Cross County Sanitary-Kessman Landfill

TOWN OF PATTERSON, PUTNAM COUNTY, NEW YORK

Site Management Plan

NYSDEC Site Number: 3-40-011

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation
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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
1		Corrected tax parcel numbers for site-Page1	01/23/2014

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1.0 Introduction and Description of Remedial Program

1.1 INTRODUCTION

This document is required by New York State Department of Environmental Conservation (NYSDEC) as an element of the remedial program for the Cross County Sanitary-Kessman Landfill (the "Site") under the Inactive Hazardous Waste Disposal Site Remedial Program.

1.1.1 General

Remedial work, completed at the site in 1995, included removal of impacted sediments from the adjacent wetland area, disposition of those sediments in the landfill and subsequent capping of the landfill. After completing the remedial activities, subsequent monitoring of groundwater, surface water and leachate has identified concentrations of petroleum hydrocarbon and chlorinated solvent based volatile organic compounds (VOCs) in those media.

The Site Management Plan (SMP) presented herein was prepared to monitor and manage residual environmental impacts relating to the site. All historic documents and reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. This June, 2011 SMP was prepared by Aztech Technologies, Inc. on behalf of the NYSDEC under the guidelines established by NYSDEC. A site location map is provided in Figure 1.

1.1.2 Purpose

Groundwater, surface water and leachate monitoring following a remedial action undertaken to address wetland soil and sediment, as well as properly close and cap the landfill, have identified petroleum and chlorinated solvent based VOCs. Engineering Controls have been incorporated into the SMP in order to control exposure to the residual impacts during use of the site and, to ensure protection of public health and the environment. This SMP provides a detailed description of all procedures required to manage impacted and/or potentially impacted media remaining at the site after completion of the Remedial Action. This includes annual media monitoring and performance of quarterly inspections.

1.1.3 Revisions

Revisions to this plan can be proposed in writing to the NYSDEC's project manager. The NYSDEC project manager will provide a notice of any approved changes to the SMP, and append these notices to the SMP.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The Site is located in the Town of Patterson, Putnam County, New York and is identified as Section 13., Block 3, Lots 16 and 17 and a portion of Lot 14 on the Town of Patterson Tax Map. The site is an approximately ten-acre area bounded by undeveloped land to the north, a commercial property to the south, residential properties and Cornwall Hill Road to the east, and the Metro North Railroad and the Great Swamp of Patterson, a protected wetland (NYSDEC Classification DP-22) to the west (see

Figure 2). The site includes approximately 7.2 acres of landfill area and approximately 1.6 acres of wetland area containing sediment impacted with residual concentrations of PCBs.

1.2.2 Site History

The Site was operated as a municipal landfill by the Town of Patterson on property owned by the Kessman family from approximately 1963 to 1972. In 1972, the landfill was purchased by Cross County Sanitation, Inc., a private carting company, which operated the site from 1972 to 1974. Historical information provided by the NYSDEC indicates that unknown types and quantities of industrial and hazardous wastes were disposed at the Site between 1972 and 1974. In 1974, NYSDEC forced the landfill to close and the Kessman family repossessed the property. The landfill was covered with clean soil at that time in order to support a thin layer of vegetation. There have been no reported former or current structures at the Site.

A Phase I Site Assessment (Phase I) was prepared for the Site in 1983 by Camp, Dresser, and McKee, Inc. (CDM). During the Phase I, field personnel observed several leachate seeps on the north and east sides of the landfill that had discolored the wetland vegetation located between the toe of the landfill and the railroad embankment (see Figure 2). The Phase I assessment also documented observations from site workers in which an estimated 40 to 60 partially exposed 55-gallon drums were seen in the landfill toe adjacent to the wetland. In addition, the workers indicated that strong chemical odors were present in the vicinity of the drums.

In 1985, Wehran Engineering, P.C. (Wehran) conducted a Phase II Site Investigation (Phase II) at the site that included a metal detection survey; sampling of surface water, sediments, and leachate; advancing two test pits and collecting composite soil samples; installing four (4) groundwater monitoring wells; and collecting a groundwater sample from a nearby domestic water well. The analytical results from the samples collected during the Phase II recorded several detections of VOCs and semi-VOCs. Based on the results of the Phase II investigation, the site was reclassified to a Class 2 inactive hazardous waste site under the NYSDECs Recistry of Inactive Hazardous Waste Sites in New York State. A Class 2 site is defined as a site which poses a significant threat to public health and the environment.

