

**Five-Year Review Report
Old Bethpage Landfill Superfund Site
Old Bethpage
Nassau County, New York**

Prepared by:

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

September 2007

EXECUTIVE SUMMARY

This is the third five-year review for the Old Bethpage Landfill Superfund site (Site), located in the Village of Old Bethpage, Nassau County, New York. The remedy for the Site included the installation of a landfill clay cap, installation of a gas control system to control subsurface gas migration, installation of a landfill leachate collection and treatment system, and operation of a groundwater collection treatment facility to recover and remediate contaminated groundwater associated with the landfill. The operations, maintenance and monitoring activities include groundwater, soil gas quality and ambient air-quality monitoring, as well as annual site inspections to ensure that the cap and cover, as well as the fence around the landfill property, remain intact.

Institutional controls were not included in the 1988 ROD or the Consent Decree. The Region did not find a need for institutional controls as part of the final remedy or as an interim action based on the reasonably anticipated future land and groundwater use at this site. State and local law and regulation currently address this landfill as well as contaminated groundwater. However, additional institutional controls (e.g., deed restrictions limiting future use) may be appropriate for the Site. EPA intends to further engage the State and the Town in discussions on institutional controls, including state requirements covering the landfill property.

Based upon a review of the Records of Decision, Consent Decree, the operations, maintenance and monitoring reports, annual site inspection reports, and, the recent site inspection conducted for this five-year review, the U.S. Environmental Protection Agency (EPA) concludes that the remedies implemented at the Site function as intended by the decision documents. Currently, the Site protects human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name (from WasteLAN): Old Bethpage Solid Waste Disposal Complex

EPA ID (from WasteLAN): NYD980531727

Region: 2

State: NY

City/County: Old Bethpage, Nassau

SITE STATUS

NPL status: Final Deleted Other (specify) _____

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

Multiple OUs? YES NO

Construction completion date: 10/01/1993

Has site been put into reuse? YES NO N/A (site involves groundwater plume and not real property)

REVIEW STATUS

Lead agency: EPA State Tribe Other Federal Agency _____

Author name: Maria Jon

Author title: Remedial Project Manager

Author affiliation: EPA

Review period: 09/30/2002 to 07/30/2007

Date(s) of site inspection: 06/19/2007

Type of review:

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

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): 09/30/2002

Due date (five years after triggering action date): 9/30/2007

Does the report include recommendation(s) and follow-up action(s)? yes no

Is human exposure under control? yes no

Is contaminated groundwater under control? yes no not yet determined

Is the remedy protective of the environment? yes no not yet determined

Five-Year Review Summary Form (continued)

Issues, Recommendations and Follow-Up Actions

The remedy has been implemented and is functioning as intended by the Old Bethpage Landfill site's decision documents. Institutional controls were not included in the 1988 ROD or the Consent Decree. The Region did not find a need for institutional controls as part of the final remedy or as an interim action based on the reasonably anticipated future land and groundwater use at this site. State and local law and regulation currently address this landfill as well as contaminated groundwater. However, additional institutional controls (e.g., deed restrictions limiting future use) may be appropriate for the Site. EPA intends to further engage the State and the Town in discussions on institutional controls, including state requirements covering the landfill property.

Protectiveness Statement

The implemented remedy for the Old Bethpage Landfill Superfund Site protects human health and the environment. The groundwater contamination and the potential for gas migration at the Old Bethpage Landfill are under control and there is no exposure to human receptors from site-related contaminants. There are no exposure pathways that could result in unacceptable risks and none expected as long as the site and groundwater use does not change and the engineered and access controls selected in the decision documents continue to be properly operated, monitored and maintained. However, in order to ensure long-term protectiveness, some resolution concerning institutional controls must be reached.

