Assessor).

Community Involvement

The EPA Community Relations Coordinator for the Hertel Landfill Site, David Kluesner, published a notice in the *Poughkeepsie Journal*, a local newspaper, on December 16, 2009, notifying the community of the five-year review process. The notice indicated that EPA would be conducting a five-year review of the remedy for the site to ensure that the implemented remedy remains protective of public health and the environment and is functioning as designed. It was also indicated that once the five-year report is completed, the results will be made available in the local Site repository. In addition, the notice included the RPM's address and telephone number for questions related to the five-year review process or the Hertel Landfill Site.

Document Review

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

Data Review

Since the completion of the landfill cap at the site, the groundwater, sediment and surface water, residential wells, and landfill gas vents have been monitored and sampled on a regular basis.

Groundwater monitoring wells

The groundwater monitoring program includes sampling of approximately 21 groundwater monitoring wells located on or adjacent to the site and these samples are analyzed for organic and inorganic compounds.

The analysis shows that iron and manganese are found in most wells at elevated levels in and adjacent to the landfill. However, these contaminants are also considered to be naturally occurring in the Hertel Landfill area. Results from monitoring wells installed along the eastern edge of the landfill show elevated levels of iron, manganese, sodium, and arsenic; some sporadic exceedences of antimony and thallium were also detected. These results are consistent with previous monitoring events. Analysis of samples from monitoring wells installed downgradient of the landfill indicate some elevated levels of iron and manganese above their respective New York Department of Conservation Water Quality Regulations (NYSDEC WQRs) or Federal Maximum Contaminant Levels (MCLs). There are two categories of drinking water standards identified under the federal drinking water regulations. The first category is the National Primary Drinking Water Regulations (NPDWRs or primary standards), which are legally enforceable standards that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water. The second category is the National Secondary Drinking Water Regulations (NSDWRs or secondary standards), which are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. The MCLs for iron and manganese are secondary standards. Although the concentrations of iron and manganese are above their MCLs (300ug/l for iron, 300ug/l for manganese and 500ug/l for iron and manganese together), the concentrations do not currently pose a human health risk. Additional investigation will be initiated to further assess whether the results are indicative of site-related contamination or are related to naturally occurring background levels of these constituents.

Residential wells

As part of the monitoring program, nine residential wells are also sampled for organic and inorganics. Iron, copper and manganese have been detected above their respective MCLs in several potable wells. The maximum detected concentrations of COPCs in the private wells were compared to their respective residential groundwater Regional Screening Levels (RSLs) and MCLs (National Primary Drinking Water Standards) and NYSDEC WQRs. The MCL is the highest level of contaminant that is allowed in drinking water. MCLs are promulgated standards that apply to public water systems and are intended to protect human health by limiting the levels of contaminants in drinking water. The RSLs are a human health risk-based value that is equivalent to a cancer risk (CR) of 1×10^{-6} or a hazard index (HI) of 1. The NYSDEC WQRs are the chemical-specific applicable or relevant and appropriate requirements (ARARs) established in the ROD. The maximum detected concentrations of iron and manganese did exceed their respective NYSDEC WQR or MCL but did not exceed their respective human health risk-based criteria (RSL). The MCLs for iron and manganese are secondary standards which are not based on human health but rather are based on cosmetic or aesthetic effects, which are not enforceable guidelines. Although the concentrations of iron and manganese are above the MCL, the concentrations do not currently pose a human health risk. Copper was detected in several private well samples above its MCL or NYSDEC GWQS but was not detected in the on-site monitoring wells above the respective criteria. This suggests that the exceedences of copper in the private wells are not site-related and may be related to secondary sources (e.g., copper

plumbing or brass water fixtures). The private wells will continue to be monitored.