From December 1991 to May 1992, ABB Environmental Services (ABB-ES) conducted a Remedial Investigation (RI) of the site. During the RI, site-specific data was obtained from: (1) aerial photographs and historical records; (2) ecological inventories; (3) geophysical surveys; (4) samples of cover soil, landfill refuse, and overburden soil collected from beneath the fill areas via test pits and soil borings; (5) groundwater samples collected from existing and newly installed monitoring wells and nearby private potable wells; (6) shallow groundwater via leachate seeps, wetland surface water and sediment; (7) hydrogeologic testing; and, (8) photogrammetric survey maps. The objective of the RI was to measure the nature and distribution of site related compounds in soil, sediment, surface water, and groundwater at the site and evaluate the risk for migration from the site to sensitive receptors. ABB-ES used the data collected during the RI to prepare a 1994 Feasibility Study to evaluate potential remedial strategies for the site.

Remediation activities at the site were initiated in August 1995 and completed in August 1996. The remediation consisted of: (1) excavation of PCB-impacted sediment from the wetland

immediately adjacent to the east of the landfill; (2) restoration of the remediated wetland area; and, (3) capping the landfill in accordance with New York Codes, Rules, and Regulations (NYCRR) Part 360 and (4) installing landfill gas ventilation and leachate collection systems. Once these remedial activities were completed, routine operation, maintenance, and monitoring activities were performed by O'Brien & Gere Engineers, Inc. (OBG) and Iyer Environmental Group, PLLC (IEG) from February 2002 through November 2007.

1.2.3 Geologic Conditions

According to the previous Phase I, Phase II and RI investigations, the regional geology generally consists of metamorphic bedrock overlain by glacial lacustrine, overlain by more recent organic rich marsh sediments. According to Fisher, et al. (1970) the bedrock underlying the region consists of Stockbridge Marble, which is a late Cambrian-lower Ordivician aged formation.

Site geology as described from test pitting activities during previous investigations consisted of approximately 10 – 14 feet of refuse (fill) overlying a thin layer of peat and organic soil (2 – 4 feet thick). The organic layer is underlain by silt and fine to coarse sand (20 – 35 feet thick). The sand layer becomes finer grained towards the wetland along the eastern boundary of the site and more coarse with depth (cobbles and boulders).

According to the groundwater information presented in the November, 2007 Operations, Maintenance and Monitoring (OM&M) Report prepared by IEG and submitted by OBG both the shallow and deep groundwater at the site flows to the east toward the wetland area.

1.3 Summary of Remedial Investigation Findings

The purpose of the RI conducted by ABB in 1991-1992 was to characterize the nature and extent of site related compounds in soil, sediment, surface water, and groundwater at the site and evaluate the risk for their migration to sensitive receptors. The results of the RI are described in detail in the following reports:

- Phase I Site Investigation, prepared by CDM, dated 1983
- Phase II Subsurface Investigation, prepared by Wehran Engineering, dated 1985
- Remedial Investigation Report, ABB Environmental Services, dated 1994
- Record of Decision, prepared by the New York State Department of Environmental Conservation, dated November 1994
- Construction Certification Report, prepared by ABB Environmental Services, dated 1996
- OM&M Report, prepared by Iyer Environmental Group, PLLC, submitted by O'Brien & Gere Engineers, Inc., dated November 2007

Generally, the RI determined that the environmental risks posed by the site included the degradation of the quality of the adjacent wetland to the east of the site.

Below is a summary of site conditions identified in the RI conducted from 1991 to 1992:

Surface Soil

Two surface soil samples were collected at the site to characterize the condition of the intermediate soil cover overlying the landfill. In addition, one background surface soil sample was collected to characterize the condition of the soil at an offsite location. Soil from this offsite location was intended to be used as borrow soil for the final soil cover.

Analytical results of the surface soil samples indicate that one VOC constituent (2-butanone at 24 micrograms per kilogram (µg/kg)) was detected in one of the surface soil samples (SS-1). That sample also contained one semi-VOC constituent (bis(2-ethlhexyl)phthalate). PCBs were not detected in either of the surface soil samples. Pesticides at concentrations that ranged up to 54 µg/kg were detected in each of the surface soil samples.

