



**THIRD FIVE-YEAR REVIEW REPORT FOR
SYOSSET LANDFILL SUPERFUND SITE
SYOSSET, NEW YORK**



Prepared by

**U.S. Environmental Protection Agency
Region 2
New York, NY**

**Walter E. Mugdan, Director
Emergency and Remedial Response Division**

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Date

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LIST OF ABBREVIATIONS

AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
BOD	Biological Oxygen Demand
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CNG	Compressed Natural Gas
COC	Contaminant of Concern
COD	Chemical Oxygen Demand
EPA	United States Environmental Protection Agency
FS	Feasibility Study
HDPE	High Density Polyethylene
HI	Hazard Index
LKB	Lockwood, Kessler & Bartlett, Inc.
MCL	Maximum Contaminant Level
NCDOH	Nassau County Department of Health
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Party
PVC	Polyvinyl Chloride
RA	Remedial Action

RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SVOC	Semi-volatile organic compound
TCE	Trichloroethene
TDS	Total Dissolved Solids
TIC	Tentatively Identified Compound
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
VOC	Volatile Organic Compound
WQR	Water Quality Regulation

EXECUTIVE SUMMARY

The Syosset Landfill Superfund Site located in Syosset, Nassau County, New York includes a landfill area and on- and off-property ground water monitoring wells. The remedy includes landfill closure pursuant to the New York State requirements, ground water monitoring, and institutional controls. The trigger for this five-year review was the previous five-year review conducted in January 2007.

Based upon reviews of the two Records of Decision, Annual Ground Water Sampling Results, and Site Inspection Reports as prepared by the Town of Oyster Bay since the last five-year review, as well as a Site visit conducted by United States Environmental Protection Agency (EPA) personnel on November 2, 2011, it was concluded that the remedy is functioning as intended by the decision documents and is protective of human health and the environment.

This is the third Five-Year Review for the Syosset Landfill Superfund Site.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Syosset Landfill		
EPA ID: NYD000511360		
Region: 2	State: NY	City/County: Syosset/Nassau
SITE STATUS		
NPL Status: Deleted		
Multiple OUs? Yes	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA If "Other Federal Agency" was selected above, enter Agency name: Click here to enter text.		
Author name (Federal or State Project Manager): Sherrel Henry		
Author affiliation: EPA		
Review period: 01/19/2007 – 01/19/2012		
Date of site inspection: 11/02/2011		
Type of review: Statutory		
Review number: 3		
Triggering action date: 1/19/2007		
Due date (<i>five years after triggering action date</i>): 1/19/2012		

Five-Year Review Summary Form (continued)

The table below is for the purpose of the summary form and associated data entry and does not replace the two tables required in Section VIII and IX by the FYR guidance. Instead, data entry in this section should match information in Section VII and IX of the FYR report.

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
01

Issues and Recommendations Identified in the Five-Year Review:

OU(s): Click here to enter text.	Issue Category: Choose an item.			
	Issue: Click here to enter text.			
	Recommendation: Click here to enter text.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Choose an item.	Choose an item.	Choose an item.	Choose an item.	Enter date.

To add additional issues/recommendations here, copy and paste the above table as many times as necessary to document all issues/recommendations identified in the FYR report.

Protectiveness Statement(s)

Include each individual OU protectiveness determination and statement. If you need to add more protectiveness determinations and statements for additional OUs, copy and paste the table below as many times as necessary to complete for each OU evaluated in the FYR report.

<i>Operable Unit:</i> 01	<i>Protectiveness Determination:</i> Protective	<i>Addendum Due Date (if applicable):</i> Click here to enter date.
<i>Protectiveness Statement:</i> The implemented remedy for the Syosset Landfill Superfund Site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected, as long as the Site use does not change and the implemented engineered		

and institutional controls are properly operated, monitored, and maintained.

Sitewide Protectiveness Statement (if applicable)

For sites that have achieved construction completion, enter a sitewide protectiveness determination and statement.

Protectiveness Determination:

Protective

Addendum Due Date (if applicable):

[Click here to enter date.](#)

Protectiveness Statement:

The implemented remedy for the Syosset Landfill Superfund Site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected, as long as the Site use does not change and the implemented engineered and institutional controls are properly operated, monitored, and maintained.

I. Introduction

This third five-year review for the Syosset Landfill Superfund Site (the Site), located in Syosset, Nassau County, New York, was conducted by the EPA Remedial Project Manager (RPM) Sherrel Henry. It was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §9601 *et seq.* and 40 CFR 300.430(f)(4)(ii), and done 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 ensure that implemented remedies protect public health and the environment and that they function as intended by the Site decision documents. This report will become part of the Site file.

In accordance with Section 1.3.3 of the five-year review guidance, this third five-year review is triggered by the signing date of the previous five-year review report. The five-year review is required due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The previous five-year review report was signed on January 19, 2007. EPA addressed the Site using two separate components called operable units (OUs). The first operable unit addresses the identification and abatement of the source of Site contamination at the landfill property. The second operable unit addresses the nature and extent of migration of contaminants from the landfill property into nearby ground water.

This five-year review will review the remedy implemented at OU1. OU2 will not be reviewed because a no action remedy was selected.

II. Site Chronology

Table 1, which is attached, summarizes the site-related events running from the disposal of hazardous wastes at the Site to the present.

III. Site Background

Site Location

The Site is located at 150 Miller Place in Syosset, in the Town of Oyster Bay (the Town), Nassau County, New York. The Site is rectangular in shape and covers approximately 38 acres. The offices and facilities for the Town's Department of Public Works are located adjacent to the landfill to the east and occupy 15 acres. The Town controls access to the Site, and the entire landfill area is enclosed by a six-foot high chain-link fence. The Site is bounded by the Long Island Expressway and Miller Place to the southeast, property formerly occupied by Cerro Conduit Company to the southwest, and the Long Island Railroad to the northwest. A residential

area and the South Grove Elementary School border the Site to the northeast. Figure 1 provides a location of the Site.

Land and Resource Use

The landfill is owned by the Town and is located in a densely populated residential and industrial area. The total population of Syosset is estimated to be 10,400 people. All the residents around the Syosset Landfill obtain drinking water from public supply wells. The Site is relatively flat and at a similar elevation to the surrounding area. There are two recharge basins owned by Nassau County which border the landfill to the north and northeast. Both basins collect storm water runoff from the neighboring residential area for recharge to the underlying ground water aquifers. These or similar uses are expected to continue well into the future.

History of Contamination

The Town operated the landfill from approximately 1933 to 1975. Between 1933 and about 1967, no restrictions were imposed on the types of wastes accepted at the landfill. Categories and types of wastes included: commercial, industrial, residential, demolition, agricultural, sludge material and ash. After about 1967, waste disposal at the landfill became restricted, though disposal of wastes (including industrial wastes) continued. Several large companies have been identified as generators of large quantities of waste that were disposed at the landfill over a period of years. Types of waste disposed included heavy metals, solvents, organics, oils, plasticizers, and polychlorinated biphenyls.