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Acronyms Used in this Document	
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CIC	Community Involvement Coordinator
NCP	National Contingency Plan
MCL	Maximum Contaminant Level
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Protection
NYSDOH	New York State Department of Health
PCE	tetrachloroethene
RA	Remedial Action
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TCE	Trichloroethene

U.S. Environmental Protection Agency
Region II
Emergency and Remedial Response Division
Five-Year Review

Old Bethpage Landfill Superfund Site
Town of Oyster Bay, Nassau County, New York

I. INTRODUCTION

This five-year review for the Old Bethpage Landfill Superfund Site (Site), located in the Village of Old Bethpage, Nassau County, New York, was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager, Maria Jon. The five-year review was conducted pursuant to Section 121 (c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §9601 et seq. and 40 CFR 300.430(f)(4)(ii), and in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of a five-year review is to assure that implemented remedies protect public health and the environment and function as intended by the decision documents. This report will become part of the Site file.

In accordance with Section 1.3.1 of the five-year review guidance, a five-year review is triggered by the initiation of the first remedial action at the site that leaves hazardous substances, pollutants, or contaminants on-site above levels that allow for unlimited use and unrestricted exposure. A subsequent statutory five-year review is triggered by the signature date of the previous five-year review report. The trigger for this five-year review is the date of the second five-year review report, which is September 30, 2002. This report covers one operable unit.

II Site Chronology

Chronology of Site Events

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

III. Background

Site Location and Physical Description

The Site is located in Old Bethpage, Town of Oyster Bay, Nassau County, New York. The 68-acre landfill is an inactive municipal landfill that is part of a larger sanitary landfill complex, namely, the Old Bethpage Solid Waste Disposal Complex (OBSWDC). The OBSWDC is owned and operated by the Town of Oyster Bay. The property on which the landfill is located is bounded primarily on the north by Bethpage Sweethollow Road, on the east by Winding Road and on the west by Claremont Road and Round Swamp Road.

The OBSWDC consists of a total of 134 acres which contain the closed and capped landfill, inactive incinerators, a municipal solid waste transfer facility, a groundwater treatment facility, a leachate treatment facility, landfill gas control and recovery systems, a periodically operated New York State Department of Environmental Conservation (NYSDEC) approved clean fill disposal site, a recycling facility, scale house, recharge basins, stockpile areas and vehicle maintenance facilities. See Figure 1.

Geology/Hydrogeology

The Old Bethpage Landfill is underlain by four stratigraphic units, known generally as the Upper Glacial Formation, Magothy Formation, and the Raritan Clay and Lloyd Sand members of the Raritan Formation. These units form a wedge-shaped sequence of Pleistocene and Cretaceous age unconsolidated deposits, approximately 1,100 feet thick, which overlies a southeast-dipping bedrock surface.

The Pleistocene age Upper Glacial Formation consists chiefly of sand and gravel deposits, locally interbedded with clay and silt lenses. This unit occurs from near land surface to approximately 50 feet below grade, and is present as a relatively thin veneer over the area. The Cretaceous age Magothy Formation directly underlies the Upper Glacial Formation. This unit consists chiefly of interbedded gray buff and white fine sand and clayey sand, and black, gray, white, buff and red clay. The upper surface of the Magothy Formation varies in elevation from approximately 40 feet to more than 120 feet above mean sea level (msl). The base of the Magothy Formation occurs at an elevation of approximately 550 feet below msl. The Magothy Formation is the principal aquifer in the area, however, most supply water wells are screened in the lower portion of the formation. The underlying Raritan Clay, which is approximately 220 feet thick, is generally considered to be a barrier to groundwater flow.

Three aquifer zones have been identified. These zones include the Water-Table zone (from 76 to 43 feet above msl), the Shallow Potentiometric Zone (from 30 feet above to 30 feet below msl), and the Deep Potentiometric Zone (from 65 to 157 feet below msl). Water-level elevations in all three aquifer zones are highest northwest of the landfill, and lowest southeast of the landfill in Bethpage State Park, indicating a southeast horizontal groundwater flow direction.