Test Pit Soil Samples

Test pits were advanced at six locations within the landfill area to characterize and define the extent of areas of of known or suspected buried drums. Three of the test pitted areas were positioned at the toe of the landfill adjacent to the wetland on the eastern side of the landfill, in an area where several partially buried drums were observed. Three additional test pit areas were chosen based on interpretation and evaluation of magnetometry/terrain conductivity anomaly maps of the site. Soil samples were collected from test pit locations TP-6 and TP-11 for laboratory analysis for Target Compound List (TCL) organics and inorganics. VOCs detected in the samples included tetrachloroethene (PCE) at 2 µg/kg and 2-butanone at 13 µg/kg. Eighteen semi-VOCs, and seventeen inorganic analytes were detected in the test pit soil samples. In addition, several pesticides were also detected in the test pit soil samples.

Subsurface Soil Samples

Eight (8) subsurface soil samples were collected from piezometer borings to characterize refuse, marsh deposits, and the glacio-lacustrine sand deposits beneath the landfill. The subsurface soil samples were analyzed for TCL organics and inorganics. The VOCs detected included ethylbenzene (160 µg/kg), toluene (140 µg/kg) and xylenes (270 µg/kg). Semi-VOCs detected included phenol (3,000 to 42,000 µg/kg) and naphthalene (82 to 88,000 µg/kg). Pesticides, PCBs, and inorganic constituents were also detected.

Leachate

Five (5) leachate samples, representing shallow groundwater discharging to the surface via seeps, were collected to identify compounds migrating to surface water. The leachate samples were analyzed for TCL organics and inorganics, chemical oxygen demand (COD), total dissolved solids (TDS) and total suspended solids (TSS). The VOCs detected included benzene (1 to 15 µg/kg) and xylenes (6 to 140 µg/kg). The semi-VOCs detected included 1,4-dichlorobenzene (8 µg/kg). The PCB Arclor-1232 was detected at 4 µg/kg. Pesticides and inorganic constituents were also detected in the samples.

Sediments

Thirteen (13) sediment samples were collected concurrently with surface water samples from the wetland area east of the site. In addition to the samples collected during the RI in 1991/1992, ABB-ES conducted additional surface water and sediment sampling in 1993 to further delineate the distribution of site related compounds. This included an additional six (6) sediment samples. The sediment samples were analyzed for TCL organics and inorganics and

total organic carbon (TOC). The VOCs detected included 2-butanone (67 to 110 µg/kg), benzene (2 to 28 µg/kg) and chlorobenzene (23 µg/kg). The semi-VOCs detected included naphthalene (400 µg/kg). PCBs and inorganic constituents were also detected in the sediment samples.

Surface Water

Thirteen (13) surface water samples were collected (Figure X **(WHY A FIGURE FOR SURFACE WATER SAMPLES BUT NOT FOR ANYTHING ELSE ??)** Additional surface water sampling conducted in 1993 included six (6) surface water locations. The surface water samples were analyzed for TCL organics and inorganics, total alkalinity, COD, TDS, and TSS. The VOCs detected in the surface water sam[ples included benzene (1 to 11 µg/L) and 1,2 dichloroethylene (76 µg/L). SVOCs, PCBs and inorganic constituents.

Groundwater

Groundwater analytical results were evaluated to identify site-related compounds potentially migrating off-site via groundwater migration pathways. However, because of the proximity of the site to the adjacent wetland (the Great Swamp), access was limited and, as such, groundwater monitoring wells were not able to be installed hydraulically downgradient (beyond the eastern toe) of the landfill.

Selected domestic wells and groundwater monitoring wells were sampled to provide data on upgradient groundwater quality (**Figure X)**. VOCs were not detected in the domestic wells. Semi-VOCs (bis(2 ethylhexyl) phthalate at 9 µg/L) and pesticides (endosulfan I at 0.086 µg/L) were detected in domestic well DW-2 and DW-1, respectively. In addition, seven inorganic constituents were detected in the domestic wells sampled. Upgradient monitoring wells identified the presence of VOCs (chloroform at 2 µg/L), semi-VOCs (bis(2 ethylhexyl) phthalate at 8 µg/L), pesticides (4,4'-DDE at 0.031 µg/L and 4,4'-DDT at 0.091 µg/L). PCBs were not detected in the upgradient groundwater samples.

Six groundwater monitoring wells were sampled to provide data on the groundwater quality beneath the landfill. The VOCs detected included benzene (4 µg/L) and chlorobenzene (4 µg/L). semi-VOCs detected include diethylphthalate (14 µg/L). In addition, inorganic constituents were detected in the samples. Pesticides and PCBs were not detected in these samples.

