McKenna Landfill Site
ORLEANS COUNTY, NEW YORK

Site Management Plan

NYSDEC Site Number: 837003

Prepared for:
New York State Department of Environmental Conservation
Division of Environmental Remediation
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Prepared by:
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Work Assignment No. D007620-45

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
1	2/27/2015	Revised Site Monitoring Plan and Reporting Requirements	6/16/2015
2	5/18/2020	Removed select wells from Monitoring Plan. Revised to conform to latest SMP Template.	

MAY 2020

CERTIFICATION STATEMENT

I, Matthew R. DeVinney, certify that I am currently a NYS Registered Professional Engineer and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Matthew R. DeVinney P.E.

5-18-20
DATE

SITE MANAGEMENT PLAN
MCKENNA LANDFILL SITE
ORLEANS COUNTY, NEW YORK

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SITE MANAGEMENT PLAN

EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the McKenna Landfill Site (herein referred to as "Site" or "Property"), as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification: **NYSDEC Site Registry No. 837003, McKenna Landfill Site**

Institutional Controls:	1. The Property is subject to the Environmental Notice.
	2. Unless prior written approval by the NYSDEC is first obtained, where contamination remains at the Property subject to the provisions of this SMP, there shall be no disturbance or excavation of the Property which threatens the integrity of the Engineering Controls or which results or may result in a significantly increased threat of harm or damage at any site as a result of exposure to soils.
	3. No person shall disturb, remove, or otherwise interfere with the installation, use, operations, and maintenance of Engineering Controls required for the Remedy, including but not limited to the Engineering Controls described in this SMP, unless in each instance they first obtain a written waiver of such prohibition from the NYSDEC.
	4. The remedy was designed to be protective for the following use: Commercial and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and (iv). Any use for purposes other than Commercial and Industrial without the written waiver of such prohibition by the NYSDEC may result in a significant increased threat of harm or damage at any site.
	5. No person shall use the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the NYSDEC. Use of the groundwater without appropriate treatment may result in a significantly increased threat of harm or damage at any site.

	6. It is a violation of 6 NYCRR 375-1.11(b) to use the Property in a manner inconsistent with the Environmental Notice.
Engineering Controls:	1. Final cover system
	2. Gas venting system
	3. Leachate collection system
	4. Barrier/cut-off wall
	5. Surface water drainage
Inspections:	**Frequency**
1. Site-wide inspection	Annually (in autumn), every fifth quarter in conjunction with sampling events and following severe weather
2. Final cover inspection	Annually (in autumn) and every fifth quarter in conjunction with sampling events
3. Gas venting system	Annually (in autumn) and every fifth quarter in conjunction with sampling events
4. Leachate collection system	Annually (in autumn) and every fifth quarter in conjunction with sampling events
5. Surface water drainage	Annually (in autumn) and every fifth quarter in conjunction with sampling events
6. Groundwater monitoring wells & piezometers	Annually (in autumn) and every fifth quarter in conjunction with sampling events
7. Access & service roads	Annually (in autumn) and every fifth quarter in conjunction with sampling events

Monitoring:	
1. Water level monitoring of monitoring wells, piezometers, and wet wells	Annually (in autumn) and every fifth quarter in conjunction with sampling events
2. Groundwater Monitoring	Every fifth quarter
3. Surface Water Monitoring	Every fifth quarter
4. Leachate Monitoring	Every fifth quarter
Maintenance:	
1. Final cover maintenance	Annually (in autumn) and as needed
2. Surface water drainage maintenance	Annually (in autumn) and as needed
3. Access road maintenance	As needed
Reporting:	
1. Site-wide inspections	Annually (in autumn), every fifth quarter in conjunction with sampling events and following severe weather
2. Groundwater, surface water and leachate monitoring	Every fifth quarter
3. Site Management Report	Annually
4. Periodic Review Report	Every three (3) years

Further description of the above requirements is provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

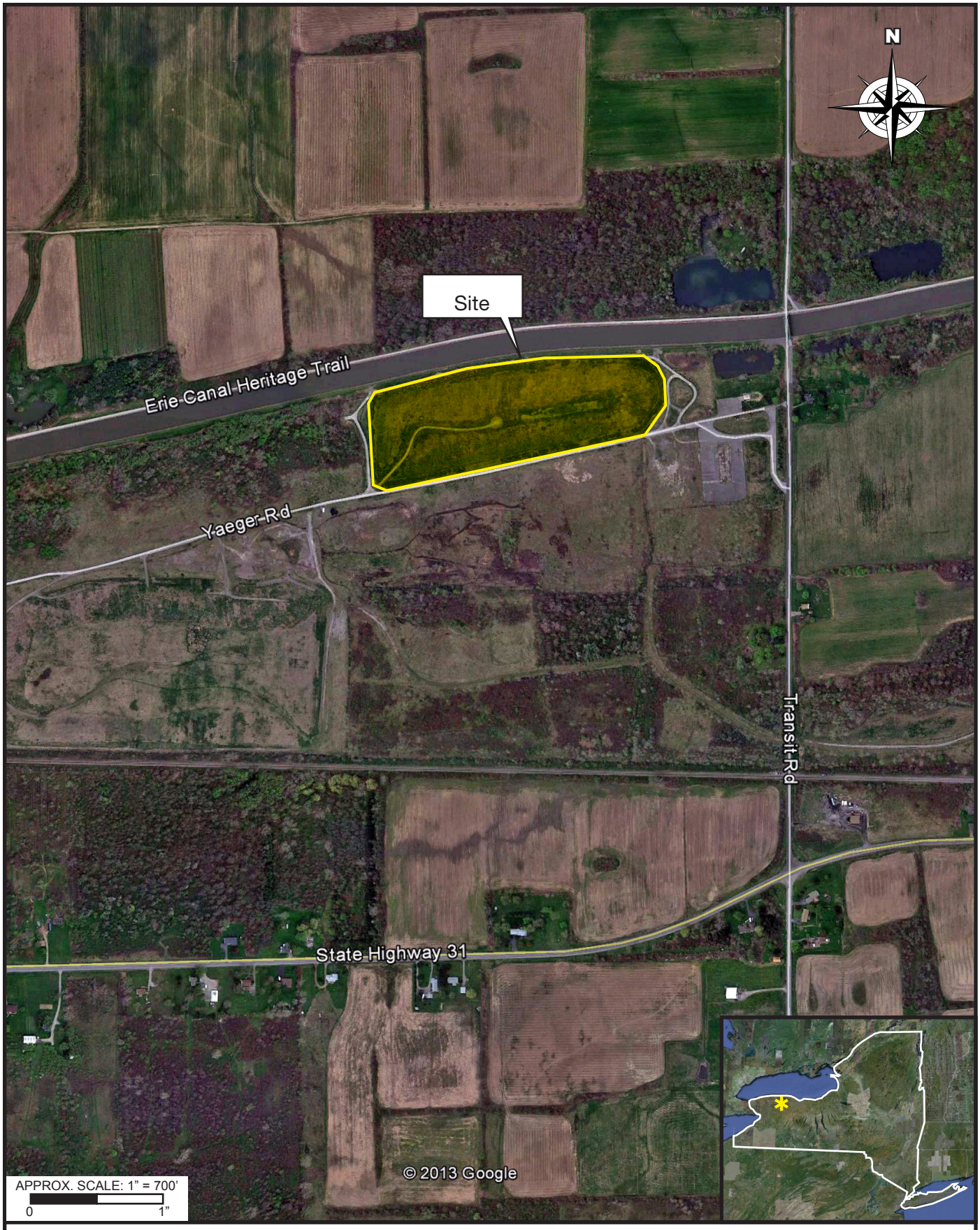
1.1 General

This Site Management Plan (SMP) is required as an element of the remedial program at the McKenna Landfill Site (hereinafter referred to as "Site" or "Property") under the New York State ("NYS") Inactive Hazardous Waste Disposal Site Remedial Program administered by New York State Department of Environmental Conservation ("NYSDEC"). The Site was remediated in accordance with Order on Consent Index B8-0374-91-06, Site 837003, which was executed in March 1998.

Chemical Waste Management, LLC ("Waste Management") entered into an Order on Consent (the "Order") with the NYSDEC to properly close the 18 acre "unlined" private landfill located in Albion, New York. This Order on Consent required the Remedial Party, Waste Management, to implement a remedy consisting of a final cover system and supporting features to address various 6 NYCRR Part §360 violations as well as groundwater contamination beneath the Site. Upon completion of the remedy, the NYSDEC assumed responsibility for operation and maintenance activities at the Site pursuant to stipulations in the Order.

A figure showing the site location and boundaries of this 18-acre Site is provided in **Figure 1-1**. The boundaries of the Site are more fully described in the metes and bounds site description that is part of the Environmental Notice presented in **Appendix A**.

After completion of the remedial work described in the report entitled "Final Design Rationale/Engineering Report", dated December 1999, contamination was left in the subsurface at this Site, which is hereafter referred to as "remaining contamination." This Site Management Plan ("SMP") was prepared to manage remaining contamination at the Site until the Environmental Notice is extinguished in accordance with ECL Article 71, Title 36. All reports associated with



SOURCE: GOOGLEARTH.COM

D&B Engineers and Architects, P.C.

MCKENNA LANDFILL SITE
ALBION, NEW YORK
SITE MANAGEMENT PLAN

SITE LOCATION MAP

FIGURE 1-1

3150-06 - Site Location Map (Fig 1 and 1-1).indd (02/19/15 - 11:07 AM)

the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by D&B Engineers and Architects, P.C. (D&B), on behalf of NYSDEC (Work Assignment No. D007620-45), in accordance with the requirements in NYSDEC "DER-10 Technical Guidance for Site Investigation and Remediation" (DER-10), dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the Institutional Controls ("ICs") and Engineering Controls ("ECs") that are required by the Environmental Notice for the Site.

The Site contains contamination left after completion of the remedial action. Engineering Controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the Site to ensure protection of public health and the environment. An Environmental Notice granted to the NYSDEC, and recorded with the Orleans County Clerk, requires compliance with this SMP and all ECs and ICs placed on the Site. The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Notice for contamination that remains at the Site.

This SMP provides a detailed description of all procedures required to manage remaining contamination at the Site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes three plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual for complex systems).

This plan also includes a description of Periodic Review Reports for the periodic submittal of data, information, recommendations, and certifications to NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Environmental Notice. Failure to properly implement the SMP is a violation of the Environmental Notice, which is grounds for revocation of the Certificate of Completion (COC);
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6 NYCRR Part §375 and the Order on Consent, Index #B8-0374-91-06; Site #837003 for the Site, and thereby subject to applicable penalties.

Site investigation and remediation activities at the Site were performed by others. As a result, the description of site background information in Section 2.0 has been prepared based on the information provided to D&B by the NYSDEC.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Notice for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC as needed for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the Order on Consent, 6 NYCRR Part §375, and/or Environmental Conservation Law.

- 7-day advance notice of any field activity associated with the remedial program.

- 15-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan.

- Notice within 48-hours of any damage or defect to the Engineering Controls that reduces or has the potential to reduce the effectiveness of an Engineering Control and likewise any action to be taken to mitigate the damage or defect.

- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake that reduces or has the potential to reduce the effectiveness of Engineering Controls in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser has been provided with a copy of the Order on Consent and all approved work plans and reports, including this SMP.

- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing.

Notifications will be made to:

Robert Strang, Project Manager
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, NY 12233-7017
Phone: (518) 402-8642
E-mail: robert.strang@dec.ny.gov

1.4 Contingency Plan

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

1.4.1 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 Division of Environmental Remediation. These emergency contact lists must be maintained in an easily accessible location at the Site.

Table 1-1: 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
NYSDEC Project Manager – Robert Strang	(518) 402-8642

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

1.4.2 Map and Directions to Nearest Health Facility

Site Location: Intersection of Transit Road and Yaeger Road, Albion, New York

Nearest Hospital Name: Medina Memorial Hospital.

Hospital Location: 200 Ohio Street, Medina, New York

Hospital Telephone: (585) 798-2000

Directions to the Hospital:

1. Proceed South on County Road 64/Transit Road toward NY-31/State Highway 31 (0.4 miles).
2. Turn right onto NY-31/State Highway 31 West (14.1 miles).
3. Continue onto West Center Street (0.5 miles).
4. Turn right onto Ohio Street, Medina Memorial Hospital will be on the left (0.2 miles).

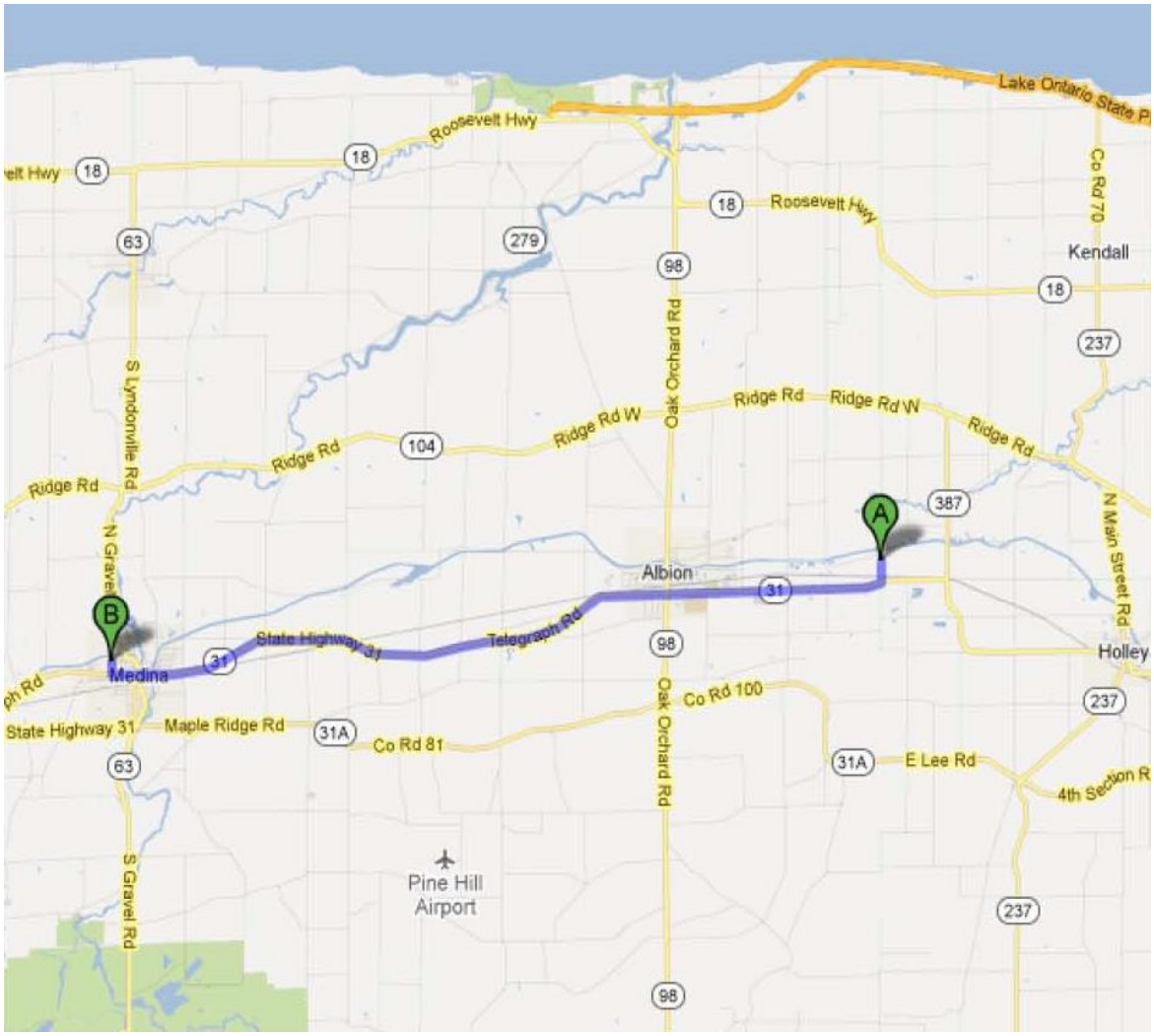
Total Distance: 15.2 miles

Total Estimated Time: 22 minutes

1.4.3 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 1-1**). The list will also be posted prominently at the Site and made readily available to all personnel at all times.

Map Showing Route from the Site to the Hospital:



Source: Google Maps

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

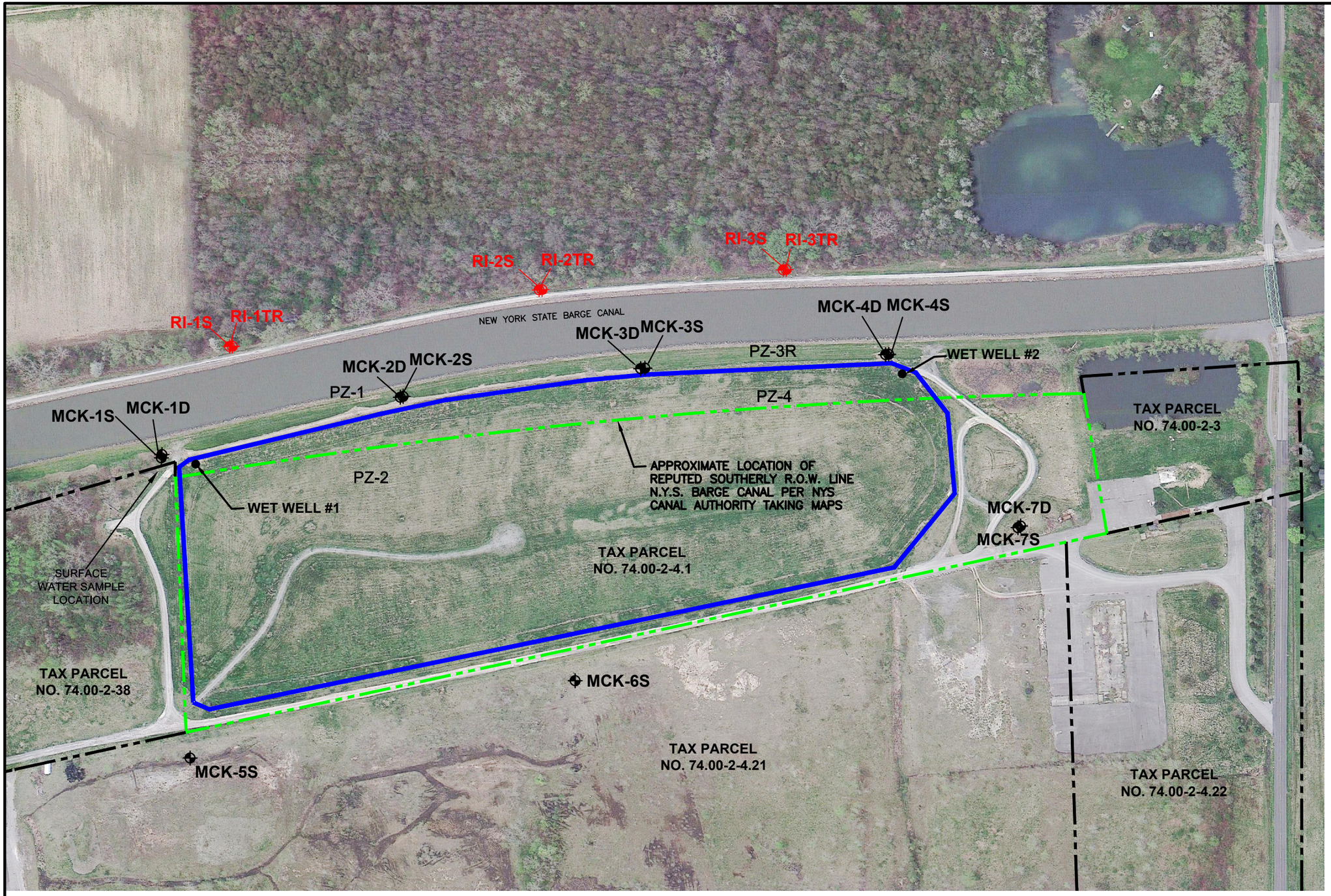
The Site is located on the north side of the former Yaeger Road, west of Transit Road in the Town of Albion, Orleans County, New York. The landfill occupies approximately 18 acres. The landfill is located adjacent to the northeast corner of the closed and capped Orleans Sanitary Landfill ("OSL"). As can be seen on **Figure 2-1**, the McKenna Landfill Site is bounded by the New York State Barge Canal (the "Canal") to the north, Transit Road to the east, the former Yaeger Road to the south and an undeveloped portion of the OSL to the west. The site setting is generally rural/agricultural in nature with a few residences within a half-mile of the Site.

The Site consists of one tax parcel (tax parcel no. 074.00-2-4.1) on the Orleans County Tax Map. However, several supporting features of the remedy (i.e., access roads, monitoring wells, etc.) extend off-site onto three additional tax parcels, which include the Canal right-of-way, tax parcel no. 074.00-2-4.21, and tax parcel no. 074.00-2-38. The Canal right-of-way is located immediately north of the Site, tax parcel no. 074.00-2-4.21 is located immediately south of the Site, and tax parcel no. 074.00-2-38 is immediately west of the Site. **Figure 2-1** presents the limits of the Site, tax parcel boundaries, and the location of the ICs/ECs and supporting features.

2.2 Physical Setting

2.2.1 Land Use

The Site occupies approximately 18 acres and is located adjacent to the northeast corner of the closed and capped OSL. The McKenna Landfill Site is bounded by the New York State Barge Canal (the Canal) to the north, Transit Road to the east, the former Yaeger Road to the south and an access road to the west. The Site setting is generally rural/agricultural. A few residences are located within a half-mile of the Site.



LEGEND

- RI-2S — MONITORING WELL DECOMMISSIONED BY D&B MAY 2019
- MCK-4S — MONITORING WELL INSTALLED BY D&B FEB 2002
- PIEZOMETER
- TAX PARCEL BOUNDARY
- SITE BOUNDARY
- LANDFILL BOUNDARY

NOTES

INSTITUTIONAL CONTROL:
ENVIRONMENTAL NOTICE 2013

ENGINEERING CONTROLS:
SUBSURFACE BARRIERS, COVER SYSTEM, AND LEACHATE COLLECTION SYSTEM

MONITORING WELL LOCATIONS NORTH OF NEW YORK STATE BARGE CANAL ARE APPROXIMATE

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH.

0 100' 200' 300'
SCALE: 1"=200'

D&B ENGINEERS AND ARCHITECTS, P.C.

MCKENNA LANDFILL SITE
ALBION, NEW YORK
SITE MANAGEMENT PLAN

SITE LAYOUT MAP

FIGURE 2-1

F:\3150-06A\FIGURE\3150-06A-SMP FIG 1-2_UPDATE_10.16.2019.dwg, 2-1, 5/18/2020 12:20:57 PM, kalesius

The land surface of the Site is relatively flat, with the exception of features associated with the OSL and McKenna Landfill. The McKenna Landfill extends up to seventy feet above the surrounding land surface. Drainage swales and the Canal create localized land depressions in areas adjacent to the Site. Although locked access gates are present at the Transit and Densmore Road Site entrances, the entire Site perimeter is not fenced. A series of formal and informal roads and trails provide access to the Site by walking or driving from adjoining roads and/or properties.

2.2.2 Geology

Soils at the Site are comprised primarily of sand and silt, with small amounts of clay and gravel. The thickness of the soil varies from a few feet up to 15 feet. The upper most bedrock unit underlying the Site has been mapped as the Grimsby Sandstone Formation. In the area of the Site, the Grimsby Sandstone Formation is reportedly 60 to 75 feet thick. The Queenston Shale underlies the Grimsby formation and consists mostly of brick-red, sandy shale with thin beds of greenish-gray shale and greenish-gray sandstone. This formation is reportedly 1,200 feet thick.

2.2.3 Hydrogeology

Based on historical water level data, groundwater is found at an average depth of approximately 5 feet below the ground surface in the wells screened in the unconsolidated and consolidated formations.

The direction of regional groundwater flow in the vicinity of the Site is north toward Lake Ontario. Locally, the direction of shallow groundwater flow at the Site is also to the north. There is also a slight vertical component to groundwater flow on-site. Generally, vertical flow at the Site is slightly downward from unconsolidated material to bedrock. In addition, groundwater elevations within the landfill are generally higher than groundwater elevations outside the landfill, indicating an outward/downward gradient.

Groundwater contour maps are presented in **Appendix B**. A contour map was not prepared for the deep monitoring wells due to the spacing and configuration of the monitoring well network.

However, a map identifying representative groundwater elevations in bedrock wells is presented for comparison purposes. Groundwater elevation data is provided in **Table 2-1**. Groundwater monitoring well construction logs are provided in **Appendix G**.

2.3 Investigation and Remedial History

The McKenna Landfill Site is a closed "unlined" private landfill, which was operated by Mr. Alan J. McKenna from 1969 to 1983 and received municipal refuse from several townships and industrial wastes from several companies. The industrial wastes were reported to include vinyl chloride from Bayex, paint sludge and spent cleaning solvent from Fisher Price Toys, and tetrachloroethylene from Aurora Cleaners. A Community Right-to-Know ("RTK") survey form documented the disposal of spent cleaning solvents, specifically trichloroethene ("TCE") at the landfill.

The landfill was closed in the early 1980s, but the closure was not properly completed. Prior to the closing of the landfill in 1983, the landfill had been cited for numerous operational violations. These violations included open burning, uncovered refuse, refuse protruding through the cover, uncontrolled leachate seeps, methane gas leaking from landfilled areas in concentrations exceeding the lower explosive limit ("LEL") and leachate seeping off-site.

In 1983 the NYSDEC executed an Order on Consent with the Site owner, Mr. McKenna, requiring proper closure and post-closure maintenance of the Site. In an attempt to control the methane gas release problem, six methane gas vents were installed by the Site owner in 1984. The owner also installed a leachate collection system along the northern edge of the landfill in an attempt to address the leachate migration problem. This system was later extended along the western perimeter and a portion of the southern perimeter of the Site in 1987. Leachate was pumped from this system into tankers and taken to the Albion Industrial Pollution Control Facility ("IPCF") facility for disposal. After construction of the leachate system, the Site owner did not regularly pump leachate as needed. Further, it was determined that the collection system was not properly constructed. As such, significant leachate problems continued. Additionally, the gas venting system at the Site was deemed inadequate, because so few vents were installed.

Table 2-1: Groundwater Elevation Measurements

WELL	GROUND ELEVATION (ft MSL)[1]	REFERENCE ELEVATION (ft MSL)[1]	TOP OF SCREEN (ft BG)	BOTTOM SCREEN (ft BG)	DATE																	
					1/30/2014		6/10/2014		10/17/2014		7/30/2015		11/16/2016		3/28/2018		4/3/2018		9/19/2018		5/21/2019		10/28/2019	
					DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV	DTW	ELEV
MCK- 1D	515.06	517.45	505.42	495.42	----	----	6.80	510.65	6.99	510.46	7.15	510.30	7.06	510.39	8.70	508.75	8.55	508.90	7.48	509.97	6.33	511.12	6.64	510.81
MCK- 1S	514.80	517.00	507.71	502.71	9.30	507.70	6.75	510.25	6.90	510.10	7.05	509.95	6.78	510.22	7.47	509.53	7.39	509.61	7.36	509.64	6.10	510.90	6.30	510.70
MCK- 2D	514.69	517.23	505.16	495.16	----	----	5.66	511.57	6.09	511.14	6.19	511.04	6.11	511.12	9.06	508.17	8.24	508.99	6.64	510.59	5.48	511.75	5.93	511.30
MCK- 2S	514.76	517.16	508.00	503.00	9.90	507.26	5.59	511.57	5.99	511.17	6.12	511.04	6.02	511.14	9.65	507.51	8.49	508.67	6.58	510.58	4.64	512.52	5.84	511.32
MCK- 3D	515.26	517.78	503.33	493.33	12.80	504.98	8.40	509.38	9.94	507.84	8.94	508.84	9.40	508.38	10.40	507.38	10.01	507.77	10.31	507.47	7.44	510.34	8.15	509.63
MCK- 3S	515.27	517.96	508.45	503.45	12.10	505.86	8.00	509.96	9.33	508.63	8.46	509.50	8.63	509.33	10.60	507.36	8.82	509.14	9.92	508.04	6.85	511.11	7.37	510.59
MCK- 4D	516.82	518.97	504.82	494.82	9.60	509.37	6.40	512.57	7.32	511.65	6.87	512.10	6.52	512.45	8.49	510.48	8.59	510.38	8.07	510.90	6.07	512.90	6.40	512.57
MCK- 4S	516.84	519.30	514.30	505.70	9.20	510.10	7.00	512.30	8.15	511.15	7.55	511.75	6.85	512.45	7.30	512.00	7.43	511.87	8.90	510.40	6.59	512.71	6.29	513.01
MCK- 5S	529.71	531.92	526.92	519.40	3.90	528.02	3.92	528.00	6.85	525.07	4.91	527.01	4.29	527.63	2.91	529.01	2.86	529.06	6.71	525.21	2.66	529.26	3.65	528.27
MCK- 6S	531.94	534.29	529.29	523.10	4.30	529.99	6.16	528.13	9.78	524.51	7.39	526.90	6.88	527.41	11.80	522.49	3.16	531.13	8.74	525.55	3.12	531.17	4.76	529.53
MCK- 7D	529.90	532.01	522.01	513.50	11.20	520.81	11.08	520.93	13.05	518.96	11.95	520.06	11.63	520.38	9.40	522.61	9.66	522.35	12.92	519.09	10.02	521.99	10.97	521.04
MCK- 7S	530.04	532.25	527.25	521.60	7.60	524.65	7.53	524.72	8.78	523.47	7.91	524.34	7.50	524.75	3.60	528.65	4.76	527.49	8.54	523.71	5.15	527.10	6.18	526.07
RI-1TR*	515.08	516.95	----	----	16.10	500.85	14.15	502.80	17.38	499.57	----	----	----	----	----	----	----	----	19.68	497.27	----	----	----	----
RI-1S*	515.24	516.92	----	----	15.60	501.32	12.57	504.35	15.30	501.62	----	----	----	----	----	----	----	----	15.68	501.24	----	----	----	----
RI-2TR*	514.57	516.30	----	----	15.70	500.60	12.35	503.95	16.63	499.67	----	----	----	----	----	----	----	----	16.62	499.68	----	----	----	----
RI-2S*	514.61	516.04	----	----	14.60	501.44	11.43	504.61	12.80	503.24	----	----	----	----	----	----	----	----	12.97	503.07	----	----	----	----
RI-3TR*	515.49	516.88	----	----	15.00	501.88	11.58	505.30	13.61	503.27	----	----	----	----	----	----	----	----	13.76	503.12	----	----	----	----
RI-3S*	514.94	515.99	----	----	14.00	501.99	10.81	505.18	12.36	503.63	----	----	----	----	----	----	----	----	12.44	503.55	----	----	----	----
PZ-1	514.96	517.26	510.83	497.83	10.00	507.26	----	----	6.33	510.93	6.52	510.74	6.43	510.83	8.50	508.76	----	----	6.78	510.48	5.73	511.53	6.06	511.20
PZ-2	537.02	539.54	519.54	508.10	DRY	----	25.95	513.59	26.30	513.24	26.35	513.19	25.76	513.78	DRY	----	DRY	----	25.69	513.85	25.61	513.93	27.18	512.36
PZ-3**	515.56	518.03	505.03	499.30	10.20	507.83	----	----	6.37	511.66	6.67	511.36	6.71	511.32	8.17	509.86	----	----	----	----	----	----	----	----
PZ-3R***	----	518.60	514.60	503.60																	5.49	513.11	5.98	512.62
PZ-4	532.15	534.19	514.19	503.30	DRY	----	DRY	----	19.04	515.15	19.40	514.79	19.06	515.13	18.89	515.30	19.10	515.09	19.29	514.90	19.20	514.99	19.42	514.77

NOTES:

[1] - Elevations based on September 2009 survey completed by Deborah A. Naybor Surveying, PLS, PC of Alden, New York.

ft MSL - feet above mean sea level.

ft BG - feet below ground.

ELEV - groundwater elevation in feet above mean sea level.

DTW - depth to water in feet relative to top of well casing.

---- Not Available

* - monitoring wells installed by others. Decommissioned by D&B in May 2019

** - PZ-3 was decommissioned on 01/10/19

*** - PZ-3R was installed on 01/15/19

During the final stages of closure in September 1983, the NYSDEC and the Orleans County Health Department inspected and sampled the Site. A Phase I investigation was completed in August 1985 and a Phase II investigation was completed in July 1990. The Phase II investigation was conducted to allow for adequate characterization of the site to evaluate the need for final closure of the landfill. Investigative activities completed consisted of: a geophysical survey to determine the limits of fill material; the installation of soil borings and monitoring wells for analysis of soils and groundwater, as well as the physical properties of soil and hydrogeologic conditions; sampling and analysis of surface water from the Erie Barge Canal; sampling and analysis of leachate seeps from the site; and the installation, sampling, and analysis of groundwater wells on the north side of the barge canal. Upon comparison of the analytical data obtained from the investigation to applicable standards, criteria, and guidance (SCGs), along with considerations of potential public health and environmental exposures, certain areas and media of the site were determined to require remediation. Groundwater sampling perform during the Phase II study revealed the presence of contaminants at levels exceeding 6 NYCRR Part §703 groundwater quality standards and guidance values.

A Record of Decision (ROD) for landfill closure was signed by the NYSDEC in March 1995 and an Order on Consent was signed in March 1998. Waste Management, one of the potentially responsible parties ("PRPs"), undertook closure of the landfill. The Site was remediated in accordance with the NYSDEC-approved report entitled "Final Design Rationale/Engineering Report", dated December 1999. Landfill closure began in May 2000 and was completed in September of 2001. The closure activities consisted of construction of a landfill cap, barrier/cut-off wall, leachate collection system, surface water drainage structures and a gas venting system. A summary of the landfill closure activities is presented below.

1. **Final Cover System** - The final cover system overlies the existing landfill soil cover and includes a geomembrane barrier (60 mil linear low density polyethylene ["LLDPE"]); low permeability soil cover (approximately 24 inches thick); and, topsoil (approximately 6 inches thick), seeded to establish vegetative cover. A passive gas venting system is also part of the final cover system. The gas vents are located on the top portion of the landfill, mid-slope, and at various points along the perimeter leachate collection system. To ensure gas collection and venting is continuous over the entire

landfill, the upper gas collection and venting trench is connected to the lower gas venting layers.

2. **Leachate Collection System** - The leachate collection system consists of a "toe drain" system around the entire perimeter of the landfill, which flows to wet wells located at the northeast and northwest corners of the landfill. The leachate collection pipe and appurtenances are located inside the barrier/cut-off wall system. The leachate collection piping consists of perforated, 6- and 8-inch diameter, high density polyethylene ("HDPE") pipe. All manholes and wet wells are also constructed of HDPE. The wet wells are 8 feet in diameter and have a 6.5 foot deep sump below the lowest incoming pipe. The wet wells have a storage capacity of 2,250 gallons.

3. **Barrier/Cut-off Wall** - A barrier/cut-off wall is present around the entire perimeter of the landfill and generally follows the center line of the perimeter surface water drainage swales. The barrier/cut-off wall extends to the top of bedrock, which ranges in depth from a few feet to approximately 15 feet below grade. The purpose of the barrier/cut-off wall is to reduce infiltration of uncontaminated groundwater into to the perimeter leachate collection system. The barrier/cut-off wall also reduces potential migration of contaminated groundwater from the Site. Finally, the barrier/cut-off wall provides a connection point for the final cover system to the top of bedrock.

4. **Surface Water Drainage** - Surface water drainage consists of sheet flow from the landfill slopes to the perimeter drainage swales, located along the base of the landfill. A drainage swale is located on the south side of the landfill between the base of the landfill and the northern edge of former Yaeger Road. Flow along the south swale is to the west and east from a high point located near manhole MH-6. Drainage swales are located to the west and east of the landfill that flow north to the northern swale, which is located between the base of the landfill and the southern edge of the Canal. The northern swale flows in a westerly direction and discharges to a stream several hundred yards west of the Site.

Note that the information presented above regarding the construction of the cap and supporting features is based on the design report and not the construction certification report as this information is not available. Therefore, the information presented makes the assumption that the landfill was constructed as designed.

It should be noted that the Consent Order only stipulated construction of the final cover system and supporting features but did not include the operation and maintenance of the landfill after the closure was completed. As a result, the NYSDEC took over operation and maintenance of the Site at the time of construction completion.

2.4 Remediation Goals

Goals for the remedial program initiated at the Site were established under the guideline of meeting all SCGs and protecting human health and the environment. They aimed, at a minimum, to eliminate or mitigate all significant threats to public health and the environment through the proper application of scientific and engineering principles. The selected goals for the Site were:

- Reduce, control, or eliminate the generation of leachate within the fill mass;
- Eliminate the threat to surface waters by eliminating any future contaminated surface run-off of the contaminated leachate;
- Eliminate the potential for direct human or animal contact with the contaminated leachate on site; and
- Prevent, to the extent possible, the migration of contaminants in the landfill to groundwater.

Further, the cleanup goals for the Site include attaining to the extent practicable the following SCGs:

- Ambient groundwater quality standards based on NYSDEC TOGS 1.1.1 "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code; and,
- Class C surface water standards and guidance values in NYSDEC TOGS 1.1.1, "Ambient Water Quality Standards and Guidance Values", dated June 1998.

2.5 Remaining Contamination

The following subsections provide a summary of remaining contamination, broken down by media, based upon currently available information.

2.5.1 Soil

As discussed above, the McKenna Landfill operation reportedly accepted municipal and industrial waste from the surrounding area. Municipal waste reportedly included household refuse and industrial waste reportedly included vinyl chloride, paint sludge, spent cleaning solvents, and TCE. The waste mass remains at the Site and was not removed as part of the remedial action. As a result, contaminated soil and waste remains within the limits of the landfill cover system.

2.5.2 Groundwater

A summary of historical analytical data relative to standards, criteria and guidance ("SCG") values is presented in the tables in **Appendix C**.

Volatile Organic Compounds ("VOC") Results in Groundwater

With respect to groundwater, VOCs are the primary contaminant of concern, and to a much lesser extent pesticides and metals. Historically, acetone, benzene, 1,4-dichlorobenzene, ethylbenzene, 2-hexanone, 2-butanone, toluene, and xylene have been detected in excess of SCGs in at least one sample collected from on-site "downgradient" monitoring wells MCK-2S, MCK-2D, MCK-3S, and MCK-3D at concentrations ranging from 1.5 µg/L to 1,200 µg/L. Benzene, 1,4-dichlorobenzene, ethylbenzene and xylene have also been detected above SCGs in on-site "upgradient" monitoring well MCK-6S and "source area" piezometers PZ-2 and PZ-4. VOCs have not been detected at concentrations in excess of SCGs in any of the "crossgradient" or "off-site" monitoring wells.

BTEX (benzene, toluene, ethylbenzene, and xylene) compound concentrations, a primary leachate indicator, has been found in monitoring wells MCK-2S, MCK-2D, MCK-3S, MCK-3D, MCK-6S and piezometers PZ-2 and PZ-4. BTEX is consistently detected in "downgradient" monitoring wells (MCK-2D, MCK-3S, and MCK-3D) as well as within "source area" piezometers (PZ-2 and PZ-4), which are situated within the waste mass, indicating contamination continues to migrate from the waste mass to the groundwater zones surrounding and beneath the landfill.

However, BTEX concentrations in all the monitoring wells and piezometers indicate an overall decreasing trend. BTEX compounds have not been detected in any of the other monitoring wells or piezometers.

Inorganic Results in Groundwater

Historically, inorganics including antimony, arsenic, barium, boron, cadmium, chromium, cyanide, hexavalent chromium, iron, lead, magnesium, manganese, nickel, selenium, sodium, and thallium have been detected at concentrations above SCGs in at least one sample collected from the on- and off-site monitoring wells and piezometers. Boron, iron, magnesium, manganese, and sodium have consistently been detected at concentrations above SCGs in all the on- and off-site monitoring wells and piezometers. Antimony, arsenic, barium, cadmium, chromium, cyanide, hexavalent chromium, lead, nickel, selenium, and thallium have been sporadically detected at concentrations in excess of SCGs in the on- and off-site monitoring wells and piezometers.

Although several of these inorganics are considered primary leachate indicators, it is difficult to attribute these inorganics directly to the Site. It is likely that the elevated levels of inorganics in groundwater are at least in part attributed to sample turbidity and background water quality (e.g., natural quality, upgradient sources, etc.). Since inorganics are wide-spread on- and off-site and difficult to attribute directly to the Site, an evaluation of trends was not performed for these analytes.

Wet/General Chemistry Results in Groundwater

Historically, ammonia, bromide, chloride, phenols, and sulfates have been detected at concentrations above SCGs in at least one sample collected from the on- and off-site monitoring wells. In general, concentrations are highest in “downgradient” monitoring wells MCK-2S, MCK-2D, MCK-3S, MCK-3D, MCK-4S, and MCK-4D, “source area” piezometers PZ-2 and PZ-4, and “upgradient” well MCK-6S.

2.5.3 Surface Water Sampling and Analysis

A summary of historical analytical data relative to SCG values is presented in the tables in **Appendix C.**

VOCs and wet/general chemistry analytes have not been detected at concentrations in excess of SCGs in the surface water samples since monitoring began in March 2002.

Historically, inorganics including aluminum, hexavalent chromium, iron, mercury, selenium, and silver have been detected at concentrations above SCGs in at least one round of surface water samples. Although several of these inorganics are considered primary leachate indicators, it is difficult to attribute these inorganics directly to the Site. It is likely that the elevated levels of inorganics are attributed to sample turbidity and background water quality.

2.5.4 Leachate Sampling and Analysis

A summary of historical analytical data relative to SCG values is presented in the tables in **Appendix C.**

Leachate samples are collected from Wet Well No.1 and Wet Well No.2 on an alternating basis. The samples are analyzed for United States Environmental Protection Agency ("USEPA") Priority Pollutants, excluding dioxin. Thirty-three rounds of leachate sampling have been completed at the Site since March 2002. To date, VOCs, semi-volatile organic compounds ("SVOCs"), and polychlorinated biphenyls ("PCBs") have not been detected in any of the samples at concentrations above SCG values.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since the waste mass remains at the site and contaminated soil and groundwater exists beneath the Site, ICs/ECs are required to protect human health and the environment. This Institutional and Engineering Control Plan describes the procedures for the implementation and management of all ICs/ECs at the Site. The IC/EC Plan is one component of the SMP and is subject to revision by NYSDEC.

This plan provides:

- A description of all ICs/ECs on the Site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Notice;
- A description of the features to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of ICs/ECs, such as the implementation of the Excavation Work Plan for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the ECs/ICs required by the Site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of Institutional Controls are required to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and, (3) limit the use and development of the site to commercial or more restrictive uses only. Adherence to these Institutional Controls on the Site is required by the Environmental Notice and will be implemented under this Site Management Plan. These Institutional Controls are:

- The Property is subject to the Environmental Notice;

- Unless prior written approval by the NYSDEC is first obtained, where contamination remains at the Property subject to the provisions of this SMP, there shall be no disturbance or excavation of the Property which threatens the integrity of the Engineering Controls or which results or may result in a significantly increased threat of harm or damage at any site as a result of exposure to soils;

- No person shall disturb, remove, or otherwise interfere with the installation, use, operations, and maintenance of Engineering Controls required for the Remedy, including but not limited to the Engineering Controls described in this SMP, unless in each instance they first obtain a written waiver of such prohibition from the NYSDEC;

- The remedy was designed to be protective for the following use: Commercial and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and (iv). Any use for purposes other than Commercial and Industrial without the written waiver of such prohibition by the NYSDEC may result in a significant increased threat of harm or damage at any site;

- No person shall use the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the NYSDEC. Use of the groundwater without appropriate treatment may result in a significantly increased threat of harm or damage at any site;

- It is a violation of 6 NYCRR 375-1.11(b) to use the Property in a manner inconsistent with the Environmental Notice.

Institutional Controls identified in the Environmental Notice may not be discontinued without an amendment to or extinguishment of the Environmental Notice.

3.2.1 Excavation Work Plan

The site remedy allows for commercial or more restrictive uses. Any future intrusive work that will penetrate the cap, or encounter or disturb the remaining contamination, including any modifications or repairs to the existing cover system will be performed in compliance with the EWP that is attached as **Appendix E** to this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the site. A sample HASP is attached

as **Appendix F** to this SMP that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, State and local regulations. Based on future changes to State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in Section E-1 of the EWP. Any intrusive construction work will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports as outlined in Section 7.

The parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all intrusive work, the structural integrity of excavations, proper disposal of excavation de-water, control of runoff from open excavations into remaining contamination, and for structures that may be affected by excavations (such as building foundations and bridge footings). The site owner will ensure that site development activities will not interfere with, or otherwise impair or compromise, the engineering controls described in this SMP.

3.2.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any enclosed structures located over areas that contain residual contamination an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system may include a vapor barrier, a passive sub-slab depressurization system that is capable of being converted to an active system, or an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion

will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. Validated SVI data will be transmitted to the property owner within 30 days of validation.

SVI sampling results, evaluations, and follow-up actions will also be summarized in the next Periodic Review Report.

3.3 Engineering Controls

Engineering controls at the Site consist of a landfill cap, barrier/cut-off wall, leachate collection system, surface water drainage structures and a gas venting system. Remedial design drawings from the report entitled "Final Design Rationale/Engineering Report" dated December 1999 are included in **Appendix D**. These engineering controls are discussed in further detail below.

3.3.1 Final Cover System

Exposure to remaining contamination at the Site is prevented by a final cover system placed over the landfill. The final cover system overlies the existing landfill soil cover (approximately 12 inches thick) and includes a geomembrane barrier (60 mil LLDPE); low permeability soil cover (approximately 24 inches thick); and, topsoil (approximately 6 inches thick), seeded to establish vegetative cover.

The Excavation Work Plan ("EWP") that appears in **Appendix E** outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Site Monitoring Plan included in Section 4.0 of this SMP.

Procedures for maintenance of this cover are provided in the Operation and Maintenance Plan included in Section 5.0.