Surface water and Sediment

The monitoring program also includes annual collection of sediment and surface water samples from three different areas: upgradient of the landfill, along the eastern edge, and downgradient of the landfill. Sediment/surface water quality data for the years 2005-2009 indicate an increase in concentrations in contaminated sediments, and to a lesser degree, an increase in contamination of surface water along the unnamed creek on the east side of the Landfill. Concentrations of manganese in sediment exceeded the 460 LEL standard at all sampling stations (SSW-4, -4A, -1A, -3, -6, -5, and -2) for the past three years. The distribution of manganese concentrations from upstream to downstream is erratic; that is, there is no progressive decrease or systematic pattern of changing concentration with distance downstream. For example, for the 2009 sampling event, the concentrations of manganese in sediments are 1,870 mg/kg, 3,520 mg/kg, 860 mg/kg, 1,520 mg/kg, 1,110 mg/kg, 852 mg/kg and 13,000 mg/kg from upstream to downstream locations. Other metal contaminants reported in the sediments that exceed quality standards include arsenic, copper, nickel, lead, silver, zinc, chromium, and cadmium. These appear to be erratically distributed among the sampling stations. There were also reported sporadic slight exceedences of semi-volatile organic compounds (SVOCs). However, the current concentrations of manganese and iron are well below sediment concentrations analyzed in the Baseline Ecological Risk Assessment (BERA) completed in 2003. This BERA was performed prior to the ROD Amendment of 2005, and it stated that the concentrations identified during the sampling events performed in 2002 and 2003 did not pose a threat/impact to the wetlands. Therefore, the sediment concentrations during the past five years do not suggest any adverse ecological impacts.

The increased level of sediment contamination may be due to changes in seepage and runoff conditions along the eastern edge of the landfill. Consequently, sediment/surface water quality along the creek and near the seeps should continue to be closely monitored. An investigation into potential causes of the recent increase in sediment contamination and ways to reduce it should also be considered.

Site Inspection

A site inspection was performed on October 27, 2009. The following parties were in attendance:

Monica Baussan, EPA RPM, Region II
Julie Mcpherson, EPA Risk Assessor, Region II
Edward Modica, EPA Hydrogeologist, Region II
Christian Franco, Hatch Mott McDonald

Interview

The gas venting system and leachate collection system are maintained and monitored by the site contractor. During the site visit, the site contractor stated that the leachate collection system and gas venting system have had very minor recovery in the past couple of years. This portion of the

remedy will be further evaluated, within the next five years, in order to determine if the "systems" as constructed are necessary or if optimization is required.

Institutional Controls Verification and Effectiveness

As noted above, the 2005 ROD amendment has several requirements for institutional controls. While these are not currently in place, they are anticipated to be completed in 2010. In the meantime, regular inspections by the PRPs ensure that the cap has not been breached. In addition, the State of New York requires submission of a water supply application for the construction of wells with pumping capacities of greater than 45 gallons per minute and the Ulster County Department of Health requires submission of well logs for all new well construction. These requirements will help prevent the drilling of wells around the site until the appropriate institutional controls are in place.

VII. Technical Assessment

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

According to the 1991 ROD, the remedy, as originally specified, consisted of multi-layered cap, a gravity drainage system to dissipate excess hydraulic head beneath the cap, a gas venting system, groundwater extraction/treatment, groundwater monitoring program, and access restrictions. Subsequent to the construction of cap, a determination was made that the extraction/treatment component of the remedy was no longer warranted as the cap was successfully reducing migration of contaminants sufficiently to improve groundwater quality. The elimination of the groundwater extraction/treatment system from the remedy was memorialized in the 2005 ROD Amendment. The Amendment also called for long-term monitoring of groundwater, surface water, sediments, residential wells, and maintenance of site access restrictions. Institutional controls were to be implemented to prohibit any land use that would impair the effectiveness of the cap, and prohibit installation of wells immediately adjacent to cap.

The cap is a multi-layered design that complies with title 6 NYCRR Part 360 and covers approximately 13 acres of the landfill. The cap is designed to reduce recharge to leachate in the overburden aquifer. The cap incorporates gas venting and impermeable layers. Excess groundwater is dissipated through perforated pipes installed beneath the cap and collects at a sump located at the toe of the landfill. The gas venting systems appear to function as designed. Monitoring reports indicate that measurements taken at vents do not exceed air quality standards. The cover system and slopes appear to be well maintained. No breaches or depressions were noted during site inspection. Runoff control features appear to be in good repair. A perimeter fence surrounds the capped area and is also in good repair.