The RI concluded that site-related organic compounds and inorganic constituents were detected in surface soil, refuse, marsh deposits beneath the refuse, glacial overburden underlying the marsh deposits, and bedrock. According to the RI, the site-related organic compounds (PCBs and VOCs) and originated from four (4) drum nests identified along the eastern boundary of the landfill adjacent to the wetland. In addition, the RI identified the landfill refuse as the source of the semi-VOCs, pesticides, and inorganic constituents. Each of these were detected in the leachate, groundwater, sediment and surface water. Based on their distribution, the RI concluded that site related compounds were migrating off-site.

1.4 Summary of Remedial Actions

A Feasibility Study (FS) was prepared for the site in 1994 by ABB-ES to evaluate potential remediation approaches. Ultimately, the selected remedy for the site was sediment removal

and landfill capping. The project scope was described in detail in Specification Section 01010 – Summary of Work (ABB-ES, 1995).

The following is a summary of the Remedial Actions performed at the site:

1. Leachate Management
   A. Leachate Storage – The leachate collection system was designed by Insite Construction Surveys, Inc. and installed by EPA, Inc.

2. Landfill Gas Management
   A. Collection – Vertical gas vent pipes were installed throughout the landfill cap area.

3. Wetland Remediation
   A. Approximately 6,170 cubic yards of impacted sediment was excavated from the wetland along the eastern boundary of the landfill. The excavated sediment was placed within the landfill area to be capped.

   B. Upon completion of the excavation activities, samples were collected within the wetland remediation area to confirm that the remediation goal of 1.0 milligrams per kilogram (mg/kg) for PCBs and 0.11 mg/kg for mercury were met. The laboratory results were below the remediation goals.

   C. Approximately 7,000 cubic yards of wetland replacement soil, a mixture of topsoil and bark mulch, was backfilled in the excavated wetland area for restoration purposes. Wetland vegetation was planted on peninsulas constructed within the backfilled areas.

4. Final Cover Placement
   A. Grading Materials – The NYSDEC allowed for common borrow fill material to be used as backfill at the landfill. In addition, Alternate Grading Materials (AGM) were approved to be used in place of the previously approved common borrow for grading and sub-base material below the geomembrane. These materials, as well as the excavated impacted sediment from the wetland area, were backfilled and graded to achieve the final cover slopes.

   B. Sub-Base Preparation – The sub-base was compacted and tested by ABB-ES, prior to the placement of the barrier layer.

   C. Barrier Layer – The geomembrane was installed by an approved contractor in accordance with NYSDEC approved Contract Documents, including proper QA/QC testing.

   D. Topsoil Layer – Screened topsoil was installed in a six inch layer. After the top soil was placed, rocks, roots and other debris were removed and seed and mulch was applied.

Remedial activities were completed at the site in August 1996.

1.4.1 Removal of Contaminated Materials from the Site

No contaminated materials were removed from the site. Excavated sediment from the wetland in the northeast corner of the site was placed within the landfill.

1.4.2 Site-Related Treatment Systems

No long-term treatment systems were installed as part of the site remedy.

1.4.3 Remaining Contamination

Reportedly, no contamination was left outside the footprint of the landfill.

2.0 Contingency Plan

2.1 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

2.1.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence requiring assistance, the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to the NYSDEC then Aztech.

Table 1: Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3 day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

Table 2: Contact Numbers

NYSDEC Project Manager – Carl Hoffman	(518) 402-9813
Aztech Technologies, Inc. – Joe McCormick	(518) 885-5383
Aztech Technologies, Inc. – Matt Ryan	(518) 885-5383