3.3.2 Gas Venting System

A passive gas venting system was installed as part of the final cover system. The gas venting system consists of 19 gas vent points. Of the 19 gas vent points, 9 are located on the top portion of the landfill, and 10 gas vent points are located mid-slope. In addition, 12 gas vent points were also installed at various points along the perimeter leachate collection system. These vents were installed on the cleanout risers on the south side of the landfill as well as on each of the manholes and wet wells. To ensure gas collection and venting is continuous over the entire landfill, the upper gas collection and venting trench is connected to the lower gas venting layers.

3.3.3 Leachate Collection System

Leachate collection consists of a "toe drain" system around the entire perimeter of the landfill, which flows to wet wells located at the northeast and northwest corners of the landfill. The leachate collection pipe and appurtenances are located inside the barrier/cut-off wall system.

The leachate collection piping consists of perforated, 6- and 8-inch diameter, HDPE pipe. All manholes and wet wells are also constructed of HDPE. The wet wells are 8 feet in diameter and have a 6.5 foot deep sump below the lowest incoming pipe. The wet wells have a storage capacity of 2,250 gallons.

3.3.4 Barrier/Cut-Off Wall

A barrier/cut-off wall was constructed around the entire perimeter of the landfill and generally follows the center line of the perimeter surface water drainage swales. The barrier/cut-off was designed to extend to the top of bedrock, which ranges in depth from a few feet to approximately 15 feet below grade.

The purpose of the barrier/cut-off wall is to reduce infiltration of uncontaminated groundwater into to the perimeter leachate collection system. The barrier/cut-off wall also reduces potential migration of contaminated groundwater migration from the Site. Finally, the barrier/cut-off wall provides a connection point for the final cover system to the top of bedrock.

3.3.5 Surface Water Drainage

Surface water drainage consists of sheet flow from the landfill slopes to perimeter drainage swales, located along the base of the landfill. A drainage swale is located on the south side of the landfill between the base of the landfill and northern edge of former Yaeger Road. Flow along the south swale is to the west and east from a high point located near manhole MH-6. Drainage swales are located to the west and east of the landfill that flow north to the northern swale, which is located between the base of the landfill and the southern edge of the Canal. The northern swale flows in a westerly direction and discharges to a stream several hundred yards west of the Site.

Procedures for operating and maintaining the final cover system and supporting features are documented in the Operation and Maintenance Plan (Section 4 of this SMP). Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect controls at the Site, occurs.

3.3.6 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

4.0 MONITORING AND SAMPLING PLAN

4.1 General

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, the soil cover system, and all affected site media identified below. This Monitoring Plan may only be revised with the approval of NYSDEC. This Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, surface water and leachate);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards, and surface water standards;
- 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; and
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Monitoring of the performance of the remedy and overall reduction in contamination on-site and off-site will be conducted once every fifth quarter. Trends in contaminant levels in groundwater, surface water and leachate in the affected areas, will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in **Table 4-1** and outlined in detail in Sections 4.2 and 4.3 below.

4.2 Site-Wide Inspection

Site-wide inspections will be performed on an annual basis in the autumn and every fifth quarter during groundwater, surface water and leachate monitoring events. Additionally, site-wide inspections will be performed after all severe weather conditions that may affect Engineering Controls or monitoring devices. The inspection will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection;
- Compliance with permits and schedules included in the Operation and Maintenance Plan; and
- Confirm that site records are up to date.

The condition of the final cover system, leachate collection system, gas venting system, drainage swales, monitoring wells, and access roads will be inspected. Inspections will be performed annually in autumn, every fifth quarter during groundwater, surface water and leachate monitoring events, and following severe weather, as needed. Observations will be recorded in a field notebook dedicated to the project. Photographs will also be taken to document pertinent observations. An inspection report detailing the results of the site inspection will be prepared for

Table 4-1: Monitoring/Inspection Schedule

MONITORING PROGRAM	SPECIFIC ITEM	TYPES OF ISSUES	FREQUENCY	ANALYSIS
Groundwater and Surface Water	Water	Compliance with SCGs	Every fifth quarter	6 NYCRR Part §363-4.6(h) "Water Quality Analysis Tables"
Leachate	Leachate	Compliance with SCGs	Every fifth quarter	USEPA Priority Pollutants (excluding dioxin) and leachate indicator parameters
Water Level Monitoring	Wells, piezometers, and wet wells	Water level monitoring	Annually (in autumn) and every fifth quarter in conjunction with sampling events	NA
Site-wide Inspection	Final cover, leachate collection system, gas venting system, surface water drainage, groundwater monitoring wells/piezometers, and access/service roads	Damage or deterioration of Engineering Controls or the Property	Annually (in autumn), every fifth quarter in conjunction with sampling events and following severe weather	NA
Final Cover	Surface layer	Erosion of soil, deterioration of vegetation, wet spots, ponding, settlement	Annually (in autumn) and every fifth quarter in conjunction with sampling events	NA
Leachate Collection System	Wet wells and collection lines	Blocked flow, head buildup, leakage, and damage	Annually (in autumn) and every fifth quarter in conjunction with sampling events	NA

Table 4-1: Monitoring/Inspection Schedule (continued)

MONITORING PROGRAM	SPECIFIC ITEM	TYPES OF ISSUES	FREQUENCY	ANALYSIS
Gas Venting System	Gas vent points	Settlement, damage or blockage, and odors	Annually (in autumn) and every fifth quarter in conjunction with sampling events	NA
Surface Water Drainage	Swales and culverts	Obstruction of flow, bank erosion, ponding, vegetation stress, scouring, sedimentation, and debris	Annually (in autumn) and every fifth quarter in conjunction with sampling events	NA
Groundwater Monitoring Wells/Piezometers	Locks, covers, plugs, protective casings, concrete, and well materials	Tampering, missing parts, deterioration, rust, cracking, settlement, blockage and siltation	Annually (in autumn) and every fifth quarter in conjunction with sampling events	NA
Access and Service Roads	Access and service roads	Rutting, erosion and accessibility	Annually (in autumn) and every fifth quarter in conjunction with sampling events	NA

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

each site visit. If conditions are observed that require immediate action, the NYSDEC will be notified. The NYSDEC Project Manager will review the inspector's comments, conduct a follow-up inspection, if needed, and determine if maintenance work is required.

Inspections of all remedial components installed at the Site will be conducted at the frequency specified in the SMP Monitoring Plan schedule. A comprehensive site-wide inspection will be conducted as specified in the SMP Monitoring Plan schedule, regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether Engineering Controls continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Notice;
- Achievement of remedial performance criteria;
- Sampling and analysis of appropriate media during monitoring events;
- If site records are complete and up to date; and
- Changes, or needed changes, to the remedial or monitoring system.

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.2.1 Final Cover System

The inspector will make observations of the final cover and side slopes. The inspector will walk along the cover and look for adverse conditions such as:

- Leachate outbreaks (soft spots, sloughing, seeps, precipitates on the ground surface, etc.);
- Erosion gullies, sloughing, settling and unevenness; and,
- Stressed or undesirable vegetation.

4.2.2 Gas Venting System

The inspector will make observations of the ground surface above the gas venting system in conjunction with the final cover inspection. Detection of gas odors will be based on olfactory senses.

4.2.3 Leachate Collection System

The inspector will make observations of the leachate collection system. The wet wells, manholes, and cleanout risers will be inspected for signs of leakage or damage. In addition, the inspector will take liquid level measurements annually in the wet wells and also every fifth quarter in conjunction with the collection of leachate samples. Liquid levels in the wet wells will then be compared to historic data to assess the potential for problems with the system.

4.2.4 Surface Water Drainage System

Observations of the storm water control system will be made for uneven grade in drainage swales due to settlement, accumulation of sediment, litter or other debris that could interfere with storm water flow in the swales or culverts.

4.2.5 Access Roads

The condition of the access roads around the perimeter of the landfill will be inspected. Visual evidence of any erosion, deposition, differential subsidence, pothole development, or other adverse conditions that would impede vehicular traffic on the access roads will be photographed and noted in the field logbook.

4.3 Post-Remediation Sampling

4.3.1 Groundwater Monitoring

Groundwater monitoring will be performed on a periodic basis to assess the performance of the remedy. The network of monitoring wells has been installed to monitor both up-gradient and down-gradient groundwater conditions at the Site. The network of wells has been designed based on the following criteria:

- Groundwater is found at an average depth of approximately 5 feet below grade in unconsolidated material and bedrock at the Site. **Table 2-1** presents historical groundwater level measurements.
- The direction of regional groundwater flow in Western New York is north toward Lake Ontario. Previous investigations have confirmed that the direction of groundwater flow at the Site is also to the north. Groundwater contour maps are presented in **Appendix B**.
- Vertical flow at the Site is slightly downward from unconsolidated material to bedrock. In addition, groundwater elevations within the landfill are generally higher than groundwater elevations outside the landfill, indicating an outward/downward gradient.
- The landfill is unlined, and contamination continues to migrate from the waste mass to the groundwater zones surrounding and beneath the landfill.
- Monitoring wells were installed in pairs, including a shallow well screening the water table and a deep well screening either shallow bedrock or the bedrock/soil interface, depending on depth to bedrock. It should be noted, only shallow wells were installed at upgradient locations. **Table 4-2** summarizes Monitoring Well Construction Details. Boring/Well Construction Logs are included in **Appendix G.**

Table 4-2: Monitoring Well/Piezometer Construction Details

Boring ID	Total Depth	Depth to Rock or refusal	Screen (feet below ground surface)			Elevation (feet above mean sea level)					
			Top	Bottom	Length	Casing Top	Surface	Bedrock	Screen Top	Screen Middle	Screen Bottom
MCK- 1D	20.0	14.0	9.5	19.5	10.0	517.45	515.06	501.06	505.56	500.56	495.56
MCK- 1S	12.5	ne	7.0	12.0	5.0	517.00	514.80	na	507.80	505.30	502.80
MCK- 2D	20.0	12.8	9.5	19.5	10.0	517.23	514.69	501.89	505.19	500.19	495.19
MCK- 2S	12.5	ne	7.0	12.0	5.0	517.16	514.76	na	507.76	505.26	502.76
MCK- 3D	22.5	14.2	12.0	22.0	10.0	517.78	515.26	501.06	503.26	498.26	493.26
MCK- 3S	12.5	ne	7.0	12.0	5.0	517.96	515.27	na	508.27	505.77	503.27
MCK- 4D	22.5	12.0	12.0	22.0	10.0	518.97	516.82	504.82	504.82	499.82	494.82
MCK- 4S	12.5	ne	7.0	12.0	5.0	519.30	516.84	na	509.84	507.34	504.84
MCK- 5S	11.5	1.3	6.0	11.0	5.0	531.92	529.71	528.41	523.71	521.21	518.71
MCK- 6S	9.7	1.9	4.5	9.5	5.0	534.29	531.94	530.04	527.44	524.94	522.44
MCK- 7D	17.5	3.7	7.0	17.0	10.0	532.01	529.90	na	522.90	517.90	512.90
MCK- 7S	9.5	3.7	4.0	9.0	5.0	532.25	530.04	526.34	526.04	523.54	521.04
RI-1TR	36.5	----	----	----	----	516.95	515.08	----	----	----	----
RI-1S	20.0	19.6	----	----	----	516.92	515.24	----	----	----	----
RI-2TR	40.0	----	----	----	----	516.30	514.57	----	----	----	----
RI-2S	23.7	23.7	----	----	----	516.04	514.61	----	----	----	----
RI-3TR	35.5	----	----	----	----	516.88	515.49	----	----	----	----
RI-3S	19.0	19.0	----	----	----	515.99	514.94	----	----	----	----
PZ-1	17.5	14.8	4.0	17.0	13.0	517.26	514.96	na	510.96	504.46	497.96
PZ-2	30.0	ne	10.0	30.0	20.0	539.54	537.02	na	527.02	517.02	507.02
PZ-3	17.0	15.3	4.0	17.0	13.0	518.03	515.56	na	511.56	505.06	498.56
PZ-4	30.0	31.5	10.0	30.0	20.0	534.19	532.15	500.65	522.15	512.15	502.15

ne - Not encountered
na - Not applicable
---- - Information not avaliable

- The monitoring well network includes two "upgradient" wells (MCK-5S and MCK-6S) located south of the landfill, eight "downgradient" wells (MCK-1S/D, MCK-2S/D, MCK-3S/D, and MCK-4S/D) located between the north side of the landfill and the Canal and two "sidegradient" wells (MCK-7S/D) located southeast of the landfill. **Figure 2-1** presents the locations of the monitoring wells.

- The monitoring well network also includes four piezometers (PZ-1, PZ-2, PZ-3R, and PZ-4). Piezometer PZ-3 was replaced in January 2019 with piezometer PZ-3R. Piezometers PZ-1 and PZ-3R are located between the north side of the landfill and the Canal to monitor groundwater elevations in relation to the Canal water elevation and the leachate collection system liquid elevation. PZ-2 and PZ-4 are located on the north slope of the landfill to monitor the accumulation of groundwater beneath the landfill cap. **Table 4-2** summarizes monitoring well construction details. Boring/Well Construction Logs are included in **Appendix G.**

Groundwater monitoring will be conducted every fifth quarter. Samples will be collected from twelve on-site monitoring wells, and one on-site piezometer (alternating between PZ-2 and PZ-4). The samples will be analyzed for Baseline Parameters as described in 6 NYCRR Part §363-4.6 (h) "Water Quality Analysis Table". Sample locations are shown on **Figure 2-1.**

The sampling frequency may be modified with the approval NYSDEC. The SMP will be modified to reflect changes in sampling plans approved by NYSDEC.

All monitoring well sampling activities will be recorded in a field book as well as the purging and sampling log presented in **Appendix A** of the Quality Assurance Project Plan (QAPP-**Appendix H**). Other observations (e.g., well integrity, etc.) will be noted on the well sampling log.

In order to evaluate the groundwater flow direction at the Site, groundwater level gauging will be performed. Prior to the withdrawal of any water, water levels will be obtained from the entire set of monitoring wells using a hand-held electronic water level indicator. The indicator probe will be gradually lowered into the well until the point at which the indicator light or audible alarm indicates that the probe has reached water. The water level will then be obtained by measuring the depth from this point to the top of the well's inner casing or surveyed reference

mark. The water level measurement will be recorded to the nearest 0.01 foot. Total depth of the well will then be measured from the top of the well's inner casing or surveyed reference mark to the bottom of the well. The total well depth measurements will be to the nearest 0.1 foot.

Prior to sampling, each well will be purged of at least three volumes of groundwater using appropriate equipment. Field parameters, including pH, conductivity, turbidity, dissolved oxygen, and temperature will be monitored during the groundwater sampling events using a water quality instrument.

After purging, groundwater samples will be collected using NYSDEC-approved procedures. The groundwater samples will be transferred directly to the appropriate laboratory supplied sample container(s). Both filtered and unfiltered samples will be collected for metals analysis. Sample containers will be properly labeled at the time of sample collection and proper chain of custody procedures will be followed. One matrix spike/matrix spike duplicate will be collected and analyzed for each round of sampling. One trip blank will accompany each shipment of aqueous samples requiring VOC analysis. Detailed sample collection and analytical procedures are discussed in the Quality Assurance Project Plan (QAPP **in Appendix H**).

If biofouling or silt accumulation occurs in the on-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable and the NYSDEC determines that replacement is necessary. 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, decommissioning or replacement of monitoring wells. Any repair, decommissioning or replacement will be documented in the subsequent Periodic Review 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 documented entitled "CP-43 Groundwater Monitoring Well Decommissioning Policy", dated November 2009. 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.

4.3.2 Surface Water Monitoring

Flow permitting, a surface water sample will be collected for chemical analysis from one location at the confluence of drainage swales at the northwest corner of the landfill every fifth quarter. Surface water sampling will be performed in conjunction with groundwater sampling events. Sample locations are shown on **Figure 2-1**.

All surface water samples will be collected using NYSDEC-approved procedures. The surface water samples will be collected by immersing the laboratory supplied sample containers into the surface water as close to the bottom of the water column as practicable (or at the water/air interface if there is a sheen present). Field parameters, including pH, conductivity, turbidity, dissolved oxygen, and temperature will be monitored during the surface water sampling events using a water quality instrument.

Sample containers will be properly labeled at the time of sample collection and proper chain of custody procedures will be followed. Both filtered and unfiltered samples will be collected for metals analysis. The samples will be analyzed for Baseline Parameters as described in 6 NYCRR Part §363-4.6 (h) "Water Quality Analysis Table". One matrix spike/matrix spike duplicate will be collected and analyzed for each round of sampling. One trip blank will accompany each shipment of aqueous samples requiring VOC analysis.

Detailed sample collection and analytical procedures are discussed in the Quality Assurance Project Plan (QAPP in **Appendix H**).

4.3.3 Leachate Monitoring

Leachate samples from Wet Well No.1 and Wet Well No.2 will be collected every fifth quarter and analyzed for USEPA Priority Pollutants (excluding dioxin). The leachate samples will

also be analyzed for leachate indicator parameters as defined by 6 NYCRR Part §360. Leachate analyses will be used to track the performance of the cap.

All leachate samples will be collected using NYSDEC-approved procedures. The samples will be collected from Wet Well No.1 and Wet Well No. 2, using disposable bailers. The samples will then be transferred immediately into appropriate laboratory-supplied sample containers. Field parameters, including pH, conductivity, turbidity, dissolved oxygen, and temperature will be monitored during the leachate sampling events using a water quality instrument. Sample locations are shown on **Figure 2-1**.

Sample containers will be properly labeled at the time of sample collection and proper chain-of-custody procedures will be followed. One matrix spike/matrix spike duplicate will be collected and analyzed for each round of sampling. One trip blank will accompany each shipment of aqueous samples requiring VOC analysis.

Detailed sample collection and analytical procedures are discussed in the Quality Assurance Project Plan (QAPP in **Appendix H**).

4.4 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the QAPP prepared for the Site (**Appendix H**). Main Components of the QAPP include:

- QA/QC objectives for data measurement;
- Sampling program:
  - Sample containers will be properly washed, decontaminated, and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
  - Sample holding times will be in accordance with the NYSDEC ASP requirements.
  - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.

- Sample tracking and custody;
- Calibration procedures:
  - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
  - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical procedures;
- Preparation of a Data Usability Summary Report (DUSR), which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain-of-custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and checks;
- QA performance and system audits;
- Preventative maintenance procedures and schedules;
- Corrective action measures.

Inspection Forms, Sampling Data, and Maintenance Reports

All inspections and monitoring events will be recorded in a field logbook. All applicable field inspection and monitoring notes and other records, including all media sampling data, generated for the Site during the reporting period will be provided in electronic format in the Periodic Review Report. An annual Site Management Report (SMR) will also be provided to present a summary of all inspection, monitoring, and maintenance activities completed at the Site throughout the calendar year.

Evaluation of Records and Reporting

The results of the inspection and site monitoring data will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly, and remain effective;
- The Monitoring Plan is being implemented;
- Operation and maintenance activities are being conducted properly; and, based on the above items,
- The site remedy continues to be protective of public health and the environment and is performing as designed.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

The site remedy does not rely on any active mechanical systems, such as sub-slab depressurization systems or air sparge/ soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

Site operations and maintenance for the McKenna Landfill Site includes maintenance of the following components:

- Final Cover System
- Leachate Collection System
- Gas Venting System
- Surface Water Drainage System
- Access Roads

Each of these aspects of site operations and maintenance is covered in more detail in the sections that follow.

5.2 Final Cover System Maintenance

5.2.1 Routine Maintenance

Mowing will be performed once a year in the fall to help control the development of deep-rooted plants and intrusion of roots into the final cover. In addition, any potentially deep-rooted plants identified during the site inspections will be removed. When mowing is performed, well-maintained equipment specifically designed to safely operate on the landfill slopes will be used.

If the vegetative cover interferes with site inspections, mowing will be performed more frequently to allow for proper inspection.

Minor repairs to the final cover system will be completed as needed, as determined by the final cover system inspections. Minor repairs will generally consist of regrading, reseeding, and stabilization activities to repair erosion features or depressions caused by the settlement of waste. All repairs will be performed using low ground pressure type equipment suitable for fine grading. Additional soil suitable for the development of vegetation will be placed and graded as necessary. The soil will be placed in a manner to match the surrounding grade and the area will be reseeded either by broadcasting or hydroseeding, depending on the size of the repair. Temporary erosion controls such as tack mulch, rolled erosion fabrics, and silt fences will be installed as necessary.

In general, regrading, seeding and stabilization activities will be performed in accordance with applicable sections of the specifications and drawings developed during the landfill closure design and NYSDEC's document entitled "DER-10 Technical Guidance for Site Investigation and Remediation", dated May 2010.

Erosion control will be performed in a manner consistent with procedures set forth in NYSDEC's document entitled "New York Standards and Specifications for Erosion and Sediment Control", dated August 2005. Erosion and sediment control procedures will be developed and implemented as necessary to prevent erosion and sediment migration based on the actual site conditions and surface water drainage patterns at the time of work. All erosion and sediment control procedures will be maintained until suitable vegetation has been established.

5.2.2 Non-routine Maintenance

Non-routine final cover maintenance will be undertaken if signs of excessive differential settlement or subsidence of the final cover system are found during routine inspections, which could affect the proper functioning of the final cover. These areas will be regraded and reseeded as soon as the area can be safely accessed. Repair activities will be completed in a manner consistent with activities described above.

If final cover differential settlement is suspected to have potentially compromised one or more of the deeper layers of the final cover such as the geotextile or geomembrane, a qualified engineer will inspect the area of final cover in question. The engineer will then make a determination as to whether or not excavation down to the geosynthetic layers is necessary to facilitate inspection and possible repair. If necessary, excavation of topsoil and the various barrier protection soil layers will be completed in the area of settlement, and at least 4 to 5 feet beyond, to expose a sufficient portion of the geosynthetic layers for inspection/repair.

The engineer will then complete inspection of the geosynthetic layers, noting items such as stress/deformation and/or trampolining of geosynthetics, damaged seams, or other visible damage. The area will be inspected to assess underlying subgrade. If deemed necessary, the geosynthetic layers will be removed to evaluate the underlying layer/subgrade. Prior to restoration of the geosynthetic layers, compaction may be performed to further consolidate waste beneath the final cover to reduce the potential for additional future settlement. Structural fill soil may also be placed above the waste layer to match surrounding grades and provide a suitable subgrade for the geosynthetics repair, if necessary. The geosynthetics would then be reinstalled over the area by a qualified geosynthetics installer in accordance with the specifications approved during the design, as may be adjusted based on prevailing practice. Due to availability of qualified installers and/or ability to perform repairs based on site conditions/weather, a temporary patch of low permeability soil and/or geomembrane cover may be placed over the area prior to making the final repairs. Finally, soil suitable for the development of vegetative cover will be placed over the restored portion of the final cover. Stabilization and reseeding will be completed in a manner consistent with procedures set forth in NYSDEC's entitled "New York Standards and Specifications for Erosion and Sediment Control".

5.3 Gas Venting System Operation and Maintenance

The gas venting system does not require regular preventative maintenance as the collection piping and trenches are below the final cover. If settlement appears to have potentially affected

the system, the area in question will be investigated and repairs will be made in accordance with applicable sections of the specifications and drawings developed during the landfill closure design.

5.4 Leachate Collection System Operation and Maintenance

The leachate collection system does not require regular preventative maintenance. However, the wet wells, manholes, and cleanout risers will be inspected for signs of leakage or damage. In addition, liquid level measurements in the wet wells will be taken regularly in accordance with Section 4. If settlement appears to have potentially affected the system, the area in question will be investigated and repairs will be made as necessary. If flow is restricted in the buried piping, maintenance, such as jetting, will be performed to remove the restriction.

In December 2012, the NYSDEC evaluated several alternatives for management of leachate generated by the McKenna Landfill Site. Based on factors such as existing groundwater and leachate quality data and waste age, NYSDEC elected to cease operation of the perimeter leachate collection system with continued site inspections and monitoring events to ensure there are no adverse impacts to public health and/or the environment. The primary concern regarding terminating the leachate pumping activities would be an increase in water levels within the landfill resulting in a greater outward/downward gradient and an increased risk of contaminant migration. If the sampling and monitoring program indicates that the downgradient monitoring wells are being adversely impacted, NYSDEC may elect to resume leachate pumping activities.

If leachate management activities resume, leachate that accumulates in the wet wells will be pumped into a vacuum tanker truck and transported to a permitted disposal facility. Leachate removal and disposal will be conducted as determined by the NYSDEC. Leachate quantities will be recorded upon removal from the landfill by the hauler, and again upon delivery at the disposal facility.

5.5 Surface Water Drainage System

The surface water drainage system will be maintained by cleaning to keep the system clear of sediment, excessive plant growth and accumulated debris to prevent ponding or overflow. Sediment, debris, or other materials collected from the storm water drainage system will be properly disposed of off-site or spread-out on-site in the case of sediment and/or vegetative matter.

5.6 Access Roads

Snow plowing may be required during the winter months so other site activities (i.e., inspections, groundwater sampling, leachate management, etc.) can be performed without interruption. To maintain access, access roads will be plowed when the depth of snow is greater than 3-inches and is needed based on site activities. Snow plowing will be performed from Densmore Road, along former Yaeger Road to each of two leachate collection sumps (Wet Well No.1 and Wet Well No. 2) at the Site.

In addition to the above, plowing may also be necessary when roads become covered by drifting snow. At various times, plowing may be required on a case-by-case basis to facilitate work.

The access roads are constructed of crusher run stone and may require periodic maintenance to limit erosion, rutting, potholes and other adverse conditions that impede vehicle traffic. Maintenance will generally consist of placing, grading and compacting stone as needed. The stone will be placed via mechanical means, and in a manner that creates a relatively smooth and uniform surface. The stone will be compacted under the weight of the machine used to place and grade the stone. All maintenance activities will be performed in accordance with the specifications approved during the design.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

This section provides a summary of vulnerability assessments that will be conducted for the site during periodic assessments, and briefly summarizes the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding.

Increases in both the severity and frequency of storms/weather events, and increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

The site is located in an area of minimal flooding; however, flooding has occurred during instances of severe weather. If flooding does occur in the failure it is not expected to affect the monitoring well network as currently installed. Currently, Site drainage consists of sheet flow from the landfill slopes to the perimeter drainage swales, located along the base of the landfill. A drainage swale is located on the south side of the landfill between the base of the landfill and the northern edge of former Yaeger Road. Flow along the south swale is to the west and east from a high point located near manhole MH-6. Drainage swales are located to the west and east of the landfill that flow north to the northern swale, which is located between the base of the landfill and the southern edge of the Canal. The northern swale flows in a westerly direction and discharges to a stream several hundred yards west of the Site. The site will be inspected annually and after any significant weather event to evaluate its conditions.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation required that green remediation concepts and techniques be considered during all stages of remedial program including site management, with

the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR).

Waste Generation

Monitoring, maintenance and reporting activities associated with the groundwater sampling result in material consumption and the generation of waste. A summary of the current material consumption and waste generation activities for the groundwater monitoring are summarized below:

- Personal protective equipment associated with groundwater sampling and groundwater injections, such as disposable gloves, etc.;
- Polyethylene tubing for groundwater sampling events;
- Packaging material and ice used to pack and preserve samples to be submitted for laboratory analysis;
- Paper and office supplies associated with monitoring logs, groundwater injections and report preparation; and,
- Repair and replacement of monitoring wells.

6.2.1 Timing of Green Remediation Evaluations

Green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the Project Manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

6.2.2 Frequency of Sampling and Other Periodic Activities

All inspections will be conducted at the frequency specified in the schedules provided in Section 4 Monitoring Plan and Section 5 Operation and Maintenance Plan of this SMP. Inspections of remedial components will also be conducted whenever a severe condition has taken place, such as an erosion or flooding event that may affect the ECs.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

The RSO study will focus on overall site cleanup strategy, process optimization and management with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness and remedial time frames.

7.0 REPORTING REQUIREMENTS

7.1 Site Management Reports

All forms, records, and other relevant reporting formats generated during and summarizing the monitoring/inspection events, will be (1) subject to approval by NYSDEC; (2) submitted in electronic format to the NYSDEC in accordance with **Table 7-1**; and, (3) summarized at the time of the Periodic Review Report, as specified in the Reporting Plan of this SMP.

All interim monitoring/inspection reports will include, at a minimum:

- Date of event;
- Personnel conducting sampling/inspection;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location or incidents noted;
- Type of samples collected (e.g., groundwater, surface water, leachate, 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 figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets, and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Data will be reported in digital format unless hard copy is requested by the NYSDEC. A summary of the monitoring program deliverables are summarized in **Table 7-1** below.

Table 7-1: Schedule of Monitoring/Inspection Reports

Task	Reporting Frequency*
Groundwater, Surface Water, and Leachate Monitoring	Every fifth quarter
Water Level Monitoring	Annually (in autumn) and every fifth quarter in conjunction with sampling events
Site-wide Inspection	Annually (in autumn), every fifth quarter in conjunction with sampling events and following severe weather
Final Cover Inspection	Annually (in autumn) and every fifth quarter in conjunction with sampling events
Leachate Collection System Inspection	Annually (in autumn) and every fifth quarter in conjunction with sampling events
Gas Venting System Inspection	Annually (in autumn) and every fifth quarter in conjunction with sampling events
Surface Water Drainage Inspection	Annually (in autumn) and every fifth quarter in conjunction with sampling events
Groundwater Monitoring Well Inspection	Annually (in autumn) and every fifth quarter in conjunction with sampling events
Access and Service Road Inspection	Annually (in autumn) and every fifth quarter in conjunction with sampling events

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

7.2 Periodic Review Report

A Periodic Review Report will be submitted to the Department every three (3) years. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in **Appendix A**. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 60 days of the end of

each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site;
- Results of the required site inspections and severe condition inspections, if applicable;
- All applicable inspection forms and other records generated for the site during the reporting period in electronic format;
- A summary of any discharge monitoring data and/or information generated during the reporting period with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, surface water and leachate), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends;
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format;
- A site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the site-specific ROD;
  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan; and
  - The overall performance and effectiveness of the remedy.

The Periodic Review Report will be submitted to the NYSDEC Central Office in electronic format.

7.2.1 Certification of Engineering and Institutional Controls

After the last inspection of the reporting period, a qualified environmental professional will prepare the following certification:

For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;
- The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;
- Nothing has occurred that would impair the ability of the control to protect the public health and environment;
- Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;
- Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;
- If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;
- Use of the site is compliant with the environmental notice;
- The engineering control systems are performing as designed and are effective;
- To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner or Owner's Designated Site Representative] for the site.

The signed certification will be included as an appendix to the Periodic Review Report described below.

In the event that reconstructive engineering efforts (i.e., engineering control modifications) are performed during any given reporting period, a Professional Engineer licensed to practice in New York State will be required to certify that such efforts were performed in conformance with requirements set forth herein. Additionally, at the request of the NYSDEC a Professional Engineer licensed to practice in New York State will prepare the above certification.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, 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.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed, the RSO activities, findings and recommendations will be summarized in an RSO report which shall be submitted to the Department for approval. A general outline for the RSO report is provided in Appendix H. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

D&B, 2003, Operation and Maintenance Annual Report 2002 – McKenna Landfill Site. Work Assignment No. D003600-29. March 2003.

D&B, 2004, Operation and Maintenance Annual Report 2003 – McKenna Landfill Site. Work Assignment No. D003600-29. September 2004.

D&B, 2005, Operation and Maintenance Annual Report 2004 – McKenna Landfill Site. Work Assignment No. D003600-29. April 2005.

D&B, 2006, Operation and Maintenance Annual Report 2005 – McKenna Landfill Site. Work Assignment No. D003600-29. March 2006.

D&B, 2007, Operation and Maintenance Project Management Work Plan – McKenna Landfill Site. Work Assignment No. D004446-14.1. June 2007.

D&B, 2008, Site Management Plan– McKenna Landfill Site. Work Assignment No. D004446-14. April 2008.

D&B, 2009, Periodic Review Report No. 1– McKenna Landfill Site. Work Assignment No. D004446-14. May 2009.

D&B, 2010, Periodic Review Report No. 2– McKenna Landfill Site. Work Assignment No. D004446-14. December 2010.

D&B, 2011, Periodic Review Report No. 3– McKenna Landfill Site. Work Assignment No. D004446-14. April 2011.

D&B, 2012, Periodic Review Report No. 4– McKenna Landfill Site. Work Assignment No. D004446-14. May 2012.

D&B, 2013, Periodic Review Report No. 5– McKenna Landfill Site. Work Assignment No. D007620-06. March 2013.

D&B, 2014, Periodic Review Report No. 6– McKenna Landfill Site. Work Assignment No. D007620-06. March 2014.

D&B, 2015, Periodic Review Report No. 7– McKenna Landfill Site. Work Assignment No. D007620-06. March 2015.

D&B, 2018, Periodic Review Report No. #8 McKenna Landfill Site. Work Assignment No. D007620-06. March 2018.

GZA, 1999. Final Design Rationale/Engineering Report – McKenna Landfill Remedial Closure Project. Site No. 8-37-003. December 1999.

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

NYSDEC, 2013. Site Management Plan Template. February 2013.

NYSDEC, 1995. Record of Decision: McKenna Landfill Site, Town of Albion, Orleans County. Site Number 8-37-003. March 1995.

APPENDIX A

ENVIRONMENTAL NOTICE

Orleans County
Karen Lake-Maynard County Clerk
3 South Main Street Courthouse Square
Albion NY 14411

Volm-846 Pg-358

Instrument Number: 2013- 00077694

As

Recorded On: August 16, 2013 **Miscellaneous Recording**

Parties: NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

To

Billable Pages: 5

Recorded By: THOMAS E CORSI **Num Of Pages:** 6

Comment: ENVIRONMENTAL NOTICE

**** Examined and Charged as Follows: ****

Miscellaneous Recording	65.00	Coversheet	5.00
Recording Charge:	**70.00**		

Liber: 846 PG: 358
Aug 16,2013 01:42P
INST #: 00077694
ORLEANS COUNTY CLERK
Karen Lake-Maynard

**** THIS PAGE IS PART OF THE INSTRUMENT ****

I hereby certify that the within and foregoing was recorded in the Clerk's Office For: Orleans County,

File Information:

Document Number: 2013- 00077694
Receipt Number: 213266
Recorded Date/Time: August 16, 2013 01:42:43P
Book-Vol/Pg: Bk-D Vl-846 Pg-358
Cashier / Station: V Niederhofer / Cashier Station 1

Record and Return To:

THOMAS E CORSI
61 PALM STREET
LACKAWANNA NY 14218

COUNTY OF ORLEANS NEW YORK

Karen Lake-Maynard
Karen Lake-Maynard
Orleans County Clerk

McKenna Landfill
Site No. 837003
North of Yaeger Road
Albion, Orleans County, NY
Tax Map ID: 74.-2-4.1

ENVIRONMENTAL NOTICE

THIS ENVIRONMENTAL NOTICE is made the 8th day of August 2013, by the New York State Department of Environmental Conservation (Department), having an office for the transaction of business at 625 Broadway, Albany, New York 12233

WHEREAS, a parcel of real property indentified as McKenna Landfill (Site 837003), located north of Yaeger Road in the Village of Albion, County of Orleans, State of New York, which is part of lands conveyed by John M. Gavigan and Fred F. Gavigan to Allen J. McKenna by deed dated March 10, 1958 and recorded in the Orleans County Clerk's Office on March 12, 1958 in Liber 284 of Deeds at Page 269 and being more particularly described in Appendix "A", attached to this noticed and made a part hereof, and hereinafter referred to as " the Property" is the subject of a remedial program under the Department's State Superfund Program.

WHEREAS, the Department approved a cleanup to address contamination disposed at the Property and such cleanup was conditioned upon certain limitations.

NOW, THEREFORE, the Department provides notice that:

FIRST, the Property subject to this Environmental Notice is as shown on a map attached to this Notice as Appendix "B" and made a part hereof.

SECOND, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the Sate and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results or may result in a significantly increased threat of harm or damage at any site as a result of exposure to soils. A violation of this provision is a violation of 6 NYCRR 375-1.11(b)(2).

THIRD, no person shall disturb, remove, or otherwise interfere with the installation, use, operations, and maintenance of engineering controls required for the Remedy, including but not limited to those engineering controls described in the SMP, unless in each instance they first obtain a written waiver of such prohibition from the Department or Relevant Agency.

FOURTH, the remedy was designed to be protective for the following use: Commercial and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iii). The current land use is as a closed landfill. Therefore, any use for purposes other than Commercial and Industrial without the express written waiver of such prohibition by the Relevant Agency may result in a significantly increased threat of harm or damage at any site.

FIFTH, no person shall use the groundwater underlying the Property without treatment rendering it safe for drinking water or industrial purposes, as appropriate, unless the user first obtains permission to do so from the Department or Relevant Agency. Use of the groundwater without appropriate treatment may result in a significantly increased threat of harm or damage at any site.

SIXTH, it is a violation of 6 NYCRR 375-1.11(b) to use the Property in a manner inconsistent with this environmental notice.

IN WITNESS WHEREOF, the undersigned, acting by and though the Department of Environmental Conservation as Designee of the Commissioner, has executed this instrument the day written below.

By: _____
Michael J. Ryan, P.E.
Assistant Director
Division of Environmental Remediation

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the 8th day of August, in the year 2013, before me, the undersigned, personally appeared Michael J. Ryan, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his signature on the instrument, the individual, or the person upon behalf of which individual acted, executed the instrument.

_____
Notary Public – State of New York

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2014

Appendix A
Metes and Bounds Description

ALL THAT TRACT OR PARCEL OF LAND SITUATE IN THE TOWN OF ALBION, County of Orleans and State of New York and being the northeast part of lot No. 3, Township 15, Range 1 of the Holland Land Company's Land, bounded east by the eastern transit meridian line 30 chains 6 links; south by land deeded to George F. Hetsler, 33 chains 27 links; west by land deeded to Thomas Plues 30 chains 6 links and north by lot number four, 33 chains, 27 links. Containing 100 acres more or less.

EXCEPTING AND RESERVING there from land conveyed to Lewis M. Butts by deed recorded in Book 9 of Deeds at page 509 in the Orleans County Clerk's Office, the quantity of land so conveyed and excepted and hereby being one-quarter of an acre.

ALSO EXCEPTING AND RESERVING there from the premises conveyed to William Newsome and Edward F. Fancher by Deed recorded in Orleans County Clerk's Office in Book 115 of Deeds at page 343, the quantity thereby conveyed being given as about Five and 75/100 acres.

ALSO EXCEPTING AND RESERVING from said land so hereby conveyed the land described in a Deed to the Medina Quarry Company by Deed recorded in Book 123 of Deeds at Page 551 in the Orleans County Clerk's Office, the land therein described being given as twenty-five acres more or less.

ALSO EXCEPTING AND RESERVING there from a parcel of land described in a certain Canal appropriation made by the State of New York and recorded in Book 146 of Deeds at page 493, the land thereby appropriated being two and 577/1000 acres.

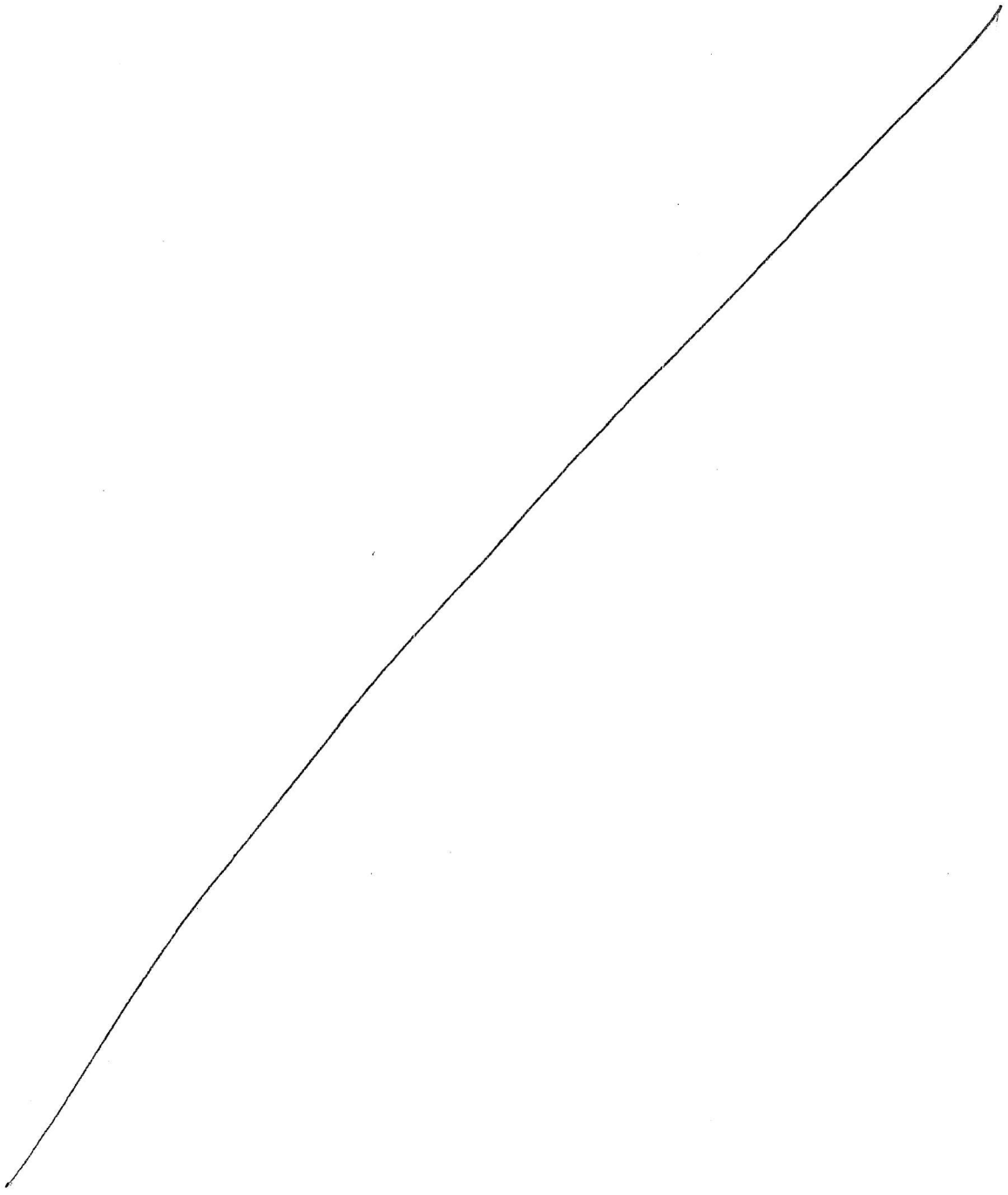
ALSO EXCEPTING AND RESERVING there from certain other lands appropriated by the State of New York and said appropriation being in Book 146 of Deeds at page 497 and the land therein described being given as one and 788/1000 acres.

The land hereby conveyed all lying south of the Erie Canal and is subject to whatever additional rights the State of New York has for canal purposes not shown in the above mentioned appropriations and also subject to the rights that the public may have in an east and west highway running across said farm but not used to any extent as a highway at the present time.

ALSO EXCEPTING AND RESERVING there from the premises conveyed to Alan J. McKenna, Jr. and Bernice McKenna by Deed recorded in the Orleans County Clerk's Office in Book 349 of Deeds, page 14 and the premises conveyed to John N. Smith and Irene M. Smith by Deed recorded in the Orleans County Clerk's Office in Book 404 of Deeds, page 79.

ALSO EXCEPTING AND RESERVING there from the premises conveyed to the Orleans Sanitary Landfill, Inc. by Deed recorded in the Orleans County Clerk's Office in Book 403 of Deeds, page 16. Being the same premises conveyed to Allen J. McKenna by Warranty Deed from John M. Gavigan and Fred F. Gavigan, dated March 10, 1958, and recorded March 12, 1958, in the Orleans County Clerk's Office in Liber 284 of Deeds at Page 269. LIBER: 846 PAGE: 361

Appendix B
Map



LIBER: 846 PAGE: 363

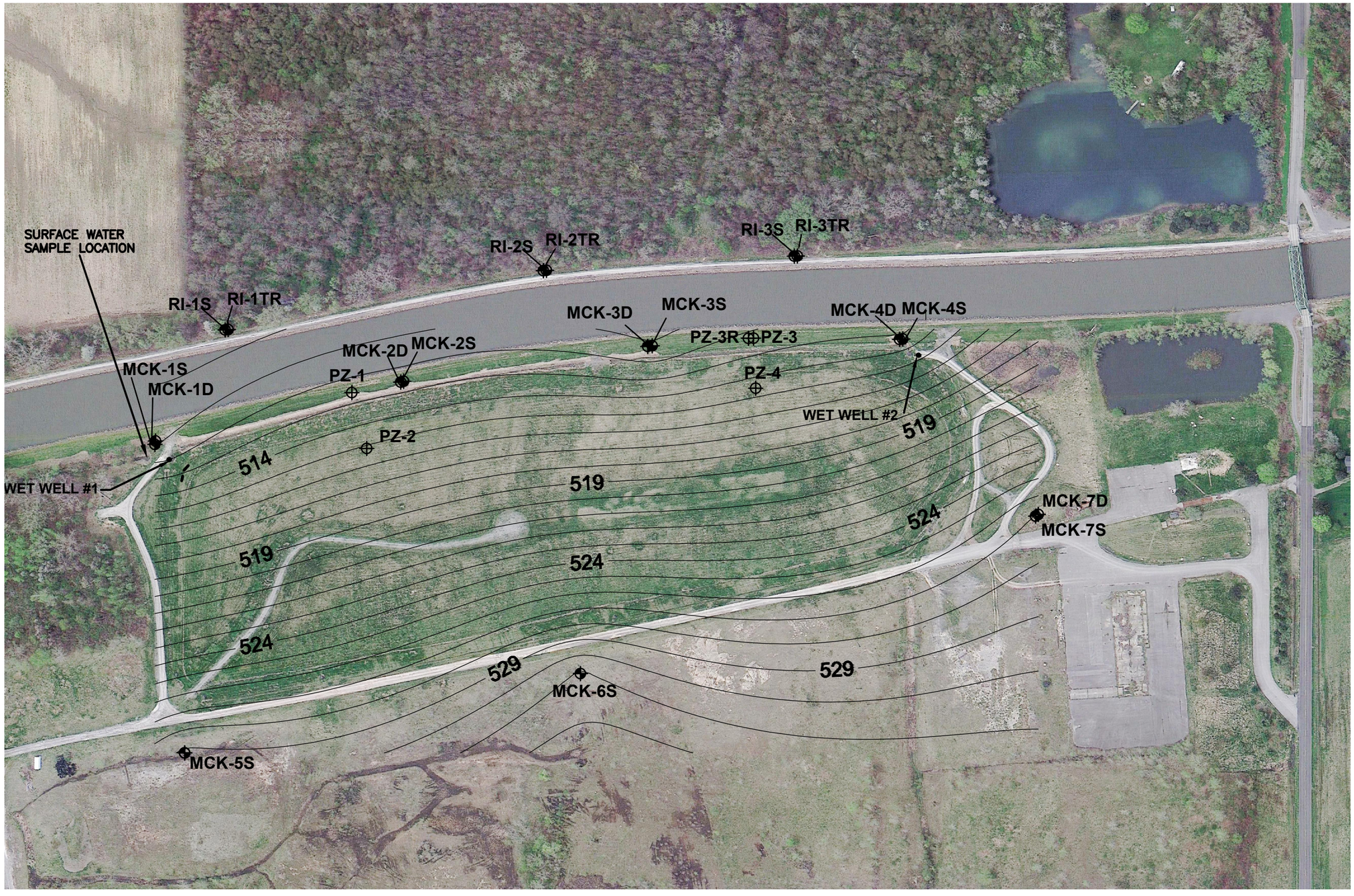
NORTH

Appendix B - McKenna Landfill, Site ID No. 8-37-003

The Environmental Notice Pertains to Parcel 74.-2-4.1

APPENDIX B

GROUNDWATER CONTOUR MAPS



LEGEND

MCK–4D — MONITORING WELL AND GROUNDWATER ELEVATION WELLS INSTALLED BY D&B FEB 2002

MONITORING WELL INSTALLED BY OTHERS PRIOR TO FEB 2002

PIEZOMETER

NOTES

MONITORING WELL LOCATIONS NORTH OF NEW YORK STATE BARGE CANAL ARE APPROXIMATE

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH. GROUNDWATER ELEVATION CONTOURS ARE INFERRED DUE TO THE SPACING AND FREQUENCY OF THE MONITORING WELLS

0 100' 200' 300'
SCALE: 1"=200'

D&B ENGINEERS AND ARCHITECTS, P.C.