Initial Response

The landfill was closed on January 27, 1975 because of a suspected ground water pollution problem. In 1981, the Town installed a passive gas venting system along the property line shared by the landfill and the South Grove Elementary School to prevent off-site gas migration. The system consisted of a gravel-filled gas venting trench and a series of polyvinyl chloride (PVC) gas vent riser pipes on both sides of the gas venting trench. The effectiveness of the trench was verified by comparing the levels of gas contaminants within the riser pipes on both sides of the trench. Typically, contaminant levels on the school side of the trench were low, while levels on the landfill side of the trench were higher. A Combustible Gas Indicator was used to monitor for methane. The data were submitted to New York State Department of Environmental Conservation (NYSDEC), New York State Department of Health (NYSDOH), Nassau County Department of Health (NCDOH), and the Syosset Central School District on a monthly basis.

Basis for Taking Action

In January 1983, Environmental Resources Management-Northeast (ERM) prepared a report summarizing the results of a ground water study performed for the NCDOH. The report concluded that the ground water quality was being impacted by landfill leachate. Elevated heavy

metal concentrations including arsenic, cadmium, chromium and lead were detected at levels exceeding New York State Primary Drinking Water Standards. One public drinking water well located down gradient of the Site was closed due to taste and odor problems. The Site was placed on the Superfund National Priorities List (NPL) in September 1983.

On June 19, 1986, EPA and the Town entered into an Administrative Order on Consent [(AOC) Index No. II CERCLA-60203]. The AOC required the Town to conduct a Remedial Investigation (RI) and Feasibility Study (FS) at the Site with provisions for performing an off-site supplemental remedial investigation to study the potential for off-site impacts of the landfill.

The first operable unit addresses the identification and abatement of the source of Site contamination at the landfill property. From April 1987 until September 1989, the field investigation for the OUI RI was performed, which included drilling and installing ground water monitoring wells, collecting ground water and soil samples for laboratory analyses, a landfill dimension study, and a sub-surface gas study. Based on the results of the RI report, which measured the levels of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and metals in various Site media, EPA performed a risk assessment for the Site.

The risk assessment determined that the subchronic HI for children was greater than one (2.61) due to ingestion of ground water contaminated with arsenic. The risks for carcinogens at the landfill fell within the acceptable EPA risk range of 10^{-4} to 10^{-6} . EPA determined that the target risk for the landfill should be on the order of 1×10^{-6} , given the size and proximity of potentially exposed neighboring populations to the landfill and the likelihood of exposures.

The second operable unit addresses the nature and extent of migration of contaminants from the landfill property into nearby ground water. Between October 1992 and March 1994, the OU2 RI was conducted by the Town and included installation of monitoring wells and soil borings; ground water monitoring well and subsurface gas monitoring well sampling, collection of water level measurements and ambient air sampling. The purpose of the off-site ground water study was to determine the extent and thickness of a leachate plume emanating from the landfill. The purpose of the off-site gas study was to determine the extent of off-site subsurface gas migration from the landfill. The results of the RI found the following contaminants of concern in ground water: 1,1-dichloroethene, tetrachloroethene, trichloroethene, vinyl chloride, arsenic and selenium. Based on discussions with the NCDOH, it was determined that residents obtain their drinking water from a municipal water supply and that private residential wells are not being used for potable purposes. Therefore, present-use scenarios for ground water were not evaluated in this assessment. In addition, the use of ground water in the vicinity of the landfill was unlikely because Nassau County controls ground water withdrawal. As a result, the baseline risk assessment concluded that the contaminants of concern found in on-site and off-site ground water did not pose a significant threat to human health or the environment and, therefore, further remediation was not necessary.

IV. Remedial Actions

Remedy Selection OU1

On September 27, 1990, EPA issued a Record of Decision (ROD) for OU1 selecting a remedial action for the Site. The goal of the remedial action is to contain the source area and to prevent, reduce, or control further migration of contaminants to the ground water to the extent practicable.

The major components of the selected remedy include the following:

- Implementing New York State landfill closure requirements as specified in 6 NYCRR Part 360, solid waste management facilities regulations, which included construction of a geosynthetic membrane cap on the top surface of the landfill;
- Providing long-term air and ground water quality monitoring;
- Monitoring and maintaining the passive gas venting system installed under a previous implemented response action, including routine inspection and repairs;
- Establishing institutional controls in the form of deed restrictions on future uses of the landfill;
- Installing an additional passive gas venting system, designed so that it can easily be converted to an active system should conversion become necessary; and
- Maintaining the existing boundary fence around the perimeter of the landfill property to continue to restrict access to the landfill.

In addition, because leachate indicator chemicals were identified in ground water beneath and down gradient of the landfill, the ROD also specified that a supplemental remedial investigation be conducted to study the potential off-site impacts of the landfill, designated as OU2.

Remedy Implementation OU1

The OU1 ROD was implemented pursuant to a Consent Decree entered into by EPA and the Town. This Consent Decree was entered by the U.S. District Court for the Eastern District of New York on February 20, 1991. The Town hired Lockwood, Kessler & Bartlett, Inc. (LKB) to perform the Remedial Design (RD) and Remedial Action (RA).

Landfill Cover

In accordance with the requirements of the Consent Decree, the Town prepared an OU1 RD Work Plan which was approved by EPA on December 11, 1991. The Work Plan outlined the following tasks: Field studies (soil boring investigation, settlement plate program, surface leachate and vector investigation), a Settlement Study, a Conceptual Grading Design Study and Contractor Procurement.

The Soil boring program was conducted in September 1992. The program identified on-site soil properties for settlement analysis and further delineated the depth and extent of the landfill. The settlement plate program was conducted between October 1992 and January 1993. The program monitored settlement properties at four on-site locations. Other field studies conducted included a surface leachate and vector (rodent) investigation.

A Conceptual Grading Design Study was prepared and submitted to EPA on March 26, 1992. The Grading Study evaluated several cap grading schemes and recommended the best grading alternative in the Preliminary Design. A Settlement Study for the Site was also prepared using data obtained during the soil boring and settlement plate studies. The purpose of the Settlement Study was to determine if primary settlement at the Site could be achieved, prior to cap construction, by performing a Preload Program. The Preload Program involved placing clean fill material on portions of the landfill to heights of four feet in excess of the final capping subgrade (bottom elevations). Achieving primary settlement of the landfill prior to cap construction was found to be beneficial in protecting the integrity of the geosynthetic (plastic) membrane cap. The Settlement Study and the Grading Study were approved by the EPA and NYSDEC on September 21, 1993. Following approval of the various studies, the preparation of the plans and specifications began for the Preload Program.

In November 1994, the Town initiated the first of two construction contracts. The first contract consisted of a Preload Program. The Preload material remained on-site for a period of three months until primary settlement was achieved. Following primary settlement, the excess clean fill material was removed. The Preload Program also involved construction of approximately 35% of the remediation program including the following: Site preparation activities, reshaping landfill material, and installing drainage and gas venting systems. The Preload Program was completed in August 1996.

The second construction contract consisted of a Capping and Closure Program that immediately followed the completion of the Preload program. The landfill cap and gas venting sand layer were placed on top of the cap subgrade which was constructed under the Preload program. Other elements of the Capping and Closure Program involved the installation of the remaining perimeter gas control system, the construction of the ridge landfill gas vent wells, the construction of a vegetated perimeter buffer zone along the northern property line, and the completion of the perimeter drainage ditch system. The Capping and Closure Program was completed in November 1997. EPA conducted a final inspection with NYSDEC and the Town on November 5, 1997. In October 1999, EPA issued its approval of the RA Report, signifying that the remedial action had been completed in accordance with the ROD and RD, and the project entered the operation, maintenance, and monitoring phase.