* Note: Contact numbers subject to change and should be updated as necessary

2.1.2 Map and Directions to Nearest Health Facility

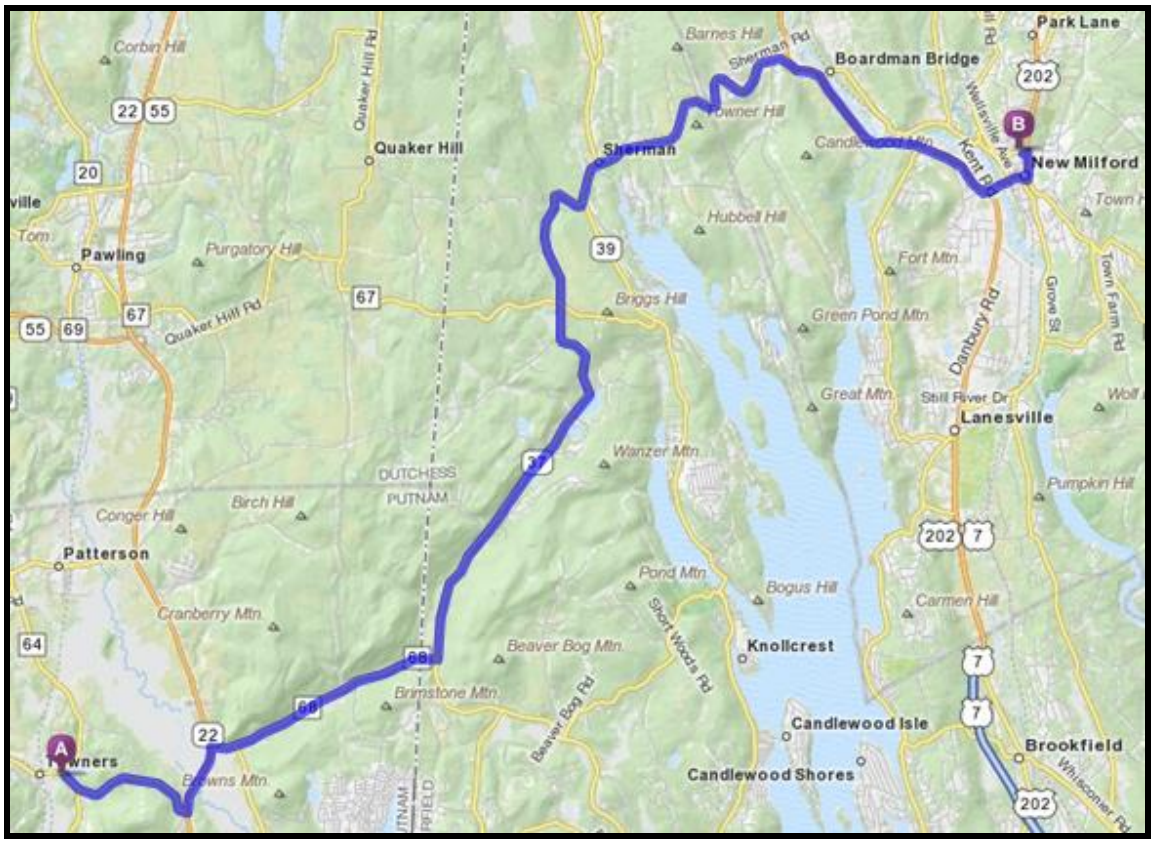
- Site Location: Cornwall Hill Road, Patterson, New York
- Nearest Hospital Name: New Milford Hospital
- Hospital Location: 21 Elm Street, New Milford, Connecticut
- Hospital Telephone: (860) 355-2611

Directions to the Hospital:

	1. Start out going SOUTH on CORNWALL HILL RD / CR-64 toward RT-164.	**Go 0.01 Mi**	0.01 mi
164	2. Turn LEFT onto RT-164.	**Go 1.6 Mi**	1.7 mi
22	3. Turn LEFT onto RT-22.	**Go 0.8 Mi**	2.5 mi
	4. Take the 1st RIGHT onto HAVILAND HOLLOW RD / CR-68. Continue to follow HAVILAND HOLLOW RD (Crossing into CONNECTICUT). *If you reach WOODED HLS you've gone about 0.4 miles too far*	**Go 2.7 Mi**	5.1 mi
37	5. Turn LEFT onto CT-37 / SHERMAN NEW FAIRFIELD RD. Continue to follow CT-37.	**Go 9.8 Mi**	14.9 mi
7	6. Turn RIGHT onto KENT RD / US-7.	**Go 2.7 Mi**	17.6 mi
67	7. Turn LEFT onto US-202 / CT-67 / BRIDGE ST. Continue to follow CT-67 / BRIDGE ST. *CT-67 is 0.4 miles past FORT HILL RD*	**Go 0.5 Mi**	18.1 mi
202	8. Turn LEFT onto US-202 / EAST ST. *If you reach MERRILD LN you've gone about 0.1 miles too far*	**Go 0.3 Mi**	18.4 mi
	9. Turn LEFT onto ELM ST. *ELM ST is just past BROOKSIDE AVE*	**Go 0.05 Mi**	18.5 mi
	10. 21 ELM ST is on the RIGHT. *If you reach TREADWELL AVE you've gone a little too far*		18.5 mi
B	**New Milford Hospital** 21 Elm St, New Milford, CT 06776 (860) 355-2611 Add a Note	**18.5 mi**	**18.5 mi**

Total Travel Estimate: **18.49 miles - about 36 minutes**

Map Showing Route from the site to the Hospital:



2.1.3 Response Procedures

As appropriate, the fire department and other emergency response groups will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (Table 1). The list will also be made readily available to all field personnel at all times.