MCKENNA LANDFILL SITE
ALBION, NEW YORK

GROUNDWATER ELEVATION CONTOURS SHALLOW MONITORING WELLS - MAY 2019

FIGURE B-1

F:\3150-06A\FIGURE\3150-06A-SMR MAY 2019 B-1.dwg, D1, 11/15/2019 9:53:30 AM, DBCadd

LEGEND

MCK–4D (510.38) — MONITORING WELL AND GROUNDWATER ELEVATION WELLS INSTALLED BY D&B FEB 2002

MONITORING WELL INSTALLED BY OTHERS PRIOR TO FEB 2002

PIEZOMETER

NOTES

MONITORING WELL LOCATIONS NORTH OF NEW YORK STATE BARGE CANAL ARE APPROXIMATE

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH.

0 100' 200' 300'
SCALE: 1"=200'

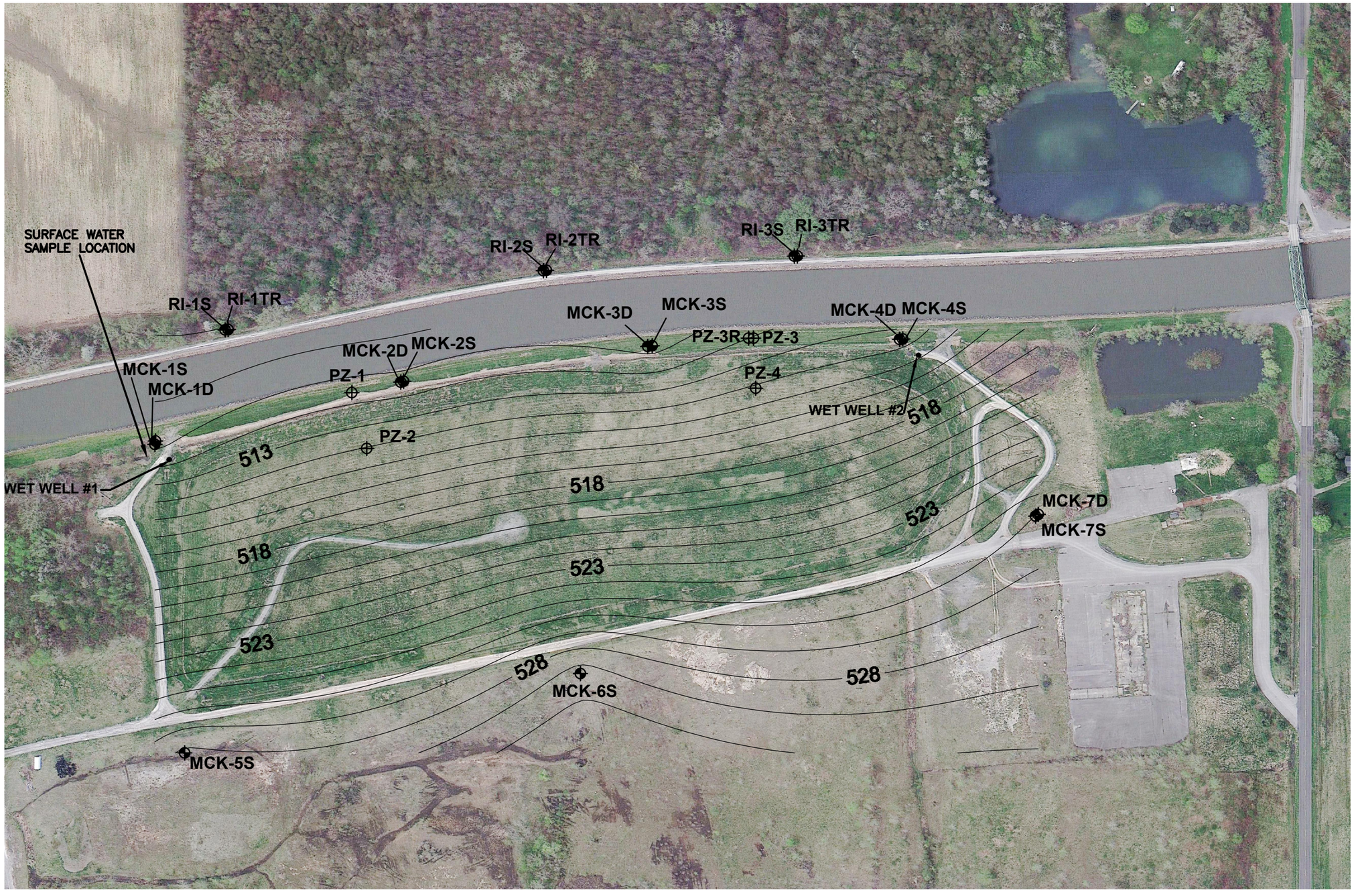
D&B ENGINEERS AND ARCHITECTS, P.C.

MCKENNA LANDFILL SITE
ALBION, NEW YORK

GROUNDWATER ELEVATIONS DEEP MONITORING WELLS - MAY 2019

FIGURE B-2

F:\3150-06A\FIGURE\3150-06A-SMR May 2019 B-2.dwg, D2, 11/15/2019 9:40:59 AM, DBCadd



LEGEND

MCK–4D — MONITORING WELL AND GROUNDWATER ELEVATION WELLS INSTALLED BY D&B FEB 2002

MONITORING WELL INSTALLED BY OTHERS PRIOR TO FEB 2002

PIEZOMETER

NOTES

MONITORING WELL LOCATIONS NORTH OF NEW YORK STATE BARGE CANAL ARE APPROXIMATE

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH. GROUNDWATER ELEVATION CONTOURS ARE INFERRED DUE TO THE SPACING AND FREQUENCY OF THE MONITORING WELLS

0 100' 200' 300'
SCALE: 1"=200'

D&B ENGINEERS AND ARCHITECTS, P.C.

MCKENNA LANDFILL SITE
ALBION, NEW YORK

GROUNDWATER ELEVATION CONTOURS SHALLOW MONITORING WELLS - OCTOBER 2019

FIGURE B-1

F:\3150-06A\FIGURE\3150-06A-SMR OCTOBER 2019 B-1.dwg, D1, 11/15/2019 9:33:14 AM, DBCadd

LEGEND

MCK–4D (510.38) MONITORING WELL AND GROUNDWATER ELEVATION WELLS INSTALLED BY D&B FEB 2002

MONITORING WELL INSTALLED BY OTHERS PRIOR TO FEB 2002

PIEZOMETER

NOTES

MONITORING WELL LOCATIONS NORTH OF NEW YORK STATE BARGE CANAL ARE APPROXIMATE

AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH.

0 100' 200' 300'
SCALE: 1"=200'

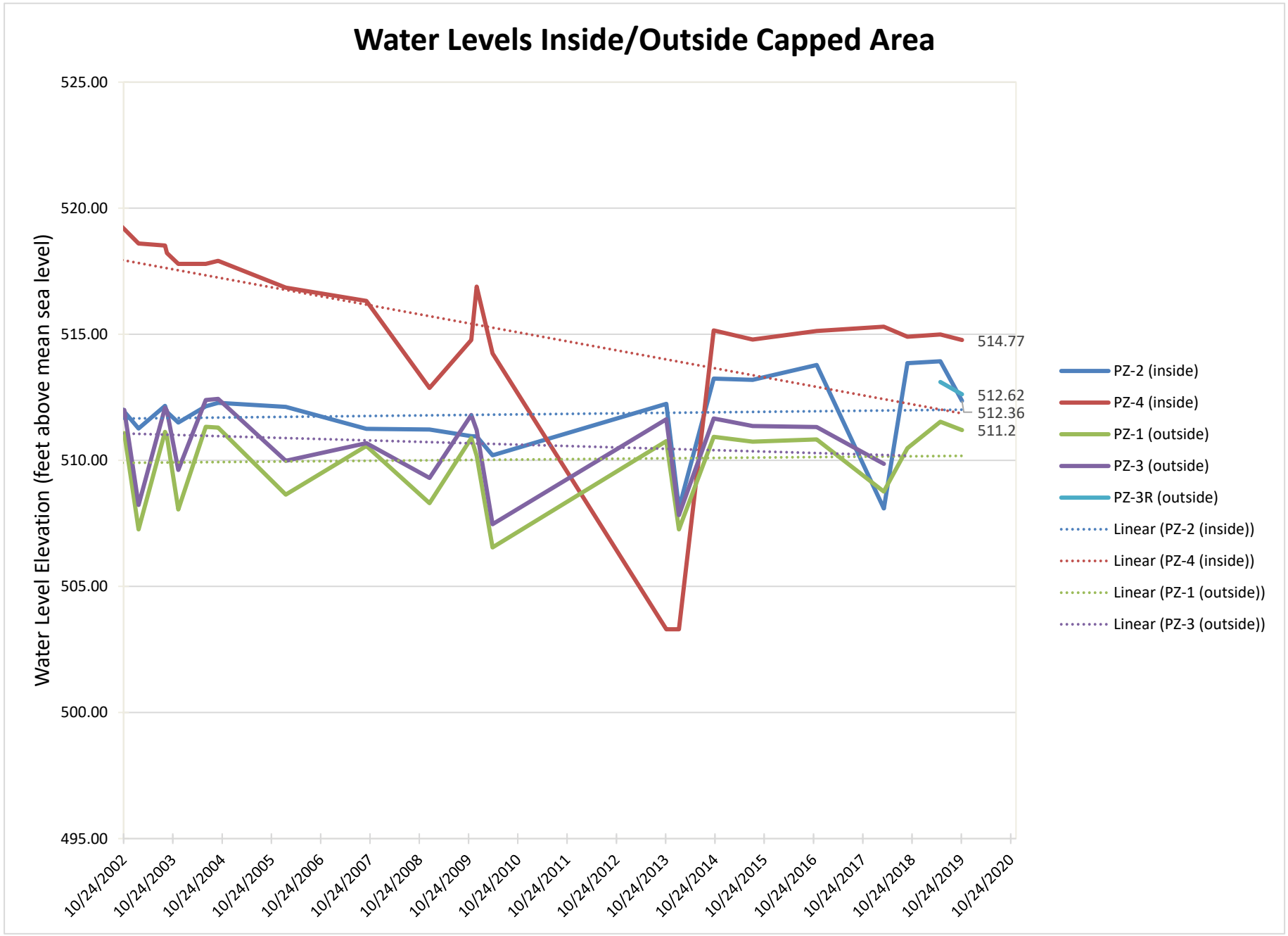
D&B ENGINEERS AND ARCHITECTS, P.C.

MCKENNA LANDFILL SITE
ALBION, NEW YORK

GROUNDWATER ELEVATIONS
DEEP MONITORING WELLS - OCTOBER 2019

FIGURE B-2

F:\3150-06A\FIGURE\3150-06A-SMR October 2019 B-2.dwg, D2, 11/15/2019 9:59:54 AM, DBCadd


Water Levels Inside/Outside Capped Area
Water Level Elevation (feet above mean sea level)
525.00
520.00
515.00
510.00
505.00
500.00
495.00
10/24/2002
10/24/2003
10/24/2004
10/24/2005
10/24/2006
10/24/2007
10/24/2008
10/24/2009
10/24/2010
10/24/2011
10/24/2012
10/24/2013
10/24/2014
10/24/2015
10/24/2016
10/24/2017
10/24/2018
10/24/2019
10/24/2020
514.77
512.62
512.36
511.2
PZ-2 (inside)
PZ-4 (inside)
PZ-1 (outside)
PZ-3 (outside)
PZ-3R (outside)
Linear (PZ-2 (inside))
Linear (PZ-4 (inside))
Linear (PZ-1 (outside))
Linear (PZ-3 (outside))

APPENDIX C

ANALYTICAL RESULTS

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-1S															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	UJ	UJ	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-1D															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	0.77 J	U	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	U	U	U	U	U	U	U	U	U	U	10	U	U	U	3.7 J	5	50 GV
Benzene	U	U	U	U	U	U	U	U	U	U	0.97 J	U	U	U	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	UJ	UJ	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	0.72 J	U	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	0.76 J	U	U	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	0	0	13.22	0	0	0	3.7	---	---
Total VOC TICs	6	9	0	0	0	10	10	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-2S															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
2-Butanone	U	U	U	1 J	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	4 J	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	11	U	U	3 J	U	U	U	U	U	U	4.2 J		U	8.95 J	UJ	5	50 GV
Benzene	**2 J**	U	U	U	U	U	U	U	U	U	**1.4 J**	**2.4 J**	U	U	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	1.2 J	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	UJ	UJ	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	2 J	U	U	UJ	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	4.7 J	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	17	0	0	4	0	0	0	0	0	0	5.6	5.6	0	8.95	4.7	---	---
Total VOC TICs	42	32	4	0	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-2D															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	5 J	5 J	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	11	U	U	2 J	7	U	U	U	U	U	7.4	11	U	U	UJ	5	50 GV
Benzene	**4 J**	U	**2 J**	**2 J**	**3 J**	1 J	**1.7 J**	**2 J**	U	**1.5 J**	**2.8 J**	**1.8 J**	U	U	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	U	U	1 J	U	U	U	0.57 J	0.95 J	U	U	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	UJ	UJ	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.9 J	2.1 J	0.95 J	U	U	UJ	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	**13**	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	20	5	2	4	11	1	1.7	2	0.57	4.35	12.3	13.75	0	0	13	---	---
Total VOC TICs	51	39	10	34	56	0	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-3S															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	2 J	2 J	3 J	3	U	1.3 J	1.3 J	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	1.4 J	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	3 ST**
2-Butanone	10	11	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	5 J	6 J	U	U	U	U	U	U	U	U	U	U	U	U	U	5	----
Acetone	40	40	22	9	22	17	U	16	15	U	U	U	U	4.33 J	U	5	50 GV
Benzene	**4 J**	**5 J**	**4 J**	**3 J**	**4 J**	**4 J**	**2.9 J**	**2.4 J**	**3.1 J**	U	**1.2 J**	0.99 J	U	0.92 J	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Chloroethane	U	U	U	NS	1 J	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	UJ	U	5	5 ST
Ethylbenzene	**6 J**	**8 J**	**11**	**10**	**18**	**12**	**8.6**	**9.5**	**9**	U	0.93 J	1.4 J	2.8 J	1.9	U	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	0.36 J	U	5	5 ST
m,p-Xylenes	**12**	**18**	**22**	**15**	U	U	U	**5.3**	**9.6**	U	0.97 J	0.81 J	**6.8**	1.48 J	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	0.6 J	U	U	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 J	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	3.8 J	NS	NS	5	10GV
o-Xylene	**19**	**26**	**27**	**21**	U	U	U	**16**	**14**	U	1.8 J	1 J	3.6 J	0.67 J	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Toluene	4 J	5 J	3 J	1 J	2 J	2 J	1.2 J	U	1.5 J	U	U	U	U	0.31 J	U	5	5 ST
Total Xylenes	NS	NS	NS	NS	**66**	**36**	**25**	**21**	**24**	U	2.8 J	1.9 J	**10**	2.15	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U		U	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	100	119	61	39	116	74	39	71.5	78.1	0	7.7	6.1	27.0	9.97	3	---	---
Total VOC TICs	363	391	245	168	273	73	133.2	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-3D															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	2 J	1 J	2 J	1 J	U	U	U	0.51 J	0.79 J	J	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	1.5 J	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.74 J	1.5 J	1.8 J	U	3.25 J	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
2-Butanone	**610 E**	**1200 E**	**320 E**	**500 DE**	U	**56**	U	U	U	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	**62**	**76**	5 J	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.5 J	U	U	2.4 J	NS	5	5 ST
4-Methyl-2-Pentanone	11	15	22	22	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	**280 E**	**700 E**	**170**	**120**	16	36	U	42	**55**	U	12 U	21	U	UJ	UJ	5	50 GV
Benzene	**4 J**	**5 J**	**5 J**	**3 J**	**4 J**	**4 J**	**4 J**	**5.1**	**5.0**	**4.7 J**	**4.4 J**	**4.4 J**	**4.5 J**	**3.25 J**	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	1.9 J	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Ethylbenzene	**8 J**	**8 J**	**6 J**	3 J	2 J	**7**	3.8	**6.9**	**7.4 J**	**9.8**	U	**10**	**14**	**6.9**	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.3 J	2.2 J	2.9 J	U	2.4 J	UJ	5	5 ST
m,p-Xylenes	**14**	**17**	**14**	**6**	U	U	U	**13**	**11 J**	**18**	**19**	**19**	**21**	**10.4**	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	0.73 J	0.89 J	0.82 J	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	**6.3 J**	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.3 J	2.2 J	3 J	NS	NS	5	10GV
o-Xylene	**12**	**15**	**14**	**7**	U	U	U	**14**	**12 J**	**19**	**12**	**7.7**	**13**	1.9 J	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	**120**	**360 E**	**180**	**240 D**	**11**	**22**	4.5 J	5 J	**5.4 J**	2.9 J	2 J	1.5 J	2.1 J	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	**10**	**22**	**18**	**27**	**23 J**	**38**	**30**	**27**	**34**	**12.3**	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	1121	2396	544	655	45	148	32	113	118.8	98.58	88.58	98.32	91.6	30.5	6.3	---	---
Total VOC TICs	289	436	340	389	389	69	157.4	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds																Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	MCK-4S																
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-07	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	----
Acetone	10 J	U	U	U	U	U	U	7.5	3.6	U	U	4.6 J	U	U	U	5	50 GV
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	UJ	U	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	U	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	10	0	0	0	0	0	0	7.5	3.6	0	0	4.6	0	0	0	---	---
Total VOC TICs	0	9	0	0	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-4D															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	0.81 J	U	U	U	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	----
Acetone	5 J	U	U	U	U	U	U	U	U	U	U	5.5	6	U	U	5	50 GV
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	3 J	4 J	3 J	U	U	2 J	U	U	0.56 J	1 J	3.8 J	4.2 J	U	3.1 J	**5.5**	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	UJ	U	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	U	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	1.0 J	1.3 J	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	2.4 J	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	8	4	3	0	0	2	0	0	0.56	0	4.8	11.81	6	3.1	7.9	---	---
Total VOC TICs	12	16	0	0	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-5S															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	1.2 J	U	U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	0	0	1.2	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-6S															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	3 J	U	U	1 J	U	U	1.3 J	U	U	0.54 J	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	**6 J**	**17**	U	U	**8**	U	U	**5.9**	U	U	1.7 J	U	U	UJ	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	2.9 J	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	U	4 J	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	U	20	10 J	U	U	7	U	U	17	U	U	U	U	U	UJ	5	50 GV
Benzene	U	**3 J**	**4 J**	U	U	**3 J**	U	U	U	U	U	U	U	U	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	1.5 J		U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	3 J	U	U	2 J	U	U	1.6 J	U	U	U	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Ethylbenzene	U	**9 J**	**21**	U	U	2 J	U	U	U	U	U	U	U	U	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
m,p-Xylenes	U	**9 J**	**23**	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	2 J	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	U	U	1 J	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	2 J	U	U	U	U	U	U	U	U	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	51	84	0	0	25	0	0	28.7	0	1.5	2.24	0	0	0	---	---
Total VOC TICs	0	43	127	0	0	29	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-7S															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	U	U	U	2 J	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	1.3 J	U	U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	2	0	0	0	0	0	0	1.3	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	MCK-7D															Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Mar-02	Jun-02	Aug-03	Jun-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Nov-16	Apr-18	May-19		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
1,3-Dichlorobenzene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
2-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
2-Hexanone	U	U	U	U	U	4 J	U	U	U	U	U	U	U	U	UJ	5	50 GV
4-Chlorotoluene	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Acetone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Benzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	50 GV
Dichlorodifluoromethane	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	U	U	U	UJ	5	5 ST
m,p-Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	U	U	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Total Xylenes	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds

Sample Identification	PZ-2					PZ-4				Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Apr-10	Oct-11	Jan-13	Jun-14	May-19	Jul-15	Jan-09	Nov-16	Apr-18		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	50.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	UJ	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	UJ	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	UJ	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	UJ	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	UJ	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	U	UJ	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	U	UJ	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	1.2 J	U	UJ	U	U	**8.1**	**7.7 J**	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	UJ	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	UJ	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	UJ	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	U	UJ	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	UJ	U	**3.7 J**	U	**3.6 J**	5	3 ST**
2-Butanone	U	U	U	U	UJ	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	U	UJ	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	UJ	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	U	UJ	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	1.2 J	U	NS	U	U	**8.1**	4.7 J	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	UJ	U	U	U	U	5	----
Acetone	U	4.9 J	U	10	UJ	U	U	**350 E**	U	5	50 GV
Benzene	U	0.81 J	1.0 J	0.97 J	UJ	0.91 J	3.4 J	U	**2.9 J**	5	1 ST
Bromodichloromethane	U	U	U	U	UJ	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	UJ	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	UJ	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	UJ	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	UJ	U	3.2 J	U	3.2 J	5	5 ST
Chloroethane	U	U	U	U	UJ	U	U	U	U	5	5 ST
Chloroform	U	U	U	U	UJ	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	UJ	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	UJ	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	UJ	U	U	U	U	5	50 GV
Dichlorodifluoromethane	U	U	U	U	UJ	U	U	U	U	5	5 ST
Ethylbenzene	U	U	0.78 J	U	UJ	U	**27**	**27**	**18.7**	5	5 ST
Isopropyl Benzene	U	U	U	U	UJ	U	U	U	U	5	50 GV
m,p-Xylenes	2.2 J	1.3 J	4.7 J	1.2 J	UJ	1.6 J	**77 DJ**	**60**	**41.6**	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	0.72 J	UJ	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	4.9 J	U	U	U	U	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	**33**	NS	5	10GV
o-Xylene	U	0.55 J	1.5 J	0.57 J	UJ	0.67 J	U	**5.7**	4.2 J	5	5 ST**
Styrene	U	U	U	U	UJ	U	1.2 J	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	UJ	U	U	U	U	5	5 ST
Toluene	U	U	J	0.76 J	UJ	0.63 J	2.8 J	U	U	5	5 ST
Total Xylenes	2.2 J	1.8 J	**6.2 J**	1.8 J	UJ	2.2 J	**77 DJ**	**65**	**45.8**	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	UJ	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	UJ	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	UJ	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	UJ	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	UJ	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	2.2	9.36	16.38	16.02	4.9	6.01	195.3	556.9	132.4	---	---
Total VOC TICs	NR	NR	NR	NR	NR	NR	291.3	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds									Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	RI-1TR									
Date of Collection	Jul-05	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	U	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	5	----
Acetone	U	U	U	U	U	U	U	U	5	50 GV
Benzene	U	U	U	U	U	U	U	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
Chloroethane	U	U	U	U	U	U	U	U	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	5	50 GV
Dichlorodifluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	5	5 ST
Isopropyl Benzene	U	U	U	U	U	U	U	U	5	50 GV
m,p-Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	U	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	5	5 ST
Toluene	U	U	U	U	U	U	U	U	5	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds									Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	RI-1S									
Date of Collection	Jul-05	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	NS	U	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	5	----
Acetone	U	U	U	U	U	U	U	U	5	50 GV
Benzene	U	U	U	U	U	U	U	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
Chloroethane	U	U	U	U	U	U	U	U	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	5	50 GV
Dichlorodifluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	5	5 ST
Isopropyl Benzene	U	U	U	U	U	U	U	U	5	50 GV
m,p-Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	U	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	5	5 ST
Toluene	U	U	U	U	U	U	U	U	5	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
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Indicates value exceeds standard or guidance value

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NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds									Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	RI-2TR									
Date of Collection	Jul-05	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	U	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	U	U	U	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	5	----
Acetone	U	U	U	U	U	U	U	U	5	50 GV
Benzene	U	U	U	U	U	U	U	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
Chloroethane	U	U	U	U	U	U	U	U	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	5	50 GV
Dichlorodifluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	5	5 ST
Isopropyl Benzene	U	U	U	U	U	U	U	U	5	50 GV
m,p-Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	U	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	5	5 ST
Toluene	U	U	U	U	U	U	U	U	5	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds										Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	RI-2S										
Date of Collection	Jul-05	Feb-06	Sep-07	Jan-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	NS	U	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	U	U	U	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	U	5	----
Acetone	U	U	U	U	U	U	U	U	U	5	50 GV
Benzene	U	U	U	U	U	U	U	U	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	U	5	5 ST
Chloroethane	U	U	U	U	U	U	U	U	U	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	5	50 GV
Dichlorodifluoromethane	U	U	U	U	U	U	U	U	U	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	U	5	5 ST
Isopropyl Benzene	U	U	U	U	U	U	U	U	U	5	50 GV
m,p-Xylenes	U	U	U	U	U	U	U	U	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	U	U	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	U	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	U	5	5 ST
Toluene	U	U	U	U	U	U	U	U	U	5	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	0	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds									Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	RI-3TR									
Date of Collection	Jul-05	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	U	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	U	U	U	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	5	----
Acetone	U	U	U	U	U	U	U	U	5	50 GV
Benzene	U	U	U	U	U	U	U	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
Chloroethane	U	U	U	U	U	U	U	U	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	5	50 GV
Dichlorodifluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	5	5 ST
Isopropyl Benzene	U	U	U	U	U	U	U	U	5	50 GV
m,p-Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	U	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	5	5 ST
Toluene	U	U	U	U	U	U	U	U	5	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1A: Groundwater Sample Results - Volatile Organic Compounds									Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	RI-3S									
Date of Collection	Jul-05	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	5	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	5	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
1,2,3-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
1,2,4-Trimethylbenzene	NS	NS	NS	NS	NS	U	U	U	5	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	5	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	5	1 ST
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	5	3 ST**
2-Butanone	U	U	U	U	U	U	U	U	5	50 GV
2-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
2-Hexanone	U	U	U	U	U	U	U	U	5	50 GV
4-Chlorotoluene	U	U	U	U	U	U	U	U	5	5 ST
4-Isopropyltoluene	NS	NS	NS	NS	NS	U	U	U	5	5 ST
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	5	----
Acetone	U	U	U	U	U	U	U	U	5	50 GV
Benzene	U	U	U	U	U	U	U	U	5	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	5	50 GV
Bromoform	U	U	U	U	U	U	U	U	5	50 GV
Bromomethane	U	U	U	U	U	U	U	U	5	5 ST
Carbon Disulfide	U	U	U	U	U	U	U	U	5	60
Carbon Tetrachloride	U	U	U	U	U	U	U	U	5	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	5	5 ST
Chloroethane	U	U	U	U	U	U	U	U	5	5 ST
Chloroform	U	U	U	U	U	U	U	U	5	7 ST
Chloromethane	U	U	U	U	U	U	U	U	5	5 ST
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	5	50 GV
Dichlorodifluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Ethylbenzene	U	U	U	U	U	U	U	U	5	5 ST
Isopropyl Benzene	U	U	U	U	U	U	U	U	5	50 GV
m,p-Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
Methyl tert-Butyl Ether	U	U	U	U	U	U	U	U	5	10GV
Methylene Chloride	U	U	U	U	U	U	U	U	5	5 ST
Napthalene	NS	NS	NS	NS	NS	NS	NS	NS	5	10GV
o-Xylene	U	U	U	U	U	U	U	U	5	5 ST**
Styrene	U	U	U	U	U	U	U	U	5	5 ST
Tetrachloroethene	U	U	U	U	U	U	U	U	5	5 ST
Toluene	U	U	U	U	U	U	U	U	5	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	5	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	5	5 ST
trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	5	0.4 ST *
Trichloroethene	U	U	U	U	U	U	U	U	5	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	5	5 ST
Vinyl Acetate	U	U	U	U	U	U	U	U	5	----
Vinyl Chloride	U	U	U	U	U	U	U	U	5	2 ST
Total VOCs	0	0	0	0	0	0	0	0	---	---
Total VOC TICs	0	0	0	0	NR	NR	NR	NR	---	---

QUALIFIERS:
U: Analyzed for but not detected
B: Compound found in the blank
J: Estimated value or limit
E: Exceeds the calibration range for analysis
D: Reported from a secondary dilution

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
Indicates value exceeds standard or guidance value

NS: Not sampled for this analyte
NR: Not reported
----: Not established

Table C-1B: Groundwater Sample Results - Semi-Volatile Organic Compounds							Contract	NYSDEC Class GA
Sample Identification	RI-1TR	RI-1S	RI-2TR	RI-2S	RI-3TR	RI-3S	Required	Groundwater
Date of Collection	Jul-05	Jan-05	Jan-05	Jan-05	Jan-05	Jan-05	Detection	Standard or
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	Limit	Guidance Value
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/L)	(ug/l)
1,2,4-Trichlorobenzene	U	U	U	U	U	U	10	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	10	3 ST
1,3-Dichlorobenzene	U	U	U	U	U	U	10	3 ST
1,4-Dichlorobenzene	U	U	U	U	U	U	10	3 ST
2,2-Oxybis (1-Chloropropane)	U	U	U	U	U	U	10	----
2,4,5-Trichlorophenol	U	U	U	U	U	U	20	----
2,4,6-Trichlorophenol	U	U	U	U	U	U	10	----
2,4-Dichlorophenol	U	U	U	U	U	U	10	1 ST *
2,4-Dimethylphenol	U	U	U	U	U	U	10	1 ST *
2,4-Dinitrophenol	U	U	U	U	U	U	20	1 ST *
2,4-Dinitrotoluene	U	U	U	U	U	U	10	5 ST
2,6-Dinitrotoluene	U	U	U	U	U	U	10	5 ST
2-Chloronaphthalene	U	U	U	U	U	U	10	5 ST
2-Chlorophenol	U	U	U	U	U	U	10	1 ST *
2-Methylnaphthalene	U	U	U	U	U	U	10	----
2-Methylphenol	U	U	U	U	U	U	10	1 ST *
2-Nitroaniline	U	U	U	U	U	U	20	5 ST
2-Nitrophenol	U	U	U	U	U	U	10	----
3,3'-Dichlorobenzidine	U	U	U	U	U	U	10	5 ST
3-Nitroaniline	U	U	U	U	U	U	20	5 ST
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	20	----
4-Bromophenyl-phenylether	U	U	U	U	U	U	10	----
4-Chloro-3-methylphenol	U	U	U	U	U	U	10	----
4-Chloroaniline	U	U	U	U	U	U	10	5 ST
4-Chlorophenyl-phenylether	U	U	U	U	U	U	10	----
4-Methylphenol	U	U	U	U	U	U	10	1 ST *
4-Nitroaniline	U	U	U	U	U	U	20	5 ST
4-Nitrophenol	U	U	U	U	U	U	20	----
Acenaphthene	U	U	U	U	U	U	10	20 GV
Acenaphthylene	U	U	U	U	U	U	10	----
Anthracene	U	U	U	U	U	U	10	50 GV
Benzo (a) anthracene	U	U	U	U	U	U	10	0.002 GV
Benzo(a)pyrene	U	U	U	U	U	U	10	ND ST
Benzo(b)fluoranthene	U	U	U	U	U	U	10	0.002 GV
Benzo(g,h,i)perylene	U	U	U	U	U	U	10	----
Benzo(k)fluoranthene	U	U	U	U	U	U	10	0.002 GV
bis(2-Chloroethoxy)methane	U	U	U	U	U	U	10	5 ST
bis(2-Chloroethyl)ether	U	U	U	U	U	U	10	1 ST
bis(2-Ethylhexyl)phthalate	5 J	1 J	U	1 J	U	U	10	5 ST
Butylbenzylphthalate	U	U	U	U	U	U	10	50 GV
Carbazole	U	U	U	U	U	U	10	----
Chrysene	U	U	U	U	U	U	10	0.002 GV
Dibenzo(a,h)anthracene	U	U	U	U	U	U	10	----
Dibenzofuran	U	U	U	U	U	U	10	----
Diethylphthalate	U	U	U	U	U	U	10	50 GV
Dimethylphthalate	U	U	U	U	U	U	10	50 GV
Di-n-butylphthalate	U	U	U	U	U	U	10	50 ST
Di-n-octylphthalate	U	U	U	U	U	U	10	50 GV
Fluoranthene	U	U	U	U	U	U	10	50 GV
Fluorene	U	U	U	U	U	U	10	50 GV
Hexachlorobenzene	U	U	U	U	U	U	10	0.04 ST
Hexachlorobutadiene	U	U	U	U	U	U	10	0.5 ST
Hexachlorocyclopentadiene	U	U	U	U	U	U	10	5 ST
Hexachloroethane	U	U	U	U	U	U	10	5 ST
Indeno(1,2,3-cd)pyrene	U	U	U	U	U	U	10	0.002 GV
Isophorone	U	U	U	U	U	U	10	50 GV
Naphthalene	U	U	U	U	U	U	10	10 GV
Nitrobenzene	U	U	U	U	U	U	10	0.4 ST
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	10	----
N-Nitrosodiphenylamine	U	U	U	U	U	U	10	50 GV
Pentachlorophenol	U	U	U	U	U	U	20	1 ST *
Phenanthrene	U	U	U	U	U	U	10	50 GV
Phenol	U	U	U	U	U	U	10	1 ST *
Pyrene	U	U	U	U	U	U	10	50 GV
Total PAHs	0	0	0	0	0	0		
Total Carcinogen PAHs	0	0	0	0	0	0		
Total SVOCs	5	1	0	1	0	0		
Total SVOC TICs	54	251	6	0	21	4		

QUALIFIERS:
U: Analyzed for but not detected
J: Estimated value

NOTES:
* : Applies to Total Phenols
----: Not established
GV: Guidance Value
ST: Standard

Table C-1C: Groundwater Sample Results - Pesticides/PCBs							Contract Required Detection Limit	NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	RI-1TR	RI-1S	RI-2TR	RI-2S	RI-3TR	RI-3S		
Date of Collection	07/29/05	07/29/05	07/29/05	07/29/05	07/29/05	07/29/05		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
4,4'-DDD	U	U	U	U	U	U	0.10	0.3 ST
4,4'-DDE	U	U	U	U	U	U	0.10	0.2 ST
4,4'-DDT	U	U	U	U	U	U	0.10	0.2 ST
Aldrin	U	U	U	U	U	U	0.05	ND ST
alpha-BHC	U	U	U	U	U	U	0.05	0.01 ST
alpha-Chlordane	U	U	U	U	U	U	0.05	0.05 ST
beta-BHC	U	U	U	U	U	U	0.05	0.04 ST
delta-BHC	U	U	U	U	U	U	0.05	0.04 ST
Dieldrin	U	U	U	U	U	U	0.10	0.004 ST
Endosulfan I	U	U	U	U	U	U	0.05	----
Endosulfan II	U	U	U	U	U	U	0.10	----
Endosulfan Sulfate	U	U	U	U	U	U	0.10	----
Endrin	U	U	U	U	U	U	0.10	ND ST
Endrin Aldehyde	U	U	U	U	U	U	0.10	5 ST
Endrin Ketone	U	U	U	U	U	U	0.10	5 ST
gamma-BHC (Lindane)	U	U	U	U	U	U	0.05	0.05 ST
gamma-Chlordane	U	U	U	U	U	U	0.05	0.05 ST
Heptachlor	U	U	U	U	U	U	0.05	0.04 ST
Heptachlor Epoxide	U	U	U	U	U	U	0.05	0.03 ST
Methoxychlor	U	U	U	U	U	U	0.50	35 ST
Toxaphene	U	U	U	U	U	U	5.0	0.06 ST
Aroclor - 1016	U	U	U	U	U	U	1.00	0.09 ST *
Aroclor - 1221	U	U	U	U	U	U	1.00	0.09 ST *
Aroclor - 1232	U	U	U	U	U	U	1.00	0.09 ST *
Aroclor - 1242	U	U	U	U	U	U	1.00	0.09 ST *
Aroclor - 1248	U	U	U	U	U	U	1.00	0.09 ST *
Aroclor - 1254	U	U	U	U	U	U	1.00	0.09 ST *
Aroclor - 1260	U	U	U	U	U	U	1.00	0.09 ST *
Total Pesticides	0.0	0.0	0.0	0.0	0.0	0.0		
Total PCBs	0	0	0	0	0	0		

QUALIFIERS:
U: Analyzed for but not detected

NOTES:
*: Applies to the sum of the isomers
GV: Guidance Value
ST: Standard
----: Not established

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-1S																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	89 B	130 B	120 B	540	NR	100	NR	1,850	294	NR	U	6,070	56.0 U	996	4,730	256	1080	U	U	U	274	U	15.2 J	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	**5.4 B**	**10.7 B**	UB	UB	U	U	3 ST
Arsenic [e]	U	U	U	U	NR	U	NR	1.6 B	U	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	25 ST
Barium [e]	U	U	U	U	NR	100	NR	92.8 B	81 B	NR	48.3 B	118 B	50.5 B	40.5 B	105 B	49.50 B	72.2 B	200	200	177 B	210	45.8	51	41	48	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	0.19 B	0.24 B	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	U	1.7	1.2	0.20 B	0.45 B	0.83 B	0.14 B	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
Calcium	260,000	210,000	100,000	270,000	255,000	320,000	320,000	240,000	231,000	242,000	184,000	185,000	169,000	130,000	196,000	199,000	196,000	227,000	227,000	181,000	186,000	154,000	150,000	138,000	141,000	----
Chromium [e]	U	U	U	**210**	NR	0.90 B	NR	1.1 B	U	NR	0.44 B	24.1	U	U	**56.1**	3.90 B	8.4 B	1.6 B	1.6 B	0.86 B	**189**	U	9.3	U	2.4 J	50 ST
Cobalt [e]	U	U	U	U	NR	0.80 B	NR	2.8 B	2.5 B	NR	0.40 B	9.1 B	1.5 B	U	4.1 B	U	1.5 B	1.6 B	1.6 B	1.6 B	2.5 B	U	U	U	U	----
Copper [e]	U	U	U	U	NR	5.1	NR	7.4 B	U	NR	10.6 B	3.2 B	5.0 U	5.6 B	6.3 B	U	3.8 B	4.2 B	4.2 B	3.5 B	5.5 B	U	U	U	U	200 ST
Iron	120	240	220	**1,100**	**58 B**	**29,000**	**30,000**	**2,380**	**485**	U	U	**8,660**	244	**1,460**	**6,780**	**363**	**1,400**	U	**1730**	U	**1,160**	U	90.2	U	UB	300 ST ^
Lead	U	U	U	U	8 B	U	1.0 B	U	0.6 B	U	U	3.8 B	U	2.6 B	U	U	U	U	U	U	U	U	U	U	U	25 ST
Magnesium	**35,000**	**28,000**	**17,000**	**36,000**	**34,300**	**41,000**	**47,000**	**31,900**	**30,800**	**32,700**	**25,600**	**27,700**	**27,500**	**21,500**	**29,900**	**31,100**	**30,400**	**43,200**	**45,200**	**43,300**	**45,500**	24,600	26,500	25,900	26,800	3,500 GV
Manganese	**1,100**	**1,600**	**1,200**	**1,300**	**897**	**1,700**	**1,500**	**2,250**	**1,500**	**1,420**	**925**	**1,900**	**2,810**	**3,380**	**4,370**	**603**	**1,110**	98	98	**2,690**	**4,340**	**349**	**463**	**2,000**	**2,300**	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	0.094 B	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	U	U	U	U	NR	7.8	NR	6.2 B	4.8 B	NR	U	58.3	2.1 B	7.4 B	21.2 B	3.30 B	9.9 B	20.2 B	30.8 B	32 B	55.1	1.8 J	3.2 J	4.7 J	5.4 J	100 ST
Potassium	U	5,900	32,000	U	1,300 B	5,400	8,500	1,200	1,370	636 B	404 B	2,940	336 B	583 B	1,650	190 B	1,340	19,900	24,800	32,600	34,000	2,990 J	2,900	3,900	4,300	----
Selenium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	**33.7**	**20.1 B**	U	U	**18.10 B**	U	U	**17 B**	**11.3 B**	U	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	13.2 B	8 B	NR	U	U	U	U	U	U	U	U	U	U	U	UJ	U	U	U	50 ST
Sodium	**190,000**	**240,000**	**490,000**	**210,000**	**86,100**	**200,000**	**200,000**	**55,400**	**63,000**	**62,400**	**34,200**	**51,500**	**23,400**	19,000	**27,500**	17,400	**48,200**	**161,000**	**161,000**	**190,000**	**190,000**	**22,100 JH**	**20,800**	**23,000**	**25,300**	20,000 ST
Thallium [e]	U	U	U	U	NR	0.30 B	NR	U	U	NR	**4.5 B**	**13.4 B**	**15.2 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	U	NR	3.0 B	U	NR	U	9.5 B	U	1.5 B	8.4 B	1.60 B	2.0 B	U	2.3 B	U	1.2 B	U	U	U	U	----
Zinc [e]	U	U	U	U	NR	5.1	NR	6.4 B	5 B	NR	10.9 B	19.1 B	13.0 B	15.2 B	33.1 B	U	5.7 B	12 B	12 B	U	17.7 B	3.4 J	1.6 J	8 J	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	U	U	U	U	U	U	U	U	3 B	U	U	NS	U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	143 B	176 B	NR	95.7 B	120 B	65.5 B	59.9 B	74 B	77.4 B	172	402 B	402 B	411 B	412 B	64.4	93.8 JH	110 B	120	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	0.066	0.044	0.054	U	U	NS	U	U	U	U	U	2 J	11	11	50 ST

QUALIFIERS:

U: Analyzed for but not detected

UB: Qualified as non detect due to blank result

J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-1D																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	U	92 B	200 B	U	NR	NS	NR	703	204	NR	U	1,340	U	704.0	151 B	315	674	U	U	U	293	U	13.2 J	U	U	----
Antimony [e]	U	U	U	U	NR	NS	NR	U	U	NR	U	U	U	**4.7 B**	U	U	U	U	U	U	**6.1 B**	UB	UB	U	U	3 ST
Arsenic [e]	U	U	U	U	NR	NS	NR	U	3.9 B	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	25 ST
Barium [e]	U	U	U	U	NR	NS	NR	62.2 B	57.8 B	NR	72.0 B	59.5 B	50.5 B	58.9 B	50.3 B	64.70 B	55.1 B	43.8 B	43.8 B	43 B	42.5 B	25.6	26.4	36	38	1,000 ST
Beryllium [e]	U	U	U	U	NR	NS	NR	U	0.28 B	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	U	NS	0.20 B	U	0.18 B	1.0 B	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
Calcium	68,000	92,000	89,000	110,000	79,800	NS	200,000	104,000	90,300	167,000	191,000	112,000	169,000	118,000	110,000	138,000	188,000	189,000	189,000	154,000	155,000	155,000	141,000	139,000	135,000	----
Chromium [e]	U	U	U	U	NR	NS	NR	0.45 B	0.85 B	NR	U	17.8 B	U	U	4.8 B	4.40 B	2.3 B	U	U	0.76 B	1.8 B	1 J	U	U	U	50 ST
Cobalt [e]	U	U	U	U	NR	NS	NR	2.9 B	4.60 B	NR	2.7 B	5.7 B	1.5 B	3.3 B	3.1 B	3.50 B	6.0 B	4.7 B	4.7 B	5.5 B	6.6 B	3.5 J	3.7 J	3.1 J	3.2 J	----
Copper [e]	U	U	U	U	NR	NS	NR	U	6.90 B	NR	11.3 B	U	U	11.8 B	U	U	4.6 B	U	U	1.8 B	2.4 B	U	U	U	U	200 ST
Iron	U	170	**350**	160	290	NS	**28,000**	**1,230**	**346**	U	112 B	**3,000**	244	**1,290**	**1,510**	**7,570**	**3,350**	179 B	**1200**	U	**864**	47.4	274	U	**1,000**	300 ST ^
Lead	U	U	U	U	5 B	NS	0.60 B	U	0.87 B	U	U	2.3 B	U	U	U	U	U	U	U	10	U	U	U	U	U	25 ST
Magnesium	**21,000**	**28,000**	**25,000**	**23,000**	**24,400**	NS	**37,000**	**29,600**	**23,600**	**28,800**	**30,900**	**33,200**	**27,500**	**36,800**	**31,800**	**37,600**	**55,200**	**55,100**	**50,200**	**49,300**	**48,400**	**45,100**	**44,800**	**40,400**	**40,300**	3,500 GV
Manganese	**630**	**1,000**	**430**	**5,200**	**970**	NS	**7,000**	**1,160**	**1,250**	**6,210**	**6,400**	**1,000**	**2,810**	**885**	**1,130**	**1,990**	**1,980**	**1,570**	**1,570**	**1,450**	**1,440**	**1,340**	**1,670**	**2,300**	**2,500**	300 ST ^
Mercury [e]	U	U	U	U	NR	NS	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	U	U	U	U	NR	NS	NR	16.3 B	16.2 B	NR	4.2 B	22.2 B	2.1 B	10.1 B	**107**	13.40 B	19.1 B	16.1 B	16.5 B	17.5 B	18 B	10.8	9.3 J	9.2 J	9.4 J	100 ST
Potassium	22,000	21,000	20,000	20,000	18,200	NS	20,000	20,300	17,000	13,800	12,100	37,800	336 B	58,700	44,300	52,000	63,100	62,600	56,000	59,500	63,200	64,200 J	58,200	51,400	53,300	----
Selenium [e]	U	U	U	U	NR	NS	NR	U	U	NR	U	**32.7**	**20.1 B**	U	U	U	U	U	**18.7 B**	U	**11 B**	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	NS	NR	6.9 B	10.2 B	NR	0.94 B	U	U	U	U	U	U	U	U	U	U	UBJ	U	U	U	50 ST
Sodium	**810,000**	**990,000**	**580,000**	**490,000**	**663,000**	NS	**440,000**	**502,000**	**571,000**	**182,000**	**92,000**	**462,000**	**23,400**	**148,000**	**173,000**	**145,000**	**263,000**	**281,000**	**281,000**	**254,000**	**261,000**	**165,000 JH**	**139,000**	**136,000**	**137,000**	20,000 ST
Thallium [e]	U	U	U	U	NR	NS	NR	U	**1.3 B**	NR	**35.1**	**5.9**	**15.2 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	NS	NR	1.2 B	U	NR	U	2.4 B	U	1.5 B	U	1.80 B	1.7 B	U	1.3 B	U	0.55 B	U	U	U	U	----
Zinc [e]	U	U	U	U	NR	NS	NR	3.3 B	8.9 B	NR	12.5 B	7 B	13 B	16.1 B	18.7 B	5.60 B	9.6 B	U	U	U	18 B	4.2 J	2.4 J	1.9 J	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	U	U	U	U	U	7.5 D	U	U	U	U	U	NS	U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	770	769	NR	187 BN	612	65.5 B	303 B	358	347 B	525	544	544	569	558	486	UB	460 B	480	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	**65 H**	NS	NR	U	0.075	0.044	0.055	U	U	NS	U	U	U	U	U	3 J	11	11	50 ST