Performance of the remedy is evaluated with groundwater-quality data collected in and adjacent to the landfill. Monitoring wells are sampled semi-annually for organic and inorganic compounds. Groundwater quality data for the previous five years show no exceedences (of NYSDEC GWQS for organic compounds). The analysis does show that iron and manganese are found in most wells at elevated levels in and adjacent to the landfill. However, these constituents

are considered to be naturally occurring in the Hertel Landfill area. Results from monitoring wells installed along the eastern edge of the landfill show elevated levels of iron, manganese, sodium, and arsenic; some sporadic exceedences of antimony and thallium were also detected. These results are consistent with previous monitoring events. Analysis of samples from monitoring wells installed downgradient of the landfill indicate some elevated levels of iron and manganese. Results of groundwater analysis from residential wells along Route 44/55 indicate that the iron, copper and manganese have been detected above their respective MCLs. Copper was detected in several private well samples above its respective MCL or NYSDEC (GWQS) but was not detected in the on-site monitoring wells above the criteria. This suggests that the exceedences of copper in the private wells are not site-related and may be related to secondary sources (e.g., copper plumbing or brass water fixtures). The maximum detected concentration of iron and manganese did not exceed their respective human health risk-based criteria (RSL). The MCLs for iron and manganese are secondary standards which are not based on human health but rather are based on cosmetic or aesthetic effects. Although the concentrations of iron and manganese are above the MCL, the concentrations do not currently pose a human health risk. As iron and manganese are prevalent in the groundwater in areas not impacted by the site, it is thought that the concentrations of analytes detected in the wells may not be site-related. The residents' potable wells will continue to be sampled annually and an investigation will be initiated to determine if the downgradient residential potable wells are potentially impacted by site-related contamination. Additional studies related to groundwater and sediment inorganic contamination are required.

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

Some chemical-specific toxicity values have changed since the site was originally assessed. In order to account for changes in toxicity values since the baseline human health risk assessment was performed, the maximum detected concentrations of the contaminants of concern (COCs) identified during the 2005 through 2009 sampling period were compared to National Primary Drinking Water Standard Maximum Contaminant Levels and their respective New York State Department of Environmental Conservation Groundwater Quality Standards. The MCL is the highest level of contaminant that is allowed in drinking water. MCLs are promulgated standards that apply to public water systems and are intended to protect human health by limiting the levels of contaminants in drinking water. The RSLs are a human health risk-based value that is equivalent to a cancer risk (CR) of 1×10^{-6} or a hazard index (HI) of 1. The NYSDEC GWQR are the chemical-specific ARARs established in the ROD. The results indicate that the concentrations of iron and manganese have increased and exceed their respective secondary MCLs or NYSDEC GWQS but did not exceed their respective human health risk-based criteria (RSL). The MCLs for iron and manganese are secondary standards which are not based on human health but rather are based on cosmetic or aesthetic effects, which are not enforceable guidelines. Additional investigation will be initiated to further assess whether the results are indicative of site-related contamination or are related to naturally occurring background levels of these constituents.

The residential potable wells monitored as part of the O&M plan have also detected copper, iron,

manganese and lead above their respective MCLs. Lead was detected in only one residential well during the 2005-2009 sampling period. The sample was collected from the tap. Previous evaluation of the sampling data for this residence determined that the lead detected is not site-related but may be related to other sources (e.g., plumbing). Copper was detected in several private well samples above its respective MCL or NYSDEC GWQS but was not detected in the on-site monitoring wells above its criteria. This suggests that the exceedences of copper in the private wells are not site-related and may be related to secondary sources (e.g., copper plumbing or brass water fixtures). Iron and manganese exceedences of MCLs or NYSDEC GWQS occurred in several private wells in the past five years. The maximum detected concentrations of iron and manganese did exceed their respective NYSDEC WQR or MCL but did not exceed their respective human health risk-based criteria (RSL). Although the concentrations of iron and manganese are above the MCL, the concentrations do not currently pose a human health risk. The residential potable wells will continue to be sampled annually and an investigation will be conducted to determine if the downgradient residential potable wells are potentially impacted by site-related contamination.