Land and Resource Use

A residential community is located to the northwest of the landfill and an industrial park, including the Claremont Polychemical Corporation Superfund site, is located to the east. Bethpage State Park, which consists largely of a public golf course, is located to the south, west, and east of the landfill. The Nassau County Fireman's Training Center is located to the south of the landfill. There are two public drinking water well fields in the general vicinity of the landfill, Plainview Well Field #5 to the north and two Farmingdale wells to the south-southeast. There are no permanent surface water bodies within a mile of the Site in any direction.

Presently, the OBSWDC is fenced and operations largely consist of operating the Town's scale house, solid waste transfer station, recycling program, clean fill disposal site, gas control system, power generating facility, leachate and groundwater treatment facilities and a vehicle maintenance garage.

The landfill is closed and the Town of Oyster Bay does not have plans for re-use of the landfill. Since the Site must be maintained as a Superfund containment facility, the re-use opportunities are limited.

History of Contamination

The Town of Oyster Bay (Town) began landfilling operations in 1958, which consisted of processing and disposal of municipal waste at the OBSWDC. The municipal wastes were burned in two on-site incinerators, and excess materials were compacted and baled for disposal in the adjacent landfill. The landfill also accepted incinerator ash and residue, as well as raw municipal solid waste bypassed around the incinerators during periods of maintenance downtime. In 1986, all landfilling and incineration activities ceased, and the Town began to ship off-site all waste collected and not recycled.

In 1979, local, state and federal investigations were initiated to determine the groundwater quality beneath and adjacent to the OBSWDC and the Site's potential impact to the public health and safety of area residents. The data obtained during these investigations indicated the presence of inorganic compounds and volatile organic compounds (VOCs) in the groundwater. The VOCs detected in the groundwater were 1,2 dichloroethene, vinyl chloride, trichloroethene, benzene, toluene, ethylbenzene and xylenes. In addition, methane gas was detected in the subsurface soil, both on- and off-site. The Site was listed on the National Priorities List (NPL) on September 8, 1983.

Initial Response

From 1982 to 1984, prior to the NPL listing, the Town had already initiated various remediation activities. These remediation activities included the following:

- Installation of a gas control system to control subsurface gas migration.
- Installation of a landfill leachate collection and treatment system to control the accumulation and migration of landfill leachate off-site.
- Placement of an impermeable clay cap on the eastern and northern slopes of the landfill (approximately 29 acres).

Basis for Taking Action

The primary contaminants detected in the groundwater are benzene, chlorobenzene, 1,2 dichloroethene, vinyl chloride, and trichloroethene. The main health risk associated with the Site is drinking contaminated groundwater, and since the Village of Farmingdale uses the public drinking water wells directly downstream of the landfill, these wells could be threatened by the contaminants.

IV. Remedial Actions

Remedy Selection

Following the completion of the remedial investigation and feasibility study (RI/FS) in July 1987, EPA issued a Record of Decision (ROD) on March 17, 1988, and in June 1988, the Town entered into a Consent Decree with the State of New York. The Consent Decree required the Town to undertake the design and construction of specific remedial actions, as set forth in the ROD:

- Design, construct and operate a groundwater collection and treatment facility to recover and remediate the contaminated groundwater plume associated with the landfill;
- Design and construct a cap for the remaining uncapped areas of the landfill, approximately 29 acres of the 68-acre landfill has been capped;
- Continue to operate the leachate treatment facility;
- Continue to operate the landfill gas migration control system; and
- Perform various monitoring to determine the effectiveness and performance of each of the remedial systems components described above.

The remedy selected in the ROD focuses on the control and clean up of groundwater contamination emanating from the Landfill and source control of the Landfill by capping and gas control.

Remedy Implementation

Lockwood, Kessler & Bartlett, Inc., (LKB) was selected by the Town to prepare remedial design (RD) plans and specifications for all remedial components. These RDs were approved by the New York State Department of Environmental Conservation (NYSDEC) on various dates from 1989 through 1992. The following describes the remedial action (RA) efforts that were undertaken to implement each remedial component called for in the ROD and the Consent Decree:

Groundwater Collection and Treatment

The groundwater treatment system consists of five recovery wells, with an average depth of 280 feet delivering a combined maximum design flow of 1.5 million gallons per day; a treatment plant building, which houses the control room, laboratory, wet wells, pumps, acid rinse system and chemical holding tanks; an air stripper; a recharge basin with diffusion wells; and transmission piping.