QUALIFIERS:

U: Analyzed for but not detected

UB: Qualified as non detect due to blank result

J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-2S																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	66 B	86 B	U	96 B	NR	220	NR	232	350	NR	165 B	4,470	74.8	551	116 B	1,120	1,590	U	1,950	U	628	U	26.2	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	**14.20** B	U	U	U	U	UB	UB	U	U	3 ST
Arsenic [e]	U	U	U	U	NR	U	NR	4.8 B	6.9 B	NR	3.2 B	8.5 B	U	4.1 B	U	4.30 B	8.00 B	U	U	U	15.1 B	2 J	9.1	U	18	25 ST
Barium [e]	**2,200**	**2,200**	**2,400**	570	NR	**1,600**	NR	**1,340**	**1,210**	NR	817	**1,140**	615	602	618	703	**1,500**	787	862	311	107 B	111	209	130	240	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	U	0.18 B	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	1 B	2.3	U	0.67 B	U	1.4 B	U	0.53 B	U	U	U	U	U	U	U	U	U	U	1.6 J	U	U	5 ST
Calcium	120,000	150,000	190,000	120,000	126,000	210,000	190,000	106,000	117,000	120,000	60,400	81,000	78,500	74,900	74,000	94,400	249,000	159,000	165,000	102,000	112,000	94,800	113,000	90,400	99,300	----
Chromium [e]	U	U	U	U	NR	4.0 B	NR	U	U	NR	1.5 B	8.4 B	U	U	0.99 B	3.00 B	10.0 B	4 B	12.3 B	1.3 B	2.9 B	3 J	1.2 J	2.3 J	3.2 J	50 ST
Cobalt [e]	U	U	U	U	NR	11	NR	7.1 B	7.3 B	NR	7.2 B	9.7 B	5.4 B	5.2 B	3.3 B	3.70 B	15.5 B	19.1 B	19.1 B	9.7 B	10.9 B	10.8	11	9.8	11	----
Copper [e]	U	U	U	U	NR	12	NR	U	U	NR	13.1 B	6.7 B	U	6.0 B	U	U	5.4 B	U	U	U	3 B	2.4 J	U	U	U	200 ST
Iron	**4,900**	**13,000**	**13,000**	**5,700**	**14,000**	**43,000**	**9,800**	**8,570**	**9,910**	**7,530**	**4,200**	**21,100**	**1,860**	**2,470**	**2,520**	**5,470**	**26,200**	**18,000**	**18,000**	87 B	**17,200**	205	**18,700**	120	**25,300**	300 ST ^
Lead	U	3	U	U	7 B	U	0.50 B	U	1.50 B	U	U	5.50 B	U	U	U	U	U	U	U	U	U	U	U	U	U	25 ST
Magnesium	**110,000**	**100,000**	**120,000**	**100,000**	**87,300**	**96,000**	**86,000**	**55,000**	**56,600**	**58,900**	**34,100**	**42,600**	**47,500**	**60,800**	**38,000**	**56,300**	**175,000**	**117,000**	**118,000**	**72,800**	**77,300**	**85,200**	**92,600**	**86,300**	**93,800**	3,500 GV
Manganese	**3,600**	**6,100**	**6,700**	**3,800**	**5,000**	**5,400**	**6,200**	**4,550**	**5,410**	**4,660**	**2,060**	**3,270**	**2,800**	**1,920**	**3,230**	**2,960**	**5,560**	**2,480**	**2,920**	**2,980**	**3,200**	**996**	**2,930**	**1,100**	**1,200**	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	0.11 B	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	**130**	**160**	**130**	**120**	NR	80	NR	42.4	42.3 B	NR	33.8 B	36 B	25.2 B	36 B	13.3 B	16.70 B	**109**	**103**	**107**	49.1 B	54.4	52.4	52 J	54	61	100 ST
Potassium	100,000	70,000	84,000	91,000	62,600	60,000	47,000	41,400	39,700	38,500	49,900	55,000	53,600	78,200	43,100	50,700	121,000	160,000	161,000	105,000	115,000	125,000 J	108,000	140,000	156,000	----
Selenium [e]	U	U	U	U	NR	5.2	NR	U	U	NR	U	**23.6 B**	**10.4 B**	**10.5 B**	U	U	**12.8 B**	U	U	9.7 B	U	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	9.2 B	5.7 B	NR	U	U	U	U	U	U	U	U	U	2.8 B	3.1 B	UBJ	U	U	U	50 ST
Sodium	**1,000,000**	**800,000**	**860,000**	**850,000**	**707,000**	**760,000**	**680,000**	**472,000**	**394,000**	**465,000**	**389,000**	**288,000**	**276,000**	**247,000**	**164,000**	**199,000**	**925,000**	**951,000**	**951,000**	**592,000**	**650,000**	**498,000 JH**	**517,000**	**518,000**	**563,000**	20,000 ST
Thallium [e]	U	U	U	U	NR	**1.0 B**	NR	U	U	NR	**11.1 B**	**4 B**	**7.6 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	U	NR	0.96 B	1.0 B	NR	0.96 B	7.4 B	U	1.4 B	U	2.30 B	4.30 B	3.7 B	6.6 B	U	1.5 B	U	1.2 J	U	1.6 J	----
Zinc [e]	U	U	U	U	NR	6.8	NR	U	101	NR	8.5 B	14.1 B	12.3 B	18.5 B	16.4 B	5.90 B	10.90 B	12.4 B	12.4 B	4.3 B	22.4 B	6.5	4.6 J	4.6 J	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	U	U	U	U	U	U	13.2 B	2.9 B	5.6 B	UJ	U	NS	7.3 J	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	**1,350**	**1,230**	NR	**1,200**	**1,250**	988	972	863	837	**1,480**	**2,360**	**2,360**	**1,380**	**1,380**	**1,590**	**1,380 JH**	**1,600 B**	**1,800**	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	0.18	0.22	0.2	U	U	NS	U	U	U	U	U	U	40 J	41 J	50 ST

QUALIFIERS:

U: Analyzed for but not detected

UB: Qualified as non detect due to blank result

J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-2D																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	69 B	U	U	220	NR	140	NR	98.3 B	290	NR	171 B	7,590	U	332	2,190	1,850	453	U	922	U	290	U	13.6 J	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	1.7 B	NR	U	U	U	U	U	U	**12.5 B**	U	U	U	U	UB	UB	U	U	3 ST
Arsenic [e]	U	U	U	U	NR	6.8	NR	11.0 B	10.3 B	NR	10.2 B	14.4 B	12.0 B	10.6 B	9.8 B	21.3	13.8 B	U	8.8 B	5.1 B	18.7 B	5.5	9.6	7 J	17	25 ST
Barium [e]	**2,600**	**1,900**	**2,000**	**2,800**	NR	**1,200**	NR	**1,510**	**1,390**	NR	**2,710**	**1,820**	**1,570**	**2,050**	**1,230**	**1,250**	**1,560**	227	782	152 B	121 B	291	390	540	860	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	U	0.2 B	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	U	**10**	U	0.36 B	U	**19**	U	0.75 B	U	U	U	2.70 B	U	U	U	U	U	U	1 J	U	U	5 ST
Calcium	160,000	130,000	130,000	170,000	99,800	150,000	140,000	95,600	97,400	96,800	128,000	152,000	90,300	135,000	80,500	92,400	179,000	140,000	151,000	95,700	104,000	134,000	123,000	140,000	143,000	----
Chromium [e]	U	U	U	U	NR	6.0	NR	U	1.5 B	NR	4.7 B	21.4	3.0 B	2.2 B	6 B	9.00 B	8.2 B	4.2 B	13.1 B	3.8 B	4.7 B	3.4 J	2.6 J	3 J	4.6	50 ST
Cobalt [e]	U	U	U	U	NR	13	NR	9.0 B	10.6 B	NR	11.5 B	17.2 B	9.4 B	9.2 B	6.8 B	7.30 B	16.10 B	13.4 B	13.4 B	9.2 B	9.6 B	8	8	9.6	10	----
Copper [e]	U	U	U	U	NR	12	NR	U	U	NR	13.0 B	14.9 B	5.0 U	6.4 B	4.3 B	8.40 B	4.60 B	U	U	1.6 B	3.3 B	8.6 J	UJ	U	U	200 ST
Iron	**13,000**	**2,100**	**3,700**	**16,000**	**5,660**	**31,000**	**7,400**	**10,300**	**12,400**	**6,950**	**9,550**	**25,300**	**11,000**	**10,800**	**12,000**	**19,000**	**19,200**	**11,100**	**11,100**	98.9 B	**9,370**	**435**	**11,800**	190	**13,300**	300 ST ^
Lead	U	U	U	U	7 B	U	0.80 B	U	0.96 B	**147**	U	6.4 B	U	2.2 B	U	U	U	U	U	U	U	**56.2**	U	U	U	25 ST
Magnesium	**140,000**	**130,000**	**150,000**	**160,000**	**100,000**	**110,000**	**130,000**	**82,800**	**81,000**	**95,000**	**115,000**	**102,000**	**86,500**	**113,000**	**70,500**	**80,600**	**150,000**	**115,000**	**120,000**	**86,800**	**90,000**	**101,000**	**95,300**	**103,000**	**106,000**	3,500 GV
Manganese	**560**	**1,300**	**1,100**	**600**	**1,420**	**2,800**	**1,600**	**1,730**	**2,180**	**785**	**525**	**1,010**	**535**	**539**	**804**	**810**	**713**	**499**	**562**	**433**	**514**	**465**	**490**	**500**	**530**	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	**120**	**120**	**120**	**120**	NR	94	NR	71.8	75.8	NR	**105**	**106**	75.5	94.7	54	56.9	**119**	83.2	91.2	55	61	59.2	55.4 J	72	78	100 ST
Potassium	220,000	180,000	220,000	240,000	144,000	140,000	180,000	125,000	118,000	160,000	216,000	168,000	140,000	178,000	130,000	119,000	196,000	191,000	205,000	156,000	166,000	145,000 J	141,000	167,000	178,000	----
Selenium [e]	U	U	U	U	NR	**17**	NR	U	U	NR	U	**26.7**	**17.1 B**	U	U	U	U	U	**13.2 B**	U	9.9 B	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	6.8 B	8.5 B	NR	0.98 B	U	U	U	U	U	U	U	U	3 B	U	UBJ	U	U	U	50 ST
Sodium	**1,100,000**	**810,000**	**850,000**	**980,000**	**757,000**	**880,000**	**970,000**	**699,000**	**686,000**	**856,000**	**1,090,000**	**852,000**	**739,000**	**840,000**	**575,000**	**545,000**	**1,200,000**	**743,000**	**743,000**	**594,000**	**636,000**	**556,000 JH**	**535,000**	**748,000**	**802,000**	20,000 ST
Thallium [e]	U	U	U	U	NR	**0.90 B**	NR	U	U	NR	**1.5 B**	U	**10.2 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	U	NR	2.0 B	1.7 B	NR	3.0 B	15.3 B	U	2.9 B	5.4 B	6.00 B	5.60 B	4.3 B	7 B	0.69 B	3.5 B	UB	2.8 J	1.6 J	3.5 J	----
Zinc [e]	U	U	U	U	NR	13	NR	4.6 B	40.5 B	NR	8.4 B	32 B	15.6 B	15.6 B	49.4 B	12.70 B	11.70 B	12.6 B	12.6 B	U	21 B	119 J	4.2 J	6 J	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	U	U	U	U	U	7.5 D	10.5 B	2.4 B	U	UJ	UJ	NS	6.7 J	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	**2,120**	**2,000**	NR	**2,470**	**2,260**	**2,120**	**1,900**	**1,710**	**1,500**	**2,240**	**2,360**	**2,360**	**1,660**	**1,700**	**1,430**	**1,470 JH**	**1,600 B**	**1,600**	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	38	U	0.23	0.1	U	39	NS	U	U	U	U	U	U	14	16	50 ST

QUALIFIERS:

U: Analyzed for but not detected

UB: Qualified as non detect due to blank result

J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-3S																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	130 B	130 B	110 B	110 B	NR	170	NR	685	435	NR	88.5 B	7,720	228	856	336	103 B	248	U	69.7 B	U	55.6 B	21 J	45.2	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	2.6 B	NR	U	**5.8 B**	U	**15.7 B**	**9.3 B**	U	U	U	U	**5.4 B**	**9.6 B**	UB	UB	U	U	3 ST
Arsenic [e]	U	U	14	U	NR	**34**	NR	19.6 B	19.6 B	NR	18.2 B	21.6	21.7	20.5	**32.9**	U	5.6 B	U	6.1 B	9.9 B	13.3 B	6.6	9.3	U	6.8 J	25 ST
Barium [e]	**1,300**	**1,800**	**3,000**	**1,600**	NR	**1,800**	NR	**2,290**	**2,090**	NR	**2,010**	**2,450**	**1,680**	**1,520**	**1,640**	135 B	634	460	384	692	**1,260**	660	714	320	480	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	0.17 B	0.16 B	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	1 B	U	U	0.34 B	U	1.1 B	U	0.35 B	U	U	U	U	U	U	U	U	U	U	0.4 J	U	U	5 ST
Calcium	51,000	69,000	32,000	41,000	51,500	140,000	98,000	66,200	55,100	56,800	62,200	52,300	67,300	38,000	38,900	82,600	132,000	165,000	165,000	56,600	78,000	153,000	151,000	119,000	126,000	----
Chromium [e]	18	22	24	20	NR	28	NR	18.0 B	17.2 B	NR	15.3 B	32.2	14.1 B	14.8 B	17 B	23.3	**1,070**	U	**1,000**	23.5	**65.8**	8.3	16.7	5.9	26	50 ST
Cobalt [e]	U	U	U	U	NR	33	NR	26.4 B	29.6 B	NR	30.8 B	34.8 B	32.8 B	35.3 B	27.6 B	1.9 B	12.4 B	U	14.8 B	28.1 B	26.7 B	17.2	14.2	9.9	11	----
Copper [e]	56	30	U	U	NR	42	NR	U	U	NR	20.6 B	12.4 B	U	9 B	U	U	20.6 B	U	4.4 B	44.9	13.8 B	6.8	2.4 J	U	U	200 ST
Iron	**1,700**	**1,600**	**6,900**	**5,300**	**3,350**	**330,000**	**16,000**	**14,400**	**11,600**	**13,200**	**10,600**	**18,800**	**14,600**	**5,380**	**6,770**	**1,450**	**17,600**	**4,550**	**4,550**	**834**	**9,560**	**364**	**5,840**	160	**13,100**	300 ST ^
Lead	U	U	U	U	8 B	0.60 B	2 B	U	1.3 B	U	0.90 B	11.9	U	U	U	U	U	U	U	17.4	U	13.4 J	UJ	U	U	25 ST
Magnesium	**120,000**	**160,000**	**150,000**	**140,000**	**152,000**	**280,000**	**170,000**	**130,000**	**125,000**	**117,000**	**118,000**	**110,000**	**123,000**	**101,000**	**91,600**	**39,000**	**81,100**	**82,100**	**79,600**	**77,400**	**89,800**	**88,000**	**84,000**	**58,200**	**62,800**	3,500 GV
Manganese	230	**490**	120	170	**366**	**810**	**840**	**551**	**401**	**596**	**600**	**449**	**852**	255	**377**	298	**1,280**	**1,520**	**1,510**	**389**	**393**	**630**	**670**	**720**	**830**	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	0.071 B	U	U	U	U	0.03 B	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	**340**	**610**	**400**	**420**	NR	**560**	NR	**382**	**437**	NR	**405**	**387**	**362**	**384**	**301**	53.6	**390**	**540**	**807**	**269**	**255**	**254**	**219 J**	**160**	**180**	100 ST
Potassium	190,000	210,000	360,000	250,000	245,000	220,000	170,000	155,000	197,000	180,000	213,000	242,000	176,000	245,000	224,000	6,570	46,900	75,600	69,800	209,000	206,000	83,000 J	74,600	67,400	72,500	----
Selenium [e]	U	U	U	U	NR	**48**	NR	U	U	NR	U	**18.8 B**	**15.7 B**	**14.9 B**	U	U	U	**27.8 B**	**26.1 B**	**10.9 B**	U	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	7.1 B	6.4 B	NR	1.5 B	2.9 B	0.75 B	2.70 B	U	U	U	U	U	5.1 B	4.7 B	UJ	U	U	U	50 ST
Sodium	**3,300,000**	**270,000**	**2,300,000**	**3,900,000**	**2,670,000**	**3,700,000**	**3,100,000**	**3,110,000**	**2,960,000**	**2,820,000**	**3,190,000**	**3,070,000**	**2,620,000**	**2,590,000**	**2,440,000**	**283,000**	**994,000**	**961,000**	**961,000**	**2,010,000**	**2,070,000**	**1,020,000 JH**	**936,000**	**783,000**	**855,000**	20,000 ST
Thallium [e]	U	U	U	U	NR	U	NR	U	**5.0 B**	NR	**2.1 B**	U	**9.6 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	27 B	U	NR	23	NR	18.4 B	21.7 B	NR	15.7 B	44.6 B	14.0 B	20 B	23.8 B	1.20 B	11.90 B	7 B	10.6 B	10.3 B	17.7 B	UB	8	U	6.1	----
Zinc [e]	U	U	U	U	NR	7.8	NR	U	8.8 B	NR	6.5 B	32.8 B	17.0 B	17.1 B	26 B	U	5.20 B	11.1 B	11.1 B	U	15.7 B	41.7 J	5.4 J	4.8 J	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	9.4 B	NS	NR	U	U	U	**7.4 B**	U	U	U	25.7	U	5.8 B	4.6 B	UJ	U	NS	U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	**2,500**	**2,450**	NR	**2,130**	**2,650**	**2,030**	**2,090**	**2,660**	122 B	711	957	957	**2,290**	**2,190**	912	870 JH	650 B	690	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	**130 H**	NS	NR	30	U	0.40	0.068	U	U	NS	U	U	U	U	U	U	14	26	50 ST

QUALIFIERS:

U: Analyzed for but not detected

UB: Qualified as non detect due to blank result

J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

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NA: Not applicable

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ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-3D																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	90 B	71 B	80 B	96 B	NR	130	NR	237	494	NR	51.9 B	173 B	56.0 U	345	117 B	793	544	U	828	U	37.6 B	35.5	96.8	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	**5.1 B**	U	U	U	U	U	U	**5.1 B**	UB	UB	U	U	3 ST
Arsenic [e]	U	U	10 B	U	NR	**27**	NR	14.2 B	11.3 B	NR	14.6 B	11.5 B	**28.7**	13.9 B	**54.3**	7.0 B	U	20.7	**42.3**	9.8 B	12.5 B	6	5.3 J	8.5 J	12 J	25 ST
Barium [e]	**5,400**	**7,900**	**6,300**	**6,500**	NR	**6,800**	NR	**6,620**	**7,460**	NR	**3,740**	**7,570**	**3,870**	**6,710**	**3,980**	**4,410**	**6,860**	**6,360**	**5,680**	**4,520**	**4,810**	**4,330**	**4,800**	**1,900**	**2,000**	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	U	0.17 B	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	3 B	**23**	0.73	0.75 B	0.1 U	0.89 B	U	U	U	U	U	U	U	U	1 B	U	U	U	U	U	U	5 ST
Calcium	220,000	560,000	260,000	200,000	355,000	300,000	170,000	246,000	276,000	94,000	64,800	237,000	54,200	225,000	58,600	54,900	164,000	138,000	117,000	47,100	49,500	79,200	61,500	39,300	38,900	----
Chromium [e]	19	13	20	20	NR	27	NR	16.7 B	15.3 B	NR	16.2 B	14 B	16.1 B	13.2 B	12.8 B	14 B	15.2 B	15.8 B	24.6	17.8 B	17.7 B	13.8	14.2	9.7	11	50 ST
Cobalt [e]	U	U	U	U	NR	20	NR	14.1 B	17.1 B	NR	12.5 B	20.9 B	20.5 B	18.9 B	15.6 B	15.70 B	17 B	17.1 B	17.1 B	21.8 B	22 B	19.2	21.4	17	17	----
Copper [e]	U	U	U	U	NR	40	NR	U	U	NR	14.3 B	U	U	6.4 B	U	U	5.1 B	U	U	U	U	7.4	U	U	U	200 ST
Iron	**2,500**	**26,000**	**14,000**	**9,800**	**18,600**	**47,000**	**9,600**	**13,500**	**14,100**	**9,560**	**8,880**	**13,700**	**8,920**	**13,000**	**14,300**	**5,260**	**9,080**	**11,400**	**11,400**	**1,290**	**2,910**	**1,060**	**3,750**	**780**	**3,700**	300 ST ^
Lead	U	U	U	U	8 B	U	0.50 B	U	1.90 B	U	0.52 B	2.6 B	U	U	U	U	U	5.1 B	5.1 B	7.4 B	U	**43.2**	U	U	U	25 ST
Magnesium	**140,000**	**210,000**	**180,000**	**140,000**	**180,000**	**200,000**	**170,000**	**139,000**	**153,000**	**106,000**	**96,200**	**130,000**	**105,000**	**135,000**	**87,400**	**73,800**	**120,000**	**115,000**	**109,000**	**888,000**	**90,200**	**90,400**	**92,500**	**58,500**	**59,600**	3,500 GV
Manganese	160	**350**	150	110	185	140	66	117	123	56.7	36.8 B	93.3	32.4	70.1	50	51.5	96.3	62.6	69.4	22.9 B	24.4	26	22.9	32	37	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	**210**	**170**	**250**	**260**	NR	**330**	NR	**244**	**269**	NR	**233**	**211**	**255**	**210**	**202**	**188**	**208**	**217**	**225**	**212**	**215**	**167**	**179 J**	**130**	**130**	100 ST
Potassium	270,000	140,000	300,000	310,000	215,000	250,000	310,000	191,000	191,000	252,000	245,000	182,000	234,000	212,000	235,000	263,000	198,000	319,000	317,000	305,000	320,000	187,000 J	256,000 J	187,000	194,000	----
Selenium [e]	U	U	U	U	NR	**45**	NR	U	U	NR	U	**34.6**	**11.0 B**	**18.3 B**	U	U	U	**20.6 B**	**16.6 B**	U	9.4 B	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	14.1 B	10 B	NR	1.9 B	U	1.2 B	U	U	U	U	U	U	6.1 B	5.3 B	UBJ	U	U	U	50 ST
Sodium	**2,800,000**	**1,700,000**	**2,200,000**	**2,800,000**	**2,450,000**	**3,000,000**	**2,800,000**	**2,740,000**	**2,460,000**	**2,470,000**	**2,780,000**	**2,760,000**	**2,390,000**	**2,510,000**	**2,130,000**	**2,140,000**	**2,190,000**	**2,270,000**	**2,270,000**	**2,100,000**	**2,180,000**	**1,680,000 JH**	**1,900,000**	**1,330,000**	**1,440,000**	20,000 ST
Thallium [e]	U	U	U	U	NR	U	NR	U	**9.1 B**	NR	U	**5.7 B**	**5.7 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	22 B	22 B	NR	33	NR	27.6 B	28.1 B	NR	32.2 B	18.7 B	30.2 B	26.5 B	24.1 B	23.5 B	24.80 B	27 B	29.4 B	24 B	27.8 B	UB	26.4	16	23	----
Zinc [e]	U	U	U	54	NR	22	NR	U	9.9 B	NR	3.8 B	14.4 B	15.3 B	15.1 B	55.9	9.9 B	6.80 B	10 B	10 B	4.6 B	15.5 B	129 J	5.6 J	U	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	10.3 B	NS	NR	U	6.8 B	U	3.7 B	U	U	U	19.9 B	U	6.4 B	5 B	U	U	NS	11 J	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	**2,330**	**2,070**	NR	**2,620**	**1,620**	**2,540**	**1,680**	**2,480**	**3,090**	**1,840**	**2,680**	**2,680**	**2,510**	**2,530**	**2,010**	**2,440 JH**	**1,900**	**1,900**	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	0.030	NR	**72 H**	NS	NR	**66**	U	0.31	0.24	U	U	NS	U	U	U	U	U	U	32	30	50 ST

QUALIFIERS:

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J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-4S																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	U	U	U	U	NR	62	NR	800	98.1 B	NR	U	116 B	U	6,310	84.2 B	1,680	372	U	124 B	U	145 B	U	20.8 J	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	**5.2 B**	UB	UB	U	U	3 ST
Arsenic [e]	U	U	U	U	NR	8.2	NR	11.9 B	10.4 B	NR	2.6 B	4.1 B	6 B	10.4 B	5.3 B	6.40 B	U	U	U	4.3 B	13.9 B	U	3.5 J	U	U	25 ST
Barium [e]	330	470	600	300	NR	520	NR	379	372	NR	221	251	216	322	182 B	215.00	197 B	135 B	135 B	157 B	207	85.8	103	65	74	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	0.33 B	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	1 B	3.2	1.1	0.64 B	1 U	3.6 B	0.14 B	0.4 B	U	0.82 B	U	U	U	U	U	U	U	U	0.8 J	U	U	5 ST
Calcium	260,000	240,000	140,000	230,000	226,000	260,000	260,000	205,000	155,000	189,000	188,000	137,000	145,000	170,000	118,000	141,000	143,000	111,000	111,000	144,000	148,000	156,000	132,000	99,800	102,000	----
Chromium [e]	U	U	U	U	NR	3.0 B	NR	U	U	NR	U	1.5 B	U	5.5 B	1.9 B	5.30 B	1.70 B	U	U	U	0.76 B	1 J	U	U	U	50 ST
Cobalt [e]	U	U	U	U	NR	2.0 B	NR	2.8 B	1.6 B	NR	2.3 B	4.3 B	2.2 B	10.5 B	U	1.40 B	0.68 B	0.88 B	0.88 B	0.59 B	1.4 B	2 J	1 J	U	U	----
Copper [e]	U	U	U	U	NR	9	NR	7.5 B	U	NR	24.2 B	U	U	23.1 B	U	4.70 B	U	U	U	U	5.3 B	5	5.5	6.4 J	6.4 J	200 ST
Iron	**4,100**	**35,000**	**18,000**	**5,200**	**22,300**	**63,000**	**9,800**	**35,400**	**23,500**	**5,090**	**7,650**	**17,500**	**14,600**	**38,900**	**11,100**	**18,900**	**16,000**	**4,710**	**4,710**	66.6 B	**17,700**	17.6	**7,810**	49 J	**1,900**	300 ST ^
Lead	U	U	U	U	6 B	U	0.60 B	U	1.70 B	U	U	3 B	U	15.3	U	U	U	U	U	U	U	U	U	U	U	25 ST
Magnesium	**45,000**	**45,000**	**41,000**	**40,000**	**45,700**	**55,000**	**43,000**	**40,800**	**35,200**	**37,800**	**36,900**	**30,300**	**34,500**	**34,900**	**26,600**	**31,300**	**35,000**	**30,700**	**30,700**	**45,200**	**44,800**	**40,200**	**40,400**	**31,900**	**33,000**	3,500 GV
Manganese	**1,800**	**2,700**	**1,800**	**1,400**	**3,100**	**2,700**	**3,300**	**3,730**	**2,980**	**2,890**	**3,460**	**3,010**	**3,530**	**3,400**	**2,710**	**3,450**	**4,700**	**3,160**	**3,160**	**3,540**	**3,880**	**1,600**	**2,020**	**280**	**340**	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	0.062 B B	U	0.048 B	0.048 B	U	U	U	U	U	U	0.7 ST
Nickel [e]	U	**240**	U	U	NR	47	NR	35.7 B	32.6 B	NR	31.4 B	24.2 B	27.5 B	42.7 B	12.5 B	13.00 B	8.80 B	4.3 B	4.3 B	6.3 B	7.2 B	8.7	6.5 J	2.3 J	2.5 J	100 ST
Potassium	U	6,900	19,000	U	4,320 B	13,000	4,800	2,880	5,400	2,920	2,170	2,930	1,930	2,530	2,040	2,280	2,390	1,730	1,730	2,600	2,520	2,140 J	2,180	3,600 B	3,700	----
Selenium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	**24.5 B**	**15.6 B**	U	U	U	U	U	U	U	8.9 B	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	7.9 B	5.1 B	NR	2.7 B	U	U	U	U	U	U	U	U	3.5 B	3.4 B	UBJ	U	U	U	50 ST
Sodium	**130,000**	**210,000**	**200,000**	**170,000**	**213,000**	**290,000**	**200,000**	**228,000**	**193,000**	**185,000**	**156,000**	**149,000**	**159,000**	**153,000**	**104,000**	**94,900**	**137,000**	**88,800**	**88,800**	**98,700**	**97,500**	**63,900 JH**	**61,100**	**35,800**	**37,100**	20,000 ST
Thallium [e]	U	U	U	U	NR	**2.0 B**	NR	U	U	NR	**22.0**	**8.2 B**	**13.2 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	U	NR	2.1 B	0.86 B	NR	0.63 B	U	U	18.7 B	1.6 B	3.20 B	2.40 B	2.2 B	2.2 B	U	3.1 B	U	5.4	U	U	----
Zinc [e]	U	U	U	U	NR	5.4	NR	4.0 B	12.5 B	NR	18.1 B	12 B	8.8 B	56.7 B	18 B	U	U	U	U	U	19.1 B	3.1 J	2.6 J	12	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	U	U	U	U	U	U	U	U	U	UJ	UJ	NS	U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	185 B	190 B	NR	89.4 B	79.4 B	86.2 B	52 B	70.8 B	48 B	73.7 B	41.7 B	41.7 B	85.7 B	88 B	51	60.6 JH	39	40	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	35	U	0.097	0.057	U	U	NS	U	U	U	U	U	10 J	U	U	50 ST

QUALIFIERS:

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J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-4D																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	70 B	69 B	110 B	100 B	NR	190	NR	24.3 B	118 B	NR	U	191 B	U	161 B	966	129 B	172 B	U	248	U	89.4 B	U	22.6 J	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	U	NR	1.3 B	U	U	U	U	U	U	U	U	U	**5.3 B**	UB	UB	U	U	3 ST
Arsenic [e]	U	U	15	U	NR	7.4	NR	9.4 B	11.1 B	NR	6.5 B	11.6 B	7.2 B	4.1 B	11.5 B	**28.1**	15.8 B	10.7 B	**30.3**	8.2 B	15.1 B	4.6	11.3	U	13 J	25 ST
Barium [e]	640	580	480	550	NR	250	NR	357	300	NR	209	311	154	279	199 B	343	586	592	666	441	665	370	527	470	690	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	U	4.8	U	U	U	0.91 B	U	U	U	U	U	U	U	U	U	U	U	U	1.5 J	U	U	5 ST
Calcium	91,000	95,000	82,000	90,000	88,900	130,000	97,000	74,800	65,800	76,500	72,700	90,000	109,000	112,000	103,000	122,000	183,000	187,000	192,000	160,000	171,000	156,000	146,000	160,000	169,000	----
Chromium [e]	U	U	U	U	NR	2.0 B	NR	U	U	NR	U	1.20 B	U	U	3.9 B	4.60 B	2.90 B	1.2 B	8.4 B	1.8 B	1.5 B	1.6 J	U	U	U	50 ST
Cobalt [e]	U	U	U	U	NR	3.0 B	NR	1.2 B	1.8 B	NR	0.79 B	3.80 B	U	U	1.1 B	1.50 B	2.50 B	2.5 B	2.5 B	2.4 B	2.9 B	1.4 J	1.8 J	2 J	2.3 J	----
Copper [e]	U	U	U	U	NR	7.6	NR	U	U	NR	16.9 B	U	U	U	U	U	U	U	U	U	1.5 B	U	U	U	U	200 ST
Iron	**11,000**	**18,000**	**14,000**	**14,000**	**13,600**	**41,000**	**11,000**	**10,600**	**8,510**	**8,610**	**6,900**	**10,300**	**7,980**	**8,360**	**9,840**	**25,100**	**24,900**	**17,200**	**17,200**	124 B	**21,100**	**4,890**	**18,300**	110	**21,400**	300 ST ^
Lead	U	U	U	U	6 B	U	0.40 B	U	1.20 B	U	U	2.00 B	U	U	U	U	U	U	U	4.7 B	U	18.8 J	UJ	U	U	25 ST
Magnesium	**42,000**	**48,000**	**43,000**	**44,000**	**45,100**	**54,000**	**39,000**	**36,100**	**32,100**	**35,200**	**29,300**	**35,800**	**35,900**	**40,300**	**34,400**	**44,200**	**79,000**	**84,500**	**83,700**	**81,900**	**85,900**	**73,300**	**71,100**	**86,000**	**89,900**	3,500 GV
Manganese	**1,800**	**1,600**	**1,200**	1,500	**1,380**	**1,400**	**1,400**	**1,360**	**1,130**	**1,510**	**1,510**	**2,040**	**2,020**	**2,130**	**1,820**	**2,230**	**2,930**	**2,900**	**2,950**	**2,410**	**2,620**	**1,950**	**2,070**	2,200	**2,300**	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	0.07 B	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	U	52	42	U	NR	37	NR	7.9 B	9.3 B	NR	2.4 B	28.9 B	4.7 B	16.9 B	8.3 B	21.50 B	46.3 B	50.2	53.4	50.5	53.5	33.5	34.2 J	51	53	100 ST
Potassium	40,000	58,000	67,000	54,000	37,700	42,000	29,000	24,100	24,600	18,300	12,100	25,500	9,150	18,900	12,200	21,500	41,800	51,400	49,100	51,400	51,900	35,000 J	33,700	51,600	53,600	----
Selenium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	**23.3 B**	**13.9 B**	**11.6 B**	U	U	U	U	**17.2 B**	9.3 B	9.8 B	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	4.0 B	4.0 B	NR	U	U	U	U	U	U	U	U	U	3.3 B	U	UBJ	U	U	U	50 ST
Sodium	**250,000**	**260,000**	**240,000**	**200,000**	**161,000**	**220,000**	90,000	**80,100**	**74,700**	**52,300**	**36,600**	**107,000**	**41,900**	**97,900**	**62,000**	**116,000**	**236,000**	**276,000**	**276,000**	**270,000**	**277,000**	**138,000 JH**	**174,000**	**284,000**	**294,000**	20,000 ST
Thallium [e]	U	U	U	U	NR	**2.0 B**	NR	U	U	NR	**7.5 B**	**3.6 B**	**10.1 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	0.64 B	2.3 B	1.40 B	2.40 B	2.8 B	5.8 B	0.39 B	1.2 B	U	1.4 J	U	U	----
Zinc [e]	U	U	U	11 B	NR	9.3	NR	U	11.1 B	NR	13.4 B	11.7 B	13.3 B	11.0 B	23.7 B	U	U	10.8 B	10.8 B	U	15.3 B	33.8 J	UJ	12	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	U	U	U	U	U	U	U	U	U	UJ	U	NS	U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	246 B	281 B	NR	121 B	201 B	120 B	133 B	122	183 B	385 B	369	369 B	365 B	360 B	256	329 JH	390	410	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	0.042	NR	U	NS	NR	33	U	0.10	0.057	U	U	NS	U	U	U	U	U	U	U	U	50 ST

QUALIFIERS:

U: Analyzed for but not detected

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J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-5S																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	U	U	U	630	NR	775	NR	16.8 B	87.9 B	NR	U	483	U	508	293	67 B	U	U	U	U	21.2 B	U	U	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	**5.5 B**	U	U	U	U	U	3 ST
Arsenic [e]	U	U	U	U	NR	U	NR	2.5 B	3 B	NR	U	U	U	U	5.9 B	U	U	U	U	4.6 B	U	U	U	U	U	25 ST
Barium [e]	U	U	U	U	NR	20 B	NR	16.9 B	37.9 B	NR	25.6 B	U	16.0 B	19.6 B	25.6 B	11.00 B	7.2 B	9.2 B	9.2 B	18.1 B	15 B	6.7	5.4	5.2	4.6	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	U	**30**	U	U	0.5 B	0.52 B	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
Calcium	160,000	160,000	150,000	160,000	156,000	180,000	250,000	150,000	137,000	177,000	173,000	124,000	147,000	159,000	162,000	160,000	164,000	163,000	163,000	134,000	138,000	162,000 JL	174,000	160,000	147,000	----
Chromium [e]	U	U	U	U	NR	4.0 B	NR	0.73 B	U	NR	0.54 B	2 B	U	U	1.7 B	U	U	U	U	1.3 B	1.6 B	U	U	U	U	50 ST
Cobalt [e]	U	U	U	U	NR	0.90 B	NR	0.70 B	1.3 B	NR	1.80 B	4.1 B	3.2 B	1.7 B	87.4	23.2 B	6.1 B	1.5 B	1.5 B	8.9 B	16.3 B	U	U	U	U	----
Copper [e]	U	U	U	U	NR	7.0	NR	U	U	NR	9.0 B	1.8 B	U	U	50.8	9.0 B	U	U	U	9.4 B	11.5 B	U	U	U	U	200 ST
Iron	U	U	U	**920**	79 B	**27,000**	**470**	145 B	119 B	39.8 B	28.1 B	**1,860**	102	**665**	**2570**	278	116 B	U	**930**	U	186 B	U	80.8	U	UB	300 ST ^
Lead	U	U	U	U	5 B	U	0.60 B	U	U	U	U	1.6 B	U	U	U	U U	U	U	U	U	U	U	U	U	U	25 ST
Magnesium	**32,000**	**31,000**	**28,000**	**29,000**	**32,200**	**36,000**	**38,000**	**30,600**	**25,800**	**32,400**	**33,100**	**26,200**	**30,800**	**32,100**	**30,900**	**32,200**	**33,500**	**32,900**	**31,500**	**26,400**	**27,200**	35,000	33,300	33,000	30,800	3,500 GV
Manganese	64	65	27	66	38	39	62	49.0 B	94.5	121.0	77.4	56.7	66.1	249	**656**	192	109	55.7 U	55.7	24.6 B	79	46.3	55.5	43	41 B	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U U	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	U	U	U	U	NR	7.5	NR	3.7 B	2.4 B	NR	1.2 B	8.3 B	2.2 B	1.7 B	8.0 B	2.8 B	1.0 B	1.5 B	2.9 B	4.6 B	4.7 B	UJ	U	U	U	100 ST
Potassium	U	5,800	6,400	5,300	5,290	7,900	5,400	5,960	4,660	3,880	5,150	7,080	5,190	4,970	5,480	5,610	5,450	6,450	6,020	4,340	4,920	5,400	4,920	5,600	5,400	----
Selenium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	**29.4 B**	**18.2** B	U	U	U U	U	**12.3 B**	U	**13 B**	U	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	7.2 B	2.4 B	NR	U	U	U	U	U	U U	U	U	U	U	U	U	U	U	U	50 ST
Sodium	**22,000**	17,000	18,000	18,000	18,500	**66,000**	19,000	17,800	16,700	**21,300**	**20,700**	15,600	**66,200**	15,300	16,600	16,500	14,500	14,900	14,900	15,800	13,700	13,100	12,200	12,500	12,000	20,000 ST
Thallium [e]	U	U	U	U	NR	**2.0 B**	NR	U	**5.5 B**	NR	U	**3.7 B**	U	U	U	U U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	0.71 B	U	0.69 B	2.5 B	U U	U	U	1.2 B	0.16 B	0.28 B	U	U	U	U	----
Zinc [e]	U	U	U	34	NR	34	NR	3.7 B	2.4 B	NR	12.2 B	3.6 B	14.4 B	18.3 B	51.4	15.9 B	8.6 B	5.8 B	5.8 B	9.1 B	25.7 B	1.9 J	U	2 J	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	2.6 B	U	U	U	U	U	U	U	U	U	U	NS	U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	122 B	151 B	NR	88.3 B	99.8 B	91.9 B	59.2 B	108	103 B	104 B	97 B	97 B	105 B	96.1 B	72.8 JL	73.4	81	77	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	34 H	NS	NR	U	0.048	0.050	U	U	U	NS	U	U	U	U	4 J	4 J	10	11	50 ST

QUALIFIERS:

U: Analyzed for but not detected

UB: Qualified as non detect due to blank result

J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

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NR: Not required for routine parameter sampling

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ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-6S																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Dec-03	Aug-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	U	76 B	U	U	NR	140	NR	50.5 B	346	NR	U	90.50 B	56.0 U	204	162 B	720	80.4 B	U	U	U	U	U	U	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	**6 B**	1.6 JH	UB	U	U	3 ST
Arsenic [e]	U	**37**	**69**	U	NR	**86**	NR	**28.0**	**78.1**	NR	U	**42.5**	U	14.6	**84.7**	**28**	**43.7**	**39.4**	23	6.1 B	U	U	7.6 J	18	24	25 ST
Barium [e]	U	740	**1,200**	U	NR	**1,300**	NR	386	983	NR	153 B	839	108 B	163 B	491	106 B	121 B	191 B	191 B	163 B	169 B	68.2	75	59	66	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	3 GV
Cadmium	U	U	U	U	U	3.0	U	0.17 B	U	0.92 B	0.26 B	0.22 B	0.31 B	U	U	U	U	U	U	U	U	0.8 J	1.1 J	U	U	5 ST
Calcium	200,000	320,000	280,000	180,000	197,000	370,000	280,000	217,000	291,000	199,000	160,000	268,000	153,000	151,000	162,000	149,000	149,000	131,000	131,000	160,000	166,000	138,000 JL	147,000	143,000	138,000	----
Chromium [e]	U	U	12	U	NR	24	NR	30.0	7.5 B	NR	0.68 B	9.9 B	U	U	4.9 B	**76.2**	6.9 B	1.4 B	1.4 B	0.36 B	U	U	U	U	U	50 ST
Cobalt [e]	U	U	U	U	NR	23	NR	8.3 B	14.9 B	NR	1.1 B	19.2 B	8.0 B	5.5 B	10.3 B	2.8 B	6.7 B	3.4 B	3.4 B	7.2 B	8.5 B	4.2 J	2.8 J	0.63 J	0.63 J	----
Copper [e]	U	U	U	U	NR	26	NR	U	U	NR	10.4 B	U	U	U	5.2 B	5 B	U	U	U	U	2 B	2.8 J	4.4 J	U	U	200 ST
Iron	**2,700**	**19,000**	**33,000**	71 B	299	**47,000**	U	**9,520**	**14,200**	96.4 B	42.0 B	**10,100**	**1,430**	**5,290**	**10,200**	**8,370**	**7,550**	**5,180**	**4,050**	275	**316**	13.5 J	27.5 J	**1,100**	**5,100**	300 ST ^
Lead	U	7.7	10	U	U	7.8	0.20 B	U	12.80	U	U	7.9 B	U	U	18.5	4.3 B	U	U	U	U		U	U	U	U	25 ST
Magnesium	**30,000**	**87,000**	**130,000**	**26,000**	**29,800**	**130,000**	**40,000**	**40,500**	**87,400**	**31,900**	**25,500**	**79,900**	**25,300**	**24,400**	**44,200**	**24,700**	**25,500**	**26,000**	**25,900**	**30,900**	**30,600**	22,300	20,700	21,500	21,100	3,500 GV
Manganese	**1,600**	**7,300**	**6,400**	240	**741**	**6,000**	**620**	**4,210**	**5,690**	**1,400**	**813**	**4,870**	**982**	**5,910**	**5,030**	**1,810**	**2,640**	**2,560**	**2,560**	**3,990**	**4,410**	147	245	**1,200**	**1,300**	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.7 ST
Nickel [e]	**180**	**130**	**110**	U	NR	**180**	NR	35.8 B	**114**	NR	9.1 B	92.3	9.7 B	10.7 B	59	16.4 B	16.5 B	23.8 B	22.8 B	34.5 B	34.4 B	9.4 J	8.6	2.4 J	2.8 J	100 ST
Potassium	8,900	130,000	270,000	9,600	7,020	210,000	16,000	34,900	150,000	11,100	10,600	139,000	7,200	12,100	88,500	16,100	20,600	37,700	30,700	32,400	32,200	7,700	8,640	6,500	7,100	----
Selenium [e]	U	U	U	U	NR	6.3	NR	U	U	NR	U	**46**	**18.7** B	U	U	U	**17 B**	U	U	**11.7 B**	9 B	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	12.7 B	3.0 B	NR	U	U	U	U	U	U	U	U	U	2.8 B	3 B	U	U	U	U	50 ST
Sodium	**110,000**	**660,000**	**980,000**	**120,000**	**123,000**	**1,200,000**	**210,000**	**285,000**	**862,000**	**166,000**	**126,000**	**927,000**	**92,500**	**102,000**	**495,000**	**124,000**	**128,000**	**205,000**	**205,000**	**211,000**	**194,000**	**53,800**	**51,700**	**40,300**	**43,600**	20,000 ST
Thallium [e]	U	U	U	U	NR	**0.70** B	NR	U	U	NR	**3.9 B**	**24**	**4.4 B**	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	16	NR	1.3 B	10.7 B	NR	U	14.9	1.6 B	1.2 B	6.2 B	3 B	1.4 B	2.9 B	5.7 B	U	U	U	U	U	U	----
Zinc [e]	U	13 B	10 B	U	NR	30	NR	4.0 B	33.8 B	NR	8.5 B	10.7	70.3 B	14.8 B	58.6	17 B	18 B	8.9 B	8.9 B	6.5 B	17.9 B	8.8	6.5	U	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	NA	U	4.9 B	U	U	U	8.3 B	U	U	U	U	U	NS	U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	296 B	879	NR	89.5 B	719	70.3 B	71.9 B	553	94 B	158 B	272 B	272 B	257 B	224 B	47.2 JL	56	46	49	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	0.23	0.058	0.034	U	U	NS	U	U	U	U	8 J	8 J	10	10	50 ST