The concentrations of site-related inorganic contaminants in groundwater have increased in the past five years and are detected above their respective criteria. The concentrations of site-related contaminants detected in the perimeter wells downgradient of the landfill exceed MCLs. It should also be noted that the furthest upgradient sediment sample (SSW-4) has some of the highest concentrations of site-related contaminants. Considering that the screening intervals of the perimeter wells are currently unknown, it cannot be determined if the contamination observed in the sediment is primarily site-related or associated with an upgradient source. It is recommended that additional information, such as pore water samples, be provided in order to determine if contamination from the landfill is migrating and discharging into the surface water body or if a secondary source is located upstream of the landfill.

Soil vapor intrusion was not previously evaluated as a potential future exposure pathway based on the conservative (health protective) assumption that buildings are constructed at locations directly above the maximum detected concentration of the contaminants of concern in the groundwater. The health-based screening criteria provided in the Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (USEPA, 2002) was used to initially evaluate this exposure pathway. This guidance provides calculations of concentrations in groundwater associated with indoor air concentrations at acceptable levels of cancer risk and noncancer hazard. This review compared the maximum detected concentrations of the chemicals of potential concern with the vapor intrusion screening criteria. The maximum detected concentrations of volatile organic compounds were found to be below the screening criteria. Based on this information, it is not anticipated that this exposure pathway will be a concern at this site.

Sediment concentrations were evaluated to assess potential impacts to the ecological environment. As previously stated, these current concentrations of manganese and iron are well below sediment concentrations analyzed in BERA in 2003. Therefore, the sediment concentrations during the past five years do not suggest any adverse ecological impacts.

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

No human health or ecological risks have been currently identified, and no weather-related events have affected the protectiveness of the remedy. Some groundwater exceedences have been detected and an investigation will be initiated in order to determine if they are site related or reflect naturally occurring background conditions.

Technical Assessment Summary

The results of the five-year review have demonstrated that:

- There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.
- Data show that in residential wells iron and manganese have been detected above standards; while the levels do not present a health threat, it would be appropriate to initiate an investigation to further assess whether this is site-related or naturally occurring in the area.
- Groundwater data show exceedences of iron and manganese criteria (though not above risk-based levels) which are also naturally occurring.
- The increased level of sediment contamination may be due to changes in seepage and runoff conditions along the eastern edge of the landfill. Consequently, sediment/surface water quality along the creek and near the seeps should continue to be closely monitored.
- Implementation of Institutional Controls is underway and should be completed.

VIII. Issues/Recommendations, and Follow-up Actions

After reviewing the current conditions at the site, there several recommendations for the next five-year review:

- Increase the number of wells in the upgradient well network in order to more robustly characterize the background conditions, primarily iron and manganese concentrations.
- Perform an assessment of iron and manganese conditions in the background and downgradient wells to more fully assess whether contaminants in downgradient monitoring and residential wells are site-related or representative of naturally occurring conditions.
- Evaluate the performance of the gas venting system and the leachate collection system to determine if optimization is necessary.

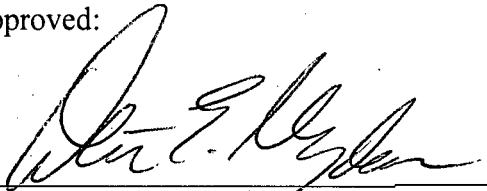
IX. Protectiveness Statement

The remedy for the Hertel Landfill Superfund site protects human health and the environment in the short-term. Currently, there are no exposure pathways that could result in unacceptable risks and none are expected as long as the engineered, access and institutional controls selected in the decision documents continue to be properly monitored and maintained.