The landfill cover system was constructed in accordance with 6 NYCRR Part 360 provisions to minimize stormwater infiltration, vent landfill gases passively, provide a permanent barrier between the fill material and the land surface and provide surface cover material compatible with future Site uses.

The capping system consists of three types of cap surface cover over a 60 mil High Density Polyethylene (HDPE) geomembrane and gas venting layer. Specifically, the cap cover system contains the following layers (from top to bottom)

- 24-inch barrier protection layer consisting of :
 - 2-inch asphalt concrete top course
 - 5-inch asphalt concrete base course
 - 17-inch clean fill
 - or
 - 6-inch recycled concrete
 - 18-inch clean fill
 - or
 - 6-inch top soil with a vegetative cover
 - 18-inch clean fill
- 60-mil HDPE geomembrane
- 12- inch gas venting layer
- geotextile filter fabric

The three different surface covers were placed over the cap for use in particular areas of the Site based on the anticipated future Site uses. The Site was divided into five different facilities as shown in Figure 1, Syosset Landfill Cover System Location Plan. The asphalt surface cover was utilized in the Highway Division's Salt Storage Facility and Vehicle Parking Facility as well as the Sanitation Division Vehicle Parking Facility (areas designated as C, D, and E, respectively, on Figure 1). The recycled concrete surface was utilized in both the Highway Divisions' Storage Facility and the Miscellaneous Equipment Storage Facility (areas designated as A and B, respectively, on Figure 1). The vegetative cover surface was utilized in a buffer area along the northern property line in Areas A, B and C.

Passive Gas Venting

To address potential post-closure issues associated with the presence of landfill gases, including the possibility of migration, a passive gas collection and venting system was installed at the Site. The landfill gas venting system consists of 38 property line gas vent wells, 16 perimeter gas vent wells and 26 landfill ridge gas wells. In addition, four six-inch diameter PVC gas vents wells were installed over a gas venting trench during the Preload Program within the landfill limits in an area northeast of the Salt Storage Sheds.

Landfill gases are being vented to the atmosphere following collection by passive gas vents, distributed throughout the landfill at a minimum frequency of one per acre. The perimeter gas vent wells are six-inch diameter PVC wells extending 52 feet below grade with a screen length of 40 feet. The landfill ridge gas vents wells are six-inch diameter PVC wells, extending 32 feet below the landfill gas surface with a screen length of 30 feet. This system was supplemented by

the installation of six-inch diameter gas wells, approximately 40 feet deep located every 75 feet along the South Grove Elementary School property boundary, along the property boundary in the vicinity of the residences and near the Town Facilities adjacent to the landfill perimeter.

An existing passive gas venting system, consisting of eight gas monitoring cluster wells, a gas venting trench and a series of vertical venting pipes, parallels the fence separating the landfill from the South Grove Elementary School. The remedy was implemented in a manner consistent with the 1990 ROD and in accordance with the plans and specifications of the RD. The gas monitoring results indicate that the passive gas venting system is operating successfully to prevent off-site gas migration and, therefore, an active gas monitoring system is not required.

Long-Term Monitoring

The Post-Closure Monitoring and Maintenance Manual (O&M Manual) was approved by EPA in May 2003. The O&M Manual provides for long-term maintenance of the landfill cap and gas venting system. The post-closure monitoring and maintenance requirements also include on-site and off-site ground water monitoring, leachate monitoring and landfill gas monitoring.

Remedy Selection OU2

OU2 addresses the nature and extent of migration of contaminants from the landfill property into nearby ground water. EPA in consultation with the State of New York determined that ground water contamination is limited and did not pose a significant threat to human health or the environment and, therefore, further remediation was not necessary. This determination was based on the OU2 RI and the successful implementation of the OU1 remedy. On March 28, 1996, a No Further Action OU2 ROD was signed by EPA. The OU1 remedy required that an environmental monitoring program must be implemented. The environmental monitoring program performed as part of the OU1 remedy takes into account sampling for both on-site and off-site ground water, ambient air, and landfill gas which further ensures that the OU1 and OU2 remedies remain protective of human health and the environment.

Site Completion

The Site achieved construction completion status with the signing of the Preliminary Close-Out Report on September 18, 1998. The Site was removed from the NPL on April 28, 2005.

Systems Operation/Operation and Maintenance (O&M)

The O&M Manual prepared by LKB, dated April 2003, requires the inspection, monitoring and maintenance of the various components of the capping and closure system on a regular basis throughout the post-closure period. The frequency and scope of the monitoring and maintenance tasks are generally based on the post-closure monitoring and maintenance requirements stipulated under 6 NYCRR Part 360. Specifically, the activities currently include the following:

- Annual ground water quality monitoring at 11 monitoring wells to ensure that the landfill continues to be protective to public health and the environment;
- Annual ground water elevation monitoring at 20 monitoring wells to determine if changes occur in the direction of ground water flow;
- Quarterly inspection of the landfill cover system to insure that no erosion damage has occurred;
- Quarterly inspection of the landfill drainage system, with one inspection after a significant rainfall event (i.e., 5-year frequency);
- Quarterly inspection and monitoring of the landfill gas venting system drainage system;
- Inspection of the landfill to insure that no erosion damage has occurred; and
- Submittal of annual reports summarizing the results of the O&M activities.

Landfill gas is being monitored for methane levels. Ground water samples are analyzed for organics and inorganics identified in samples during the OU1 and OU2 RI.

Table 2 provides an estimate of annual monitoring costs.

Institutional Controls Implementation

Institutional controls were implemented under a restrictive covenant placed on the Site. Counsel for the Town provided EPA with a copy of the cover page of the Consent Decree bearing the stamp of the Nassau County Clerk's Office, showing that the Consent Decree was recorded in that office on December 6, 1990. The Town's Counsel also provided EPA with a copy of restrictive covenants placed on the real property at the Site by the Town of Oyster Bay. The Covenants were filed with the land records on March 23, 2004. These items complete the institutional controls requirement of the 1990 OU1 ROD.

V. Progress Since Last Five-Year Review

The second five-year review for this Site was signed on January 19, 2007. The five-year review concluded that the remedies selected in the two RODs continue to be protective of human health and the environment. There were no relevant issues and recommendations in the 2007 five-year review that required follow-up. However, three suggestions were made pertaining to abandoning monitoring wells, SY-6D and SY-9S and locating and repairing SY-7. As per the suggestions in the second five-year review, the following activities were performed:

- Monitoring well SY-6D which contained an obstruction was abandoned.
- Monitoring Well SY-9 which previously had no standing water was scheduled to be abandoned. However, during the past five monitoring rounds, the well contained water and therefore, the well is being maintained.
- Monitoring well SY-7, a flush mounted well that had been paved over, was located and a new flush-mounted curb box was installed.

Since the second five-year review was completed, the activities that have occurred include long-term monitoring of ground water, operation and maintenance of the landfill cap, and construction of a compressed natural gas (CNG) fueling facility.

The Town received funds under the American Recovery and Reinvestment Act of 2009 through the U.S. Department of Energy Clean Cities Alternative Fuel and Advanced Technology Vehicles Pilot Program to construct a CNG fueling facility station and to convert 44 heavy-duty sanitation trucks from diesel fuel to CNG. The constructed facility include six fast-fill and 50 time-fill CNG fueling station dispensers at the Town's Sanitation Vehicle Parking Facility located at the Site.

The design for the CNG fueling facility was submitted to EPA and indicated that no work would penetrate the geomembrane landfill cap or interfere with the Site's capping and closure systems. A CNG fueling facility was constructed by the Town at the Site in 2011.