QUALIFIERS:

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JH: Estimated value bias high

JL: Estimated value bias low

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NA: Not applicable

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---: Not established

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Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-7S																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	U	U	300	U	NR	40 B	NR	142 B	91.8 B	NR	U	845	U	618	3060	375	1710	U	200 U	16.4 B	4,490	U	66	U	U	----
Antimony [e]	U	U	U	U	NR	U	NR	U	U	NR	1.7 B	U	U	**5.5 B**	U	U	U	U	20 U	U	**5.8**	2.2 JH	U	U	U	3 ST
Arsenic [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	4.4 B	U	U	20 U	16 B	**26.3**	U	U	U	U	25 ST
Barium [e]	U	U	U	U	NR	80 B	NR	23.0 B	82.6 B	NR	75.7 B	31.9 B	71.2 B	59 B	122 B	56 B	60.5 B	59.2 B	59.2 B	552	**1,040**	33.8	33.2	38	38	1,000 ST
Beryllium [e]	U	U	U	U	NR	U	NR	0.25 B	U	NR	U	U	U	U	U	U	U	U	5 U	U	0.67	U	U	U	U	3 GV
Cadmium	U	U	U	U	U	0.30 B	U	U	0.5 B	0.66 B	0.19 B	U	0.33 B	U	U	U	U	U	5 U	U		U	U	U	U	5 ST
Calcium	140,000	140,000	180,000	140,000	130,000	#######	160,000	165,000	121,000	126,000	130,000	140,000	134,000	108,000	99,600	127,000	103,000	97,500	97,500	110,000	120,000	150,000 JL	158,000	148,000	150,000	----
Chromium [e]	U	U	U	U	NR	1.0 B	NR	0.62 B	U	NR	0.43 B	3.3 B	U	U	5.9 B	2.3 B	3.6 B	U	20 U	U	29.8	U	8.9 J	U	1.2 J	50 ST
Cobalt [e]	U	U	U	U	NR	0.30 B	NR	0.97 B	1.3 B	NR	1.3 B	4 B	1.3 B	0.83 B	6 B	2.5 B	1.4 B	U	50 U	28.4 B	45.9	U	U	U	U	----
Copper [e]	U	U	U	U	NR	4.0 B	NR	10.8 B	U	NR	10.3 B	U	U	U	4.2 B	U	4.8 B	U	30 U	U	31.2	U	U	U	U	200 ST
Iron	U	U	**360**	63 B	66 B	**27,000**	**460**	200	93	64.7 B	104 B	**1,510**	95.7 B	**806**	**3560**	**837**	**1460**	U	**301**	U	**11,800**	141	234	79	170	300 ST ^
Lead	U	U	U	U	U	U	U	U	U	U	U	2.9 B	U	2.3 B	U	U	U	U	10 U	U	6.7	U	U	U	U	25 ST
Magnesium	**23,000**	**22,000**	**26,000**	**21,000**	**21,000**	**220,000**	**19,000**	**24,000**	**19,900**	**20,200**	**20,300**	**21,800**	**20,100**	**16,300**	**17,300**	**18,200**	**18,100**	**17,600**	**17,200**	**20,600**	**21,400**	18,100	17,000	16,700	16900	3,500 GV
Manganese	**1,500**	**880**	44	**310**	**373**	**750**	**710**	104	**1,200**	**957**	**1,670**	181	**1,180**	**1,540**	**5,930**	**2,070**	**924**	**1,300**	**1,300.0**	**27,400**	**43,600**	23.4	44.9	47	50	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	0.04 B	U	U	0.2 U	U	U	U	U	U	U	0.7 ST
Nickel [e]	U	U	U	U	NR	5.4	NR	3.7 B	3.3 B	NR	6.6 B	8.2 B	2.5 B	3.5 B	7.6 B	6.2 B	4.8 B	4.7 B	3.8 B	31.2 B	48.4	UJ	3.2 J	U	U	100 ST
Potassium	U	U	U	U	2,400 B	39,000	2,700	2,700	3,400	2,300	2,210	3,240	2,550	1,870	3,510	2,460	2,670	2,860	3,010	3,590	4,670	853	782	760	920	----
Selenium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	**42.1**	**15.9 B**	U	U	U	U	**13.2 B**	**13.3 B**	13.4 B	25.9	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	U	NR	8.4 B	1.1 B	NR	2.2 B	U	U	U	6.90	U	U	U	30 U	8.2 B	10.6	U	U	U	U	50 ST
Sodium	14,000	12,000	14,000	13,000	14,300	**140,000**	8,500	12,900	8,400	11,600	11,400	12,700	6,540	5,080	3,970	4,470	4,080	3,890	3,890	8,370	6,710	3,090	2,700	2,800	2,900	20,000 ST
Thallium [e]	U	U	U	U	NR	**2.0 B**	NR	U	**1.2**	NR	**7.7 B**	**5.1 B**	**6.1 B**	U	U	U	U	U	20 U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	0.84 B	U	2.4 B	6.7 B	1.9 B	2.9 B	U	3.6 B	U	39	U	U	U	U	----
Zinc [e]	U	U	10 B	U	NR	3.0 B	NR	3.3 B	5.2 B	NR	13.7 B	12.1 B	11.9 B	12.2 B	26.5 B	8 B	10.4 B	9.2 B	9.2 B	U	62.3	3.2 J	1.8 J	3 J	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	U	U	U	U	U	U	7.5 U	U	U	UJ	U		U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	86.9 B	94 B	NR	43.5 B	54 B	43.8 B	17.6 B	54.5 B	58 B	60.1 B	25.5 B	25.5 B	63.3 B	58.6	14.6 JL	11.5 J	15 J	UB	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	35 H	NS	NR	47	0.25	0.14	0.062	0.076	U	NS	U	U	U	U	2 J	2 J	11	11	50 ST

QUALIFIERS:
U: Analyzed for but not detected
UB: Qualified as non detect due to blank result
J: Estimated value or limit
JH: Estimated value bias high
JL: Estimated value bias low
B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
^: The combined standard for iron and manganese is 500 ug/l
Indicates value exceeds standard or guidance value
[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics

Sample Identification	MCK-7D																								NYSDEC Groundwater Standard
Date of Collection	Mar-02	Jun-02	Oct-02	Feb-03	May-03	Aug-03	Dec-03	Jun-04	Sep-04	Dec-04	Feb-06	Sep-07	Jan-09	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	
Type of Sample	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	U	U	U	U	NR	420	NR	154 B	429	NR	U	1690	U	203	1,930	12,800	4,590	U	200 U	U	4,670	U	1370	U	U	----
Antimony [e]	U	U	U	U	NR	1.0 B	NR	U	U	NR	U	U	U	**4.6 B**	U	U	U	U	20 U	**5.6 B**	U	U	U	U	U	3 ST
Arsenic [e]	U	U	U	U	NR	0.10 B	NR	**50.1**	3.9 B	NR	U	U	U	U	U	7.70 B	U	U	11.6 B	U	4.4 B	U	U	U	U	25 ST
Barium [e]	U	U	U	U	NR	20 B	NR	28.7 B	30.8 B	NR	30.8 B	38.4 B	33.9 B	30.9 B	31.9 B	59.90 B	38.6 B	16.7 B	16.7 B	20.3 B	124 B	13.8	18.2	19	19	1,000 ST
Beryllium [e]	U	U	U	U	NR	0.20 B	NR	0.23 B	U	NR	U	U	U	U	U	0.460 B	U	U	5 U	U	0.78 B	U	U	U	U	3 GV
Cadmium	U	U	U	U	U	0.74	U	0.17 B	0.38 B	0.53 B	U	U	U	U	U	1.80 B	U	U	5 U	U	U	U	U	U	U	5 ST
Calcium	150,000	170,000	190,000	160,000	153,000	#######	200,000	143,000	152,000	156,000	153,000	154,000	137,000	129,000	131,000	129,000	142,000	134,000	134,000	129,000	141,000	133,000 JL	141,000	146,000	138,000	----
Chromium [e]	U	**6,900**	U	U	NR	9.1	NR	0.48 B	1.8 B	NR	0.55 B	4.5 B	U	U	4.6 B	18.20 B	6.7 B	1.1 B	1.1 B	2 B	12.1 B	U	4.7 J	U	U	50 ST
Cobalt [e]	U	38 B	U	U	NR	0.80 B	NR	2.2 B	1.3 B	NR	0.62 B	95.3	1.2 B	2.2 B	5.8 B	6.10 B	5 B	U	50 U	1.2 B	39.2 B	U	U	U	U	----
Copper [e]	U	73	U	U	NR	4.0 B	NR	8.5 B	U	NR	13.0 B	1.8 B	U	U	U	12.70 B	7 B	U	30 U	U	27 B	U	U	U	U	200 ST
Iron	70 B	**31,000**	**390**	58 B	62 B	**30,000**	**1,300**	**9,420**	**667**	172 B	U	**3,890**	66.2 B	**305**	**2550**	**10,700**	**3,910**	U	**15,000**	U	**5,840**	U	**1480**	29 J	UB	300 ST ^
Lead	U	13	U	U	5 B	1 B	U	U	0.85 B	U	U	3.5 B	U	U	U	10.80	U	U	10 U	U	U	U	U	U	U	25 ST
Magnesium	**25,000**	**27,000**	**34,000**	**25,000**	**25,600**	**280,000**	**25,000**	**31,200**	**25,100**	**23,900**	**23,600**	**27,700**	**22,000**	**19,800**	**21,000**	**22,300**	**22,000**	**21,800**	**24,400**	**25,000**	**26,900**	18,000	16,900	20,700	19600	3,500 GV
Manganese	170	**590**	**570**	43	31 B	180	10 B	**736**	111	50.5	224	**3,970**	83.2	110	**1,450**	**4,220**	**740**	12.5 B	12.5 B	12.8 B	**4,420**	87.4	**580**	**310**	**370**	300 ST ^
Mercury [e]	U	U	U	U	NR	U	NR	U	U	NR	U	U	U	U	U	0.12 B	U	U	0.2 U	U	0.1 B	U	U	U	U	0.7 ST
Nickel [e]	U	**3,600**	U	U	NR	5.0	NR	7.6 B	3.3 B	NR	0.92 B	17.6 B	1.8 B	1.1 B	8.4 B	30.40 B	10.3 B	0.95 B	41.2 B	1.8 B	68.9	2 J	6	2.1 J	1.8 J	100 ST
Potassium	U	5,100	9,200	U	3,320	70,000	2,700	10,300	4,550	2,260	2,170	7,940	2,070	2,000	2,880	4,630	3,400	3390	6350	6,670	7,770	1,410	1,620	2,000	1,800	----
Selenium [e]	U	U	U	U	NR	U	NR	U	U	NR	U	**35.6**	**18.1 B**	U	U	U	U	18.2 B	30 U	U	9.9 B	U	U	U	U	10 ST
Silver [e]	U	U	U	U	NR	0.50	NR	7.1 B	2.0 B	NR	1.7 B	U	U	U	U	U	U	U	30 U	U	U	U	U	U	U	50 ST
Sodium	15,000	15,000	**21,000**	15,000	14,800	**200,000**	11,000	12,300	13,600	15,300	14,200	16,800	11,200	9,090	10,300	9,390	8,660	9,240	9,240	17,900	11,700	4,210	3,710	5,600	5,500	20,000 ST
Thallium [e]	U	U	U	U	NR	0.40 B	NR	U	**5.4 B**	NR	**3.5 B**	**17.6 B**	U	U	U	U	U	U	20 U	U	U	U	U	U	U	0.5 GV
Vanadium [e]	U	U	U	U	NR	0.90 B	NR	3.8 B	1.0 B	NR	U	3.6 B	U	0.58 B	4.2 B	16.00 B	6.7 B	U	24.2 B	U	8.1 B	U	3.6 J	U	U	----
Zinc [e]	U	11 B	U	U	NR	18	NR	12.8 B	3.5 B	NR	11.0 B	7.4 B	14.5 B	10.2 B	21 B	28.70 B	14.5 B	4.9 B	4.9 B	U	52	28	5.9	4 J	U	2,000 GV
Cyanide, total [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	U	U	U	U	U	U	U	7.5 U	U	U	UJ	U		U	200 ST
Boron [e]	NS	NR	NR	NR	NR	NS	NR	188 B	121 B	NR	64.9 B	127 B	52.4 B	23.7 B	60 B	57 B	75.4 B	38.8 B	38.8 B	176 B	129 B	19.6 JL	21.3 J	46	UB	1,000 ST
Chromium-VI [e]	U	NR	NR	NR	NR	U	NR	U	NS	NR	U	0.034	0.14	0.058	0.041	U	NS	U	U	U	U	UJ	UJ	5 J	5 J	50 ST

QUALIFIERS:

U: Analyzed for but not detected

UB: Qualified as non detect due to blank result

J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection limit

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1D: Groundwater Sample Results - Inorganics													NYSDEC
Sample Identification	PZ-2							PZ-4					Groundwater
Date of Collection	Apr-10	Oct-11	Jan-13	Jun-14	Jul-15	Jul-15	May-19	Jan-09	Nov-16	Nov-16	Apr-18	Apr-18	Standard
Type of Sample	Total	Total	Total	Total	Dissolved	Total	Total	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum [e]	2,240	3,030	39,600	31,300	10800	412	800	728	283	549	352	455	----
Antimony [e]	**6.4 B**	**9.4 B**	**31.50**	**25.7**	**15.6 B**	**15.6 B**	U	U	U	**5.2 B**	**4.2 JH**	UB	3 ST
Arsenic [e]	4.5 B	5.9 B	23.4	17.1 B	7.5 B	20 U	9 J	8.8 B	10.2 B	12.2 B	16	20.9	25 ST
Barium [e]	977	982	**1,920**	**1,860**	**1,200**	883	**1,500**	156 B	140 B	159 B	150	132	1,000 ST
Beryllium [e]	U	U	0.760 B	0.55 B	U	5 U	U	U	U	U	U	U	3 GV
Cadmium	1 B	1.3 B	**19.5**	**14.7**	**5.5**	5 U	0.51 J	0.33 B	U	U	0.5 J	1 J	5 ST
Calcium	43,800	69,900	85,400	87,200	56700	44300	35,000	26,100	18,100	19,300	20,100 JL	19,200	----
Chromium [e]	7.6 B	10.5 B	**75.9**	**57.9**	28.5	6.4 B	7.1	35	**56.9**	**65.8**	**72.4**	**67.8**	50 ST
Cobalt [e]	10.6 B	7.8 B	24.6 B	21.6 B	14 B	14 B	13	26.7 B	46.2 B	47 B	47.1	42.3	----
Copper [e]	28.7 B	69	**491**	**451**	183	183	20	5.6 B	6 B	11.9 B	6.5	8.2 J	200 ST
Iron	**7,220**	**12,200**	**80,000**	**66,200**	**26,500**	**26,500**	**5,100**	**7,200**	**6,140**	**7,080**	**7,060**	**7,580**	300 ST ^
Lead	**163**	**248**	**2,280**	**2,080**	**631**	**631**	**41**	**79.6**	**168**	**164**	**49.8**	**42.4**	25 ST
Magnesium	**136,000**	**143,000**	**133,000**	**131,000**	**116,000**	**111,000**	**116,000**	**68,100**	**57,500**	**57,600**	**65,000**	**60,000**	3,500 GV
Manganese	121	180	**1,300**	**1,080**	**423**	138	49	106	30.8 B	57	18.8	17.8	300 ST ^
Mercury [e]	U	U	U	0.032 B	U	0.2 U	U	U	U	U	U	U	0.7 ST
Nickel [e]	**101**	95.3	**146**	**147**	**115**	95	**110**	**133**	**251**	**251**	**244 J**	222	100 ST
Potassium	275,000	297,000	268,000	237,000	293,000	279,000	272,000	517,000	640,000	639,000	706,000	658,000	----
Selenium [e]	U	U	U	U	**14 B**	30 U	U	9.6 B	U	U	5.1 J	U	10 ST
Silver [e]	U	U	8 B	U	U	30 U	U	U	5.3 B	5 B	U	U	50 ST
Sodium	**1,780,000**	**1,790,000**	**1,710,000**	**1,750,000**	**1,830,000**	**1,830,000**	**1,680,000**	**1,680,000**	**2,490,000**	**2,490,000**	**2,670,000**	**2,600,000**	20,000 ST
Thallium [e]	U	U	U	U	U	20 U	U	**7.2 B**	U	U	U	U	0.5 GV
Vanadium [e]	4.3 B	5.6 B	43 B	33.6 B	16.6 B	3.3 B	2.9 J	U	6.6 B	7 B	7.4	5.5 J	----
Zinc [e]	213	296	**3,220**	**2,620**	807	807	63	193	116	240	81.8	114	2,000 GV
Cyanide, total [e]	U	U	U	U	14.3 B	11.8 B	9.5 J	18.7 B	10.3 B	8.3 B	11 J	14.6	200 ST
Boron [e]	**2,520**	**2,690**	**2,900**	**2,220**	**2,400**	**2,400**	**2,200**	**1,830**	**1,970**	**1,970**	2,630 JL	**2,340**	1,000 ST
Chromium-VI [e]	0.24	U	U	NS	U	U	8.8 J	0.58	U	U	**190 J**	**175 J**	50 ST

QUALIFIERS:

U: Analyzed for but not detected

UB: Qualified as non detect due to blank result

J: Estimated value or limit

JH: Estimated value bias high

JL: Estimated value bias low

B: Concentration is between the instrument detection limit and contract required detection li

NOTES:

NS: Not sampled for this analyte

NR: Not required for routine parameter sampling

NA: Not applicable

GV: Guidance Value

ST: Standard

---: Not established

^: The combined standard for iron and manganese is 500 ug/l

Indicates value exceeds standard or guidance value

[e] Expanded analyte

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-1S																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**11/16/16**	**04/03/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	9.60	6.75	7.40	8.94	6.60	7.35	8.01	6.89	6.90	8.02	7.63	8.60	7.98	8.99	7.25	7.19	6.75	7.05	6.78	7.43	6.08	---
Conductivity (ms/cm)	2.120	2.030	3.290	2.530	1.390	1.810	2.110	1.590	1.180	1.610	1.080	0.163	0.820	0.641	1.090	1.140	1.090	1.740	2.040	0.731	0.790	---
Temperature (^{O}C)	6.45	17.65	15.60	4.47	10.57	19.42	13.46	15.43	16.50	8.93	5.10	16.10	7.65	9.6	17.81	6.31	16.18	19.21	12.15	5.88	12.08	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	none	None	---
pH (standard units)	6.68	7.66	6.94	7.43	6.94	5.02	6.94	6.76	7.24	6.84	7.97	7.09	8.15	7.75	7.59	7.64	7.16	8.63	6.94	5.25	6.74	---
Eh (mV)	226.00	60.00	11.00	78.00	176.00	79.00	41.00	NC	NC	NC	NS	NM	120.00	NC	NC	76.10	135.00	17.00	181.00	182.00	90.40	---
Dissolved Oxygen (mg/l)	15.50	5.39	8.71	10.15	6.57	7.72	13.50	6.29	3.74	9.20	0.11	3.13	9.70	10.05	7.73	14.45	9.22	5.34	8.90	2.85	0.39	---
Field Observations	clear	clear	clear	brown / red	clear	NS	clear	clear	turbid brown	clear	clear	cloudy	clear	clear	clear	clear	NC	clear	clear	clear	clear	---
Turbidity (NTUs)	194	11.60	10.90	705.00	1	38	76.60	105	>999	<10	<10	19.50	18.60	144	16.40	76.10	94.90	29.80	185.00	1.00	5.0	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**11/16/16**	**04/03/18**	**05/22/19**	**NYSDEC Groundwater Standard**
Wet/General Chemistry																						
TKN (as N) (mg/l)	1.4	U	1.1	1.1	U	U	U	U	0.54	U	0.49	1.3	1.0	0.7	0.420	NS	0.56	332 D	3.71	0.49	0.58 J	---
Ammonia-N (mg/l)	U	0.5	0.43	0.21	0.31	0.49	U	0.46	0.16	U	0.45	0.23	0.3	U	U	NS	0.2	1.47	**3.22**	0.08	0.095	2 ST
Nitrate-Nitrite/N (mg/l)	NS	7.1	1.1	3	1.1	4.2	U	0.16	0.97	0.06	0.17	U	U	0.07 BJ	0.057 BJ	1.90	0.4	0.304	0.04 BJ	2.05	1 J	10ST
COD (mg/l)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	ND	15 J	19 J	3.76 J	UB	---
BOD-5 (mg/l)	U	4	10	10	U	U	U	U	U	U	U	U	U	69	U	NS	45	3 U	9.0	UJ	U	---
TOC (mg/l)	13	120	12	U	U	U	8.5	U	17.0	U	U	26	U	U	2.8 J	4.1 J	6.4 J	6.6	7.46	2.85	2.6	---
TDS (mg/l)	1,400	1,300	1,700	1,500	1,200	1,200	1,200	1,000	1,000	1,100	790	790	690	560	690	720	865	1200	1,270	502	526	---
Sulfates (mg/l)	**340**	**280**	250	**750**	**450**	**500**	**330**	**340**	**520**	**320**	**270**	160	200	180	160	190	180	**332 D**	130	95 J	141	250 ST
Alkalinity-CaCO3 (mg/l)	NS	580	980	560	480	500	590	410	410	490	380	400	310	270	430	410	520	620	590	411	267	---
Phenols (mg/l)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	**0.006 B**	U	UB	0.001 ST
Chloride (mg/l)	110	130	**300**	69	31	58	45	15	22	18	25	50	34	15	18 B	6.8 B	37	105 D	53 B	21.5	27.5	250 ST
Bromide (mg/l)	U	**2.6**	0.68	U	0.41	NS	0.24	U	0.94	0.18	0.10	0.14	U	U	0.14	U	0.34	1.08	0.52	U	U	2 GV
Hardness(mg/l)*	793	640	320	822	778	968	23000	730	700	740	570	580	530	410	610	620	610	750	650	428	462	---
Color (CoPt)	40	NR	NR	NR	NR	10	NR	20	NS	NS	10	10	15	U	20	U	U	15	125	10	10	---

QUALIFIERS:
U: Analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution
J: Estimated value or limit

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-1D																					NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**11/17/16**	**04/03/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	10.60	7.10	7.70	10.14	6.90	7.55	9.71	7.19	7.21	9.52	9.47	9.66	9.67	10.26	7.51	9.10	6.80	7.15	7.06	8.48	6.48	---
Conductivity (ms/cm)	35.000	4.330	5.190	3.070	2.710	3.950	2.770	3.130	2.470	1.920	1.560	0.426	0.867	1.180	1.590	1.450	2.050	2.190	7.340	1.320	1.190	---
Temperature (^{O}C)	6.65	16.51	14.10	6.17	10.85	18.76	13.51	14.25	16.90	9.29	6.40	16.10	4.29	9.90	17.37	8.34	14.45	19.20	13.22	8.02	13.18	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none		none	---
pH (standard units)	6.30	7.82	7.08	7.60	7.26	5.04	7.10	7.01	7.25	7.07	7.95	7.23	7.62	7.56	7.87	7.09	6.88	8.39	6.97	6.27	6.99	---
Eh (mV)	265.00	67.00	42.00	69.00	168.00	30.00	-10.00	NC	NC	NC	NS	NM	80.00	NC	NC	131.00	112.00	-7.00	0.00	-54.00	49.00	---
Dissolved Oxygen (mg/l)	10.48	5.39	9.05	9.13	10.56	5.45	10	11.24	6.86	10.14	0	2.37	8.14	10.23	8.14	10.09	10.13	7.02	10.38	0	0.36	---
Field Observations	clear	clear	clear	clear	clear	NS	clear	clear	clear	clear	clear	clear	clear	clear	clear	clear	NC	clear	clear		NC	---
Turbidity (NTUs)	58.30	16.70	4.40	103	36	42	35.10	174	<10	<10	0	45.40	22.00	116	12.70	66.30	38.90	38.40	138.00	12.7	12.55	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**11/17/16**	**04/03/18**	**05/22/19**	**NYSDEC**
Wet/General Chemistry																						**Groundwater Standard**
TKN (as N) (mg/l)	2.4	2.0	1.5	2.4	1.9	1.4	1.7	2.7	2.7	U	0.93	4.8	1.3	10.1	5.74	NS	9.24	7.77	8.26	9.1	8.6 J	---
Ammonia-N (mg/l)	0.9	1.2	0.80	1	1	1.1	0.48	1.70	0.54	0.47	U	**4.4**	1.1	**8.4**	**4.34**	NS	**8.61**	**7.07**	**9.66**	**8.72**	**8.6**	2 ST
Nitrate-Nitrite/N (mg/l)	NS	0.15	U	0.77	0.72	U	0.56	0.09	0.85	0.046	0.28	U	U	0.27 B	0.063 BJ	0.052 J	U	0.1 U	U	U	U	10ST
COD (mg/l)	U	43	43	26	37	29	49	30	U	U	U	21	U	U	U	U	12 J	32	38 J	33.4	44.3	---
BOD-5 (mg/l)	U	6	16	6	5	4	10	U	U	U	U	U	U	81	U	NS	56	U	U	6 J	U	---
TOC (mg/l)	22	46	20	11	11	12	11	U	8.2	U	U	22	U	U	5.1 J	4.7 J	12	8	9.40	4.7	5.3	---
TDS (mg/l)	2,000	2,700	2,900	2,000	1,900	2,300	1,900	1,900	1,800	1,200	930	1,500	690	760	1,100	930	1,490	1510	1,480	1150	1020	---
Sulfates (mg/l)	130	120	220	170	160	180	150	240	**440**	**270**	230	170	160	140 B	170	160	**390**	**412 D**	190	**345 J**	**290**	250 ST
Alkalinity-CaCO3 (mg/l)	NS	1,000	960	1,000	1,200	1,100	780	900	920	600	510	710	430	430	500	550	600	570	660	556	456	---
Phenols (mg/l)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.011	0.001 ST
Chloride (mg/l)	**420**	**830**	**1,100**	**350**	**340**	**640**	**350**	**310**	**320**	56	190	**280**	38	37	120 B	110 B	200	215 D	100 B	107	127	250 ST
Bromide (mg/l)	U	**2.8**	1.60	U	U	NS	1	0.37	1.50	0.27	1.30	0.86	U	U	0.37	0.7	1.1	0.756	0.48	U	0.8	2 GV
Hardness(mg/l)*	256	345	325	369	300	NS	4,200	380	320	530	600	420	500	450	410	500	700	660	590	494	504	---
Color (CoPt)	25	NR	NR	NR	NR	13	NR	23	NS	NS	10	U	10	U	25	30	20	20	75	10	25	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-2S																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	10.40	6.40	6.72	10.10	6.30	6.80	9.66	6.69	6.74	9.20	9.30	7.47	9.65	10.50	6.69	9.27	5.59	6.12	6.02	8.5	5.56	---
Conductivity (ms/cm)	9.100	6.100	7.520	8.990	4.950	5.060	5.750	4.380	2.920	4.160	2.840	0.459	2.780	2.420	2.050	2.780	-74.000	6.250	4.970	4.830	5.279	---
Temperature (^{O}C)	7.24	16.45	14.30	7.02	10.35	18.57	12.94	13.98	16.40	8.03	6.80	19.20	6.14	10.9	17.30	8.48	19.11	19.32	13.01	6.79	10.13	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	none	none	---
pH (standard units)	7	8.20	6.94	7.34	7.16	5.06	7.17	6.97	7.19	7.05	5.13	7	7.97	7.50	7.27	7.4	6.66	8.54	7.06	3.75	7.21	---
Eh (mV)	-65.00	-105.00	-58.00	-92.00	-103.00	-104.00	-83.00	NC	NC	NC	NS	NM	35.00	NC	NC	-24.00	-13.00	228.00	-131.00	26.00	-127.30	---
Dissolved Oxygen (mg/l)	14.06	5.67	9.17	9.35	6.57	6.69	10	6.09	1.79	8.52	0.68	2.38	7.97	10.63	7.84	13.45	43.9	12.53	11.88	10.16	0.19	---
Field Observations	clear	yellow / gray	yellow	brown	brown / yellow	NS	yellow	weak odor	clear	slight yellow	rusty / clear	cloudy	Lt. brown	Lt. brown	clear	clear	NC	pale yellow	yellow	orange	orange	---
Turbidity (NTUs)	15.20	25.60	28	90	34	82	37.60	85.70	<10	25.30	104	67.90	232.00	132	21.30	56	6.13	13.9	152	37	0.52	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/22/19**	**NYSDEC Groundwater Standard**
Wet/General Chemistry																						
TKN (as N) (mg/l)	210	210	210	310	200	150	150	130	76	370	93	110	110	97.4	88.5	NS	273	176	132	158	252 J	---
Ammonia-N (mg/l)	**250**	**180**	**260**	**240**	**190**	**150**	**150**	**100**	**70**	**110**	**120**	**140**	**110**	**94.1**	**73.4**	NS	**141**	**168**	**138**	**153**	**193**	2 ST
Nitrate-Nitrite/N (mg/l)	NS	U	U	U	U	U	U	U	U	U	0.18	U	1.3	1.1 B	0.067 BJ	10	U	0.1 U	0.072 BJ	UJ	UBJ	10ST
COD (mg/l)	416	390	490	360	250	340	250	160	130	170	120	90	71	64	55	56	310	430	240	216	265	---
BOD-5 (mg/l)	79.0	21	24	60	15	11	14	13	15	9.6	U	U	U	66	U	NS	66	22	25.0	11 J	8.8	---
TOC (mg/l)	160	160	140	120	91	81	81	U	52.0	64.0	35	26	28	18	20	20	150	130	81.8	81.8	83.5	---
TDS (mg/l)	3,600	3,000	3,800	3,000	2,600	2,400	2,400	1,900	1,700	1,900	1,500	1,200	1,200	1,200	820	1100	3520	3480	2,460	2300	2410 J	---
Sulfates (mg/l)	160	12	U	120	150	11	54	86	U	95	170	110	150	**270**	77	200	75 B	**370 D**	230	285 J	248	250 ST
Alkalinity-CaCO3 (mg/l)	NS	1700	1800	1700	1700	1400	1400	1200	1200	1200	960	890	850	680	850	680	1300	1600	550	1150	1040	---
Phenols (mg/l)	U	U	U	U	**1.1**	**3.1**	**0.49**	**0.23**	**0.02**	U	U	U	U	U	U	U	U	U	**0.015**	U	0.017	0.001 ST
Chloride (mg/l)	**1,500**	**1,200**	**2,200**	**1,400**	**940**	**790**	**740**	**440**	**520**	**1,200**	**330**	**270**	**250**	190	100 B	200 B	**1700**	**1280 D**	**390 B**	**763**	**912**	250 ST
Bromide (mg/l)	U	U	U	U	U	NS	**5**	**2.90**	**3.80**	**3.40**	**2.40**	1.80	1.5	1.1	0.91	1.4	**12**	**7.9 D**	**2.4**	**5.9**	**6.8**	2 GV
Hardness(mg/l)*	753	786	969	711	674	920	34,000	490	530	540	290	380	390	440	340	470	1300	900	600	522	634	---
Color (CoPt)	80	NR	NR	NR	NR	70	NR	45	NS	NS	60	45	50	40	40	20	250	700 D	500	500	70	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-2D																					NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	10.70	6.75	7.05	10.35	6.57	7	9.91	6.90	6.90	9.41	9.44	7.55	9.75	10.60	6.80	9.60	5.66	6.19	6.11	8.24	5.82	---
Conductivity (ms/cm)	9.870	7.420	7.460	13.600	5.630	6.200	9.050	5.300	4.370	7.050	7.780	0.990	6.270	5.370	4.360	6.110	-94.000	6.400	5.530	5.190	6.630	---
Temperature (^{O}C)	8.39	16.35	14.20	7.49	10.26	19.35	13.15	14.27	16.70	8.49	4.00	16.10	7.20	10.1	16.37	7.05	18.84	8.77	13.38	8.06	10.98	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	NC	none	---
pH (standard units)	6.86	8.12	7	7.30	7.17	4.94	7.01	7.13	7.16	7.21	6.76	7.08	7.02	7.19	7.15	7.42	7.12	8.41	7.17	6.37	7.04	---
Eh (mV)	-83.00	-61.00	-43.00	-96.00	-42.00	36.00	-82.00	NC	NC	NC	NS	MN	-89.00	NC	NC	-62.00	-40.00	211.00	-85.00	-160.00	6.63	---
Dissolved Oxygen (mg/l)	13.61	4.18	8.32	8.97	7.91	5.09	9	8.65	2.06	9.91	0	2.97	7.84	10.73	13.22	10.81	87.10	6.70	10.61	0	0.1	---
Field Observations	yellow tint	yellow / gray	yellow	cloudy brn	brown / gray	NS	yellow	mod. odor	slight yellow	slight yellow	yellow	cloudy	Lt yellow /	Lt yellow	clear	clear	NC	pale yellow	yellow	NC	orange	---
Turbidity (NTUs)	35	38	48.60	350	29	113	47.30	54.10	<10	19.80	<10	638	80.10	280	56.30	165	0.009	44.40	274	4.6	0.37	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/22/19**	**NYSDEC**
Wet/General Chemistry																						**Groundwater Standard**
TKN (as N) (mg/l)	220	250	290	370	260	160	260	220	150	260	250	180	260	189	115	NS	223	196	168	179	251 J	---
Ammonia-N (mg/l)	**320**	**260**	**320**	**340**	**260**	**210**	**290**	**190**	**140** U	**220** U	**280**	**190** U	**180** U	**192** U	**109** U	NS	**228** U	**193** U	**162** U	**174** U	**182** UJ	2 ST
Nitrate-Nitrite/N (mg/l)	NS	U	U	U	U	U	U	U	U	U	0.22	U	U	U	U	0.03 J	U	0.1 U	U	U	UJ	10ST
COD (mg/l)	496	470	480	410	270	570	470	350	260	330	U	170	310	430	110	320	460	470	240	250	298	---
BOD-5 (mg/l)	28.0	17	23	36	11	10	23	14	7.2	22	33	U	12	250	5.0	NS	428	15	13	14 J	13.3	---
TOC (mg/l)	200	200	180	170	110	100	140	U	130	130	150	61	93	100	38	100 B	210	120	85.3	91.2	38.5 J	---
TDS (mg/l)	4,400	3,600	3,900	4,600	2,800	2,900	3,400	3,200 H	2,700 H	2,800 H	3,700	2,100	2,700	3,400	1,300	2,400	4,280	3490	2,460	2590	3320 J	---
Sulfates (mg/l)	120	U	U	15	140	12	35	75	77	120	89	99	79	66 B	130	140	170 B	**431 D**	180	237 J	183	250 ST
Alkalinity-CaCO3 (mg/l)	NS	1,800	1,900	1,800	1,600	1,500	1,800	1,500	1,600	1,500	1,600	1,100	1,300	1,400	850	1,000	1600	1400	1,000	1060	1110	---
Phenols (mg/l)	**1.2**	U	**0.69**	**0.68**	**0.35**	**1.3**	U	U	**0.02**	U	U	**2.2**	U	U	U	U	U	**0.01**	**0.006 B**	U	UB	0.001 ST
Chloride (mg/l)	**2,000**	**1,600**	**2,000**	**2,200**	**1,300**	**1,200**	**1,300**	230	**740**	**1,100**	U	**710**	**1,300**	**1,600**	**390 B**	**1,000 B**	**2,100**	**1320 D**	**550 B**	**983**	**1510**	250 ST
Bromide (mg/l)	U	U	U	U	**330**	NS	**9**	**7.1**	**6.50**	**7.50**	**11**	**6.1**	**7.0**	**15**	**2.2**	**9.3**	**14.0**	**7.48 D**	**3.2**	**6.7**	**9.2**	2 GV
Hardness(mg/l)*	976	860	942	1083	661	828	44,000	580	580	630	790	800	580	800	490	560	1,100	870	630	679	795	---
Color (CoPt)	100	NR	NR	NR	NR	80	NR	50	NS	NS	150	60	75	140	120	120	180	500 D	300	400	60	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-3S																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	11.40	6.60	8.50	NS	7.65	7.60	10.82	7.33	7.69	10.53	10.29	10.10	10.70	11.79	8.34	9.79	8.01	8.46	8.63	8.81	6.87	---
Conductivity (ms/cm)	19.000	17.300	18.500	20.800	15.300	15.600	16.600	18.300	16.300	19.100	19.100	18.700	16.400	15.700	14.400	1.720	3.220	5.630	12.100	6.700	4.620	---
Temperature (^{O}C)	7.75	16.70	15.20	6.63	10.69	15.60	12.05	14.47	16.10	7.87	6.40	19.40	5.11	10.4	16.94	9.0	16.59	17.32	19.93	7.36	11.71	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	none	none	---
pH (standard units)	7.32	8.02	7.15	7.70	7.37	4.88	7.09	6.96	7.31	7.26	6.02	7.11	7.78	7.64	7.19	7.33	7.18	8.48	7.27	5.94	6.91	---
Eh (mV)	-82.00	-2.00	-118.00	-95.00	-53.00	-123.00	-111.00	NC	NC	NC	NS	NM	-117.00	NC	NC	-16.00	-79.00	181.00	-120.00	-27.00	-147.30	---
Dissolved Oxygen (mg/l)	12.76	4.87	8.13	9.09	3.89	6.32	9	4.09	1.56	8.13	0.11	2.07	7.22	10.22	2.02	17.89	1.02	6.47	11.85	5.06	0.4	---
Field Observations	deep yell.	yellow	yell.foamy	yellow	deep yellow	NS	deep yellow	strg. odor	yellow	yellow	str. odor	green	yellow	yellow	yellow	clear	NC	yellow / green	yellow / green	yellow/ brown	tan/sulfur smell	---
Turbidity (NTUs)	14.20	49	9.10	383	25	42	5.90	169	<10	<10	<10	430	75.80	186	23.90	16.80	6.90	3.40	79.40	3.3	25.01	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/21/19**	**NYSDEC**
Wet/General Chemistry																						**Groundwater Standard**
TKN (as N) (mg/l)	360	280	460	710	610	120	480	510	380	22	140	440	560	400	400	NS	98	109.0	440	169	151	---
Ammonia-N (mg/l)	**500**	**250**	**470**	**460**	**210**	**110**	**470**	**490**	**350**	**460**	**480**	**650**	**520**	**480**	**341**	NS	**111**	**92.1**	**386**	**159**	**123**	2 ST
Nitrate-Nitrite/N (mg/l)	NS	U	U	U	U	U	U	U	U	U	U	U	U	0.051 BJ	U	0.70	0.17	U	U	0.05	3.5	10ST
COD (mg/l)	1,289	1,100	1,600	1,000	1,100	1,400	1,100	1,200	1,000	1,000	1,200	900	890	870	1,100	U	300	360	850	345	373 J	---
BOD-5 (mg/l)	610	1,400	160	120	95	60	42	75	72	72	45	690	32	230	62	NS	1840	11.0	55.0	18 J	12.8 J	---
TOC (mg/l)	480	550	510	520	U	530	560	U	450	460	U	380	230	310	290	15 B	150	89	280	125	102	---
TDS (mg/l)	7,800	7,900	9,000	7,900	7,700	7,200	8,100	7,600 H	8,600 H	9,600 H	8,300	11,000	7,400	7,100	6,600	1,100	3,780	3350	6,100	3980	2880 J	---
Sulfates (mg/l)	U	U	U	30	30	44	19	7.9	U	19	29	5.8	23	31 B	2.8 J	220	87 B	120	2.3 J	60.1 J	77.2	250 ST
Alkalinity-CaCO3 (mg/l)	NS	3,100	3,700	4,000	3,900	1,900	3,800	3,100	3,800	3,600	3,500	500	1,000	2,800	3100	490	1400	2000	1200	1940	1300	---
Phenols (mg/l)	**6**	**0.2**	**1.4**	**0.29**	**0.48**	**2.2**	**3.4**	**2.2**	**0.06**	U	**1.6**	**1.2**	**2.1**	U	**1.4**	U	U	**0.009**	**0.022**	**0.088**	**0.023 J**	0.001 ST
Chloride (mg/l)	**3,900**	**3,800**	**4,100**	**4,300**	**4,100**	**3,800**	**3,700**	**3,700**	**4,000**	**3,300**	**3,600**	**3,000**	**3,500**	**3,200**	**3,900 B**	190 B	**1,100**	**1170 D**	**1,500 B**	**1400**	**1040**	250 ST
Bromide (mg/l)	U	U	U	U	**950**	NS	**14**	U	**19**	**19**	**19**	**15**	**15**	**18**	**13.0**	1.0	**5.4**	**5.77 D**	**6.7**	U	**5.6**	2 GV
Hardness(mg/l)*	1,126	2,263	1,390	7	755	1,503	25,000	700	650	620	640	580	670	510	470	370	660	740	560	673	573	---
Color (CoPt)	95	NR	NR	NR	NR	400	NR	490	NS	NS	430	450	350	400	270	20	350	500 D	700	450	140 J	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-3D																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/16/16**	**04/03/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	13.10	7.40	8.95	NS	8.70	8.60	12.56	8.44	8.54	12.11	11.77	10.16	11.60	12.55	8.98	24.60	8.40	8.94	9.40	9.82	7.71	---
Conductivity (ms/cm)	17.900	14.800	17.100	22.900	13.800	15.100	16.700	17.900	14.900	17.000	17.600	17.200	7.250	14.900	12.900	13.200	6.810	11.000	13.700	9.800	7.690	---
Temperature (^{O}C)	8.90	15.91	14.30	7.59	10.39	15.10	12.58	12.60	15.30	9.50	6.60	19.20	6.36	11.0	16.75	8.91	17.09	18.40	13.74	8.04	11.71	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	none	none	---
pH (standard units)	6.86	8.17	6.88	7.36	6.94	4.82	6.92	7	7.13	7.15	7.65	6.76	7.25	7.16	7.57	7.27	7.32	8.31	7.19	6.47	7.24	---
Eh (mV)	-92.00	-103.00	-120.00	-108.00	-107.00	-108.00	-105.00	NC	NC	NC	NS	NM	-104.00	NC	NC	-68.00	-61.00	212.00	-67.00	-169.00	-126.40	---
Dissolved Oxygen (mg/l)	13.33	2.65	8.21	8.45	9.43	4.26	8.00	6.92	1.85	6.55	0.18	3.40	7.08	9.75	2.60	11.14	0.34	11.32	12.04	0	0.32	---
Field Observations	yellow	yellow	yellow	yellow / brown	deep yellow	NS	deep yellow	strg. odor	yellow	yellow	str. odor	yellow	yellow	yellow	yellow	clear	NC	yellow	yellow	str. Odor	tan/sulfer smell	---
Turbidity (NTUs)	38.50	72	5	73	19	142	1	84.20	<10	<10	<10	48.80	36.00	92	15.10	20.80	23.50	10.00	11.80	7.6	21.01	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/15/15**	**11/16/16**	**04/03/18**	**05/22/19**	**NYSDEC**
Wet/General Chemistry																						**Groundwater Standard**
TKN (as N) (mg/l)	360	280	460	570	420	200	470	370	280	530	240	160	410	305	395	NS	322	333	409	300	417 J	---
Ammonia-N (mg/l)	**500**	**250**	**470**	**370**	**280**	**89**	**430**	**290**	**270**	**480**	**460**	**360**	**310**	**360**	**272**	NS	**308**	**283**	**364**	**282**	**226**	2 ST
Nitrate-Nitrite/N (mg/l)	NS	U	U	0.16	U	U	0.055	U	U	U	0.5	U	U	U	U	U	U	2.49	U	U	UJ	10ST
COD (mg/l)	1,289	1,100	1,600	1,100	1,200	1,400	1,200	1,400	1,100	1,100	1,200	900	900	830	730	750	110	870	1,000	645	599	---
BOD-5 (mg/l)	610.0	1,400	160	240	150	110	64	120	120	80	33	720	26	330	27	NS	54	22	40.0	32 J	26.7	---
TOC (mg/l)	480	550	510	590	U	410	510	U	540.0	380.0	U	340	270	330	260	380	480	290	296	232	151 J	---
TDS (mg/l)	7,800	7,900	9,000	7,800	7,000	8,200	7,700	8,300 H	7,900 H	7,100 H	7,500	7,900	5,900	6,500	6,200	5,800	6,350	6700	6,420	5690	4530 J	---
Sulfates (mg/l)	U	U	U	37	52	68	6	U	U	12	U	U	5.1	6.1 B	2.3 J	1.9 J	3 BJ	4.26	11	37.7 J	62.2	250 ST
Alkalinity-CaCO3 (mg/l)	NS	3,100	3,700	3,200	3,500	1,700	3,600	1,700	3,200	3,400	3,300	460	1,100	2,700	2,900	2,800	3000	3100	1400	2840	2140	---
Phenols (mg/l)	**6**	**0.2**	**1.4**	**2.9**	**0.61**	**1.4**	**4**	**3.6**	**0.14**	**0.24**	U	**1.1**	**1.4**	U	**0.45**	**0.48**	**0.03**	**0.04**	**0.026**	**0.068**	**UB**	0.001 ST
Chloride (mg/l)	**3,900**	**3,800**	**4,100**	**4,100**	**3,800**	**3,900**	**320**	**3,700**	**4,200**	**3,300**	**3,700**	**3,200**	**3,300**	**2,700**	**3,500 B**	**2,400 B**	**2,600**	**2690 D**	**2,700 B**	**2110**	**1630**	250 ST
Bromide (mg/l)	U	U	U	U	**610**	NS	1.4	U	**20**	**18**	**20**	**15**	**14**	**14**	**11**	**17.0**	**14.0**	0.1 U	**7.1**	U	**8.1**	2 GV
Hardness(mg/l)*	1,126	2,263	1,390	1,076	1,628	1,573	33,000	1,200	1,300	670	560	1,100	570	1,100	510	440	900	740	500	441	342	---
Color (CoPt)	95	NR	NR	NR	NR	500	NR	470	NS	NS	430	380	380	400	430	110	350	800 D	500	500	70	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-4S																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/21/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	10.30	7.95	7.68	10.05	7	8	9.30	7.27	7.20	6.68	8.81	9.66	8.84	9.23	7.42	8.07	7.00	7.55	6.85	7.43	6.59	---
Conductivity (ms/cm)	2.430	2.370	2.270	2.680	2.100	2.220	2.330	2.400	1.650	2.230	1.610	0.981	1.520	1.370	1.120	1.210	0.680	0.966	1.570	0.849	0.784	---
Temperature (^{O}C)	6.51	15.73	14.70	5.17	9.97	19	10.73	14.15	16.40	7.25	4.60	18.10	4.80	10.6	17.25	7.56	16.43	21.35	13.52	5.59	12.22	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	none	NC	---
pH (standard units)	7.01	7.90	6.58	7.29	6.91	4.58	6.62	6.61	7.16	6.94	6.20	6.82	7.96	7.29	7.20	7.19	6.67	7.55	6.91	6.14	7.11	---
Eh (mV)	7.00	-81.00	-48.00	-6.00	-57.00	-99.00	-41.00	NC	NC	NC	NS	NM	-90.00	NC	NC	-99.00	-37.00	173.00	-83.00	NC	154.10	---
Dissolved Oxygen (mg/l)	15.52	6.50	8.15	10.59	7.83	5.25	10	3.46	1.70	9.75	0.07	3.82	7.59	10.50	2.92	11.90	0.75	11.27	10.20	0	1.17	---
Field Observations	clear	lt gray	slight yell.	clear	clear	NS	clear	sulfur like	clear	clear	rusty / clear	cloudy	Lt. gray	Lt. gray	brown	clear	NC	rust orange	orange	clear	NC	---
Turbidity (NTUs)	21.7	42.80	50.10	26	22	37	6	192	<10	11.3	<10	73.60	80.90	202	14.20	75.40	141.00	50.80	61.60	10.6	89.28	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/21/19**	**NYSDEC Groundwater Standard**
Wet/General Chemistry																						
TKN (as N) (mg/l)	8.1	13	47	22	11	200	8.6	6	10	U	3.8	7.3	5.7	3.5	4.13	NS	3.29	37.4	3.43	1.79	0.76	---
Ammonia-N (mg/l)	**8.6**	**13**	**45**	**18**	**6**	**18**	**7**	**5.2**	**7.8**	**5.5**	0.6	**7.9**	**4.0**	**2.8**	**2.73**	NS	**2.5**	**2.03**	1.96	0.77	0.14	2 ST
Nitrate-Nitrite/N (mg/l)	NS	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.045 BJ	3.79 J	3.4	10ST
COD (mg/l)	62	41	68	20	37	67	44	50	36	39	43	U	38	21	28	27	17 J	26	83	18.8	19.8 J	---
BOD-5 (mg/l)	7	16	U	5	U	10	6	6	7.8	9	U	47	9.0	96	5.0	NS	65.0	3 U	4.0	UJ	U	---
TOC (mg/l)	14	51	35	20	17	31	22	18	18	20	12	38	14	13	12	10 B	16	8.9	13.8	7.82	7	---
TDS (mg/l)	1,500	1,400	1,100	1,300	1,300	1,200	1,400	1,300	1,100	1,300	1,200	680	1,000	1,100	640	440	805	584	939	721	521	---
Sulfates (mg/l)	U	46	87	9	37	150	28	49	23	43	100	16	74	84 B	5.1	37	94 B	37.4	92	152 J	117	250 ST
Alkalinity-CaCO3 (mg/l)	NS	800	700	670	820	680 H	730	750	770	740	730	480	750	620	550	550	560	470	1400	477	335	---
Phenols (mg/l)	U	U	**0.75**	U	U	U	U	U	**0.03**	U	U	U	U	U	U	U	U	U	U	U	UJ	0.001 ST
Chloride (mg/l)	**480**	**410**	**320**	**370**	**320**	**270**	**280**	220	240	91	190	110	120	97	66	62 B	56	49.7 D	60 B	40.7	13.7	250 ST
Bromide (mg/l)	U	U	U	U	U	NS	1.6	1.6	2.0	1.7	1.5	0.7	0.74	0.4	0.48	0.32	0.43	0.213	0.21	U	U	2 GV
Hardness(mg/l)*	835	785	518	739	753	876	22,000	680	530	630	620	470	500	570	410	480	500	400	550	429	391	---
Color (CoPt)	40	NR	NR	NR	NR	55	NR	42	NS	NS	20	45	75	70	130	100	75	350 D	600	25	25	---