X. Next Review

Since hazardous substances, pollutants or contaminants remain at the Hertel Landfill site which do not allow for unlimited use or unrestricted exposure, in accordance with 40 CFR 300.430(f)(4)(ii), the remedy for the site shall be reviewed no less often than once every five years. The next five-year review for the Hertel Landfill Superfund site will be completed within five years from the date of this review.

Approved:



Walter E. Mugdan, Director
Emergency and Remedial Response Division

April 13, 2010

Date

List of Figures

Figure 1. Hertel Superfund Site Location Map

Figure 2. Hertel Landfill Superfund Site Well Location Map

Figure 3. Site Sampling Locations for Private Wells

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**Hatch Mott
MacDonald**

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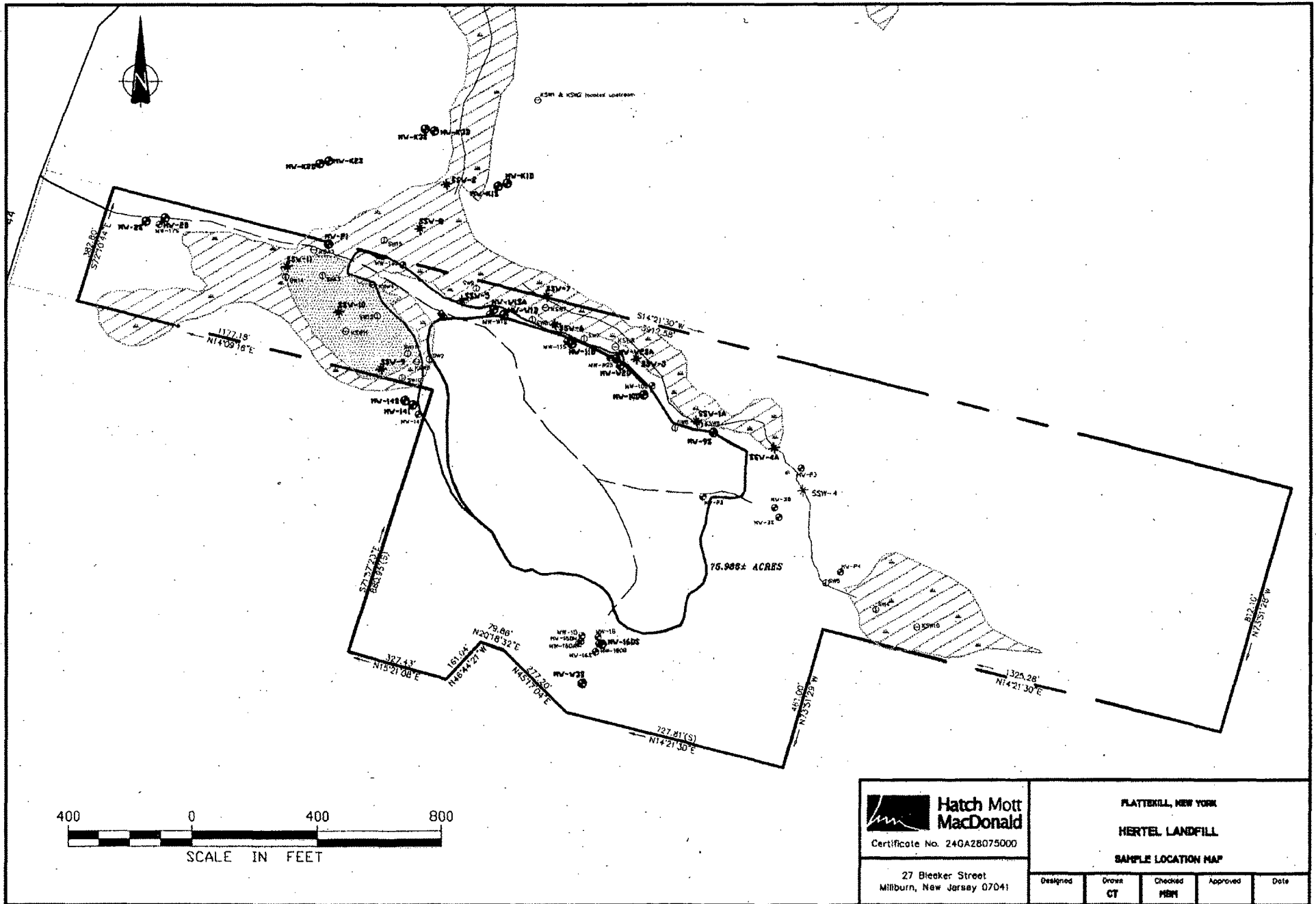
27 Bleeker Street
Millburn, New Jersey 07041