3.0 Site Monitoring Plan

3.1 Introduction

3.1.1 General

The SMP describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate impacts from the site, the soil cover system, and all affected site media identified below. This SMP may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This SMP describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, landfill gas, surface water and, sediment);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance;
- Assessing achievement of the remedial performance criteria;
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this SMP provides information on:

- Sampling locations, protocol, and frequency;
- All designed monitoring systems (e.g., well construction information);
- Analytical sampling program requirements;
- Reporting requirements;
- Inspection and maintenance requirements for monitoring wells; and,
- Quarterly inspection.

Annual monitoring of the performance of the remedy and, the overall reduction of site related compounds on-site will be conducted for three years. The frequency thereafter will be determined by NYSDEC. Trends in the concentrations of site related conmpounds in soil vapor and groundwater at the site will be evaluated to determine if the remedy continues to be effective. Monitoring programs are summarized in Table 3 and outlined in detail in Sections 3.2 and 3.3 below.

Table 3: Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Matrix	Analysis
Groundwater	Annual	Groundwater	• Target Compound List (TCL) Volatiles via EPA Method 624/SW846 8260 • TCL Semivolatiles via EPA Method 8270 • TCL PCBs via EPA Method 8082 • Total Analyte List Metals using EPA Method 200.7/SW846 • Chlorides via EPA Method 300.0 • Total Suspended Solids via EPA Method160.2 • Total Organic Carbon EPA via Method 415.1 • Groundwater Quality Parameters including pH, specific conductivity, and temperature.
Soil Vapor	Annual	Soil Vapor	• Landfill gas parameters including hydrogen sulfide (H_2S), oxygen (O_2), methane (CH_4), and carbon monoxide (CO)
Surface Water	Annual	Surface Water	• Target Compound List (TCL) Volatiles via EPA Method 624/SW846 8260 • TCL Semivolatiles via EPA Method 8270 • TCL PCBs via EPA Method 8082 • Total Analyte List Metals using EPA Method 200.7/SW846 • Chlorides EPA via Method 300.0 • Total Suspended Solids via EPA Method160.2 • Total Organic Carbon via EPA Method 415.1 • Groundwater Quality Parameters including pH, specific conductivity, and temperature.
Sediment	Annual	Sediment	• Target Compound List (TCL) Volatiles via EPA Method 624/SW846 8260 • TCL Semivolatiles via EPA Method 8270 • TCL PCBs via EPA Method 8082 • Total Analyte List Metals using EPA Method 200.7/SW846 • Chlorides via EPA Method 300.0
Site Wide Inspection	Quarterly	Landfill Infrastructure	• Landfill Cap Inspection (barrier layer, geomembrane, vegetation) • Vent Riser Inspection • Monitoring Well Inspection • Perimeter Fence Inspection • Leachate area inspection

* The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH

3.2 Engineering Controls

All engineering controls at the site are considered passive components and do not require an operation and maintenance plan. The engineering controls in place at the site include fencing,

passive landfill gas vents, the barrier layer and the barrier protection layer. The engineering controls will be monitored with quarterly inspections.

3.3 Media Monitoring Program

3.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on an annual basis to assess the performance of the remedy. The network of monitoring wells has been installed at the site to monitor the perimeter of the landfill. A figure showing the monitoring well array is provided in Figure 2 and monitoring well specifications are provided in Table 4 below.

Table 4: Monitoring Well Specifications

Well ID	Ground Elevation	Top of Casing Elevation	Bedrock Elevation	Total Depth	Sand Pack
MW-1A	461.15	463.15	403.75	59.40	51.90 – 59.40
MW-1B	461.07	463.01	439.91	23.10	14.60 – 23.10
MW-3A	431.82	434.65	367.29	67.36	51.86 – 67.36
MW-3B	432.68	435.78	401.58	34.20	26.70 – 34.20
MW-5A	431.38	433.84	361.66	72.18	64.18 – 72.18
MW-5B	431.70	434.35	403.97	30.38	21.38 – 30.38
MW-20A	431.51	431.51	409.68	21.61	NA
MW-20B	430.92	430.92	388.64	42.53	NA

3.3.1.1 Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and/or a sampling log. Other observations (e.g., well integrity, etc.) will also be noted on the well sampling log. The well sampling log will serve as the inspection form for the groundwater monitoring well network.