The Town estimates that the trucks that operate on CNG will reduce the Town's petroleum usage by an estimated 264,000 gallons per year, or 22,000 gallons a month, thereby reducing dependence on imported fuel. The clean-burning CNG vehicles are estimated to produce an average of 27 percent fewer greenhouse emissions than comparable gasoline or diesel models. Additionally, it is estimated that a total of 67,130 pounds of identifiable pollutants will be reduced annually as a result of this program.

Additional monitoring, which has occurred since the second Five-Year Review, is discussed in Section VI. Five-Year Review Process, below.

VI. Five-Year Review Process

Administrative Components

The five-year review team consisted of: Sherrel Henry (Remedial Project Manager), Peter Mannino (Western New York Remediation Section Chief), Dr. Marian Olsen (Human Health Risk Assessor), Kathryn Flynn (Hydrogeologist), Leilani Davis (Attorney) and Cecilia Echols (Community Involvement Coordinator).

Community Involvement

On December 2, 2011, the EPA Community Involvement Coordinator for the Site, Cecilia Echols, published a notice in the *Syosset-Jericho Tribune*. The notice indicated that EPA would be conducting a five-year review to ensure that the remedies implemented at the Site remain protective of public health and are functioning as designed. It also indicated that once the five-year review document is completed, it will be made available in the local Site repository. The local Site repository is available at:

Syosset Public Library
225 South Oyster Bay Road
Syosset, New York 11791
Tel. (516) 921-7161

In addition, the notice included the RPM's mailing addresses and telephone number in the event the public had any comments or questions. No comments were received.

The Site remedy was discussed with representatives for the Town. There were no interviews with local officials or community representatives.

Document Review

This five-year review consisted of a review of relevant documents including O&M records and monitoring data identified in Table 3.

Data Review

The primary objectives of the implemented remedy are to control the source of contamination at the Site, to reduce and minimize the migration of contaminants into the ground water and to minimize any potential human health and environmental impacts resulting from exposure to contamination at the Site. These objectives were accomplished by the installation of a containment system. A long-term monitoring program was designed to ensure that the implemented remedy remains effective.

The long-term monitoring program, which is being conducted by the Town, includes the quarterly inspection of the landfill cover system; monitoring of the gas venting system for methane gas; an annual inspection of ground water level monitoring; and collection of ground water samples from selected wells.

Cover System Inspection

The landfill cover system is inspected for asphalt pavement cracks, surface material erosion, insufficient vegetative cover growth, erosion of vegetative cover, and areas of surface settlement. The results of the inspections are reported in the Post-Closure Checklist Reports which are generated by the Town quarterly. The Town's most recent quarterly checklist, dated November 2010, indicated that several of the paved, recycled concrete and vegetative cover areas of the landfill cap have developed surface cracks. Furthermore, two areas were identified where pooling of water occurs after rainfall. The pooling does not currently indicate a concern for the cap, but should be monitored. During the Site inspection on November 2, 2011, it was observed that all surface cracks had been sealed and pooling of water was not observed.

Drainage System Inspection

The storm water drainage system consists of perimeter drainage ditches which collect storm water runoff from the landfill and transmits it to storm drains which discharge into three Nassau County recharge basins. The perimeter drainage ditches consist of rip-rap lined and asphalt-lined perimeter collection ditches that intercept runoff at the foot of the landfill.

The Town's most recent quarterly checklist, dated November 19, 2010, indicated that the majority of the rip-rap lined drainage ditches have been filled with silt and are over vegetated. However, during the Site inspection on November 2, 2011, it was observed that the drainage ditches had been cleared of all vegetation and silt material.

Gas Venting System Inspection and Methane Monitoring

The landfill gas venting system consists of 38 property line gas vent wells, 16 perimeter gas vent wells, and 26 landfill ridge gas vent wells. Inspection of the gas vents revealed that the upper portion of one of the property line gas vents was detached from the well casing pipe. The Town's most recent quarterly checklist, dated November 2010, indicated that two of the 54 property line and perimeter gas vent wells inspected were damaged. The upper sections of the gas vent wells were detached from the well casing pipe below grade and the upper portion was lying on the ground.

Each ridge vent well is protected by a six-foot diameter concrete ring. Seven of the 26 ridge vent wells inspected had a broken well casing. Two of the ridge vent wells also had significantly damaged protective concrete rings. In addition, one ring contained trash that could attract vectors and two of the ridge wells abut stockpiled materials which could cause future damage to the ring. However, during the Site inspection on November 2, 2011, all of the reported damage to the ridge and property line vents had been repaired.

The gas vents are monitored for methane gas on a quarterly basis in accordance with the requirements of the O&M Manual to determine compliance with 6 NYCRR Part 360 provisions for levels of combustible gas. The O&M Manual stipulates that if monitoring indicates the existence of combustible gas in excess of the lower explosive limit (i.e., 5% gas-in-air) within the property line gas vent, subsurface borehole monitoring for methane gas must be conducted at the property line. As noted in the November 2010 quarterly report, no methane gas was detected in any of the vents. The gas monitoring conducted in 2010 compared to the results in 2009 indicates that the Site is continuing to meet the regulatory requirements for levels of gas at the property line. Therefore, the passive gas venting system is operating successfully to prevent off-site gas migration.

Ground Water Elevation Level Monitoring

The OU2 ROD stipulates that ground water elevation monitoring continue to determine if changes occur in the direction of ground water flow. The 2010 monitoring showed that water level elevations were 1.27 to 2.68 feet higher relative to the levels measured from 2006 to 2009,

which is related to natural variation in recharge to the aquifer from precipitation. The ground water flow direction in the shallow and intermediate aquifers is consistently from the south to the north and converges down gradient of the landfill near the PK-10 well cluster. The ground water flow direction measured in the deep aquifer was generally slightly west of north until 2010, when there was a minor shift toward the north down gradient of the Site.

Based on the results of the ground water elevation monitoring performed from 2006 to 2010, there are no significant changes to the direction of ground water flow and the monitoring well network is adequate for determining the ground water gradient.

Ground Water Quality Monitoring

The Town is required to perform annual ground water sampling at the Site to monitor ground water flow and quality conditions to ensure that the selected remedy for the landfill continues to be protective of human health and the environment. The post-closure ground water monitoring well network consists of the following 11 wells (see Figure 2):

- SY-6 (up gradient);
- SY-2R, SY-2D, SY-3, SY-3D and SY-3DD (on-site down gradient wells); and
- PK-10S, PK-10I, PK-10D, RW-12I and RW-12D (off-site down gradient wells).

All samples taken were analyzed for VOCs, inorganic parameters, and NYSDEC Part 360 leachate indicator parameters.

Results of VOC Analyses

Results from the 2010 annual ground water sampling revealed detection of VOCs in three on-site down gradient wells. The detections were limited to low concentrations of trichloroethene (TCE) in well SY-3, methyl tertiary-butyl ether (MTBE) in well SY-3D, and chloroform in well SY-3DD, at concentrations lower than their respective ground water quality regulations or guidance value. The two RODs identified federal Maximum Contaminant Levels (MCLs) and the New York State Water Quality Regulations (WQRs) as the ground water standards for the Site. The use of MTBE, a gasoline additive, began long after the landfill ceased operations. Therefore, its detection in well SY-3D is attributed to regional ground water quality conditions. The TCE detected in well SY-3 and chloroform detected in well SY-3DD may also be attributable to regional ground water quality conditions. All other VOCs in the on-site wells were not measured above the detection limits.