A monitoring program to verify hydraulic containment of the groundwater plume and to assess the progress of the remediation was designed and implemented when the groundwater treatment system began continuous operation on April 1, 1992.

The Applicable or Relevant and Appropriate Requirements for groundwater cleanup include EPA's Maximum Contaminant Levels (MCLs), New York State Groundwater Standards or a zero-slope condition, if, after 5 or more years of pumping, no significant contaminant reduction is occurring and no other requisite remedial technology exists to further reduce the contamination.

Discharges from the operation of the air stripper meet the New York State Air Guide No. 1 Guidelines for the Control of Toxic Ambient Air Contaminants.

Landfill Capping

As discussed previously, prior to the development of the final Consent Decree and the issuance of the ROD, 29 acres of the total 68 acres of the landfill had already been capped. The remaining portion, 39 acres, was capped under the provisions of the final Consent Decree and the ROD. Testing was conducted in accordance with the standards established by the American Society for Testing Materials (ASTM). The clay cap was constructed in six-inch thick lifts, after compaction, to a final thickness of 18 inches. The performance specifications that were established in the final Consent Decree for the clay material included a permeability of 1×10^{-7} cm/sec or less. Twelve inches of growing medium and vegetative cover was placed over the clay cap to ensure its integrity.

Landfill Leachate Collection and Treatment

A leachate collection and treatment system has been operating at the landfill since September 1983. The system is designed to collect, store, treat and dispose of leachate generated by the landfill. Collection wells and an underdrain system have been installed over the 12-acre, lined portion of the landfill. Leachate flows from collection wells to a clay- and polyethylene-lined storage basin. The leachate is then treated by metals precipitation, solids separation, and pH adjustment. The treated effluent is discharged into the Nassau County sewage treatment system, in accordance with the requirements of the State Pollutant Discharge Elimination System (SPDES) and Nassau County ordinances. The sludge generated by the leachate collection system is disposed of at an

off-site location, in compliance with all applicable federal, State and local laws and regulations.

Landfill Gas Collection and Treatment

Since 1982, the Town has implemented programs to prevent off-site migration of landfill gas at the Site. A perimeter landfill gas-collection system has been installed and consists of 33 gas-recovery wells, 6,500 feet of collection header, and three condensate collection wells. The mechanical portion of the system consists of two independently driven blowers with a combined flow rate capacity of nearly 1800 cubic feet/minute, condensate separation equipment, safety devices, and a high temperature thermal oxidizer. Collected condensate is adjusted for pH and disposed through the Nassau County sanitary sewer system.

Under the terms of the ROD and the Consent Decree, the Town is required to operate and maintain the gas control system in compliance with the requirements of 6 NYCRR Part 360 at the OBSWDC property boundary.

Institutional Controls

Institutional controls were not included in the 1988 ROD or the Consent Decree. The Region did not find a need for institutional controls as part of the final remedy or as an interim action based on the reasonably anticipated future land and groundwater use at this site.

The groundwater treatment facility is presently operated 24 hours/day by automatic control systems, which are monitored by an operator who is on-site daily. Besides daily on-site activity, fencing and the posting of signs have effectively controlled access to the site.

Nassau County Public Health Ordinance Article 4, which prohibits the installation of new private potable water systems in areas served by a public water supply precludes any future potable water well installations in this portion of the aquifer. In addition, New York State law restricts to a large degree the future use of groundwater at this site. New York Environmental Conservation Law Section 15-527 provides that on Long Island (which includes Nassau County), “No person or public corporation shall hereafter install or operate any new or additional wells . . . to withdraw water from underground sources for any purpose or purposes whatsoever where the installed pumping capacity of any such new well or wells singly or in the aggregate, or the total installed pumping capacity of old and new wells on or for use on one property is in excess of forty-five gallons a minute without a permit pursuant to this title.” Furthermore, the New York Sanitary Code (Title 10 of the New York Code of Rules and Regulations Section 5-2.4) states that “No person shall construct or abandon any water well unless a permit has first been secured from the permit issuing official.”