Groundwater gauging is performed to track the groundwater table elevation and direction of groundwater flow at the site. The groundwater elevation for each monitoring well will be calculated based on the relative elevation of the top of the monitoring well casing (TOC) and the depth to groundwater. The TOC and calculated groundwater elevations are relative to the surveyed elevations provided in the RI and OM&M reports for the site. A water level indicator graduated to 0.01 feet will be used to measure the depth to groundwater in the monitoring wells.

Based on the gauging data and the known total depths of the monitoring wells, the volume of groundwater within each casing will be calculated. Each monitoring well will be purged of approximately three (3) volumes of groundwater, or until dryness, using a dedicated, disposable bailer. The monitoring wells will be allowed to recharge prior to sample collection. Groundwater samples will then be collected and decanted into pre-preserved, laboratory-supplied sampling vials.

The samples will be placed on ice and shipped, under chain of custody, to Adirondack Environmental Services, Inc. (AES) in Albany, New York. The samples will be analyzed within the applicable holding time for the respective laboratory analytical methods.

3.3.1.2 Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced if an event renders the wells unusable. Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning/replacement of monitoring wells. The repair or decommissioning/replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.3.2 Surface Water Monitoring

Surface Water monitoring will be performed on an annual basis to assess the performance of the remedy. Surface water sampling locations will remain consistent with previous monitoring events performed at the site. A figure showing the surface water monitoring locations is provided in Figure 2.

3.3.2.1 Sampling Protocol

All surface water sampling activities will be recorded in a field book and/or a sampling log. Surface water samples will be collected and decanted into pre-preserved, laboratory-supplied sampling vials. Surface water samples for PCB analysis will be collected utilizing a Passive In Situ Concentration Extraction Sampler (PISCES). The PISCES samplers will be deployed for a period of approximately 14 to 21 days. PISCES samplers will be deployed in pairs in the event one of the two samplers is damaged during the deployment period.

Non-PCB analysis samples will be placed on ice and shipped, under chain of custody, to Adirondack Environmental Services, Inc. (AES) in Albany, New York. PCB analysis samples collected via PISCES will be analyzed at NEA-Pace Analytical, Inc. (NEA-Pace) in Schenectady, New York. The samples will be analyzed within the applicable holding time for the respective laboratory analytical methods.

3.3.3 Sediment Monitoring

Sediment monitoring will be performed on an annual basis to assess the performance of the remedy. Sediment sampling locations will remain consistent with previous monitoring events performed at the site. A figure showing the surface water/sediment monitoring locations is provided in Figure 2.

3.3.3.1 Sampling Protocol

All sediment sampling activities will be recorded in a field book and/or a sampling log. Sediment samples will be collected by advancing Geoprobe® hand tooling into the sediment. The sample will be collected within a 1-½ inch inside diameter acetate sleeve 2.0 feet in length. The sample will be transferred from the acetate sleeve and be placed into the appropriate laboratory-supplied sample containers.The samples will be placed on ice and shipped, under chain of custody, to Adirondack Environmental Services, Inc. (AES) in Albany, New York. The samples will be analyzed within the applicable holding time for the respective laboratory analytical methods (Table 3).

3.4 Site-wide Inspection

Site-wide inspections will be performed on a quarterly basis. If necessary and with the approval of the NYSDEC, site-wide inspections will also be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. During these inspections, any deficiency with respect to the condition of the Engineering Controls and/or monitoring devices will be documented and forwarded to the NYSDEC.

3.4.1 Corrective Measures Plan

If any component of the remedy is found to have failed, a corrective measures plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

3.5 Monitoring Reporting Requirements

All monitoring results will be reported to NYSDEC in an annual Site Status Report. The report will include, at a minimum:

- Date of monitoring event;
- Personnel conducting monitoring;
- Description of the activities performed;
- Type of samples collected (e.g., groundwater, surface water, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A site map illustrating sample types and locations;
- Copies of all laboratory data sheets and the laboratory data deliverables required for all points sampled;
- Any observations, conclusions, or recommendations;
- A determination as to whether conditions have changed since the last reporting event; and,
- Data will be reported in hard copy or digital format as determined by NYSDEC.