Low, estimated concentrations of a number of aromatic hydrocarbon-related tentatively identified compounds (TICs) were detected in on-site down gradient monitoring wells SY-3, SY-3D and SY-3DD for the 2010 monitoring round. However, these TICs were not detected in the three previous annual ground water sampling events. The source of these parameters is not known, however, they are not attributed to the landfill since these parameters were not detected during previous monitoring rounds.

During the 2009 monitoring round, bromoform was detected in six wells including up gradient well SY-6. Bromoform was not detected in any wells during the 2010 monitoring round, verifying the conclusion in the 2009 data report that the landfill was not the source of the bromoform detections.

In 2010, VOCs were not detected in off-site down gradient well PK-10S. In wells PK-10I and PK-10D, a small number of chlorinated solvents and aromatic hydrocarbons were detected at concentrations lower than the MCLs or WQRs. The majority of the VOCs detected at well cluster PK-10 were not detected in the on-site down gradient wells. Therefore, their presence at well cluster PK-10 is not attributed to the landfill. No TICs were detected in these three wells.

In 2010, VOCs were reported in two off-site down gradient wells (RW-12I and RW-12D). A summary of these data is provided in Table 4. Approximately one-half of the VOCs detected in wells RW-12I and RW-12D were lower than their MCLs or WQRs, and most of the exceedances were relatively low in magnitude. Contaminants exceeding their respective standards include 1,1-dichloroethane, cis-1,2-dichloroethene, benzene, 1,2-dichloroethane, chlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene and vinyl chloride. For the most part, the same VOCs were detected in each well. However these concentrations were generally higher in well RW-12I. Total VOC concentrations in wells RW-12I and RW-12D were 66.43 ug/l and 41.32 ug/l, respectively. Low, estimated concentrations of five aromatic hydrocarbon-related TICs were also detected in well RW-12I, but are not the same TICs detected at on-site well cluster SY-3. Historically, the total concentrations of VOCs detected in well RW-12I have been several times higher than any total VOC concentration found on-site or off-site during either the OU1 or OU2 investigations or subsequent monitoring events. This well is adjacent to an industrial area located west of the Long Island Railroad tracks, and therefore, the VOCs detected in this well may not be attributable to the landfill.

The 2010 total VOC results are compared to previous results in Table 5. Review of Table 5 indicates that, in general, total VOC concentrations in all monitoring wells except wells SY-3D and SY-3DD were similar or lower relative to the 2009 results, and the other wells in which VOCs are detected continue to exhibit overall downward trends. The increases in total VOC concentrations in wells SY-3D and SY-3DD are due to the TICs detected in these wells. These TICs were not detected in 2009. Moreover, except for the spurious detection of carbon disulfide in well SY-3 in 2008, which was slightly higher than the MCL for this VOC, no exceedances of the MCLs or WQRs have occurred in the on-site wells since 2003.

The VOC results from the 2007 through the 2010 annual sampling events continue to indicate that the landfill is not a significant source of VOCs. VOC detections in the on-site down gradient wells were generally limited to low, estimated concentrations of three target VOCs and some aromatic hydrocarbon-related TICs in well cluster SY-3, at concentrations lower than their respective ground water quality standard or guidance value. The contamination observed at the off-site well cluster RW-12 is localized and has consistently been contaminated with higher levels of VOCs since the RI. As a result, this contamination is not attributed to the Site. The 1996 OU2 ROD stated that NYSDEC would further investigate the probable source(s) of the VOCs detected in well RW-12 and take action, as appropriate. EPA will continue to coordinate with NYSDEC to determine the source of the VOCs in well cluster RW-12.

Results of Inorganic (Metal) Analyses

Results from the 2010 sampling event indicated detection of 20 inorganic parameters. Eleven contaminants (aluminum, barium, cadmium, chromium, cobalt, copper, cyanide, lead, nickel, silver and vanadium) were only detected sporadically and/or at concentrations lower than MCLs and WQRs. Zinc was detected above WQRs in up gradient well SY-6. The remaining eight inorganic parameters were arsenic, mercury, calcium, iron, magnesium, manganese, potassium and sodium. A summary of the compounds detected above MCLs and/or WQRs is provided in Table 6.

Arsenic was detected in on-site down gradient wells SY-3 and SY-3D at total and dissolved concentrations higher than the MCL of 10 ug/l. Comparison of the total and dissolved results for these wells indicates that the arsenic is in dissolved form. Arsenic was not detected in the off-site down gradient wells. Landfill-related off-site impacts are minimal.

Mercury was detected at a concentration approximately four times higher than the ground water quality standard in both the unfiltered and filtered samples from off-site down gradient well PK-10D. Its presence is attributed to ground water quality conditions at this location rather than the landfill because mercury has not been detected in any of the on-site wells.

Calcium, iron, magnesium, manganese, potassium and sodium were each detected in one or more down gradient well at concentrations more than two times higher than in up gradient well SY-6. Except for sodium, which had a more widespread occurrence, the highest concentrations of these parameters occurred in wells SY-3, SY-3D, PK-10I and RW-12I. Comparison of the unfiltered sample results for these six parameters to the ground water quality standards and guidance values indicates exceedances for iron in wells SY-3, SY-3D and RW-12I; magnesium in well RW-12I; manganese in wells SY-2D, SY-3, SY-3D and PK-10I; and sodium in every well except wells SY-3DD and PK-10S.

The only landfill-related exceedances for metals in 2010 were for arsenic in on-site wells SY-3 and SY-3D. These exceedances appear to be limited to the down gradient landfill boundary as arsenic was not detected in the deeper on-site down gradient well or the off-site down gradient wells. In addition, calcium, iron, magnesium, manganese, potassium and sodium were detected above WQRs in both on-site and off-site wells. These contaminants do not have primary MCLs, and therefore are not considered Contaminants of Concern (COCs) for the Site.

The results from the 2007 through 2010 annual sampling event revealed similar detections of metals/inorganic contaminants. One notable difference between the 2010 results and the previous 2009 monitoring event is that thallium although detected in 2009 was not detected in any of the wells in 2010.

Results of Leachate Indicator Parameters Analyses

The leachate indicator parameters included alkalinity, ammonia, biological oxygen demand (BOD), bromide, chloride, chemical oxygen demand (COD), color, total hardness, nitrate,

phenols, sulfate, total dissolved solids (TDS), total kjeldahl nitrogen (TKN), and total organic carbon (TOC).

Results from the 2010 leachate sampling event revealed that when compared to up gradient well SY-6, the concentrations of every leachate indicator parameter (except bromide, nitrate and phenols) were noticeably higher in on-site down gradient wells SY-3 and SY-3D. These two wells monitor the shallow and intermediate zones of the Magothy Aquifer, respectively, at the down gradient landfill boundary. Elevated levels of leachate-related contaminants were not detected in Well SY-3DD, which monitors the deep zone of the Magothy Aquifer at the down gradient landfill boundary. At well cluster SY-2, only chloride and TDS were noticeably higher than in the up gradient well. These results are consistent with the leachate parameter trends since 1993, which have been stable or declining.