System Operations/Operation and Maintenance

The remediation system began operating on April 1, 1992. A system of five (5) recovery wells, designated RW-1 through RW-5, was installed at the leading edge of the VOC plume associated with the landfill. These recovery wells are located in Bethpage State Park, which deliver a combined maximum design flow of 1.5 million gallons per day (MGD). Flow is processed through the air stripper. The treated water is discharged into a series of Town-owned recharge basins in accordance with the SPDES requirements. The treatment plant design and the initial operating conditions are based on continuous 24 hours per day, seven days per week operation. The estimated annual O&M costs are presented in Table 2 (attached).

A groundwater sampling and monitoring program consists of monthly and quarterly water-level measurements to assess the effectiveness of the hydraulic control created by the recovery well network and groundwater quality sampling at 16 monitoring wells to evaluate changes in groundwater quality over time on a quarterly basis. The groundwater samples are analyzed for VOCs, metals and leachate indicator parameters. Also, monthly SPDES monitoring of the groundwater treatment plant discharges is performed by the Town. Air stripper influent/effluent sample pairs are collected three times per week and analyzed for VOCs at the Town's on-site laboratory. These water-quality data are used to assess the impact of air stripper emissions on the ambient air.

Soil gas quality and ambient air-quality monitoring are being conducted in the vicinity of the landfill on a quarterly basis to measure compliance with established ambient air-quality guidelines. Additionally, the Town submits an annual engineering report prepared by a licensed professional engineering firm for the purpose of summarizing the status of all landfill gas monitoring programs. The reports document the effectiveness of the methane gas-collection system for controlling gas migration beyond the boundary of the landfill. In addition, landfill leachate is monitored on a monthly basis for metals, sulfites, and total suspended solids.

V. Progress Since Last Five-Year Review

The last five-year review for this Site made some recommendations and identified several followup actions. The recommendations and followup actions, as well as their implementation status, are summarized in Table 3 (attached).

Concerning the recommendation on institutional controls, EPA guidance indicates that, "if the cleanup does not result in unrestricted use and unlimited exposure at a site, an institutional control is likely appropriate." State and local law and regulation currently address this landfill as well as contaminated groundwater. However, additional institutional controls (e.g., deed restrictions limiting future use) may be appropriate for the Site. EPA intends to further engage the State and the Town in discussions on institutional controls, including state requirements covering the landfill property. See Section VIII Issues, Recommendations and Follow-up Actions.

EPA believes that the institutional controls and health and safety protections presently in place prevent potential exposures to current site use and resource use while remediation is ongoing at the Site.

VI. Five-Year Review Process

Administrative Components

The five-year review team consisted of Maria Jon (RPM), Robert Alvey (Hydrogeologist), and Chuck Nace (Risk Assessor).

Community Involvement

The EPA Community Involvement Coordinator (CIC) for the Old Bethpage Landfill site, Cecilia Echols, published a notice in the Plainview Herald on June 1, 2007, notifying the community of the initiation 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 is functioning as designed. To date there have been no inquiries or comments from the public about the five-year remedy review.

Data Review

Since the completion of the remedial action, the Site conditions have remained relatively stable. There has been no evidence of trespassing. The fence which surrounds the Site is intact and in good condition; the monitoring wells installed within and around the Site are functional; and, the landfill leachate and gas collection systems are operational.

The groundwater recovery system was designed to capture and treat the VOC portion of the landfill plume. Therefore, the data analysis focuses on VOC contamination. Since 1992, groundwater monitoring has been conducted on a quarterly basis. The VOC data collected during each quarterly monitoring round is evaluated on the basis of their observed ranges, and compared to previous quarterly monitoring results, the 1991 baseline sampling data, as well as its individual groundwater standard.