QUALIFIERS:
U: Compound analyzed for but not detected
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D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-4D																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/21/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	10.80	8	7.70	10.28	7.22	8	9.81	7.29	7.17	9.25	9.56	9.26	9.55	9.67	7.30	9.38	6.40	6.87	6.52	8.59	6.51	---
Conductivity (ms/cm)	252.000	2.470	1.940	2.570	1.720	2.040	1.520	1.580	1.610	0.776	0.850	0.852	0.935	1.250	1.120	1.340	1.700	2.580	3.040	1.650	3.206	---
Temperature (^{O}C)	7.40	15.49	13.80	4.67	9.27	19.09	11.37	13.35	16.30	8.88	6.40	17.80	4.62	10.1	16.66	9.93	17.11	21.29	12.71	9.17	11.23	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	none	NC	---
pH (standard units)	7.30	8.04	6.73	7.20	7.07	4.53	7.02	7.03	7.74	7.14	6.60	6.99	8.20	7.30	7.68	7.25	6.94	7.57	6.77	4.56	6.8	---
Eh (mV)	-65.00	-80.00	-23.00	-21.00	-76.00	-73.00	-64.00	NC	NC	NC	NS	NM	-100.00	NC	NC	-85.00	-61.00	196.00	-75.00	NC	-70.40	---
Dissolved Oxygen (mg/l)	13.09	4.36	8.24	11.72	8.31	7.26	8.50	6.58	2.67	6.28	0.01	3.96	8.29	10.01	6.31	4.17	2.40	6.57	9.05	2.24	0.27	---
Field Observations	red yellow	brown	slight yell.	clear	clear	NS	clear	sulfur like	slight yellow	rusty	rusty / clear	orange	Lt. brown	Lt. brown	yellow	brn / orange	NC	orange	orange	brown	orange	---
Turbidity (NTUs)	11.10	26.90	48.30	132	8	118	1	30	<10	<10	<10	36.90	76.10	233	41.6	143	272	194.00	20.40	5	3.91	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/17/16**	**04/03/18**	**05/21/19**	**NYSDEC Groundwater Standard**
Wet/General Chemistry																						
TKN (as N) (mg/l)	52	85	90	83	54	200	48	37	36	7	13	25	7.9	4.9	8.75	NS	43.4	50.1	44.8	44.8	76.4	---
Ammonia-N (mg/l)	**73**	**65**	**85**	**66**	**57**	**58**	**38**	**43**	**32**	**21**	**13**	**25**	**7.4**	**4.2**	**8.68**	NS	**42.8**	**43.4**	1.12	**42.8**	**63.5**	2 ST
Nitrate-Nitrite/N (mg/l)	NS	U	U	U	U	U	U	U	1	U	U	U	U	U	0.033 J	U	U	0.1 U	U	U	U	10ST
COD (mg/l)	160	87	81	91	60	69	37	42	U	25	31	24	20	21	26	57	90	120	32	86.5	133 J	---
BOD-5 (mg/l)	16	NS	U	84	U	U	8	U	U	13	3.3	22	U	60	U	NS	56	4	9.0	12 J	3.6	---
TOC (mg/l)	46	59	53	31	21	20	18	20	13	15	U	20	12	8.2 J	7.6 J	18 B	48	40	46	31.1	43.4	---
TDS (mg/l)	1,100	1,200	1,300	1,200	930	960	72	680	580	530	460	620	600	690	530	820	1400	1500	1,580	1210	1610	---
Sulfates (mg/l)	170	140	170	210	**260**	**300**	150	160	77	67	96	66	100	65 B	46	81	28 B	39.1	25	48.8 J	9.3 J	250 ST
Alkalinity-CaCO3 (mg/l)	NS	700	750	740	550	530 H	420	440	580	380	270	420	360	490	430	600	1100	1200	1600	923	1080	---
Phenols (mg/l)	U	U	U	U	U	U	U	U	U	U	U	**0.4**	**0.28**	U	U	U	U	U	U	U	**0.027 J**	0.001 ST
Chloride (mg/l)	**390**	**300**	**270**	**290**	150	160	74	98	99	71	U	100	73	75	92	120 B	**300**	**340 D**	210 B	243	**409**	250 ST
Bromide (mg/l)	U	NS	U	U	U	NS	0	0	U	0	0	1	U	U	0.4	0.65	1.80	**2.02**	1.3	1.6	**2.5**	2 GV
Hardness(mg/l)*	400	435	382	406	408	547	8,600	340	300	340	300	270	420	440	400	490	780	830	780	596	791	---
Color (CoPt)	65	NR	NR	NR	NR	130	NR	280	NS	NS	35	40	150	400	100	110	130	400 D	400	300	40 J	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-5S																					NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**11/18/16**	**04/05/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	3.10	4.30	5.30	3.65	3.40	4.80	3.42	3.76	4.28	3.18	3.13	12.12	3.36	3.27	4.41	3.10	3.92	4.91	4.29	2.76	2.77	---
Conductivity (ms/cm)	0.982	0.840	0.897	1.270	0.060	0.540	0.980	1.090	0.770	0.846	1.030	0.960	0.825	0.779	0.092	1.060	0.539	0.888	0.749	0.799	0.921	---
Temperature (^{O}C)	4.21	19.96	12.60	1.75	12.03	20.50	8.13	14.86	16.30	5.70	2.70	18.80	0.57	11.7	19.13	5.36	18.29	19.37	11.23	5.94	10.7	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	none	NC	---
pH (standard units)	7.07	7.54	7	7.59	7.28	4.99	7.37	6.22	7.92	7.30	7.81	7.79	8.56	7.64	7.31	8.30	7.49	8.90	6.93	5.2	7.08	---
Eh (mV)	98.00	65.00	100.00	62.00	194.00	111.00	59.00	NC	NC	NC	NS	NM	39.00	NC	NC	69.00	136.00	7.00	87.00	108.00	73.50	---
Dissolved Oxygen (mg/l)	15.92	3.02	8.58	9.60	7.77	6.76	16	3.40	1.67	11.51	0.11	7.90	9.03	10.16	4.42	12.34	13.54	3.66	14.06	2.6	0.18	---
Field Observations	clear	clear	clear	clear	clear	NS	clear	clear	clear	clear	clear	cloudy	clear	clear	clear	clear	NC	clear	clear	Lt. brown	NC	---
Turbidity (NTUs)	5.90	2	8.5	162	12	29	4.70	88	<10	<10	<10	55	43.80	13	34.70	14.20	0.00	11.20	50.90	0	89.61	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**11/18/16**	**04/05/18**	**05/22/19**	**NYSDEC Groundwater Standard**
Wet/General Chemistry																						
TKN (as N) (mg/l)	0.7	U	U	3.4	U	U	U	U	12	5.8	0.47	0.56	0.57	U	U	NS	0.21	0.21	1.19	0.17	0.25 J	---
Ammonia-N (mg/l)	0.3	0.4	U	U	0.3	0.6	U	U	0.55	U	0.69	0.25	U	U	U	NS	0.14	U	0.70	U	U	2 ST
Nitrate-Nitrite/N (mg/l)	NS	U	U	0.06	U	U	0.075	U	U	0.1	0.24	U	U	0.037 BJ	0.028 J	0.067 J	U	U	0.028 BJ	0.67	0.48	10ST
COD (mg/l)	U	U	U	U	U	U	U	U	U	U	21	U	U	U	U	U	U	18 J	U	UJ	UB	---
BOD-5 (mg/l)	U	6	U	5	U	U	6	U	U	4.8	U	14	U	U	U	NS	3.0	U	3.0	7 J	U	---
TOC (mg/l)	8.0	31.0	20.0	U	U	U	U	U	U	U	U	U	U	U	U	4.8 J	U	1.5	3.27	1.58	2.5	---
TDS (mg/l)	680	600	610	640	680	580	69	650	560	780	730	510	760	690	630	640	653	579	667	606	616	---
Sulfates (mg/l)	210	160	200	240	220	180	200	160	**360**	230	240	130	230	220	190	190	180 B	153 D	77	188	189	250 ST
Alkalinity-CaCO3 (mg/l)	NS	290	310	360	360	320 H	340	340	430	370	390	350	360	350	350	370	350	360	1400	387	357	---
Phenols (mg/l)	U	U	U	U	U	U	U	U	U	U	U	**1.2**	**0.21**	U	U	U	U	U	U	U	**UB**	0.001 ST
Chloride (mg/l)	33	22	25	30	U	17	28	18	13	25	49	8.8	14	14	7.7	9.0 B	6.4	4	2.3 B	3.95	3.7	250 ST
Bromide (mg/l)	0.75	0.72	0.74	U	0.58	NS	0.14	U	U	0.15	0.28	U	0.24	0.059 J	0.097 J	0.062 J	U	0.101	0.065 J	U	U	2 GV
Hardness(mg/l)*	531	527	490	519	522	598	13000	500	450	580	570	420	490	530	530	530	550	520	460	549	493	---
Color (CoPt)	10	NR	NR	NR	NR	10	NR	U	NS	NS	10	U	10	U	10.0	U	U	15	20.0	15	10	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-6S																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**11/18/16**	**04/05/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	3.60	6.25	8.63	4.10	4.38	7.00	3.48	5.67	6.65	3.29	3.49	10.35	3.43	4.06	6.83	3.11	6.16	7.39	6.88	5.23	3.34	---
Conductivity (ms/cm)	1.870	5.860	9.040	2.090	1.470	8.520	2.560	2.700	4.470	2.140	1.490	NM	1.020	1.070	3.830	1.200	0.837	1.610	2.150	0.820	0.900	---
Temperature (^{O}C)	4.11	18	12.70	2.40	12.50	20.04	8.03	15.79	15.90	5.46	1.60	NM	0.32	9.4	18.68	5.91	17.99	19.86	13.15	3.7	11.92	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	NM	none	none	none	none	NC	none	none	none	NC	---
pH (standard units)	6.78	7.88	6.69	7.41	7.00	4.98	6.99	6.57	6.89	6.44	7.43	NM	8.19	7.27	6.70	8.27	7.06	8.75	6.64	6.73	6.85	---
Eh (mV)	0	-86.00	-51.00	54.00	88.00	-101.00	91.00	NC	NC	NC	NS	NM	6.00	NC	NC	7.00	-59.00	-195.00	-87.00	152.00	-64.00	---
Dissolved Oxygen (mg/l)	16.13	6.57	7.91	10.45	6.08	6.42	17	6.80	2.10	10.02	0.23	NM	6.92	9.97	1.45	6.74	11.56	8.04	9.20	7.69	0.31	---
Field Observations	clear	lt. yellow	yellow	clear	clear	NS	clear	sulfur like	slight yellow	clear	clear	cloudy	clear	clear	yellow	brn / orange	NC	clear	clear	NC	NC	---
Turbidity (NTUs)	11	42	49	60	0	86	12.30	45.00	<10	<10	<10	NM	41.50	15	12.20	150	0.00	10.70	44.10	0	6.85	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**11/18/16**	**04/05/18**	**05/22/19**	**NYSDEC Groundwater Standard**
Wet/General Chemistry																						
TKN (as N) (mg/l)	1.8	150	240	15	5	200	4.7	39	91	130	3.7	27	2.1	3.5	69.2	NS	11.1	19.5	21.70	3.17	0.43 J	---
Ammonia-N (mg/l)	**9.8**	**110**	**230**	**4**	**3**	**47**	**2.5**	**19**	**88**	**4**	**3.1**	**190**	1.7	U	**62.6**	NS	**10.2**	**21.1**	**20.4**	**2.88**	U	2 ST
Nitrate-Nitrite/N (mg/l)	NS	U	U	0.74	0.07	U	8.5	U	1.0	4.2	1.2	U	U	0.043 BJ	0.020 J	0.11 J	U	0.93	0.083 BJ	0.35	UJ	10ST
COD (mg/l)	U	340	86	18	22	780	41	65	300	41	37	410	U	U	200	21	22	59	61	8.58 J	UB	---
BOD-5 (mg/l)	U	52	66	10	U	29	5	6	40	6	4.5		U	78	22.0	NS	6.0	3	9.0	UJ	U	---
TOC (mg/l)	21	180	360	220	8	U	U	U	130	16	U	160	U	7 J	65	6.5 J	15	20	22.9	6.64 J	3.5	---
TDS (mg/l)	1,100	2,900	4,800	1,200	1,100	4,400	140	1,900	3,700 H	1,300	900	3,500	730	680	2,000	800	853	969	1,250	557	525	---
Sulfates (mg/l)	120	16	U	210	140	50	130	100	U	150	110	85	79	65 B	120	160	120 B	153 D	140	86.2	58.9	250 ST
Alkalinity-CaCO3 (mg/l)	NS	1,800	2,400	480	510	2,000	580	720	1,900	640	470	1,100	560	530	1200	440	540	700	1300	461	445	---
Phenols (mg/l)	U	U	U	U	U	**2.0**	U	U	**0.05**	U	U	NA	**0.35**	U	0.82	U	U	U	U	U	**UB**	0.001 ST
Chloride (mg/l)	30	**1,200**	**1,900**	**310**	240	**1,600**	**260**	**300**	**1,300**	**3,300**	160	**1,200**	89	92	**490**	100 B	74	99.5 D	77 B	21.9	20.1	250 ST
Bromide (mg/l)	U	NS	U	U	U	NS	1.1	0.37	**5.8**	1.0	0.69	**4.5**	0.27	0.33	1.9	0.6	0.31	0.405	0.53	U	0.16 J	2 GV
Hardness(mg/l)*	623	1,157	1,235	557	615	1,459	27,000	710	1,100	630	500	1,000	490	480	590	470	480	450	540	405	432	---
Color (CoPt)	15	NR	NR	NR	NR	500	NR	340	NS	NS	15	180	15	360	180.0	50.0	150.0	175 D	350	20	60	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-7S																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/18/16**	**04/05/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	6.60	8.05	9.15	7.39	6.95	8.51	6.81	7.87	8.21	6.48	6.39	10.01	6.22	6.69	7.57	5.81	7.53	7.91	7.50	4.45	5.64	---
Conductivity (ms/cm)	0.811	0.772	0.886	0.750	0.560	0.540	0.660	1.020	0.594	0.562	0.730	0.589	0.630	0.055	0.067	0.780	0.363	0.610	0.677	0.703	0.736	---
Temperature (^{O}C)	5.09	15.49	14.60	1.74	9.43	19.07	9.08	15.05	14.40	7.93	4.90	18.70	1.34	9.5	20.20	7.0	16.98	21.90	10.70	3.82	12.27	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	NC	NC	---
pH (standard units)	6.92	7.10	6.52	7.42	6.85	4.32	6.86	6.40	7.44	6.73	6.71	7.31	8.21	7.33	8.28	7.10	6.37	7.92	6.58	6.94	6.81	---
Eh (mV)	131.00	214.00	92.00	193.00	115.00	143.00	105.00	NC	NC	NC	NS	NM	90.00	NC	NC	102.00	206.00	126.00	78.00	-39.00	8.10	---
Dissolved Oxygen (mg/l)	15.81	5.60	8.50	15.02	7.76	6.00	8.00	3.16	2.54	6.12	0.29	8.06	3.98	9.93	4.92	12.91	12.30	7.6	7.14	0	0.42	---
Field Observations	red brown	clear	clear	clear	clear	NS	clear	clear	clear	slight brown	orange	clear	clear	clear	brown	clear	NC	gray	gray	clear	organic odor	---
Turbidity (NTUs)	7.90	75	41	50	50	42	1.20	35.40	<10	<10	<10	44.90	40.50	10	40.30	32.50	0.00	135.00	974.00	1.2	6.81	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/14/14**	**07/29/15**	**11/18/16**	**04/05/18**	**05/22/19**	**NYSDEC Groundwater Standard**
Wet/General Chemistry																						
TKN (as N) (mg/l)	1.0	U	U	U	U	2.5	U	U	U	9.3	0.49	1.9	0.94	0.28	0.42	NS	0.56	0.56	1.05	0.18	0.32 J	---
Ammonia-N (mg/l)	U	1.2	U	U	U	0.7	0.24	U	0.22	U	U	0.52	0.56	U	U	NS	0.21	0.21	0.28	U	U	2 ST
Nitrate-Nitrite/N (mg/l)	NS	0.16	0.22	1.6	0.94	U	0.25	0.12	U	0.16	0.055	U	U	0.15 B	0.098 J	U	U	U	U	U	UJ	10ST
COD (mg/l)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	12 J	25	6.04 J	UB	---
BOD-5 (mg/l)	U	NS	24	6	U	U	7	U	U	U	U	12	U	84	U	NS	3.0	U	12	6 J	U	---
TOC (mg/l)	11	29	U	U	U	8	U	U	8.5	12	U	5 J	U	5.1 J	2.6 J	4.7 BJ	3.3 J	2.7	10.4	3.71	4.2	---
TDS (mg/l)	570	590	650	550	570	550	550	620	490	520	500	580	500	450	330	430	374	363	517	432	435	---
Sulfates (mg/l)	200	200	**270**	230	220	230	170	180	140	160	130	160	100	80 B	89	64	74 B	88.7 D	U	27.6	35.5	250 ST
Alkalinity-CaCO3 (mg/l)	NS	230	270	270	260	230	270	250	250	240	300	310	330	360	240	340	270	250	1600	440	396	---
Phenols (mg/l)	U	U	U	U	U	U	U	U	U	U	U	**0.45**	U	U	U	U	U	U	**0.02**	U	UB	0.001 ST
Chloride (mg/l)	25	24	36	19	27	16	9.8	**3,300**	98	9.6	13	12	5.4	6.2	2.1	3 B	2.8	2.38	1.8 BJ	2.11	2.2	250 ST
Bromide (mg/l)	0.61	NS	0.62	U	0.4	NS	0.1	1	U	0.13	0.2	0.1	U	U	U	U	U	0.109	U	U	U	2 GV
Hardness(mg/l)*	444	440	557	436	411	4,152	6,900	630	510	400	410	440	420	340	320	390	330	310	390	462	445	---
Color (CoPt)	10	NR	NR	NR	NR	15	NR	NS	U	NS	15	U	35	200	45.0	15.0	15.0	80 D	500	10	15	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	MCK-7D																				NYSDEC
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/18/16**	**04/05/18**	**05/22/19**	**Groundwater Standard**
Field Parameters																						
Static Water Level (ft)	11.70	12.60	13.20	11.38	11.10	7.50	11.39	11.92	12.02	10.94	10.62	14.31	10.39	10.71	11.67	10.17	11.08	11.95	11.63	9.43	10.46	---
Conductivity (ms/cm)	0.862	0.870	0.972	1.290	0.640	0.620	1.010	1.070	0.715	0.702	0.860	0.634	0.691	0.607	0.725	29.300	0.419	0.712	0.730	0.673	0.774	---
Temperature (^{O}C)	6.53	14.45	15.00	6.42	9.30	16.97	11.33	14.07	14.70	8.09	5.50	19	0.15	8.2	19.73	8.46	17.72	22.51	11.50	5.24	11.04	---
Floaters/Sinkers	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	none	NC	none	none	none	NC	---
pH (standard units)	7.21	7.88	6.57	7.10	6.72	4.40	6.54	7.16	6.97	6.95	6.52	7.14	8.32	7.40	7.34	7.10	7.09	7.55	6.83	7.22	6.83	---
Eh (mV)	96.00	104.00	30.00	188.00	93.00	67.00	115.00	NC	NC	NC	NS	NM	93.00	NC	NC	1.38	202.00	57.00	48.00	-64.00	-18.60	---
Dissolved Oxygen (mg/l)	16.09	8.44	5.56	14.88	6.73	5.95	9.50	7.44	2.55	7.39	0.14	7.71	4.42	10.26	8.03	3.38	3.66	5.41	8.63	0.99	0.47	---
Field Observations	clear	clear	clear	clear	clear	NS	clear	clear	clear	rusty	orange	cloudy	clear	clear	brown	clear	NC	clear	clear	clear	NC	---
Turbidity (NTUs)	6.30	7.60	17.30	30	43	40	1.10	128	<10	<10	<10	50	38.00	10	34.40	314	474	260	0.00	13.60	2.15	---
Date of Collection	**03/28/02**	**06/27/02**	**10/29/02**	**02/13/03**	**05/21/03**	**08/27/03**	**12/04/03**	**06/29/04**	**09/28/04**	**12/16/04**	**02/09/06**	**09/26/07**	**01/07/09**	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/29/15**	**11/18/16**	**04/05/18**	**05/22/19**	**NYSDEC Groundwater Standard**
Wet/General Chemistry																						
TKN (as N) (mg/l)	1.0	U	U	U	U	U	U	U	U	U	0.32	0.54	0.71	0.42	1.05	NS	0.42	0.42	0.77	U	0.21 J	---
Ammonia-N (mg/l)	0.4	1.30	0.84	U	U	0.3	U	0.32	0.15	U	U	0.43	0.44	U	U	NS	0.14	0.2 U	0.28	U	U	2 ST
Nitrate-Nitrite/N (mg/l)	NS	0.33	0.14	0.86	0.7	0.1	0.29	0.094	0.82	0.25	0.1	U	U	0.28 B	0.092 J	0.092 J	U	0.1 U	U	U	UJ	10ST
COD (mg/l)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	12 J	31	3.47 J	UB	---
BOD-5 (mg/l)	U	NS	U	5.0	U	U	U	U	U	U	U	16.0	U	60	U	NS	3.0	U	4.0	UJ	U	---
TOC (mg/l)	U	26.0	U	U	U	U	U	U	7.1	U	U	U	U	3.8 J	2.3 J	2.3 BJ	2.0 J	2	2.39	3.02	2.6	---
TDS (mg/l)	600	680	720	620	640	680	650	630	670	650	630	720	480	650	450	470	491	486	510	430	502	---
Sulfates (mg/l)	220	250	240	**270**	190	**260**	210	190	200	210	220	210	140	120 B	120	120	120 B	120 D	U	42.1	117	250 ST
Alkalinity-CaCO3 (mg/l)	NS	250	300	280	310	250	280	260	300	290	300	310	320	300	300	320	320	320	1700	384	332	---
Phenols (mg/l)	U	U	U	U	U	U	U	U	U	U	U	U	**0.29**	U	U	U	U	U	U	U	UB	0.001 ST
Chloride (mg/l)	39	42	50	U	27	U	16	35	38	14	13	31	8.2	8.1	4.3	3.4 BJ	4.3	6.37	0.18 BJ	2.53	7.2	250 ST
Bromide (mg/l)	2.0	NS	U	1.9	0.3	NS	U	U	U	0.13	0.17	0.14	0.10	U	0.092 J	0.068 J	0.073 J	0.137	U	U	U	2 GV
Hardness(mg/l)*	478	536	614	502	487	5,148	10,000	490	490	490	480	500	430	400	410	420	440	440	460	391	425	---
Color (CoPt)	30	NR	NR	NR	NR	U	NR	10	10	NS	U	U	20	1,000	20.0	200.0	15.0	300 D	1250.0	50	15	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	PZ-2						PZ-4			NYSDEC
Date of Collection	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**05/22/19**	**07/29/05**	**11/18/16**	**04/05/18**	**Groundwater Standard**
Field Parameters										
Static Water Level (ft)	29.34	28.87	29.40	25.95	26.35	25.66	19.65	19.06	19.2	---
Conductivity (ms/cm)	14.100	11.700	13.300	9.200	9.480	10.880	13.200	16.800	17.500	---
Temperature (^{O}C)	16.6	16.29	10.30	19.25	24.25	12.69	7.61	15.07	8.56	---
Floaters/Sinkers	none	none	none	NC	none	NC	none	none	black and brown	---
pH (standard units)	7.93	7.54	7.90	7.34	8.74	8.08	7.35	7.66	3.9	---
Eh (mV)	NC	NC	155.00	-128.00	-266.00	-199.70	-122.00	-129.00	-19.00	---
Dissolved Oxygen (mg/l)	8.65	5.51	11.11	38.72	10.17	0.31	5.89	21.00	2.45	---
Field Observations	yellow green	black	clear	NC	brown	Medium/dark tan	yellow green	yellow	red brown	---
Turbidity (NTUs)	10	91.30	3.17	598	253	290.7	423	162	41.2	---
Date of Collection	**04/20/10**	**10/12/11**	**01/17/13**	**06/10/14**	**07/30/15**	**05/22/19**	**07/29/05**	**11/18/16**	**04/05/18**	**NYSDEC**
Wet/General Chemistry										**Groundwater Standard**
TKN (as N) (mg/l)	315	289	NS	308	263	478 J	640	406	698	---
Ammonia-N (mg/l)	**308**	**263**	NS	**291**	**241**	**292**	**640**	**16.8**	**658**	2 ST
Nitrate-Nitrite/N (mg/l)	U	U	0.039 J	**308**	2.58	U	U	U	U	10ST
COD (mg/l)	650	460	500	U	680	568	1,800	1,600	1650 J	---
BOD-5 (mg/l)	110	31	NS	44	44	44.7 J	63	84	173 J	---
TOC (mg/l)	180	150	150	230	170	167 J	240	603	508	---
TDS (mg/l)	5200	5900	5300	5100	5300	5880 J	5300	7810	7780	---
Sulfates (mg/l)	3.8 BJ	21	1.8 J	4.7 J	2	U	6.7	1.9 J	U	250 ST
Alkalinity-CaCO3 (mg/l)	1,600	1500	1600	1500	1600	1460	1,300	6,200	3780	---
Phenols (mg/l)	**0.51**	**1.5**	U	**0.022**	**0.014**	**UB**	U	**0.045**	**0.022**	0.001 ST
Chloride (mg/l)	**2900**	**2900 B**	**2900 B**	**2700**	**2730 D**	**3130**	**2500**	**460 B**	**2800**	250 ST
Bromide (mg/l)	**21**	**56**	**24**	**14**	0.1	**15.9**	**16**	**3.2**	**21.9**	2 GV
Hardness(mg/l)*	670	760	760	780	570	566	350	290	572	---
Color (CoPt)	900	210	300	190	450 D	70	500	1500	1500	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-1E: Groundwater Sample Results - Wet/General Chemistry

Sample Identification	Leach	WW #1			WW #2				NYSDEC
Date of Collection	**04/21/10**	**07/30/15**	**11/16/16**	**05/22/19**	**07/30/15**	**11/16/16**	**04/05/18**	**05/21/19**	**Groundwater Standard**
Field Parameters									
Static Water Level (ft)	NC	2.71	3.50	2.06	7.89	8.59	6.73	NC	---
Conductivity (ms/cm)	NC	0.900	1.370	0.700	0.928	0.971	0.834	NC	---
Temperature (^{O}C)	NC	21.57	10.88	14.89	19.28	9.77	4.24	NC	---
Floaters/Sinkers	NC	None	None	none	None	none	none	NC	---
pH (standard units)	NC	8.56	7.06	6.93	8.82	6.88	6.73	NC	---
Eh (mV)	NC	-2.00	137.00	94.90	-136.00	177.00	-53.00	NC	---
Dissolved Oxygen (mg/l)	NC	5.90	8.73	5.23	12	8.50	11.08	NC	---
Field Observations	NC	clear	clear	clear	NC	clear	clear	NC	---
Turbidity (NTUs)	NC	0	3.9	150.1	0	25.4	0	NC	---
Date of Collection	**04/21/10**	**07/30/15**	**11/16/16**	**05/22/19**	**07/30/15**	**11/16/16**	**04/05/18**	**05/21/19**	**NYSDEC**
Wet/General Chemistry									**Groundwater Standard**
TKN (as N) (mg/l)	10.9	3.08	8.89	0.76 J	4.2	2.03	2.27	2.7	---
Ammonia-N (mg/l)	**9.94**	**2.7**	**7.0**	0.3	**4.34**	1.4	1.67	**2.3**	2 ST
Nitrate-Nitrite/N (mg/l)	0.40	0.93	1.2 B	1.5	0.023	0.86 B	0.36	U	10ST
COD (mg/l)	47	23	23	UB	27	19 J	21.7 J	25.1 J	---
BOD-5 (mg/l)	NC	5	3	2.1	NS	5	5 J	U	---
TOC (mg/l)	9.8 J	4.4	10.10	4.1	5	5.04	7.91	6.7	---
TDS (mg/l)	820	662	83.2	471	618	623	494	536	---
Sulfates (mg/l)	170	205	98.0	135	91.2	68.0	116	104	250 ST
Alkalinity-CaCO3 (mg/l)	540	270	320	258	350	420	355	362	---
Phenols (mg/l)	U	NS	**0.006**	**UB**	NS	U	U	**0.006 J**	0.001 ST
Chloride (mg/l)	97	34.40	28.00 B	27.1	36.60	19.00 B	33.3	28.8	250 ST
Bromide (mg/l)	0.44	0.17	0.17	U	0.21	0.23	U	U	2 GV
Hardness(mg/l)*	520	460	460	365	480	490	377	424	---
Color (CoPt)	50	20	15	20	40	20	25	35 J	---

QUALIFIERS:
U: Compound analyzed for but not detected
H: Analysis preformed outside holding time
D: Detected at secondary dilution

NOTES:

NC: Not collected
NS: Not sampled for this analyte
NR: Not required for routine parameter sampling
NA: Not applicable
GV: Guidance Value
ST: Standard
---: Not established
* calculated mg equivalent CaCO3/l
Indicates value exceeds standard or guidance value

Table C-2A: Surface Water Sample Results - Volatile Organic Compounds

Sample Identification	SW-1									Contract Required Detection Limit	NYSDEC Class C Surface Water Standard
Date of Collection	03/28/02	06/30/04	02/09/06	04/20/10	1/18/2013	7/30/2015	11/16/2016	4/5/2018	5/22/2019		
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
1,1,1,2-Tetrachloroethane	NS	U	U	U	U	U	U	U	NS	10	---
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	UJ	10	---
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	UJ	10	---
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	UJ	10	---
1,1-Dichloroethane	U	U	U	U	U	U	U	U	UJ	10	---
1,1-Dichloroethene	U	U	U	U	U	U	U	U	UJ	10	---
1,2,3-Trichlorobenzene	U	NS	U	U	U	U	U	U	UJ	10	---
1,2,3-Trichloropropane	NS	U	U	U	U	U	U	NS	NS	10	---
1,2,4-Trichlorobenzene	U	NS	U	U	U	U	U	NS	UJ	10	---
1,2-Dibromo-3-Chloropropane	NS	U	U	U	U	U	U	U	NS	10	---
1,2-Dibromoethane	NS	U	U	U	U	U	U	U	NS	10	---
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	UJ	10	---
1,2-Dichloroethane	U	U	U	U	U	U	U	U	UJ	10	---
1,2-Dichloropropane	U	U	U	U	U	U	U	U	UJ	10	---
1,3-Dichlorobenzene	U	NS	U	U	U	U	U	U	UJ	10	5ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	UJ	10	---
2-Butanone	U	U	U	U	U	U	U	U	UJ	10	---
2-Chlorotoluene	U	NS	U	U	U	U	U	U	UJ	10	---
2-Hexanone	U	U	U	U	U	U	U	U	UJ	10	---
4-Chlorotoluene	U	NS	U	U	U	U	U	U	UJ	10	---
4-Methyl-2-Pentanone	U	U	U	U	U	U	U	U	UJ	10	---
Acetone	U	U	U	U	U	U	U	U	UJ	10	---
Acrylonitrile	NS	U	U	U	U	U	U	NS	NS	10	---
Benzene	U	U	U	U	U	U	U	U	UJ	10	10 ST
Bromochloromethane	NS	U*	U	U	U	U	U	U	NS	10	---
Bromodichloromethane	U	U	U	U	U	U	U	U	UJ	10	---
Bromoform	U	U	U	U	U	U	U	U	UJ	10	---
Bromomethane	U	U	U	U	U	U	U	U	UJ	10	---
Carbon Disulfide	U	U	U	U	U	U	U	U	UJ	10	---
Carbon Tetrachloride	U	U	U	U	U	U	U	U	UJ	10	---
Chlorobenzene	U	U	U	U	U	U	U	U	UJ	10	400 ST
Chloroethane	U	NS	U	U	U	U	U	U	UJ	10	---
Chloroform	U	U	U	U	U	U	U	U	UJ	10	---
Chloromethane	U	U	U	U	U	U	U	U	UJ	10	---
cis-1,2-Dichloroethene	U	U	U	U	U	U	U	U	UJ	10	---
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	UJ	10	---
Dibromochloromethane	U	U	U	U	U	U	U	U	UJ	10	---
Dibromomethane	NS	U	U	U	U	U	U	U	NS	10	---
Dichlorodifluoromethane	U	NS	U	U	U	U	U	U	UJ	10	---
Ethylbenzene	U	U	U	U	U	U	U	U	UJ	10	17 GV
m,p-Xylenes	U	U	U	U	U	U	U	U	UJ	10	---
Methyl Iodide	NS	U	U	U	U	U	U	NS	NS	10	---
Methyl tert-Butyl Ether	U	NS	U	U	U	U	U	NS	UJ	10	---
Methylene Chloride	U	U	U	U	U	U	U	U	UJ	10	200 ST
o-Xylene	U	U	U	U	U	U	U	U	UJ	10	---
Styrene	U	U	U	U	U	U	U	U	UJ	10	---
Tetrachloroethene	U	U	U	U	U	U	U	U	UJ	10	1 GV
Toluene	U	U	U	U	U	U	U	U	UJ	10	100 GV
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	UJ	10	---
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	UJ	10	---
trans-1,4-Dichloro-2-Butene	NS	U	U	U	U	U	U	NS	NS	10	---
Trichloroethene	U	U	U	U	U	U	U	U	UJ	10	40 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	UJ	10	---
Vinyl Acetate	U	U	U	U	U	U	U	U	UJ	10	---
Vinyl Chloride	U	U	U	U	U	U	U	U	UJ	10	---
Total VOCs	0	0	0	0	0	0	0	0	0		
Total VOC TICs	0	0	0	NR	NR	NR	NR	NR	NR		

QUALIFIERS:
U: Compound analyzed for but not detected
NS: Not sampled for this analyte

NOTES:
NR: Not reported
GV: Guidance Value

ST: Standard
*: Value pertains to the sum of the isomers

---: Not established

Table C-2B: Surface Water Sample Results - Inorganics																				Class C
Sample Identification	MCK-SW1																			Surface Water
Date of Collection	03/28/02	10/29/02	05/21/03	08/27/03	12/04/03	06/30/04	09/29/04	12/16/04	02/09/06	04/20/10	01/17/13	07/30/15	7/30/2015	11/16/16	11/16/2016	04/05/18	04/05/18	05/22/19	05/22/19	Standard
Sample Type	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Aluminum	**380**	**400**	NR	NS	NR	73.0 B	**130 B**	NR	U	**569**	93 B	U	U	U	23.5 B	U	**321**	U	U	100
Antimony	U	U	NR	NS	NR	U	1.2 B	NR	U	4.2 B	U	U	U	U	6.3 B	U	U	U	U	---
Arsenic	U	U	NR	NS	NR	U	U	NR	U	4.2 B	U	U	U	U	U	U	U	U	U	150 *
Barium	U	U	NR	NS	NR	36.3 B	58.2 B	NR	32.6 B	40.6 B	27.9 B	81.7 B	81.7 B	65.9 B	73.2 B	19.4	20.4	28	29	---
Beryllium	U	U	NR	NS	NR	U	0.22 B	NR	U	U	U	U	U	U	0.083 B	U	U	U	U	1,100 **
Boron	NS	NR	NR	NS	NR	85.3 B	118 B	NR	65.8 B	39.8 B	49.3 B	119	119 B	81.3	75.2	34.2 JL	29.6 J	41	UB	10,000
Cadmium	U	U	U	NS	U	U	0.19 B	0.36 B	U	U	U	U	U	U	U	U	U	U	U	***
Calcium	68,000	350,000	67,900	NS	100,000	77,600	105,000	79,300	74,000	87,200	65,000	231,000	231,000	170,000	171,000	71,000 JL	74,000	80,900	84,400	---
Chromium	U	U	NR	NS	NR	U	0.44 B	NR	0.56 B	U	U	U	U	1.4 B	0.49 B	U	U	U	U	*^
Chromium-VI	**50**	NR	NR	NS	NR	U	NS	NR	U	0.035	U	U	U	U	U	**24 J**	**25 J**	16	**17**	16
Cobalt	U	U	NR	NS	NR	U	2.5 B	NR	0.45 B	U	U	U	U	0.38 B	1.5 B	U	U	U	U	5
Copper	U	U	NR	NS	NR	U	U	NR	10.3 B	U	U	U	U	2 B	1.4 B	4 J	U	U	U	^^
Cyanide, total	U	NR	NR	NS	NR	U	NS	NR	U	U	U	U	U	U	U	U	U		U	900
Iron	**360**	**710**	**302**	NS	**1,200**	107 B	126 B	82.1 B	36.6 B	790	122 B	**54.8 B**	**826**	U	**430**	27.6	**426**	87	250	300
Lead	U	U	U	NS	U	U	U	U	U	U	U	U	U	4.7 B	U	8.5	U	U	U	^^^
Magnesium	16,000	120,000	16,900	NS	20,000	19,200	25,400	19,300	18,200	22,100	16,400	52,000	51,500	42,700	42,800	19,000	17,000	20,400	21,500	---
Mangenese	22	160	18 B	NS	6 B	23.3 B	40 B	8.3 B	7.0 B	91.4	U	1,720	1,720	248	1,810	12	15.6	100	120	---
Mercury	U	U	NR	NS	NR	U	U	NR	U	U	**0.3**	U	U	U	U	U	U	U	U	0.0007
Nickel	U	U	NR	NS	NR	0.95 B	2.6 B	NR	U	U	1 B	3.5 B	4 B	3.4 B	4.3 B	2.2 J	U	U	U	~
Potassium	U	8,300	2,740 B	NS	4,100	309 B	3,350	3,390	2,710	2,540	3,660	7,630	6,930	6,190	6,440	3,000	3,000	2,800	3,000	---
Selenium	U	U	NR	NS	NR	U	U	NR	U	**10.4 B**	U	**16.4 B**	U	U	**10.7 B**	U	U	U	U	4.6
Silver	U	U	NR	NS	NR	**3.5 B**	**2.3 B**	NR	**1.1 B**	U	U	U	U	U	U	0.7 J	U	U	U	0.1
Sodium	26,000	15,000	27,100	NS	38,000	34,900	44,700	29,300	27,700	30,100	22,000	42,700	42,700	31,500	30,600	30,000	26,000	**28,300**	**30,400**	---
Thallium	U	U	NR	NS	NR	U	6.4 B	NR	U	U	U	U	U	U	U	U	U	U	U	8
Vanadium	U	U	NR	NS	NR	U	1.3 B	NR	U	0.94 B	U	U	U	0.44 B	0.81 B	U	U	U	U	14
Zinc	U	2,700	NR	NS	NR	250	**862**	NR	23.5 B	36 B	15 B	484	484	213	346	38.4	17.2	15	10	~~

QUALIFIERS:
U: Compound analyzed for but not detected
B: Concentration is less than the CRDL but greater than the IDL
J: Estimated value or limit
JL: Estimated value bias low

^: The combined standard for iron and manganese is 500 ug/l
* : Dissolved arsenic form
** :11 ug/l when hardness is less than or equal to 75 ppm and 1,100 ug/l when hardness is greater than 75 ppm
*** : (0.85) exp(1.128 [ln (ppm hardness)] - 3.6867)
*^ : (0.316) exp(0.819 [ln (ppm hardness)] + 3.7256)
^^ : (0.96) exp(0.9422 [ln (ppm hardness)] - 1.7)
^^^ : {1.46203 - [ln (hardness) (0.145712)]} exp (1.273 [ln (hardness)] - 1.052)
~ :(0.998) exp (0.846 [ln (hardness)] + 2.255)
~~ : 0.978 exp(0.8473 [ln (ppm hardness)] + 0.884)

NOTES:

NS: Not sampled for this analyte
NR: Not required for routine parameters sampling

GV: Guidance Value
ST: Standard
---: Not established
Indicates value exceeds standard or guidance value
1 - Analyzed by Mitkem laboratory for Priority Pollutants
2 - Analyzed by NYSDEC laboratory for Target Analyte List (TAL) metals

Table C-3A: Leachate Sample Results - Volatile Organic Compounds

Sample Identification	LEACH																			NYSDEC Class GA Groundwater Standard or Guidance Value
Date of Collection	Apr-10	Jul-10	Sep-10	Dec-10	Mar-11	May-11	Oct-11	Dec-11	May-12	Nov-12	Jan-13	Apr-13	Jun-14	Jul-15	Jul-15	Nov-16	Apr-18	May-19	May-19	
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0 #1	1.0 #2	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l) 1	(ug/l) 2	(ug/l)
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
1,1,2,2-Tetrachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
1,1,2-Trichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	1 ST
1,1-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	3 ST**
1,2-Dichloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	0.6 ST
1,2-Dichloropropane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	1 ST
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	3 ST**
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	3 ST**
2-chloroethyl vinyl ether	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	5 ST
Acrolein	NS	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	5 ST
Acrylonitrile	NS	NS	NS	NS	NS	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	5 ST
Benzene	U	U	U	U	U	U	U	U	0.54 J	U	U	U	U	U	U	U	U	UJ	U	1 ST
Bromodichloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	50 GV
Bromoform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	50 GV
Bromomethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
Carbon Tetrachloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
Chlorobenzene	U	U	U	U	U	U	1.8 J	U	1.0 J	U	U	U	U	U	U	U	U	UJ	U	5 ST
Chloroethane	U	U	U	U	U	U	2.3 J	U	1.8 J	U	U	U	U	U	U	U	U	UJ	UJ	5 ST
Chloroform	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	7 ST
Chloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
cis-1,2-Dichloroethene	U	U	1.7 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
cis-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	0.4 ST*
Dibromochloromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	50 GV
Ethylbenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
m,p-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST**
Methylene Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.58 J	U	5 ST
o-Xylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST**
Tetrachloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
Toluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
Total Xylenes	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST**
trans-1,2-dichloroethene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
Trans-1,3-Dichloropropene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	0.4 ST*
Trichloroethene	U	U	1.2 J	U	U	U	U	U	0.81 J	U	U	U	U	U	U	U	U	UJ	U	5 ST
Trichlorofluoromethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	5 ST
Vinyl Chloride	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	UJ	U	2 ST
Total VOCs	0	0	2.9	0	0	0	4.1	0	4.15	0	0	0	0	0	0	0	0	0.58	0	

QUALIFIERS:
U: Analyzed for but not detected
J: Estimated value or limit

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to the sum of the isomers
**: Value pertains to each isomer, individually
NS: Not sampled for this analyte
----: Not detected in any sample.