Comparison of the leachate parameter results for the up gradient and on-site down gradient wells to ground water quality standards and guidelines indicates that down gradient well exceedances were limited to TDS in well SY-2D, ammonia, color and TDS in well SY-3, and ammonia, chloride, color and TDS in well SY-3D. No landfill-related exceedances occurred in wells SY-2R and SY-3DD.

Based on comparison of the leachate indicator parameter results for the on-site and off-site wells, the majority of the parameters detected at elevated concentrations in the on-site down gradient wells are detected at similar concentrations in off-site down gradient well PK-10I, indicating landfill-related impacts in this well.

Phenol concentrations in up gradient well SY-6 and down gradient wells SY-2R, SY-3, SY-3DD, PK-10S and PK-10D also exceeded the ground water quality standard. However, this standard is not health-based; therefore, these exceedances are not a concern with respect to public health. Taken as a whole, the 2010 leachate indicator parameter results indicate that the landfill continues to generate part 360 leachate-related contaminants, but at low concentrations.

The results from the 2007 through 2010 annual sampling events indicate that contaminants for which exceedances are detected have been stable or decreasing over time in every well, which indicates ground water-quality conditions down gradient of the landfill are improving.

Site Inspection

The Site was inspected by the RPM, the hydrogeologist, and the risk assessor on November 2, 2011. The inspection team also included representatives from the Town and LKB.

Interviews

No interviews were conducted for this review.

Institutional Controls Verification and Effectiveness

The Site is owned and used by the Town and the Town restricts access to the Site. The Town provided EPA with a copy of Institutional Controls in the form of restrictive covenants placed on

the real property at the Site by the Town which was filed with the land records on March 23, 2004. The Town still owns the property, therefore a review of institutional controls documentation was not necessary. The current IC documentation is consistent with the redevelopment discussed in Section VI, above.

VII. Technical Assessment

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

The primary objective of the implemented remedy is to control the source of contamination at the Site, to minimize the migration of contaminants into the ground water, and to minimize any potential human health risks resulting from the exposure to contamination at the Site. This objective was accomplished by the installation of the landfill cap (OU1) and the implementation of a ground water monitoring program (OU2) and implementation of institutional controls (OU1).

In general, the landfill cap is well-maintained and operating as designed. On-site data continue to indicate no or low detections of VOCs below the applicable or relevant and appropriate requirements (ARARs). The ground water at the Site is not currently used as a potable drinking water source. Off-site data indicate detection of several VOCs above their respective ARARs including: vinyl chloride, 1,1-dichloroethane, benzene, chlorobenzene, 1,4-dichlorobenzene and 1,2-dichlorobenzene in well RW-12I. However, this well has historically revealed elevated VOC concentrations and the contamination is believed to be localized. As a result, these contaminants are not attributable to the landfill. Although on-site concentrations of arsenic exceed the ARAR, off-site wells do not contain arsenic above the ARARs. The Town continues to maintain the restrictive covenant on the property and recent redevelopment is consistent with planned future land use and restrictions.

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

The 1990 risk assessment assumed a Site industrial land use that is anticipated to continue in the future under the deed restrictions implemented on the property. The 1990 risk assessment evaluated potential exposures to VOCs and metals from ingestion of or contact with contaminated ground water in the vicinity of the Site; inhalation exposures to VOCs emitted from contaminated soils; and inhalation exposures to VOCs released from contaminated ground water while showering in the residences adjacent to the Site. Receptors of concern included: public workers at the Site, children and faculty at the nearby school, off-site community residents, and trespassers. The assessment identified the following ground water contaminants: arsenic, benzene, chloroform, methylene chloride, bis-2-ethylhexyl phthalate, trichloroethylene, tetrachloroethylene, and vinyl chloride above the goal of protection of a cancer risk of 1×10^{-6} (one in a million). The calculated total cancer risks for adults exposed to the landfill was 4×10^{-5} and was 3×10^{-5} for the child and the total risks did not exceed the upper bounds of the risk range of 10^{-4} (1 in ten thousand) established under the National Contingency Plan (NCP). The

risk assessment concluded that the non-cancer Hazard Index (HI) for children was 2.6 due to ingestion of arsenic in ground water. This HI exceeds EPA's goal of protection of an HI = 1.

Under current and future conditions, soil and ground water uses at the Site are not expected to change during the next five years, the period of time considered in this review. Currently, the Site ground water is not used as a potable drinking water supply as the drinking water is provided by the municipality. The risk assessment identified arsenic as a COC based on future ground water ingestion as discussed above. The ROD established the MCLs and the WQRs as the cleanup criteria for the ground water COCs. The 2010 Annual Post-Closure Sampling Report (Volume 2 of 2) indicates arsenic detections in on-site well SY-3 at 39.9 ug/l; well SY-3D at 12.5 ug/l; and well SY-5 at 12.8 ug/l. These detected concentrations exceed the MCL of 10 ug/l in these three wells and the WQR of 25 ug/l in Well SY-5. The off-site concentrations of arsenic were all below the detection limit of 10 ug/l and below the MCL of 10 ug/l and the WQR of 25 ug/l.

The arsenic toxicity data were updated in 1998 after the Risk Assessment was conducted and the Records of Decision were signed. Comparison of the maximum concentration of arsenic found in Site ground water with the EPA Regional Screening Levels, assuming future ground water use under residential exposures for children and adults over a 30-year period, indicates that the maximum concentration of 39.9 ug/l found in ground water monitoring well SY-5 exceeds the acceptable risk range. The changes in toxicity values do not impact the protectiveness of the remedy because the ground water is not used as a potable drinking water supply since residents in the community receive drinking water from municipal supplies. At the current time, arsenic is being reassessed through the Agency's Integrated Risk Information System, the Agency's consensus database for toxicity information. It is recommended that arsenic toxicity be evaluated at the next five-year review.

Soil vapor intrusion was not further evaluated based on the recommendation in the 2002 OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Ground water and Soil (EPA530-D-02-004) that states "where contaminants are found in ground water at depths greater than 100 feet, evaluation of soil vapor intrusion is not appropriate". Vapor intrusion was not further evaluated since the on-site wells are at depths of 100 feet or greater and consistent with guidance further evaluation is not appropriate. In addition, the main COC was arsenic, which is not volatile, and the cap design includes a gas venting layer with one vent per acre.

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

There is no information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

Overall, the remedy remains protective based on the past remedial actions, ongoing monitoring,

and maintenance of the landfill Part 360 cap that provides a barrier that interrupts potential ingestion and direct contact with contaminated soil. Access to the Site and potential exposures are limited by the current on-going use of the facility for sanitation and highway activities that prevent trespassing including the fencing of the landfill including a locked gate and guards to prevent entry onto the Site by unauthorized personnel. Institutional controls, in the form of deed restrictions through a restrictive covenant, have been implemented to further restrict development of the Site and maintain the cap and industrial land use designation. Potential exposures to methane gas have also been addressed through the establishment of a passive gas system on the landfill. There have been no other changes in the physical conditions of the Site over the past five years that would change the protectiveness of the remedy.

VIII. Issues, Recommendations and Follow-up Actions

The selected remedy has been fully implemented. There are ongoing operation, maintenance, and monitoring activities included in the selected remedy. As was anticipated by the decision documents, these activities are subject to routine modification and adjustment. New York State requires annual certifications that institutional controls are in place and that remedy-related O&M is being performed. The PRPs are responsible for these certifications.

IX. Protectiveness Statement

The implemented remedy for the Syosset Landfill Superfund Site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected, as long as the Site use does not change and the implemented engineered and institutional controls are properly operated, monitored, and maintained.