The VOCs detected in the groundwater are divided into three groups: volatile halogenated hydrocarbons ([VHOs], which include the following compounds: 1,1 dichloroethene, cis-1,2 dichloroethene, 1,1,1 trichloroethane, dichlorodifluoromethane, trichloroethylene(TCE)); aromatic hydrocarbons (which include the following compounds: benzene, chlorobenzene, ethylbenzene, dichlorobenzenes, xylenes, toluene); and tetrachloroethene (PCE).

Twelve VHO compounds were detected during this five-year review period. Total VHO concentrations decreased in monitoring wells MW-5 (0.40 ppb to not detected), MW6A (0.40 ppb to not detected), MW-8B (0.60 ppb to not detected), MW-11A (2.9 to 2.1 ppb) and OBS-1 (7.5 to 4.4 ppb), but increased in MW-7B (583 to 1,473 ppb) and MW-9D (31.5 to 42.2 ppb) compared to third quarter of 2005. Concentrations of volatile halogenated compounds remained low in the water table and shallow potentiometric zone. In the deep potentiometric zone,

elevated TCE concentrations of 975 and 1,290 ppb were detected in monitoring well MW-7B during the January 2007 and April 2007 sampling rounds, respectively.

Eleven aromatic hydrocarbons were detected in the groundwater. Aromatic hydrocarbons concentrations decreased in monitoring wells LF-1 (1.0 ppb to not detected), MW6B (1.4 ppb to 5.9 ppb), MW-8B (0.60 to 0.50 ppb), MW-11B (1.7 to not detected) and OBS-1 (4.8 to 1.5 ppb), but increased in MW-6E (2.4 to 3.0 ppb) and MW-6F (not detected to 2.9 ppb).

The historical and most current monitoring data indicate an overall reduction in landfill-related VOC levels in the groundwater. Benzene, chlorobenzene and dichlorobenzene are the VOCs that have been detected on a regular basis during quarterly monitoring. During the most recent quarter, the highest concentration of benzene was detected at 7 ppb (groundwater standard of 1 ppb), chlorobenzene was detected at 4.9 ppb (groundwater standard of 5 ppb), and dichlorobenzene was detected at 6.5 ppb (groundwater standard of 5 ppb). Data evaluation also indicates a reduction in total VOC levels at certain monitoring and recovery wells. These findings indicate that groundwater quality impacted by the VOCs associated with the Landfill is continuing to improve in response to the groundwater remediation.

In addition, review of the available data regarding the distribution of VOCs in the groundwater indicates that a portion of the VOC plume being remediated by this groundwater treatment system is not attributable to the Landfill, but associated instead with the Claremont Polychemical Superfund site, and possible other upgradient source(s). The Claremont Polychemical site is located directly upgradient of the eastern portion of the Town's recovery well field and PCE is the major contaminant historically associated with the Claremont Polychemical site.

Specifically, higher concentrations of TCE and several other volatile halogenated compounds, which are breakdown products of PCE, were detected on the east side of the plume during the January and April 2007 sampling events. Monitoring well MW-7B detected PCE at 78 ppb and TCE at 1,290 ppb (The TCE data from March to October 2006 indicates a range of 458 ppb to 583 ppb; further evaluation is necessary to determine the source of this increase in concentration of contaminants at MW-7B.), MW-10C detected PCE at 43 ppb and TCE at 273 ppb, and recovery wells RW-3, RW-4 and RW-5 detected PCE at 21 ppb, 16ppb and 80 ppb, respectively, and TCE at 46 ppb, 130 ppb and 331 ppb, respectively.

Document Review

The documents, data, and information which were reviewed in completing the five-year review are summarized in Table 4 (attached).