FLATBUSH, NEW YORK

HERTEL LANDFILL

SITE LOCATION MAP

Designed	Drawn	Checked	Approved	Date
	CT	MRM		

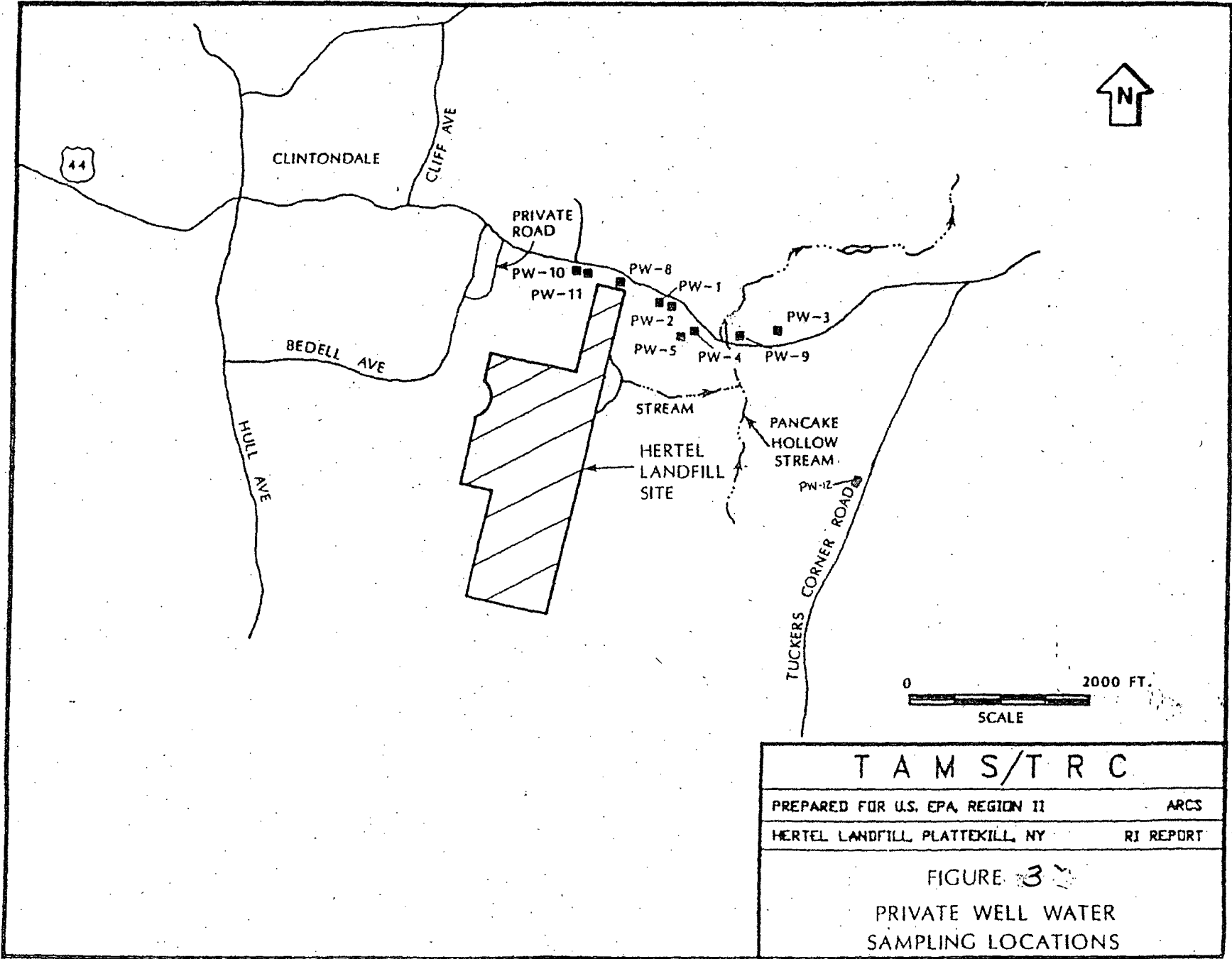


Hatch Mott MacDonald
 Certificate No. 24GA28075000

27 Bleeker Street
 Millburn, New Jersey 07041

FLATTERKILL, NEW YORK
HERTEL LANDFILL
 SAMPLE LOCATION MAP

Designed	Drawn	Checked	Approved	Date
	CT	MEM		



T A M S / T R C	
PREPARED FOR U.S. EPA, REGION II	ARCS
HERTEL LANDFILL, PLATTEKILL, NY	RI REPORT
<p>FIGURE 3</p> <p>PRIVATE WELL WATER SAMPLING LOCATIONS</p>	

Table 1: Chronology of Events

Date	Event
June 1986	Site placed on NPL
September 1989-1991	Remedial Investigation/Feasibility Study (RI/FS) was conducted
September 1991	ROD issued
September 1996	Remedial Design Report approved
November 1996	Preliminary clearing and grubbing of the landfill area
June 1997	Beginning of construction activities
December 1998	Construction of landfill cap completed
December 1998	Site Inspection of landfill cap
May 1999	Remedial Action Report Approved
September 2001	First Five-Year Review completed
October 2002	Groundwater Technical Report completed
July 2004	Post-Decision Proposed Plan issued
July 2004	Upgradient Residential Sampling performed
September 2004	Final Site Inspection conducted
February 2005	Preliminary Close-Out Report documenting completion of site construction activities approved
January 2005	ROD Amendment
2005 – to present	Long-term monitoring program

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

Document Title, Author	Submittal Date
Final Baseline Ecological Risk Assessment, Arcadis G & M	August 2004
Former Hertel Landfill Site, Groundwater technical Report, Hatch Mott Macdonald	October 2002
Former Hertel Landfill Site Remedial Action Report, Killam Associates	April 1999
Record of Decision, EPA	September 1991
First Five Year Review, EPA	September 2001