Table C-3B: Leachate Sample Results - Semi-Volatile Organic Compounds																			NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	LEACH																		
Date of Collection	Apr-10	Jul-10	Sep-10	Dec-10	Mar-11	May-11	Oct-11	Dec-11	May-12	Nov-12	Jan-13	Apr-13	Jun-14	Jul-15	Jul-15	Nov-16	May-19	May-19	
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l) 1	(ug/l) 2	(ug/l)
1,2,4-Trichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	5 ST
1,2-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	3 ST*
1,3-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	3 ST*
1,4-Dichlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	3 ST*
2,2-Oxybis (1-Chloropropane)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	--
2,4,6-Trichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
2,4-Dichlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
2,4-Dimethylphenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
2,4-Dinitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	10 GV
2,4-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
2,6-Dinitrotoluene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
2-Chloronaphthalene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	10 GV
2-Chlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
2-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
3,3'-Dichlorobenzidine	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
4,6-Dinitro-2-methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
4-Bromophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	--
4-Chloro-3-methylphenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
4-Chlorophenyl-phenylether	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	--
4-Nitrophenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
Acenaphthene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	20 GV
Acenaphthylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	--
Anthracene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Benzo (a) anthracene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.002 GV
Benzo(a)pyrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	ND
Benzo(b)fluoranthene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.002 GV
Benzo(g,h,i)perylene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	--
Benzo(k)fluoranthene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.002 GV
bis(2-Chloroethoxy)methane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
bis(2-Chloroethyl)ether	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
bis(2-Ethylhexyl)phthalate	U	U	U	U	U	U	U	U	U	3.5 J	U	U	U	U	U	U	U	U	5 ST
Butylbenzylphthalate	U	U	U	U	U	U	U	U	U	1.4 J	3.8 J	U	U	U	U	U	U	U	50 GV
Chrysene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.002 GV
Dibenzo(a,h)anthracene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	--
Diethylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Dimethylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	U	4.3 J	1.4 J	U	U	U	50 GV
Di-n-butylphthalate	U	U	U	U	U	U	U	U	U	8.9 J	U	U	2.7 BJ	U	U	U	U	U	50 GV
Di-octylphthalate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Fluoranthene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Fluorene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Hexachlorobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.04 ST
Hexachlorobutadiene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.5 ST
Hexachlorocyclopentadiene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
Hexachloroethane	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
Indeno(1,2,3-cd)pyrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.002 GV
Isophorone	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Naphthalene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	10 GV
Nitrobenzene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.4 ST
N-Nitroso-di-n-propylamine	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	--
N-Nitrosodiphenylamine	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Pentachlorophenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
Phenanthrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Phenol	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	1 ST
Pyrene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	50 GV
Total PAHs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Carcinogen PAHs	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	
Total SVOCs	0	0	0	0	0	0	0	0	0	14	3.8	0	2.7	4.3	1.4	0	0	0	

QUALIFIERS:
U: Analyzed for but not detected
J: Estimated value or limit

NOTES:
GV: Guidance Value
ST: Standard
*: Value pertains to each isomer, individually
--: Not established
----: Not detected in any s ----: Not detected in any sample.

Table C-3C: Leachate Sample Results - Semi-Volatile Organic Compounds by 8270D (SW846)			NYSDEC Class GA Groundwater Standard or Guidance Value
Sample Identification	**LEACH**		
Date of Collection	Apr-18		
Dilution Factor	1.0		
Units	(ug/l)		(ug/l)
2,4,6-Trichlorophenol		U	1 ST
2-Methylnaphthalene		U	--
2-Methylphenol		U	1 ST
2-Nitroaniline		U	5 ST
Cresols, M&P		U	1 ST
3-Nitroaniline		U	5 ST
4-Chloroaniline		UJ	5 ST
4-Nitroaniline		U	5 ST
Aniline		UJ	5 ST
Azobenzene		U	5 ST
Benzoic Acid		U	--
Benzyl Alcohol		U	--
Carbazole		U	--
Dibenzofuran		U	--
Pyridine		UJ	50 GV
Total PAHs	0		
Total Carcinogen PAHs	0		
Total SVOCs	0		

QUALIFIERS:

ug/l: Micrograms per liter
--: Not analyzed or no standard
U: Analyzed for but not detected
J: Estimated limit

Table C-3D: Leachate Sample Results - Pesticides/PCBs																				NYSDEC Class GA
Sample Identification	LEACH																			Groundwater
Date of Collection	Apr-10	Jul-10	Sep-10	Dec-10	Mar-11	May-11	Oct-11	Dec-11	May-12	Nov-12	Jan-13	Apr-13	Jun-14	Jul-15	Jul-15	Nov-16	Apr-18	May-19	May-19	Standard or
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Guidance Value
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l) 1	(ug/l) 2	(ug/l)
4,4'-DDD	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	U	U	U	U	0.3 ST
4,4'-DDE	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	U	U	U	U	0.2 ST
4,4'-DDT	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	U	U	U	U	0.2 ST
Aldrin	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	ND ST
alpha-BHC	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.01 ST
alpha-Chlordane	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	NS	U	U	U	U	0.05 ST
beta-BHC	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.04 ST
delta-BHC	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.04 ST
Dieldrin	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.004 ST
Endosulfan I	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	U	U	U	U	--
Endosulfan II	U	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	U	U	U	U	--
Endosulfan Sulfate	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	--
Endrin	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	ND ST
Endrin Aldehyde	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	5 ST
Endrin Ketone	U	U	U	U	U	NS	NS	NS	NS	NS	NS	NS	U	NS	NS	NS	U	U	U	5 ST
gamma-BHC (Lindane)	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.05 ST
gamma-Chlordane	U	U	U	U	U	U	U	U	U	U	U	U	NS	NS	NS	U	U	U	U	0.05 ST
Heptachlor	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.04 ST
Heptachlor Epoxide	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.03 ST
Methoxychlor	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	35 ST
Toxaphene	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.06 ST
Aroclor - 1016	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.09 ST *
Aroclor - 1221	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.09 ST *
Aroclor - 1232	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.09 ST *
Aroclor - 1242	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.09 ST *
Aroclor - 1248	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.09 ST *
Aroclor - 1254	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.09 ST *
Aroclor - 1260	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.09 ST *
Total Pesticides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total PCBs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

QUALIFIERS:
U: Analyzed for but not detected
NS: Not sampled for this analyte

NOTES:
*: Applies to the sum of the isomers
GV: Guidance Value
ST: Standard
--: Not established

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Table C-3E: Leachate Sample Results - Inorganics

Sample Identification	LEACH												NYSDEC Class GA Groundwater Standard	NYSDEC Class C Surface Water Standard
Date of Collection	Apr-10	Jul-10	Sep-10	Dec-10	Mar-11	May-11	Oct-11	Dec-11	May-12	Nov-12	Jan-13	Apr-13		
Sample Type	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Antimony	U	U	U	U	U	U	U	U	U	U	U	U	3 ST	---
Arsenic	U	U	U	16.8 B	U	U	7.3 B	U	12.3 B	U	4.8 B	4.5 B	25 ST	150 ST/ 340 ST
Beryllium	U	U	U	0.31 B	U	U	U	U	U	U	U	U	3 GV	11 ST
Cadmium	U	U	U	U	U	U	U	U	U	U	U	U	5 ST	---
Chromium-VI	U	0.031	NS	0.33	U	U	U	U	U	U	U	U	50 ST	11 ST / 16 ST
Chromium	U	1.2 B	1.3 B	8.7 B	U	1.3 B	2.5 B	0.71 B	0.7 B	1.5 B	0.76 B	0.78 B	50 ST	---
Copper	U	U	10 B	17.4 B	U	U	U	U	U	4.3 B	U	U	200 ST	---
Cyanide, total	U	7.6 B	U	U	U	U	U	U	U	U	U	U	200 ST	5.2 ST / 22 ST / 9,000 ST
Lead	U	U	U	22.3	U	U	U	U	U	U	U	U	25 ST	---
Mercury	U	U	U	0.053 B	U	U	U	U	U	U	0.39	0.042 B	0.7 ST	0.0007 / 0.0026 / 0.77 / 1.4 ST
Nickel	8.5 B	36 B	22.6 B	26.4 B	7.3 B	35.8 B	37.6 B	14.8 B	27.7 B	85.3 B	14.5 B	8.4 B	100 ST	---
Selenium	U	U	U	U	U	U	U	U	U	U	U	U	10 ST	4.6 ST
Silver	U	U	U	U	U	U	U	U	U	U	U	U	50 ST	0.1 ST
Thallium	U	U	U	U	U	U	U	U	U	U	U	U	0.5 GV	8 ST
Zinc	12.7 B	12.5 B	18.9 B	77.1	15.8 B	15.7 B	14.1 B	U	U	14.4 B	U	U	2,000 GV	---

Sample Identification	LEACH											NYSDEC Class GA Groundwater Standard	NYSDEC Class C Surface Water Standard
Date of Collection	Jun-14	Jul-15	Jul-15	Nov-16	Nov-16	Apr-18	Apr-18	May-19	May-19	May-19	May-19		
Sample Type	Total	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total #1	Dissolved #1	Total #2	Dissolved #2		
Units	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Antimony	U	U	U	U	U	U	U	U	U	U	U	3 ST	---
Arsenic	U	U	U	4.5 B	U	U	U	U	U	U	U	25 ST	150 ST/ 340 ST
Beryllium	U	U	U	U	U	U	U	U	U	U	U	3 GV	11 ST
Cadmium	U	U	U	U	U	U	U	U	U	U	U	5 ST	---
Chromium-VI	NS	U	U	U	U	0.002 J	0.002 J	6.5 J	5.0 J	6.3 J	6.3 J	50 ST	11 ST / 16 ST
Chromium	0.74 B	U	U	1.1 B	1.2 B	U	U	U	U	U	U	50 ST	---
Copper	U	U	U	U	U	U	U	U	U	U	U	200 ST	---
Cyanide, total	U	U	U	U	U	U	U	U	NS	8.8 J	NS	200 ST	5.2 ST / 22 ST / 9,000 ST
Lead	U	U	U	U	U	U	U	U	U	U	U	25 ST	---
Mercury	U	U	U	U	U	U	U	U	U	U	U	0.7 ST	0.0007 / 0.0026 / 0.77 / 1.4 ST
Nickel	6.6 B	3.6 B	2.1 B	2.9 B	3.8 B	0.002 J	0.002 J	U	U	2.1 J	1.9 J	100 ST	---
Selenium	U	13 B	U	U	U	U	U	U	U	U	U	10 ST	4.6 ST
Silver	U	U	U	U	U	U	U	U	U	U	U	50 ST	0.1 ST
Thallium	U	U	U	U	U	U	U	U	U	U	U	0.5 GV	8 ST
Zinc	U	8.2 B	U	16.5 B	16.2 B	U	0.002 J	U	5.6 J	U	5.6 J	2,000 GV	---

QUALIFIERS:
U: Analyzed for but not detected
B: Concentration is between the instrument detection limit and contract required detection limit
NS: Not sampled for this analyte

NOTES:
GV: Guidance Value
ST: Standard
---: Not established

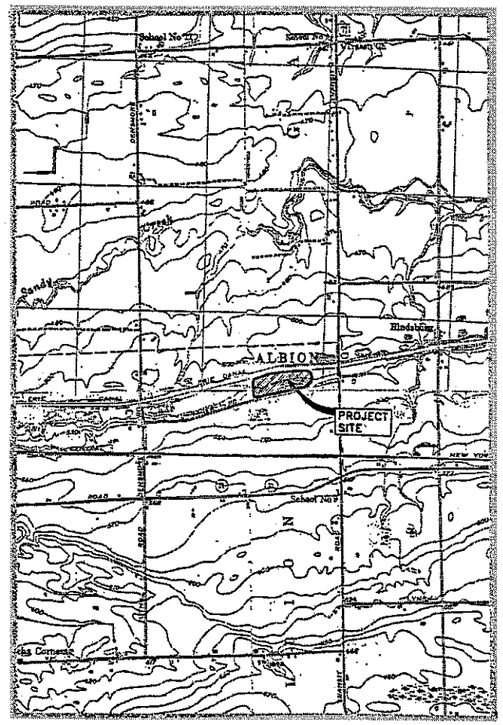
APPENDIX D

REMEDIAL DESIGN DRAWINGS

WASTE MANAGEMENT OF NEW YORK, LLC.

McKENNA LANDFILL
(SITE No. 8-37-003)
ALBION, NEW YORK

REMEDIAL CLOSURE PROJECT
CONTRACT DRAWINGS



SITE LOCATION PLAN

NOTE: BASE MAP ADAPTED FROM ALBION, N.Y. - 1950, HOLLEY, N.Y. - 1950, KENT, N.Y. - 1978 AND KENDALL, N.Y. - 1978 U.S.G.S. QUADRANGLE MAPS

DRAWING No.	TITLE
55024-C-001	COVER SHEET AND DRAWING INDEX
55024-C-002	GENERAL SITE PLAN
55024-C-003	PROPERTY BOUNDARIES AND SURVEY CONTROL PLAN
55024-C-004	EXISTING CONDITIONS AND SUBSURFACE EXPLORATION PLAN
55024-C-005	EROSION AND SEDIMENTATION CONTROL PLAN (DURING CONSTRUCTION)
55024-C-006	EXISTING SOIL RECOVERY PLAN
55024-C-007	BARRIER WALL LOCATION PLAN
55024-C-008	LEACHATE COLLECTION SYSTEM AND GAS VENTING SYSTEM LOCATION PLAN
55024-C-009	SUBGRADE GRADING PLAN
55024-C-010	FINAL GRADING PLAN
55024-C-011	CROSS SECTIONS A-A, B-B & C-C
55024-C-012	CROSS SECTIONS D-D & E-E
55024-C-013	TYPICAL DETAILS
55024-C-014	TYPICAL DETAILS
55024-C-015	TYPICAL DETAILS
55024-C-016	TYPICAL DETAILS
55024-C-017	TYPICAL MANHOLE DETAILS
55024-C-018	EROSION AND SEDIMENTATION CONTROL PLAN (POST CONSTRUCTION)

ISSUED FOR CONSTRUCTION
4/25/2000

GZA GeoEnvironmental of New York

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DRAWN BY: DEW
DATE:DECEMBER 1999

GZA GeoEnvironmental of New York

REV.No.	DESCRIPTION	BY	DATE

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

COVER SHEET AND DRAWING INDEX

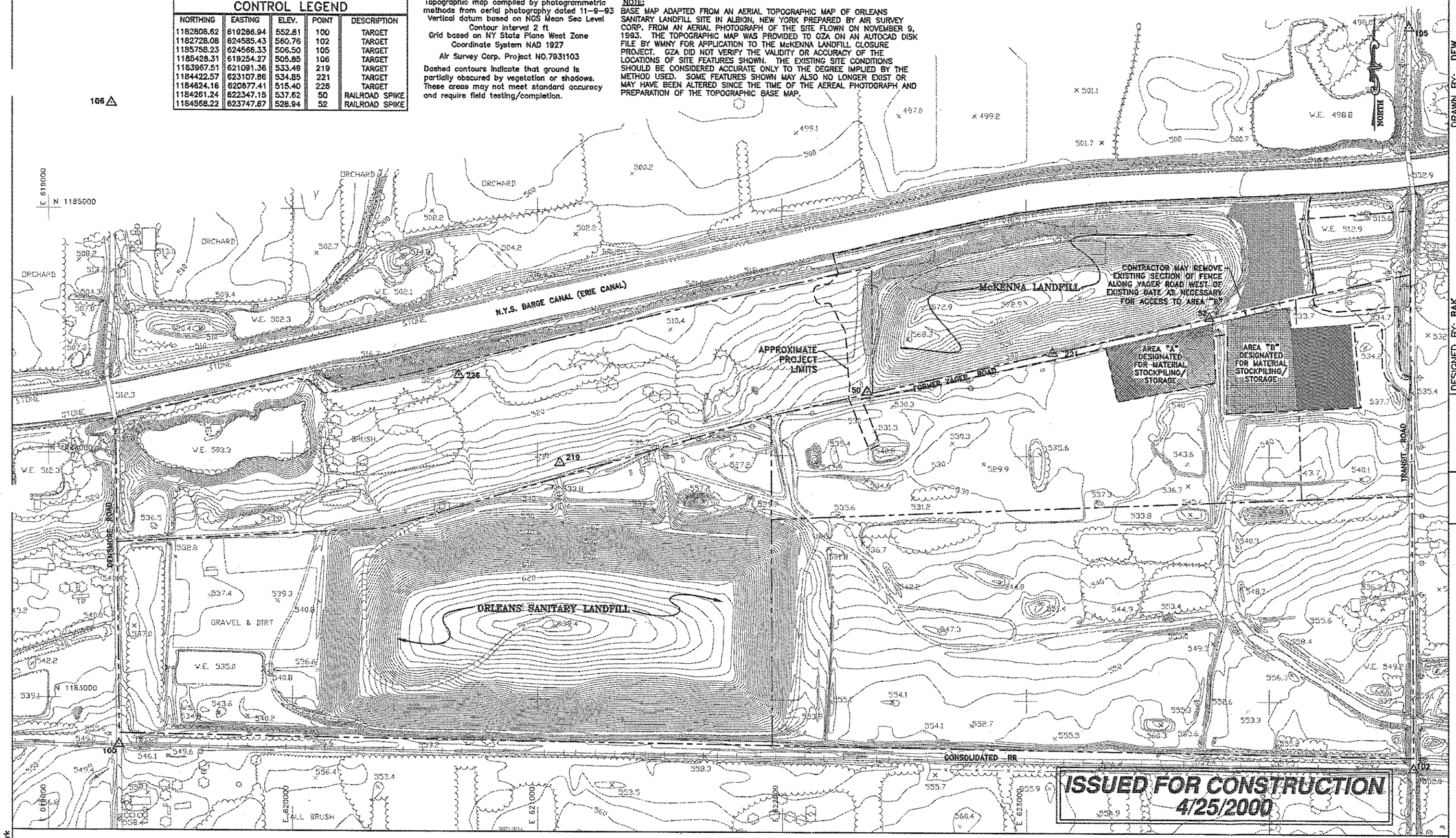
PROJECT No. 55024

DRAWING No. 55024-C-001

CONTROL LEGEND				
NORTHING	EASTING	ELEV.	POINT	DESCRIPTION
1182808.62	619286.94	552.81	100	TARGET
1182728.08	624585.43	560.76	102	TARGET
1185758.23	624566.33	506.50	105	TARGET
1185428.31	619254.27	505.85	106	TARGET
1183967.51	621091.36	533.49	219	TARGET
1184422.57	623107.86	534.85	221	TARGET
1184624.16	620877.41	515.40	226	TARGET
1184261.24	622347.15	537.62	50	RAILROAD SPIKE
1184568.22	623747.87	528.94	52	RAILROAD SPIKE

Topographic map compiled by photogrammetric methods from aerial photography dated 11-9-93
Vertical datum based on NGS Mean Sea Level
Contour interval 2 ft.
Grid based on NY State Plane West Zone Coordinate System NAD 1927
Air Survey Corp. Project NO.7931103
Dashed contours indicate that ground is partially obscured by vegetation or shadows. These areas may not meet standard accuracy and require field testing/completion.

NOTE:
BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 9, 1993. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL CLOSURE PROJECT. GZA DID NOT VERIFY THE VALIDITY OR ACCURACY OF THE LOCATIONS OF SITE FEATURES SHOWN. THE EXISTING SITE CONDITIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED. SOME FEATURES SHOWN MAY ALSO NO LONGER EXIST OR MAY HAVE BEEN ALTERED SINCE THE TIME OF THE AEREAL PHOTOGRAPH AND PREPARATION OF THE TOPOGRAPHIC BASE MAP.



ISSUED FOR CONSTRUCTION
4/25/2000

EXISTING FEATURES LEGEND

BRUSHLINE	SURVEY CONTROL POINT
CABLE MARKER	GAS VENT
CATCH BASIN	RAILROAD TRACKS
FENCE	SIGN
FIRE HYDRANT	SWAMP
GUARD RAIL	TREE
LIGHT POLE	TREELINE
MISCELLANEOUS POLE	UNIDENTIFIED OBJECT
MANHOLE	UTILITY POLE
VAULT	WATER LINE
VALVE	

ABBREVIATIONS

A,ASPH	ASPHALT
GV	GAS VENT
CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
C,CONC	CONCRETE
DI	DROP INLET
GV	GAS VENT
GVW	GAS VENT WELL
HDWL	HEAD WALL
MH	MANHOLE
TRANS	TRANSFORMER

GENERAL NOTES

1. WHERE SHOWN ON THESE DRAWINGS, THE LOCATION OF THE ABOVEGROUND AND UNDERGROUND STRUCTURES, UTILITIES, MONITORING WELLS, AND FACILITIES ARE APPROXIMATE. THE CONTRACT DRAWINGS DO NOT NECESSARILY SHOW ALL ABOVEGROUND OR BELOW GROUND UTILITIES, STRUCTURES, MONITORING WELLS AND OTHER EXISTING FACILITIES AT, OR ADJACENT TO THE PROJECT SITE AND WORK AREA. THE CONTRACTOR SHALL IDENTIFY, PROPERLY LOCATE AND PROTECT ALL UTILITIES, UNDERGROUND STRUCTURES, ABOVEGROUND STRUCTURES, MONITORING WELLS AND APPURTENANCES ON, OR ADJACENT TO THE PROJECT SITE. THE CONTRACTOR SHALL CONTACT WMNY TO OBTAIN FUTHER INFORMATION, REQUIREMENTS AND RESTRICTIONS, RELATED TO WORK PROCEDURES.
2. ANY DISTURBANCE OR DAMAGE TO EXISTING UTILITIES, MONITORING WELLS, MANHOLES, LANDFILL STRUCTURES/FINAL COVER SYSTEM OR AREAS OUTSIDE THE WORK LIMITS RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. THE CONTRACTOR IS REFERENCED TO THE PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS FOR ADDITIONAL REQUIREMENTS REGARDING ITS SCOPE OF WORK, MATERIAL REQUIREMENTS AND CONSTRUCTION REQUIREMENTS.
4. THE CONTRACTOR SHALL USE THE ACCESS ROADS SHOWN TO ACCESS THE PROJECT. ENTRANCE TO THE SITE SHALL BE VIA THE TRANSIT ROAD ENTRANCE AND GATE. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS NOT TO INTERFERE WITH THE OPERATIONS OF OF WMNY OR OTHERS AT THE FACILITY. AT NO TIME SHALL ACCESS ROADS BE BLOCKED OR SERVICES INTERRUPTED WITHOUT SPECIFIC AUTHORIZATION FROM WMNY.
5. THE LIMITS OF WORK SHOWN ARE APPROXIMATE AND SOME WORK OUTSIDE THE LIMITS SHOWN MAY BE REQUIRED TO COMPLETE THE CONSTRUCTION SHOWN AND SPECIFIED. THE CONTRACTOR SHALL NOTIFY WMNY OF ANY NEED TO WORK BEYOND THE LIMITS SHOWN PRIOR TO DOING THE WORK.
6. WATER LEVELS IN THE NYS BARGE CANAL AND SEDIMENTATION PONDS ARE BASED ON MEASUREMENTS MADE BY OTHERS ON NOVEMBER 9, 1993. THE WATER LEVELS AT TIME OF CONSTRUCTION ARE EXPECTED TO VARY AND MAY BE HIGHER OR LOWER. IT IS NOTED THAT THE CANAL IS NORMALLY DRAINED BY THE NYS CANAL CORPORATION DURING THE PERIOD FROM NOVEMBER TO APRIL.
7. THE DRAWINGS STATE THAT EXCAVATION SIDE SLOPES SHALL BE SLOPED BACK BEYOND THE PAY LIMITS FOR STABILITY AND SAFETY DEPENDING ON SITE CONDITIONS AND THE CONTRACTOR'S PROCEDURES. THE CONTRACTOR MAY HAVE TO USE BRACED EXCAVATIONS IN CONJUNCTION WITH DEWATERING AS SPECIFIED TO SUPPORT THE EARTH AND PROTECT ADJACENT STRUCTURES WHERE EXCAVATION SIDE SLOPES CANNOT BE SLOPED BACK ACCORDINGLY.
8. CONTRACTOR SHALL DISPOSE OF ALL SPOIL MATERIALS (MATERIALS NOT DESIGNATED FOR REUSE) AT SPECIFIED LOCATIONS WITHIN THE McKENNA LANDFILL AREA AS DIRECTED BY WMNY AND IN ACCORDANCE WITH THE SPECIFIED REQUIREMENTS.
9. CONTRACTOR SHALL OBTAIN ALL THE NECESSARY WORK PERMITS FROM THE NYS CANAL CORPORATION FOR WORK AND CONSTRUCTION ACTIVITIES WITHIN THE NYS BARGE CANAL RIGHT-OF-WAY.

ALTERING ANY ITEM ON THIS DRAWING IS IN VIOLATION OF THE LAW, EXCEPTING AS PROVIDED IN SECTION 7209, PART 2 OF THE NEW YORK STATE EDUCATION LAW.

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GZA GeoEnvironmental of New York

DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DRAWN BY: DEW
DATE:DECEMBER 1999

REV.No.	DESCRIPTION	DATE	BY

SCALE IN FEET: 0 100 200 400 800

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

GENERAL SITE PLAN

PROJECT No. 55024
DRAWING No. 55024-C-002

CONTROL LINE "A" LOCATION AND ELEVATIONS				
POINT	STATION	NORTHING*	EASTING*	ELEVATION
A1	0+00	4260.64	2385.65	531.42
A2	2+42.32	4324.73	2623.94	533.36
A3	4+29.82	4350.31	2806.03	531.88
A4	11+17.34	4514.80	3477.94	526.36
A5	12+96.94	4555.35	3652.92	524.92
A6	14+33.95	4595.68	3783.87	523.23
A7	15+16.70	4662.59	3835.87	519.39
A8	18+22.84	4744.82	3998.78	517.28
A9	17+55.92	4677.64	3895.83	514.59
A10	18+32.09	4946.28	3882.46	513.04
A11	19+25.38	5007.44	3792.04	511.15
A12	22+43.58	4994.89	3474.06	510.36
A13	26+43.58	4958.51	3075.92	509.36
A14	28+42.98	4926.16	2878.85	508.88
A15	30+43.78	4883.16	2682.71	509.36
A16	34+47.01	4775.91	2294.00	507.36
A17	38+93.80	4330.00	2322.00	530.77

* SEE NOTE 4

CONTROL LINE "B" LOCATION AND ELEVATIONS			
POINT	NORTHING*	EASTING*	ELEVATION
B1	4627.16	3757.83	538.00
B2	4589.16	3793.70	536.00
B3	4741.71	3829.63	536.00
B4	4756.27	3848.23	534.00
B5	4826.38	3842.11	534.00
B6	4851.92	3844.94	532.00
B7	4906.18	3818.71	532.00
B8	4930.70	3789.35	532.00
B9	4950.00	3774.04	530.00
B10	4943.13	3627.86	530.00
B11	4915.52	3584.03	530.00
B12	4925.46	3677.73	532.00
B13	4883.57	3667.06	532.00
B14	4830.65	2778.19	531.64
B15	4804.43	2689.29	532.25
B16	4725.22	2473.09	537.13
B17	4686.78	2427.84	536.91

* SEE NOTE 4

N 1185500

N 1185000

N 1184500

N 1184000

E 623500

E 623000

E 622500

E 624000

E 624500

NYS BARGE CANAL

APPROXIMATE TOE OF LANDFILL SLOPE

APPROXIMATE LOCATION OF REPUTED SOUTHERLY R.O.W. LINE N.Y.S. BARGE CANAL PER NYS CANAL AUTHORITY TAKING MAPS

PROPERTY LINE AS FOUND STAKED AND OCCUPIED AND PER L-404, D-79 & L-465, D-245 AND REF. #1

CONTROL LINE "A"

CONTROL LINE "B"

McKENNA LANDFILL
(ALAN J. McKENNA REPUTED OWNER)

PARCEL F
(OSL, INC. REPUTED OWNER)

PARCEL A
(OSL, INC. REPUTED OWNER)

PARCEL B
(OSL, INC. REPUTED OWNER)

PARCEL C
(OSL, INC. REPUTED OWNER)

AREA "A"

AREA "B"

AREA "C"

AREA "D"

ORLEANS SANITARY LANDFILL SITE

APPROXIMATE PROJECT LIMITS

FORMER YAGER ROAD

TRANSIT ROAD

POND
W.E. 512.9

W.E. 498.8

GAS VENT #1

GAS VENT #2

GAS VENT #3

CONC. VAULT (MANHOLE #1)

CONC. VAULT (MANHOLE #2)

LEACHATE COLLECTION RISER #1

LEACHATE COLLECTION RISER #2

LEACHATE COLLECTION RISER #3

LEACHATE COLLECTION RISER #4

LEACHATE COLLECTION RISER #5

LEACHATE COLLECTION RISER #6

WETLAND FLAGS #1 THROUGH 26

LEGEND:

⊠ A2 LOCATION AND DESIGNATION OF SURVEY BASELINE CONTROL POINT

NOTES:

1. BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 8, 1993. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL REMEDIAL CLOSURE PROJECT.
2. SEE DRAWING No. 55024-C-002 FOR COORDINATES AND ELEVATIONS OF CONTROL POINTS 50, 221 AND 52.
3. PROPERTY BOUNDARIES SHOWN WERE ADAPTED FROM A PROPERTY BOUNDARY MAP PREPARED BY LOZIER ENGINEERS AND PLOTTED ON THIS DRAWING BY GZA. GZA DID NOT VERIFY THE ACCURACY OF THE BOUNDARY MAP AND INFORMATION PREPARED BY LOZIER ENGINEERS. THEREFORE THE BOUNDARIES SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE THAT THE INFORMATION USED IS RELIABLE AND TO THE ACCURACY IMPLIED BY THE METHODS USED TO PLOT THIS INFORMATION.
4. ADD 1,180,000 TO THE NORTHINGS AND 820,000 TO THE EASTINGS SHOWN TO ACHIEVE ACTUAL COORDINATES.

ISSUED FOR CONSTRUCTION
4/25/2000

ALTERING ANY ITEM ON THIS DRAWING IS IN VIOLATION OF THE LAW, EXCEPTING AS PROVIDED IN SECTION 7209, PART 2 OF THE NEW YORK STATE EDUCATION LAW.

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DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH

DRAWN BY: DEW
DATE: DECEMBER 1999

GZA GeoEnvironmental of New York

SCALE IN FEET
0 50 100 200 300

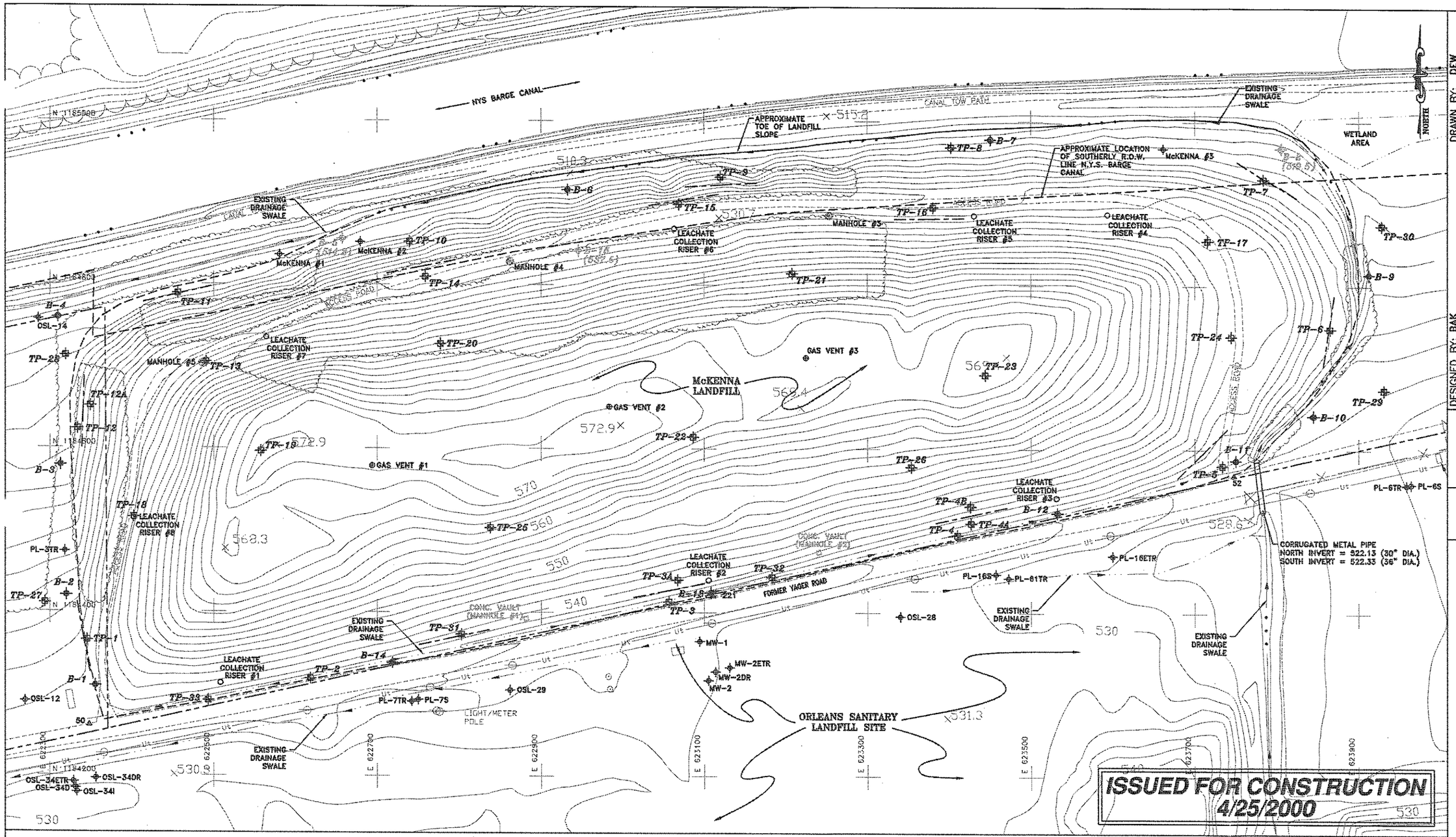
REV.No.	BY	DATE	DESCRIPTION

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

PROPERTY BOUNDARIES AND SURVEY CONTROL PLAN

PROJECT No. 55024

DRAWING No. 55024-C-003



ISSUED FOR CONSTRUCTION 4/25/2000

EXISTING MONITORING WELLS TO BE DECOMMISSIONED

THE CONTRACTOR SHALL DECOMMISSION AND REMOVE THE FOLLOWING EXISTING MONITORING WELLS AS SPECIFIED: PL-3TR, OSL-14, B-5, B-8, B-15, McKENNA #1, McKENNA #2 AND McKENNA #3

⚠

EXISTING MONITORING WELL INFORMATION

MONITORING WELL No.	TOP OF CASING ELEVATION	MONITORING WELL No.	TOP OF CASING ELEVATION
PL-6TR	530.1	PL-7S	537.1
PL-6S	530.6	PL-7TR	536.5
PL-16ETR	528.7	OSL-34DR	531.5
PL-16TR	530.2	OSL-34I	530.8
PL-16S	530.3	OSL-34D	530.7
OSL-28	530.7	OSL-34ETR	531.3
MW-2ETR	532.2	PL-3TR	527.4
MW-2DR	532.5	OSL-14	512.0
MW-1	UNKNOWN	McKENNA #1	513.2
MW-2	UNKNOWN	McKENNA #2	513.6
OSL-12	UNKNOWN	McKENNA #3	516.6
OSL-29	536.9		

EXISTING MANHOLE INFORMATION

MANHOLE NUMBER	RIM ELEVATION	INVERT ELEVATION
1	539.83	530.43
2	539.29	529.69
3	533.60	524.50
4	534.68	525.58
5	540.31	531.21

LEGEND:

- TP-6 — APPROXIMATE LOCATION AND DESIGNATION OF TEST PIT DONE IN NOVEMBER 1998 (SEE NOTE 2)
- B-1 — APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING DONE IN APRIL 1999 (SEE NOTE 2)
- B-5 (514.2) — APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING WITH GROUNDWATER OBSERVATION WELL INSTALLED IN APRIL 1999 (SEE NOTE 2); 514.2 = TOP OF CASING ELEVATION
- OSL-12 — APPROXIMATE LOCATION AND DESIGNATION OF EXISTING GROUNDWATER MONITORING WELL
- APPROXIMATE HORIZONTAL LIMITS OF REFUSE IDENTIFIED DURING TEST PIT EXCAVATION

NOTES:

1. BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 9, 1993. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL CLOSURE PROJECT.
2. THE LOCATIONS OF TEST BORINGS, TEST PITS AND MONITORING WELLS SHOWN ARE BASED ON DATA PROVIDED BY KLETTKE LAND SURVEYORS, P.C. AND A MONITORING WELL LOCATION MAP PREPARED BY ECKENFELDER ENGINEERING, P.C., DATED DECEMBER, 1994.

ALTERING ANY ITEM ON THIS DRAWING IS IN VIOLATION OF THE LAW, EXCEPTING AS PROVIDED IN SECTION 7209, PART 2 OF THE NEW YORK STATE EDUCATION LAW.

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GZA GeoEnvironmental of New York

DRAWN BY: DEW
DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DATE: DECEMBER 1999

REV.No.	DESCRIPTION	DATE	BY
1	ADDED MONITORING WELLS TO BE DECOMMISSIONED	1/24/00	JJD

SCALE IN FEET: 0, 30, 60, 120, 180

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

EXISTING CONDITIONS AND SUBSURFACE EXPLORATION PLAN

PROJECT No. 55024

DRAWING No. 55024-C-004

N 1185500

N 1185000

N 1184500

N 1184000

E 623500

E 624000

E 624500

HAY BALE SILT DAM

APPROXIMATE TOE OF LANDFILL SLOPE

NYS BARGE CANAL

TEMPORARY CONSTRUCTION FENCE

APPROXIMATE LOCATION OF REPUTED SOUTHERLY R.O.W. LINE N.Y.S. BARGE CANAL PER NYS CANAL AUTHORITY TAKING MAPS

SILT FENCE

APPROXIMATE PROJECT LIMITS

McKENNA LANDFILL (ALAN S. McKENNA REPUTED OWNER)

ORLEANS SANITARY LANDFILL SITE

PARCEL A (OSL, INC. REPUTED OWNER)

PARCEL B (OSL, INC. REPUTED OWNER)

PARCEL C (OSL, INC. REPUTED OWNER)

PARCEL F (OSL, INC. REPUTED OWNER)

AREA "A"

AREA "B"

ACCESS OPENING

FORMER YAGER ROAD

TRANSIT ROAD

POND W.E. 512.9

W.E. 498.8

MANHOLE #3

MANHOLE #4

MANHOLE #5

LEACHATE COLLECTION RISER #1

LEACHATE COLLECTION RISER #2

LEACHATE COLLECTION RISER #3

LEACHATE COLLECTION RISER #4

LEACHATE COLLECTION RISER #5

GAS VENT #1

GAS VENT #2

GAS VENT #3

CONC. VAULT (MANHOLE #1)

CONC. VAULT (MANHOLE #2)

WETLAND AREA

LEGEND:

- EXISTING DRAINAGE SWALE AND FLOW DIRECTION
- PROPOSED LOCATION OF SILT FENCE
- PROPOSED LOCATION OF HAY BALE SILT DAM
- PROPOSED LOCATION OF TEMPORARY CONSTRUCTION FENCE

NOTES:

1. BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 9, 1993. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL CLOSURE PROJECT.
2. THIS EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE THE MINIMUM REQUIREMENTS DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN THE SILT FENCES AND HAY BALE SILT DAMS SHOWN AS A MINIMUM. THE CONTRACTOR SHALL ALSO DEVELOP AND IMPLEMENT ADDITIONAL EROSION AND SEDIMENT CONTROL PROCEDURES (i.e. ADDITIONAL SILT FENCES, HAY BALE DAMS, SEEDING, etc.) AS NECESSARY TO PREVENT EROSION AND SEDIMENT MIGRATION BASED ON ACTUAL SITE CONDITIONS AND SURFACE WATER DRAINAGE PATTERNS AT THE TIME OF CLOSURE CONSTRUCTION OR AS DIRECTED BY THE OWNER.
3. FOLLOWING CONSTRUCTION, THE CONTRACTOR SHALL REMOVE TEMPORARY CONSTRUCTION FENCE, SILT FENCES AND HAY BALE SILT DAMS AS APPROVED BY THE ENGINEER AND OWNER, AND SHALL PROPERLY DISPOSE SUCH MATERIALS.

ISSUED FOR CONSTRUCTION 4/25/2000

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DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DRAWN BY: DEW
DATE: DECEMBER 1999

GZA GeoEnvironmental of New York

SCALE IN FEET: 0, 50, 100, 200, 300

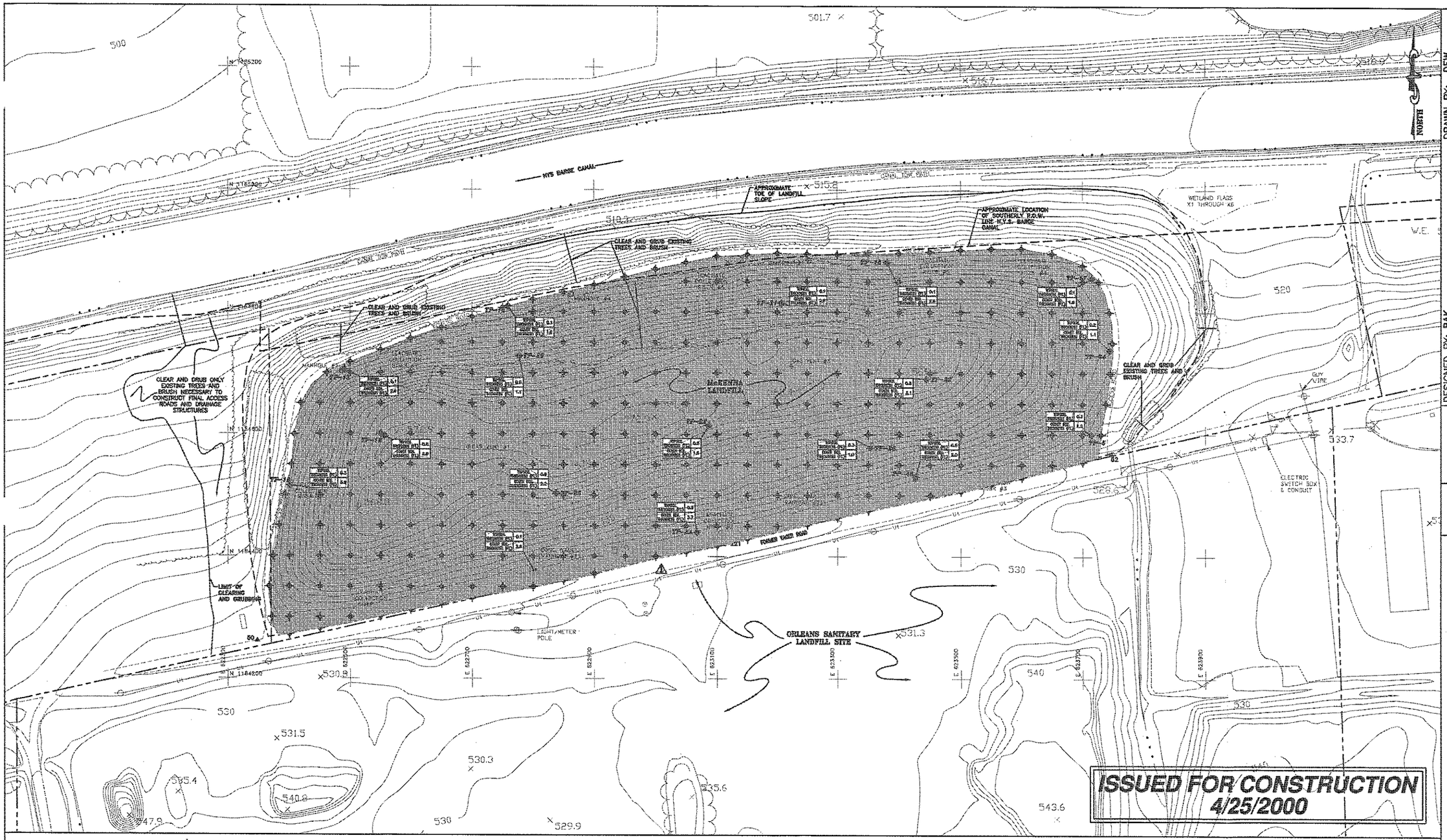
REV.No. | DESCRIPTION | BY | DATE

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

EROSION AND SEDIMENTATION CONTROL PLAN (DURING CONSTRUCTION)

PROJECT No. 55024

DRAWING No. 55024-C-005



⚠ GENERAL INFORMATION

TEST PIT EXPLORATIONS, PREVIOUSLY MADE WITHIN THE SHADED AREA SHOWN FOR POTENTIAL SOIL RECOVERY AND RE-USE, SHOWED TOPSOIL THICKNESSES RANGING BETWEEN 0.1 AND 0.8 FEET. THE UNDERLYING COVER SOIL THICKNESSES (SOIL BETWEEN THE TOPSOIL LAYER AND EXISTING WASTE MATERIALS) RANGED BETWEEN 1.0 AND 3.9 FEET AT THE TEST PIT LOCATIONS.