Site Inspection

A site inspection was conducted on June 19, 2007. The following parties were in attendance:

Maria Jon, EPA Region 2 RPM
Robert Alvey, EPA Region 2 Hydrologist
Chuck Nace, EPA Region 2 Risk Assessor

Brian Jankauskas, NYSDEC
Renata Ockerby, NYSDOH
Matthew Russo, Town of Oyster Bay
Eric Swenson, Town of Oyster Bay
Mike Rogers, Town of Oyster Bay
Robert Dwyer, Town of Oyster Bay
Patrick Slawin, Town of Oyster Bay
Ed Grass, Town of Oyster Bay
John Gerlach, LKB, Inc.
Theresa Heneveld, LKB, Inc.

VII. Technical Assessment

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

Yes. The objectives of the ROD and the Consent Decree are to prevent exposure of area residents to contaminated groundwater. Based upon the review of the documents and the results of the evaluations of the treatment units and groundwater monitoring data, it is concluded that the remedy is functioning as intended by the ROD and the Consent Decree.

The landfill cap, fencing, site drainage system, monitoring wells and recovery wells are intact and in good repair. Contaminated groundwater is extracted and properly treated and the groundwater plume does not extend to or threaten potable water supplies. Annual reports have demonstrated the effectiveness of the methane gas collection system for controlling gas migration beyond the boundary of the landfill.

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

As identified in the previous five-year review, which was completed in September 2002, the qualitative assessment that was performed identified two complete exposure pathways, ambient air exposure and groundwater exposure. The remedial actions that have taken place at the site have prevented the surrounding populations from potential exposure to contaminants found in the landfill. The cleanup levels that were identified in the Record of Decision were based upon the current standards in place at the time, however, as the standards have been revised, the Town has been applying the new standards for compliance. Thus, the exposure assumptions, toxicity data, cleanup levels, and the remedial action objectives used at the time of the remedy are still valid.

Although vapor intrusion was not evaluated in the original ROD, vapor intrusion was evaluated as part of the 2002 Five-year Review. The conclusions from that evaluation indicated that since there were no residences within 100 feet of the groundwater plume the vapor intrusion pathway was not complete. Based upon observations during the site visit, the conclusion regarding vapor intrusion reached in the 2002 Five-year Review is still valid.

Ecological – There were no completed pathways identified for ecological receptors. Based upon review of the past and current data, combined with the site visit, the previous conclusion that there is no completed exposure pathway for ecological receptors is still valid. The remedial action objectives used at the time of the remedy selection are still valid and protective of the environment.

Question 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 call into question the protectiveness of the remedy.

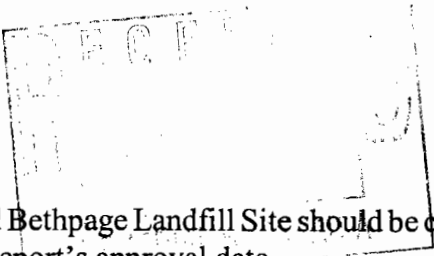
VIII. Issues, Recommendations and Follow-Up Actions

The remedy has been implemented and is functioning as intended by the Old Bethpage Landfill site's decision documents.

State and local law and regulation currently address this landfill as well as contaminated groundwater. EPA intends to further engage the State and the Town in discussions on institutional controls, especially state requirements covering the landfill property. Once EPA has determined the full extent of existing state and local requirements, EPA will then make the following determinations: which institutional controls apply to this site; which institutional controls are appropriate remedial actions under CERCLA and whether they are in place or need to be implemented; which institutional controls provide protection to public health and the environment beyond CERCLA; and, which institutional controls will EPA defer protectiveness to outside of CERCLA. These determinations will be made in an appropriate manner consistent with the requirements of the NCP. This site will not be deleted from the NPL until these determinations have been made and appropriately noticed. Table 5 summarizes the recommendations and follow-up actions stemming from this 5-year review.