ROD Amendment, EPA	January 2005
Second Five Year Review, EPA	June 2005
Quarterly Inspection Reports, Hatch Mott Macdonald	2005-2009
Groundwater, Residential, Surface water and Sediment sampling data, Hatch Mott Macdonald	2005-2009

Table 3: Other Comments on Operation, Maintenance, Monitoring, and Institutional Controls

Comment

Actions regarding the implementation of institutional controls are ongoing. Implementation is expected to take place in 2010.

Table 4: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Need to more robustly characterize the background conditions, primarily iron and manganese concentrations, in the groundwater and further assess whether contaminants in downgradient monitoring and residential wells are site related or representative of naturally occurring conditions.	Increase the number of wells in the upgradient well network Assess upgradient and sidegradient wells to identify appropriate wells for sampling to characterize background.	PRPs	EPA	5/30/15	N	Y
Evaluate the performance of the gas venting system and the leachate collection system to determine if optimization is necessary	Assess performance of these two systems to identify their need and optimization.	PRPs	EPA	05/30/15	N	Y

Table 5: List of Acronyms

ACO	Administrative Consent Order
ARAR	Applicable or Relevant and Appropriate Requirement
BERA	Baseline Ecological Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COCs	Contaminant of Concern
EPA	United States Environmental Protection Agency
FS	Feasibility Study
NYDEC	New York Department of Environmental Conservation
NPL	National Priority List
OU	Operable Unit
PRP	Potentially Responsible Party
RAO	Remedial Action Objectives
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSLs	Regional Screening Levels
SVOCs	Semi-volatile Organic Compounds
VOCs	Volatile Organic Compounds