X. Next Review

Since hazardous substances, pollutants or contaminants remain at the Syosset Landfill Superfund Site, the next five-year review for the Site should be completed within five years of the signature date of this review.

Table 1: Chronology of Site Events

DATES	EVENTS
<i>OU1-Landfill</i>	
1975-January	Landfill closed by NCDOH
1983-September	Site listed on the National Priorities List
1986-March	Administrative Order signed for RI/FS
1987-September	OU1 ROD signed by EPA
1991-February	Consent Decree signed with EPA and the PRPs
1996-July	Final Remedial Design Approved by EPA
1997-November	RA completed by the Town
1999-October	EPA approved the Remedial Action Report
1998-September	EPA signed Preliminary Close-Out Report
2005-February	Notice of Intent to Delete Published in Federal Register
2005-April	Site deleted from the NPL
<i>OU2-Off-Site Ground Water Study</i>	
1994-March	Town Completed Field work for the OU2 RI
1996-March	OU2 ROD signed by EPA
2001-November	First Five-Year Review Report issued by EPA
2007-January	Second Five-Year Review Report issued by EPA

Table 2: *Estimated Annual Monitoring Costs*

Sampling and Analysis.....	\$50,000
Site Inspection and Maintenance.....	\$75,000
Total Estimated Annual Monitoring Costs.....	\$125,000

Table 3: List of Documents Reviewed

The following documents were reviewed in completing the third Five-Year Review:

- Interim Remedial Investigation Report, August 1989;
- Record of Decision for OU1 (Landfill), September 1990;
- Record of Decision for OU2 (Ground water Study), March 1996;
- 2007 Annual Post-Closure Sampling Report (Volumes 1 and 2), August 2008;
- 2008 Annual Post-Closure Sampling Report (Volumes 1 and 2), June 2009;
- 2009 Annual Post-Closure Sampling Report (Volumes 1 and 2), June 2010;
- 2010 Annual Post-Closure Sampling Report (Volumes 1 and 2), June 2011; and
- EPA Guidance for conducting Five-Year Reviews.

Table 4: Exceedences of VOCs detected in off-site monitoring wells compared to Primary Drinking Water Standards (Maximum Contaminant Level) and New York Department of Environmental Conservation Ambient Water Quality Standards (NYSDEC WQRs) and Guidance Values Regulations.

VOCs	MCL (ug/l)	NYSDEC WQR (ug/l)	RW-12I (ug/l)	RW-12D (ug/l)
chlorobenzene	100	5	19	9.9
1,1-dichloroethane	5	5	6.2	5.3
Cis-1,2-dichloroethene	70	5	5.4	6.1
Benzene	5	1	1.5	ND
1,2-dichloroethane	5	0.6	ND	0.84
1,4-dichlorobenzene	75	3	11	4.2
1,2-dichlorobenzene	600	3	8.3	5.2
Vinyl chloride	2	2	1.9	2.5

Footnotes:

Contaminants detected in the RW-12I and RW-12D were found not to be from the landfill.

Table 5: Comparison of 2010 Ground Water Monitoring Total VOC Results to Previous Years (1993, 2003, 2005-2009) Total VOC Results

Well Number	Dec. 1993 Total VOC	July 2003 Total VOC Results	Dec. 1993 Total VOC	Dec. 2005 Total VOC	Dec. 2006 Total VOC	Dec. 2007 Total VOC	Nov. 2008 Total VOC	Dec. 2010 Total VOC
Up Gradient Ground Water Monitoring Wells								
SY-6	0	3.6	1.2	1.4	0	0	0.65	0.5
On-Site Down Gradient Ground Water Monitoring Wells								
SY-2R	0.60	3.60	0	0.20	0	4.20	0	0
SY-2D	7.90	2.80	4.90	3.90	2.10	1.50	0	0
SY-3	10.70	23.90	0.70	1.60	5.50	74	1.30	1.77
SY-3D	11.40	20.90	6	3.80	3.90	2.20	1.90	7.98
SY-3DD	0	10	0	0.60	0	0	1.90	11.15
Off-Site Down Gradient Ground Water Monitoring Wells								
PK-10S	13.90	218	0.30	0.50	0	102	0.50	0
PK-10I	15.60	33.40	17	15	11	13.60	7.70	5.25
PK-10D	6.50	21.8	1.80	2	3.10	10.20	5.10	5.41
RW-12I	260	154	134	88	72.60	72.20	62.40	66.43
RW-12D	31.90	200	111	73	65.80	87.60	60.80	41.32

Notes:

Results are in units of ug/l

Totals include estimated concentrations and TICs

Table 6: - Inorganic results from the 2010 Annual Monitoring Report detected in monitoring wells above Primary Drinking Water Standards (Maximum Contaminant Level) and/or New York Department of Environmental Conservation Ambient Water Quality Standards (NYSDEC WQR) and Guidance Values Regulations.

VOCs (ug/l)	Primary Drinking Water Standard - MCL (ug/l)	NYSDEC WQR (ug/l)	SY-6	On-Site Wells					Off-Site Wells			
				SY-2R	SY-2D	SY-3	SY-3D	SY-5	PK-10I	PK-10D	RW-12I	RW-12D
Arsenic	10	25				39.9	12.5	12.8				
Iron	300 *	300	1,750	938		25,100	12,700	12,500			818	
Magnesium		35,000									45,000	
Manganese	50 *	300			1,970	3,580	1,520	1,490	2,190			
Mercury	2	1								3.20		0.90
Sodium		20,000		147,000	130,000	105,000	471,000	465,000	237,000	461,000	178,000	122,000
Zinc		2,000	3,420j									

Footnotes:

*Values are National Secondary Drinking water regulations, which are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water