Figures

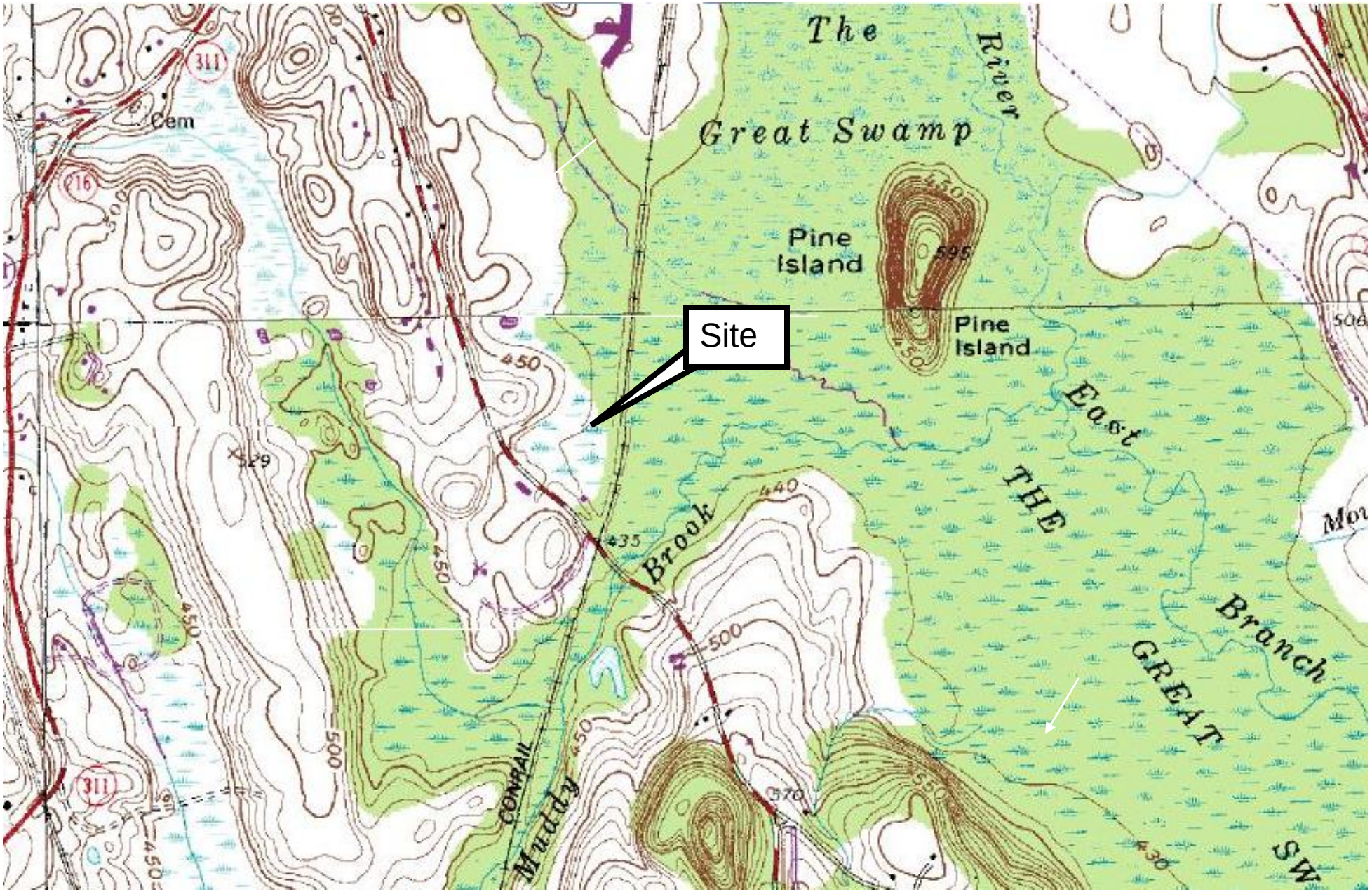


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Figure 1 - Site Location Map
Cross County Sanitary-Kessman Landfill
Town of Patterson, Putnam County, NY
NYSDEC Site Number: 3-40-011

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- Monitoring Well
- Surface Water/Sediment Sample Location

Figure 2 - Site Map
Cross County Sanitation – Kessman Landfill
Town of Patterson, Putnam County, NY
NYSDEC Site Number: 3-40-011