IX. Protectiveness Statement

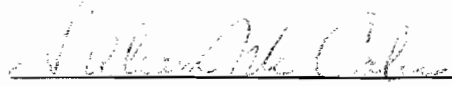
The implemented remedy for the Old Bethpage Landfill Superfund Site protects human health and the environment. The groundwater contamination and the potential for gas migration at the Old Bethpage Landfill are under control and there is no exposure to human receptors from Site-related contaminants. There are no exposure pathways that could result in unacceptable risks and none expected as long as the Site use and groundwater use does not change and the engineered and access controls selected in the decision documents continue to be properly operated, monitored and maintained. In order to ensure long-term protectiveness associated with potential changes in land and groundwater use which were not anticipated by the decision documents, it is necessary to conduct an evaluation of what, if any, additional institutional controls are required.



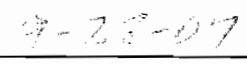
X. Next Review

The next five-year review for the Old Bethpage Landfill Site should be completed before September 2012, which is five years from this report's approval date.

Approved:



George Pavlou, Director
Emergency and Remedial Response Division



Date

Tables

Table 1 : Chronology of Site Events	
Event	Date
Volatile organic compounds detected in the groundwater	1979
Methane gas detected in the subsurface soil, both on- and off-site	1980
Construction of a landfill gas control system	1982-1984
Site placed on National Priorities List	1983
Construction of a landfill leachate collection and treatment system	1983
Placement of clay cap on landfill (approximately 29 acres)	1984
Record of Decision and Final Consent Decree	1988
Remedial Design for groundwater and landfill	1989- 1990
Remedial Action for groundwater completed	1992
Remedial Action for landfill completed	1993
First Five-Year Remedy Review	1997
Second Five-Year Remedy Review	2002
Third Five-Year Remedy Review	2007

Table 2: Groundwater Treatment Facility Annual Operating Costs	
2003	\$945,190
2004	\$976,341
2005	\$986,583
2006	not available
2007	not available

Table 3 : Recommendations and Follow-up Actions from the 2002 Five-Year Review

Issue	Recommendations and Follow-up Actions	Status
Institutional Controls	<p>It is recommended that the Town establish institutional controls, in the form of deed restrictions on future uses of the landfill property, in order to protect the integrity of the cap.</p> <p>This action would be part of the long-term protectiveness of the Site. While these controls are not yet in place, the Town's ownership of the property provides a significant control for the property.</p>	EPA has initiated preliminary discussions with the Town representatives regarding institutional controls, and will follow-up with formal discussions.
Groundwater	<p>Given the complexity of the hydrogeology of the area, the presence of multiple contaminant plumes and the on-going groundwater remedial programs in the area (pumping from the Claremont Site and the Fireman's Training Center Site), the development of groundwater flow model may be warranted to analyze the capture zones and improve the understanding of contaminant transport in the area.</p>	Completed. Groundwater model has refined plume delineation and identified potential upgradient sources. Updates of the model are ongoing.

Table 4 : Documents Reviewed		
Author	Date	Title/Description
US EPA	March 1988	Record of Decision, Old Bethpage Landfill
New York State Department of Law	July 1988	Consent Decree
Lockwood Kessler & Bartlett, Inc.	April 2007	2006 Annual Summary Report, Old Bethpage Solid Waste Disposal Complex Groundwater Treatment Facility
Lockwood Kessler & Bartlett, Inc.	January 2007	2007 First Quarter Organic Analysis Report, Old Bethpage Solid Waste Disposal Complex Groundwater Treatment Facility
Lockwood Kessler & Bartlett, Inc.	April 2007	2007 Second Quarter Organic Analysis Report, Old Bethpage Solid Waste Disposal Complex Groundwater Treatment Facility
Town of Oyster Bay	February 2007	Town of Oyster Bay Operation and Maintenance Costs for OBSWDC Groundwater Treatment Facility 2004
Town of Oyster Bay	April 2007	Town of Oyster Bay Operation and Maintenance Costs for OBSWDC Groundwater Treatment Facility 2005

Table 5: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Institutional controls	It is recommended that the Town establish institutional controls, in the form of deed restrictions on future uses of the landfill property, in order to protect the integrity of the cap. This action would be part of the long-term protectiveness of the Site. While these controls are not yet in place, the Town's ownership of the property provides a significant control for the property.	EPA/NYDEC	EPA	January 2011	N	Y