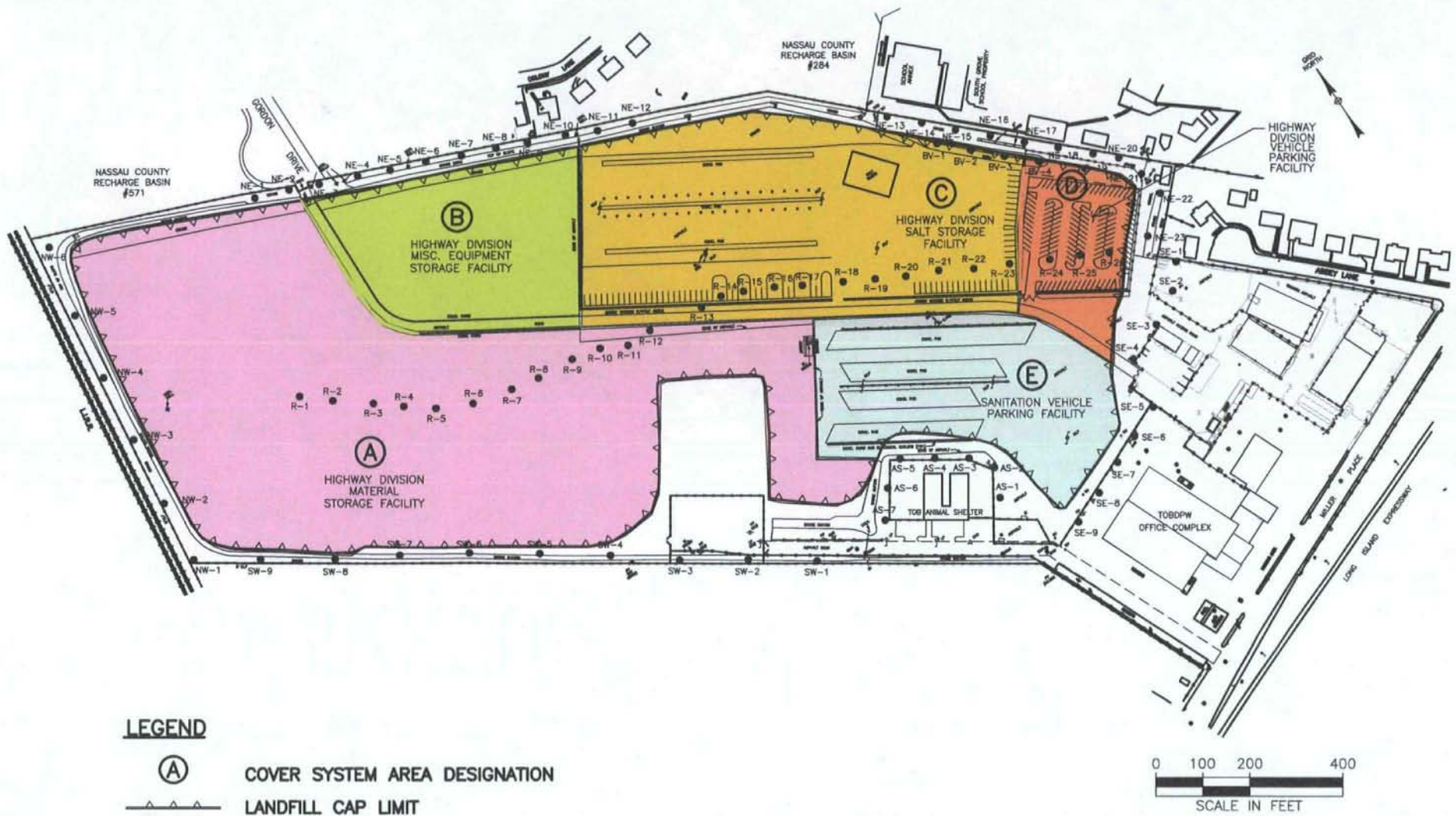
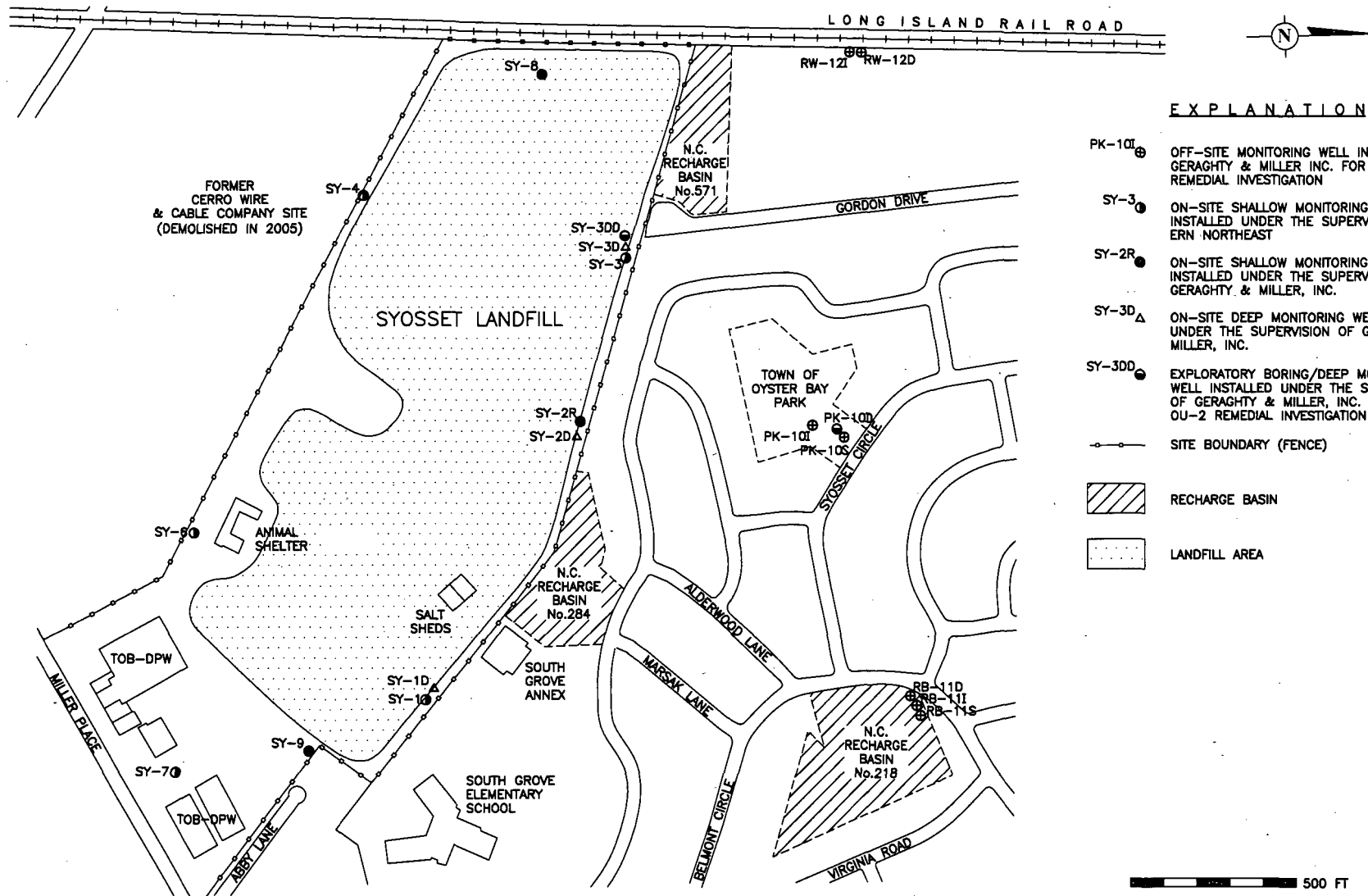


FIGURE 1
SYOSSET LANDFILL
COVER SYSTEM LOCATION PLAN



EXPLANATION

- PK-10I ⊕ OFF-SITE MONITORING WELL INSTALLED BY GERAGHTY & MILLER INC. FOR THE OU-2 REMEDIAL INVESTIGATION
- SY-3 ⊙ ON-SITE SHALLOW MONITORING WELL INSTALLED UNDER THE SUPERVISION OF ERN NORTHEAST
- SY-2R ● ON-SITE SHALLOW MONITORING WELL INSTALLED UNDER THE SUPERVISION OF GERAGHTY & MILLER, INC.
- SY-3D △ ON-SITE DEEP MONITORING WELL INSTALLED UNDER THE SUPERVISION OF GERAGHTY & MILLER, INC.
- SY-300 ⊙ EXPLORATORY BORING/DEEP MONITORING WELL INSTALLED UNDER THE SUPERVISION OF GERAGHTY & MILLER, INC. FOR THE OU-2 REMEDIAL INVESTIGATION
- SITE BOUNDARY (FENCE)
- ▨ RECHARGE BASIN
- ▤ LANDFILL AREA

FIGURE 2

GROUNDWATER MONITORING WELL LOCATION PLAN
SYOSSET LANDFILL, SYOSSET, NY