THE INTENT OF THIS EXISTING SOIL RECOVERY PLAN IS TO REMOVE THE EXISTING TOPSOIL AND PORTION OF THE EXISTING COVER SOILS FOR RE-USE AS PART OF THE REMEDIAL CLOSURE CONSTRUCTION. THE TOPSOIL, IF ACCEPTABLE, SHALL BE RE-USED AS TOPSOIL MATERIAL FOR THE FINAL COVER SYSTEM CONSTRUCTION AND/OR FOR FINAL SITE RESTORATION OUTSIDE THE LANDFILL COVER SYSTEM. THE EXISTING COVER SOIL MATERIALS, IF ACCEPTABLE, SHALL BE RE-USED AS BARRIER PROTECTION LAYER MATERIAL FOR THE FINAL COVER SYSTEM CONSTRUCTION AND/OR AS SUITABLE FILL FOR SUBGRADE FILLING. EXISTING TOPSOIL OR COVER SOIL DETERMINED TO BE UN-SUITABLE FOR RE-USE CAN BE USED AS COVER MATERIAL WITHIN THE AREA DESIGNATED FOR EXCAVATION SPOIL DISPOSAL IN THE EASTERN END OF THE LANDFILL PROVIDED THE MINIMUM COVER SOIL REQUIREMENTS ARE MAINTAINED IN THE AREAS WHERE THE MATERIAL IS REMOVED FROM.

RECOVERY OF THE EXISTING TOPSOIL AND COVER SOIL MATERIAL SHALL BE DONE ONLY WITHIN THE SHADED AREA SHOWN ABOVE FOLLOWING CLEARING AND GRUBBING OF EXISTING TREES AND BRUSH. RECOVERY OF THE EXISTING COVER SOIL SHALL BE DONE SUCH THAT A NOMINAL 1.0 FEET LAYER OF COVER SOIL SHALL REMAIN OVER THE EXISTING WASTE MATERIALS PRIOR TO CONSTRUCTION OF THE GAS VENTING SYSTEM AND FINAL COVER SYSTEM. EXISTING COVER SOIL SHALL NOT BE REMOVED FOR RE-USE IN AREAS OF SLOPE REQUIRING FILL FOR FINAL SLOPE GRADING.

THE CONTRACTOR SHALL IMPLEMENT THE PROCEDURES SPECIFIED IN SECTION 02130 OF THE TECHNICAL SPECIFICATIONS TO EVALUATE THE POTENTIAL QUANTITY OF EXISTING TOPSOIL AND COVER SOIL AVAILABLE FOR RECOVERY AND RE-USE; DETERMINE THEIR ACCEPTABILITY FOR RE-USE AND TO CONTROL EXCAVATION AND GRADING DURING THE BORROW SOIL RECOVERY. IF SOME OR ALL OF THE EXISTING TOPSOIL AND COVER SOIL MATERIALS IS DETERMINED TO BE UNACCEPTABLE FOR RE-USE, THEN THE UNACCEPTABLE MATERIAL SHALL BE LEFT IN PLACE OR USED FOR EXCAVATION SPOIL COVER AND PROPERLY PREPARED AND GRADED AS EXISTING SUBGRADE FOR CONSTRUCTION OF THE GAS VENTING SYSTEM AND FINAL COVER SYSTEM.

THICKNESS PROBES ARE TO MADE AT A MAXIMUM 50-FOOT GRID SPACING. ORIENTATION OF THE GRID MAY VARY FROM THAT SHOWN HERE-ON.

LEGEND:

- AREA PROPOSED FOR TOPSOIL AND COVER SOIL RECOVERY (SEE GENERAL INFORMATION)
- TP-22 — APPROXIMATE LOCATION AND DESIGNATION OF TEST PIT MADE THROUGH EXISTING LANDFILL COVER IN NOVEMBER 1998 BY GZA (SEE NOTE 2)
- TOPSOIL THICKNESS = THICKNESS OF TOPSOIL MEASURED BY GZA DURING TEST PIT EXCAVATIONS
- COVER SOIL THICKNESS = THICKNESS OF COVER SOIL (BOTTOM OF TOPSOIL TO TOP OF REFUSE) MEASURED BY GZA DURING TEST PIT EXCAVATIONS
- APPROXIMATE LOCATION OF THICKNESS PROBES TO BE MADE AS A MINIMUM BY THE CONTRACTOR

NOTES:

1. BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 9, 1993. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL CLOSURE PROJECT.
2. THE LOCATIONS OF TEST PITS SHOWN ARE BASED ON DATA PROVIDED BY KLETTKE LAND SURVEYORS, P.C.
3. TEST PIT EXCAVATIONS WERE DONE FROM NOVEMBER 4 - 9, 1998.

ALTERING ANY ITEM ON THIS DRAWING IS IN VIOLATION OF THE LAW, EXCEPTING AS PROVIDED IN SECTION 7209, PART 2 OF THE NEW YORK STATE EDUCATION LAW.

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DRAWN BY: DEW
DATE: DECEMBER 1999
DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH

REV.No.	DESCRIPTION	BY	DATE
1	REVISED LIMITS OF SOIL RECOVERY AND NOTES	JJD	1/24/00

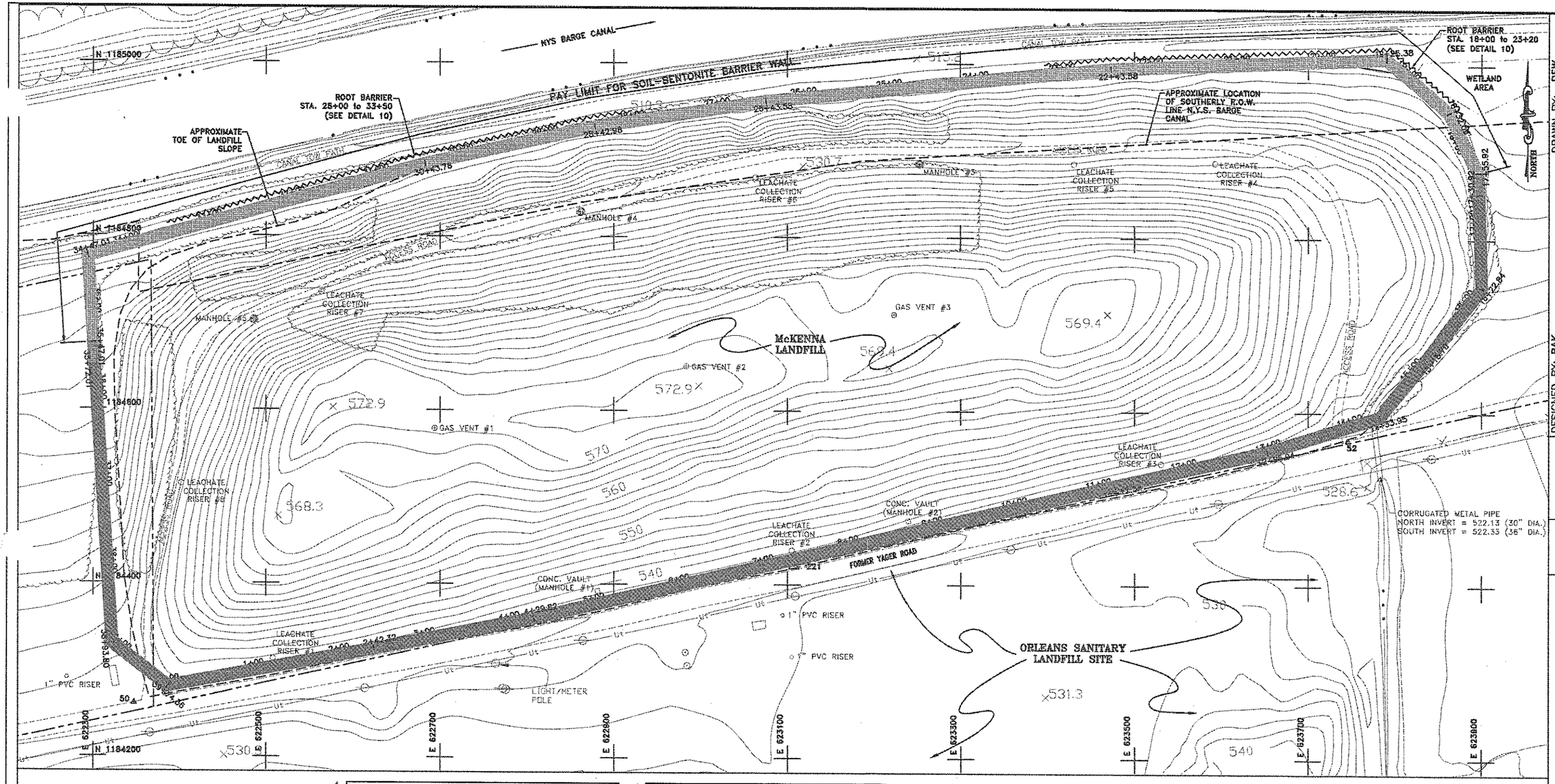
SCALE IN FEET: 0 40 80 160 240

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

EXISTING SOIL RECOVERY PLAN

PROJECT No. 55024

DRAWING No. 55024-C-006



⚠ LOW PERMEABILITY SOIL BARRIER INFORMATION

CONTROL LINE "A" STATION	APPROXIMATE EXISTING GROUND SURFACE ELEVATION (FT.)	ESTIMATED TOP OF BEDROCK ELEVATION (FT.)*	DESIGN TOP OF LOW PERMEABILITY SOIL BARRIER AT C DRAINAGE SWALE (CONTROL LINE "A")
0+05	538.2	532.0	533.53
1+00	536.0	531.0	534.33
2+00	536.4	532.0	535.13
2+42.32	536.0	532.0	535.47
3+00	537.5	530.5	533.01
4+00	537.2	530.5	534.21
4+29.62	535.9	530.5	533.57
5+00	535.8	530.5	533.41
6+00	535.5	530.5	532.61
7+00	534.8	530.5	531.81
8+00	534.3	529.0	531.01
9+00	535.6	529.0	530.21
10+00	532.8	529.0	529.41
11+00	532.4	529.0	528.61
11+17.34	532.2	529.0	528.47
12+00	532.2	529.0	527.81
12+26.94	529.9	523.0	527.03
13+00	530.0	523.0	528.09
14+00	528.0	519.0	525.78
14+33.65	526.7	519.0	525.34
15+00	523.5	520.5	522.35
15+18.70	522.7	520.5	521.99
16+00	521.7	519.0	519.85
16+22.84	521.8	518.5	519.39
17+00	518.8	513.0	517.83
17+30.92	518.0	509.5	517.21
17+55.92	515.9	509.0	506.90
35+47.01	518.7	509.5	506.90
35+72.01	517.8	510.0	516.02
36+00	518.3	510.5	517.48
37+00	524.3	516.0	522.72
38+00	531.0	524.0	527.95
38+93.80	535.2	531.0	532.88
39+00	535.5	531.0	532.93

⚠ SOIL-BENTONITE BARRIER WALL INFORMATION

CONTROL LINE "A" STATION	APPROXIMATE EXISTING GROUND SURFACE ELEVATION (FT.)	ESTIMATED TOP OF BEDROCK ELEVATION (FT.)*	DESIGN TOP OF SOIL-BENTONITE BARRIER WALL ELEVATION (FT.)
17+30.92	518.0	511.0	515.10
17+55.92	515.9	508.5	514.59
18+00	515.6	508.5	513.89
18+32.09	514.8	505.0	514.04
19+00	513.9	503.0	511.67
19+25.38	514.2	502.0	511.15
20+00	513.8	500.0	510.87
21+00	513.6	500.0	510.72
22+00	511.8	500.0	510.47
22+43.88	511.8	500.0	510.36
23+00	511.4	500.0	510.22
24+00	511.4	499.5	509.97
25+00	511.3	499.0	509.72
26+00	511.4	498.5	509.47
26+43.58	511.5	499.5	509.36
27+00	511.5	498.5	509.22
28+00	511.5	498.5	508.97
28+42.98	511.4	498.5	508.86
29+00	511.5	498.5	508.72
30+00	511.4	498.5	508.47
30+43.78	511.5	498.5	508.36
31+00	512.1	498.5	508.22
32+00	511.1	498.0	507.97
33+00	510.3	499.5	507.73
34+00	510.0	500.0	507.48
34+47.01	509.7	500.0	507.36
35+00	514.5	507.0	510.14
36+47.01	518.7	508.5	512.60
36+72.01	517.8	510.0	513.91

* ESTIMATED TOP OF BEDROCK ELEVATION IS BASED ON INTERPOLATION BETWEEN WIDELY SPACED TEST BORINGS USING A COMPUTER GENERATED TOP OF BEDROCK SURFACE CONTOUR MAP AS PRESENTED IN APPENDIX B OF THE PROJECT MANUAL AND IS PROVIDED FOR ESTIMATING PURPOSES ONLY. THE ACTUAL TOP OF BEDROCK ELEVATION ENCOUNTERED AT TIME OF CONSTRUCTION SHOULD BE EXPECTED TO VARY.

LEGEND:

- DENOTES AREA OF SOIL-BENTONITE BARRIER WALL CONSTRUCTION
- DENOTES AREA OF LOW PERMEABILITY SOIL BARRIER CONSTRUCTION
- DENOTES TRANSITION AREA FROM SOIL-BENTONITE BARRIER WALL TO LOW PERMEABILITY SOIL BARRIER CONSTRUCTION
- PROPOSED LOCATION OF ROOT BARRIER

NOTES:

1. BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 9, 1992. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL CLOSURE PROJECT.
2. SEE DETAILS 8 AND 9 FOR LOW PERMEABILITY SOIL BARRIER CONSTRUCTION.
3. SEE DETAILS 10 AND 11 FOR SOIL-BENTONITE BARRIER WALL CONSTRUCTION.

ISSUED FOR CONSTRUCTION
4/25/2000

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GZA GeoEnvironmental of New York

DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DRAWN BY: DEW
DATE: DECEMBER 1999

REV.No.	DESCRIPTION	BY	DATE
1	REVISED TABLES	JJD	1/24/00

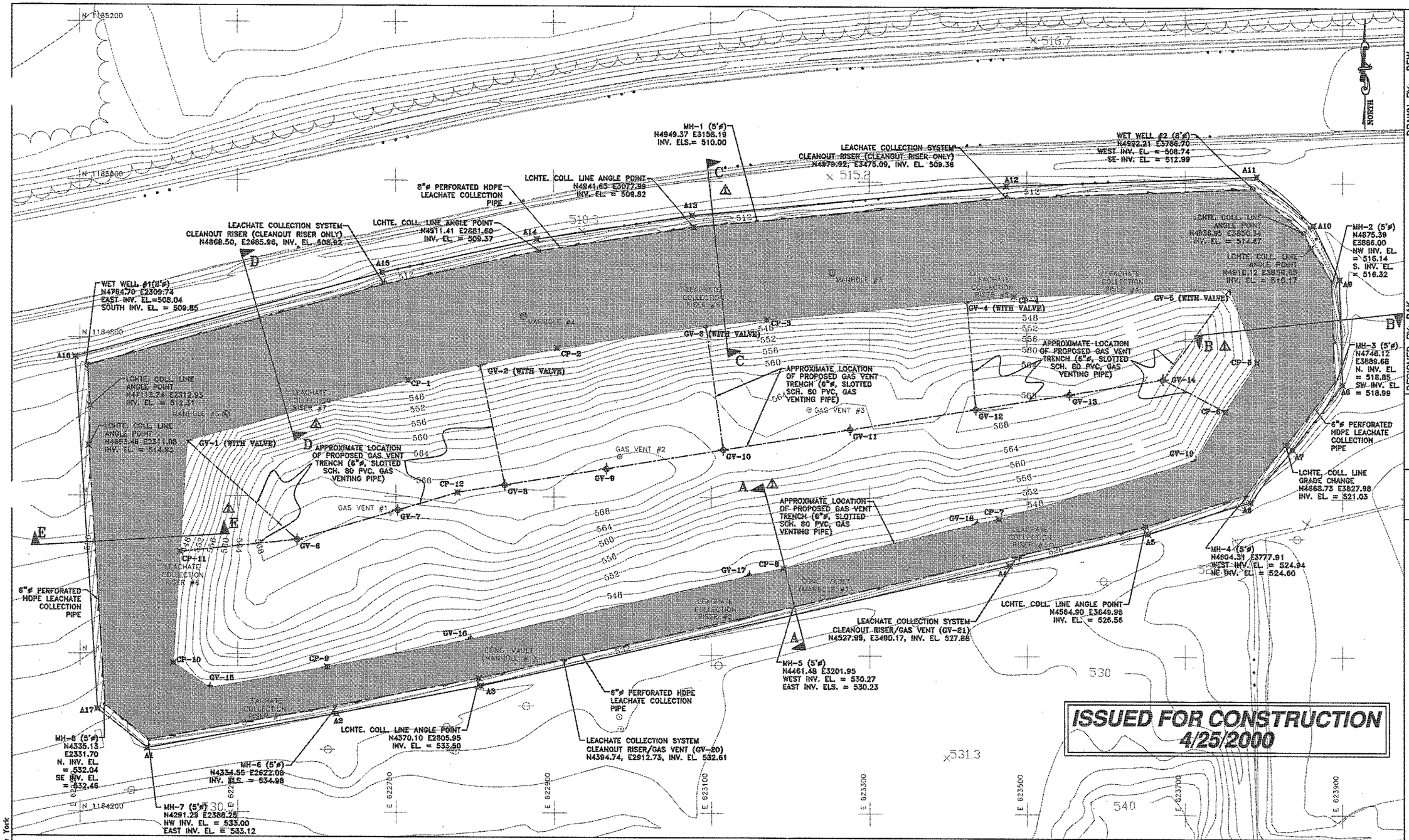
SCALE IN FEET: 0 30 60 120 180

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

BARRIER WALL LOCATION PLAN

PROJECT No. 55024

DRAWING No. 55024-C-007


N 1185200
N 1185000
N 1184800
N 1184600
N 1184400
N 1184200
E 622700
E 622900
E 623100
E 623300
E 623500
E 623700
E 623900
NORTH
WET WELL #1(5'ø)
N4784.70 E2309.74
EAST INV. EL.=508.04
SOUTH INV. EL. = 509.85
LCHTE. COLL. LINE ANGLE POINT
N4713.74 E2312.93
INV. EL. = 512.31
LCHTE. COLL. LINE ANGLE POINT
N4952.48 E2311.03
INV. EL. = 514.93
6"ø PERFORATED HDPE LEACHATE COLLECTION PIPE
MH-8 (5'ø)
N4335.13 E2331.70
N. INV. EL. = 532.04
SE INV. EL. = 532.46
MH-7 (5'ø)
N4291.29 E2368.28
NW INV. EL. = 533.00
EAST INV. EL. = 533.12
MH-6 (5'ø)
N4336.55 E2622.08
INV. ELS. = 534.98
LCHTE. COLL. LINE ANGLE POINT
N4370.10 E2805.95
INV. EL. = 533.50
6"ø PERFORATED HDPE LEACHATE COLLECTION PIPE
LEACHATE COLLECTION SYSTEM CLEANOUT RISER/GAS VENT (GV-20)
N4394.74, E2912.73, INV. EL. 532.61
MH-5 (5'ø)
N4461.48 E3201.95
WEST INV. EL. = 530.27
EAST INV. ELS. = 530.23
LEACHATE COLLECTION SYSTEM CLEANOUT RISER/GAS VENT (GV-21)
N4527.99, E3490.17, INV. EL. 527.88
LCHTE. COLL. LINE ANGLE POINT
N4564.90 E3649.98
INV. EL. = 526.56
MH-4 (5'ø)
N4604.31 E3777.91
WEST INV. EL. = 524.94
NE INV. EL. = 524.60
LCHTE. COLL. LINE GRADE CHANGE
N4668.73 E3827.98
INV. EL. = 521.03
6"ø PERFORATED HDPE LEACHATE COLLECTION PIPE
MH-3 (5'ø)
N4748.12 E3889.68
N. INV. EL. = 518.85
SW. INV. EL = 518.99
LCHTE. COLL. LINE ANGLE POINT
N4816.12 E3858.68
INV. EL. = 516.17
LCHTE. COLL. LINE ANGLE POINT
N4836.95 E3850.34
INV. EL. = 514.67
MH-2 (5'ø)
N4875.39 E3886.00
NW INV. EL. = 516.14
S. INV. EL = 516.32
WET WELL #2 (8'ø)
N4992.31 E3786.70
WEST INV. EL. = 508.74
SE INV. EL. = 512.99
LEACHATE COLLECTION SYSTEM CLEANOUT RISER (CLEANOUT RISER ONLY)
N4979.92, E3475.09, INV. EL. 509.36
MH-1 (5'ø)
N4949.37 E3158.19
INV. ELS.= 510.00
8"ø PERFORATED HDPE LEACHATE COLLECTION PIPE
LCHTE. COLL. LINE ANGLE POINT
N4941.65 E3077.86
INV. EL. = 509.82
LEACHATE COLLECTION SYSTEM CLEANOUT RISER (CLEANOUT RISER ONLY)
N4868.50, E2685.96, INV. EL. 508.82
LCHTE. COLL. LINE ANGLE POINT
N4911.41 E2681.60
INV. EL. = 509.37
GV-1 (WITH VALVE)
GV-2 (WITH VALVE)
GV-3 (WITH VALVE)
GV-4 (WITH VALVE)
GV-5 (WITH VALVE)
APPROXIMATE LOCATION OF PROPOSED GAS VENT TRENCH (6"ø, SLOTTED SCH. 80 PVC, GAS VENTING PIPE)
GAS VENT #1
GAS VENT #2
GAS VENT #3
LEACHATE COLLECTION RISER #1
LEACHATE COLLECTION RISER #2
LEACHATE COLLECTION RISER #3
LEACHATE COLLECTION RISER #4
LEACHATE COLLECTION RISER #5
LEACHATE COLLECTION RISER #6
LEACHATE COLLECTION RISER #7
LEACHATE COLLECTION RISER #8
MANHOLE #1
MANHOLE #2
MANHOLE #3
CONC. VAULT (MANHOLE #4)
CONC. VAULT (MANHOLE #5)
CP-1
CP-2
CP-3
CP-4
CP-5
CP-6
CP-7
CP-8
CP-9
CP-10
CP-11
CP-12
GV-6
GV-7
GV-8
GV-9
GV-10
GV-11
GV-12
GV-13
GV-14
GV-15
GV-16
GV-17
GV-18
GV-19
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GV-21
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510.3
515.2
516.7
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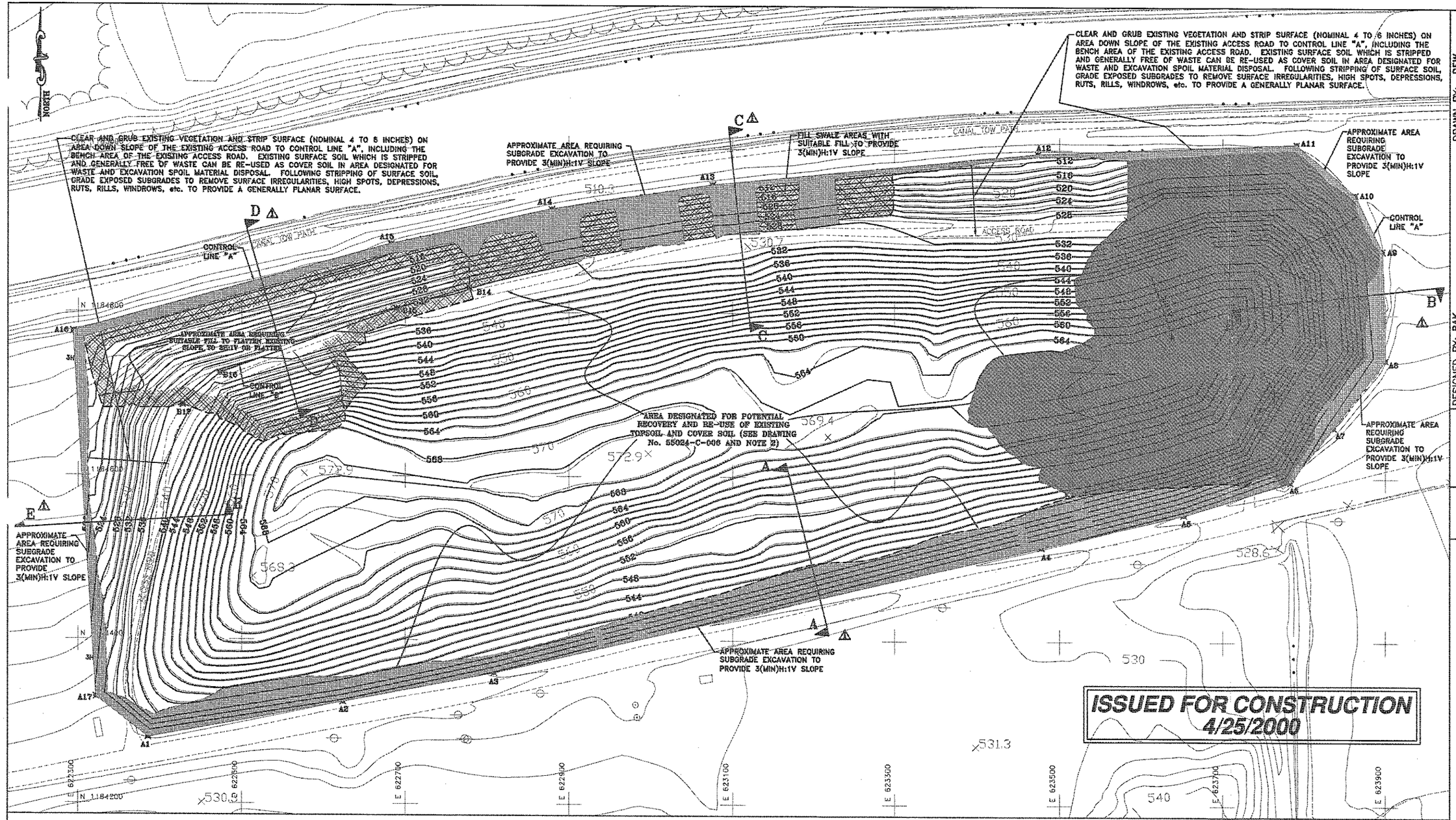

LEGEND:

A17 ⊠ APPROXIMATE LOCATION AND DESIGNATION OF CONTROL POINTS

NOTES:

1. BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 9, 1993. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL CLOSURE PROJECT.
2. AS A MINIMUM, CLEAR AND GRUB EXISTING VEGETATION AND STRIP SURFACE (NOMINAL 4 TO 6 INCHES) WITHIN AREA DESIGNATED FOR POTENTIAL SOIL RECOVERY. SURFACE SOIL WHICH IS STRIPPED AND NOT SUITABLE FOR RE-USE AS TOPSOIL, BARRIER PROTECTION MATERIAL OR SUITABLE FILL AND IS GENERALLY FREE OF WASTE, CAN BE RE-USED AS COVER SOIL IN AREA DESIGNATED FOR WASTE AND EXCAVATION SPOIL MATERIAL DISPOSAL. THE FINISH SUBGRADE CONTOURS SHOWN IN THIS AREA ARE BASED ON AN ASSUMED AVERAGE 1.7 FEET DEPTH OF EXISTING TOPSOIL/COVER SOIL RECOVERY. ACTUAL TOP OF FINISH SUBGRADE WILL VARY DEPENDING ON THE EXISTING SOIL THICKNESSES. THE SUITABILITY OF THE EXISTING SOIL FOR RE-USE AND THE ACTUAL DEPTHS OF MATERIALS REMOVED, FOLLOWING SOIL RECOVERY AND/OR SURFACE STRIPPING, THE EXPOSED FINAL SUBGRADES SHALL BE GRADED TO REMOVE SURFACE IRREGULARITIES, HIGH SPOTS, DEPRESSIONS, RUTS, RILLS, WINDROWS, ETC. TO PROVIDE A GENERALLY PLANAR SURFACE.
3. ⚠1 SEE DRAWING No 55024-C-011 FOR CROSS SECTIONS A-A, B-B & C-C AND DRAWING No. 55024-C-012 FOR CROSS SECTIONS D-D & E-E.
4. GRADING CONTOURS SHOWN IN AREA DESIGNATED FOR EXCAVATED WASTE AND SPOIL MATERIAL DISPOSAL ARE THE MAXIMUM PERMISSIBLE FINISHED SUBGRADE GRADES. DEPENDING ON ACTUAL VOLUME OF MATERIALS PLACED IN THIS AREA, THE CONTRACTOR SHALL FILL AND GRADE THIS AREA TO PROVIDE POSITIVE DRAINAGE TO THE PERIMETER DRAINAGE SWALES ALONG CONTROL LINE "A", WITH SLOPES NO STEEPER THAN 3H:1V AND NO FLATTER THAN 5 PERCENT. FINAL GRADING OF THE SUBGRADE IN THIS AREA SHALL NOT HAVE DEPRESSIONS OR SWALES WHICH WILL ACCUMULATE OR CONCENTRATE SURFACE WATER DRAINAGE. THE CONTRACTOR SHALL PLACE A NOMINAL 6 INCHES OF DAILY COVER, AT THE END OF EACH DAY, OVER ALL EXPOSED WASTE PLACED IN THIS AREA. A NOMINAL 12 INCHES OF COVER SOIL, FREE OF WASTE MATERIALS, SHALL BE PLACED OVER ALL EXCAVATED WASTE AND SPOIL MATERIALS TO MAKE UP THE FINAL SUBGRADE SURFACE IN THE AREA DESIGNATED FOR EXCAVATED WASTE AND SPOIL MATERIAL DISPOSAL.
5. THE CONTRACTOR SHALL CLEAR AND GRUB AND STRIP TOPSOIL OUTSIDE OF CONTROL LINE "A", PRIOR TO SUBGRADE EXCAVATION OR FILLING, IN AREAS PROPOSED FOR DRAINAGE SWALE AND FINAL ACCESS ROAD CONSTRUCTION.
6. THE CONTRACTOR SHALL GRADE ALL FINAL SUBGRADE SURFACES WITHIN CONTROL LINE "A" TO BE NO STEEPER THAN 3H:1V AND NO FLATTER THAN 5 PERCENT. THE FINAL SUBGRADE SURFACE SHALL BE FREE OF STONES OR ROCKS GREATER THAN 3 INCHES, WOOD, DEBRIS OR OTHER PROTRUDING OBJECTS AND SHALL BE ACCEPTABLE TO THE ENGINEER AND/OR CQA ENGINEER.
7. CONSTRUCTION OF THE FINAL COVER SYSTEM COMPONENTS SHALL PROCEED ON SUBGRADE SURFACES WHICH ARE ACCEPTABLE TO THE ENGINEER AND/OR CQA ENGINEER.

ISSUED FOR CONSTRUCTION
4/25/2000

ALTERING ANY ITEM ON THIS DRAWING IS IN VIOLATION OF THE LAW, EXCEPTING AS PROVIDED IN SECTION 7209, PART 2 OF THE NEW YORK STATE EDUCATION LAW.

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DRAWN BY: DEW
DATE: DECEMBER 1999

	DESIGNED BY:	CHECKED BY:	REVIEWED BY:
3	ADDED CROSS SECTION LOCATIONS AND NOTE 3	BAK	JJD	EMH
2				
1				
REV.No.	DESCRIPTION	BY	DATE
		JJD	1/24/00

GZA GeoEnvironmental of New York

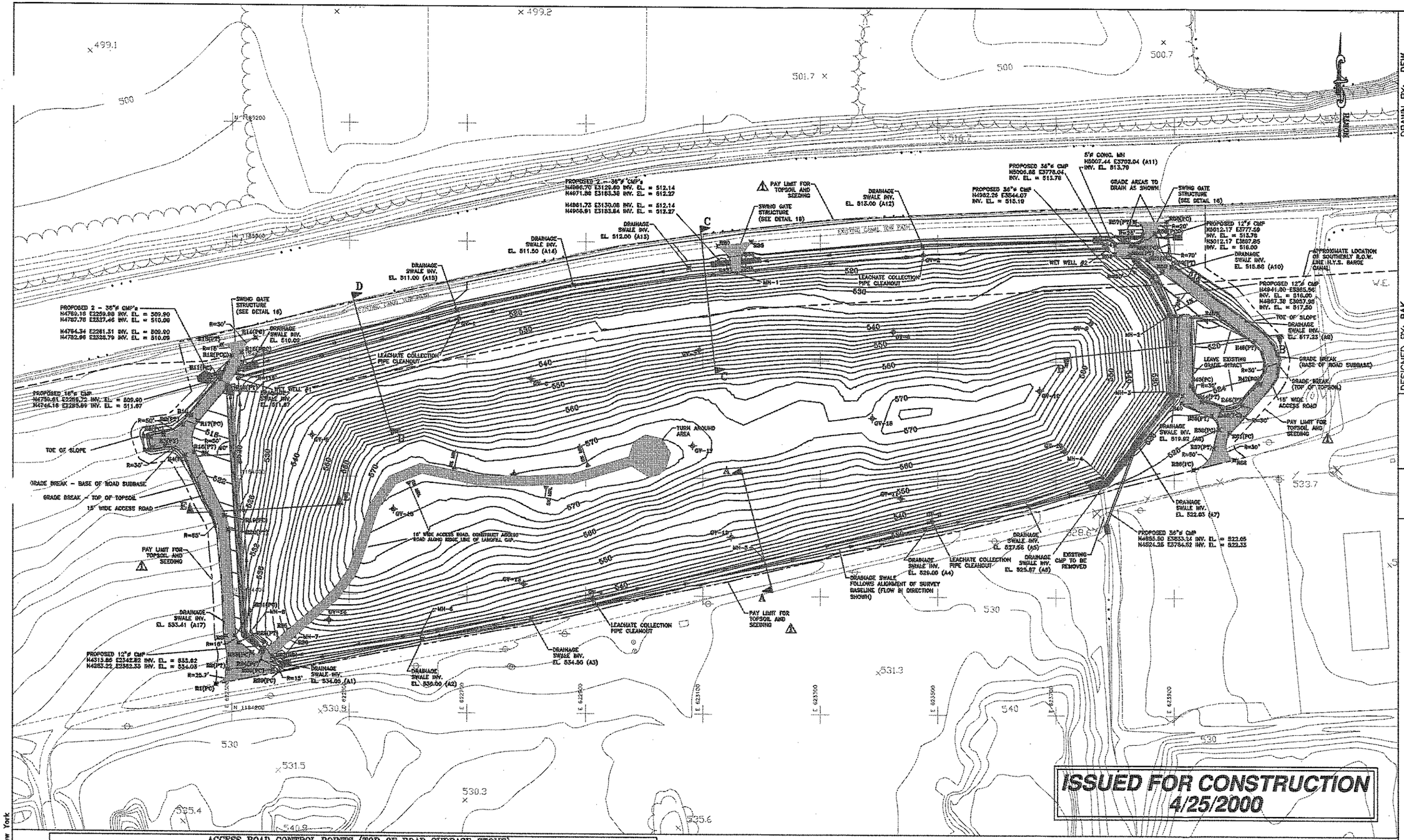
SCALE IN FEET: 0, 30, 60, 120, 180

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

SUBGRADE GRADING PLAN

PROJECT No. 55024

DRAWING No. 55024-C-009



ACCESS ROAD CONTROL POINTS (TOP OF ROAD SUBBASE STONE)

POINT#	NORTHING	EASTING	ELEVATION	POINT#	NORTHING	EASTING	ELEVATION	POINT#	NORTHING	EASTING	ELEVATION	POINT#	NORTHING	EASTING	ELEVATION
R1	4245.89	2272.96	536.00	R18	4636.90	2235.55	520.58	R35	5001.22	3162.45	516.13	R52	4883.42	3624.47	520.00
R2	4271.85	2283.19	535.92	R19	4631.72	2267.25	528.46	R36	4617.95	3933.48	530.00	R53	4983.42	3786.15	520.00
R3	4327.98	2289.53	535.72	R20	4607.56	2293.58	526.84	R37	4654.21	3970.05	530.00	R54	4998.42	3796.15	520.00
R4	4634.74	2220.91	520.24	R21	4328.62	2304.80	536.02	R38	4686.76	3978.31	526.50	R55	4998.42	3828.26	520.00
R5	4650.87	2186.66	520.00	R22	4316.39	2311.43	536.02	R39	4710.36	3966.09	527.71	R56	4998.42	3851.96	519.00
R6	4648.73	2186.50	520.00	R23	4299.59	2333.09	536.24	R40	4730.86	3912.42	526.00	R57	5038.25	3832.04	518.00
R7	4663.38	2163.66	520.00	R24	4300.26	2352.28	535.00	R41	4745.24	3914.49	524.03	R58	5038.22	3886.97	518.00
R8	4667.53	2184.04	520.00	R25	4338.98	2395.58	545.50	R42	4675.27	3910.64	521.34	R59	5016.42	3866.96	517.85
R9	4688.42	2219.50	518.23	R26	4327.80	2405.58	545.50	R43	4760.40	3928.05	524.04	R60	4951.91	3895.66	520.35
R10	4701.44	2230.00	517.34	R27	4294.59	2368.44	536.87	R44	4733.25	3948.29	526.26	R61	4660.79	3995.91	529.00
R11	4762.71	2279.46	513.70	R28	4271.54	2359.26	536.00	R45	4719.60	3983.86	526.00	R62	4655.11	4003.36	531.00
R12	4803.30	2298.42	515.66	R29	4267.65	2378.24	536.00	R46	4727.85	4017.16	526.00				
R13	4821.38	2281.67	516.00	R30	4993.76	3126.33	516.07	R47	4764.01	4046.84	526.00				
R14	4833.89	2338.90	516.00	R31	4975.52	3148.13	517.00	R48	4837.14	4040.97	521.00				
R15	4808.12	2315.79	516.00	R32	4951.00	3150.16	517.00	R49	4884.30	3976.43	522.55				
R16	4753.81	2291.55	514.00	R33	4952.23	3165.09	517.00	R50	4854.81	3879.84	518.66				
R17	4692.01	2241.67	517.64	R34	4976.97	3163.04	517.00	R51	4973.79	3853.97	519.00				

LEGEND:

- GV-1 ⊕ APPROXIMATE LOCATION AND DESIGNATION OF PROPOSED GAS VENT
- APPROXIMATE LIMITS OF RIP RAP PLACEMENT IN DRAINAGE SWALE WHERE SHOWN AND AROUND CMP ENTRANCES AND EXITS. AT CMP ENTRANCES AND EXITS, LINE SWALE WITH RIP RAP 10 FEET BEFORE ENTRANCE AND 10 FEET AFTER EXIT.
- APPROXIMATE LIMITS OF DRAINAGE SWALE TO BE LINED WITH EROSION CONTROL MATERIAL WHERE SHOWN
- ⊠ R2 LOCATION AND DESIGNATION OF ACCESS ROAD CONTROL POINT
- PROPOSED LOCATION OF MANHOLE
- PROPOSED LOCATION OF WET WELL

NOTES:

1. BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 9, 1993. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL REMEDIAL CLOSURE PROJECT.
2. FINAL GRADING CONTOURS SHOWN ARE BASED ON CONSTRUCTION OF FINAL COVER SYSTEM OVER THE SUBGRADE CONTOURS SHOWN ON DRAWING No. 55024-C-013. ACTUAL FINAL GRADES MAY VARY DEPENDING ON FINAL SUBGRADE GRADING. THE CONTRACTOR SHALL CONSTRUCT THE FINAL COVER SYSTEM ON THE FINISH SUBGRADES ACCEPTED BY THE ENGINEER AND/OR CQA ENGINEER. THE FINAL COVER SYSTEM SHALL BE CONSTRUCTED WITHIN THE THICKNESS TOLERANCES SPECIFIED.
3. SEE DRAWING No. 55024-C-011 FOR CROSS SECTIONS A-A, B-B & C-C AND DRAWING No. 55024-C-012 FOR CROSS SECTIONS D-D & E-E.

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DESIGNED BY: BAK
DRAWN BY: DEW
CHECKED BY: JJD
REVIEWED BY: ERH
DATE: DECEMBER 1999

REV.No.	DESCRIPTION	BY	DATE
1	ADDED PAY LIMITS FOR TOPSOIL AND SEEDING	JJD	1/24/00

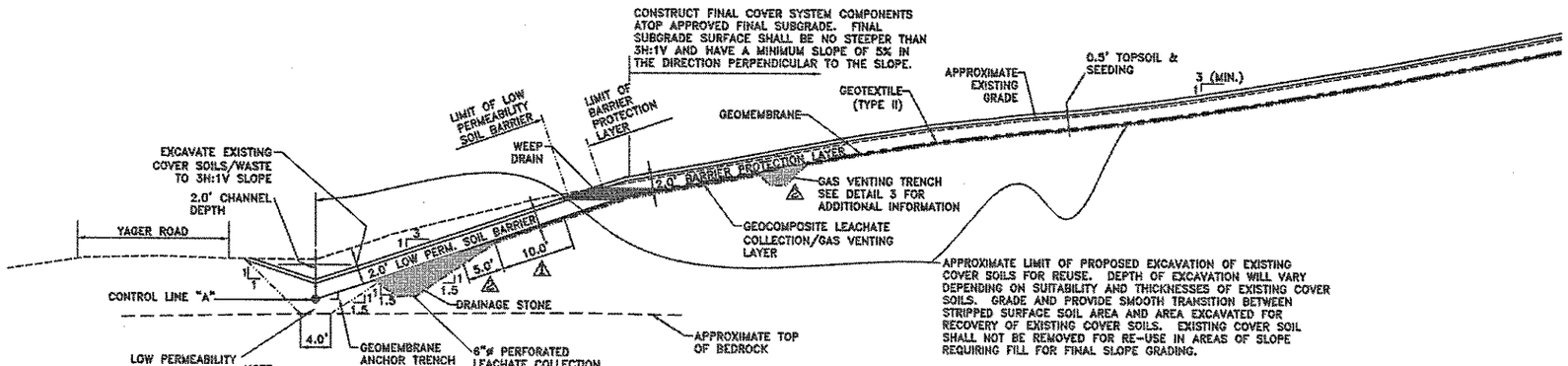
SCALE IN FEET
0 40 80 160 240

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

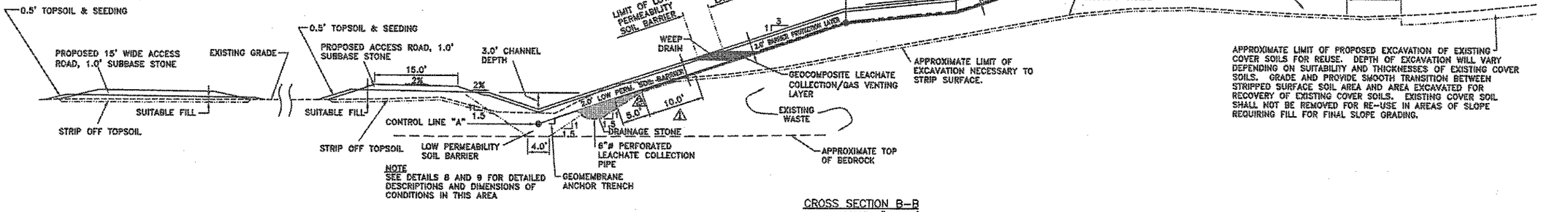
FINAL GRADING PLAN

PROJECT No.
55024

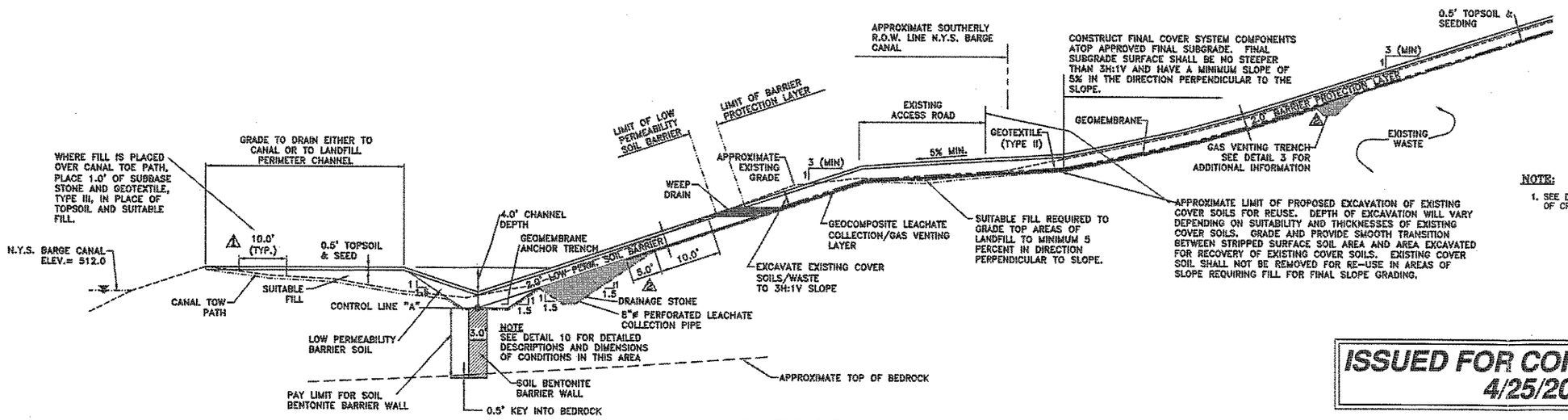
DRAWING No.
55024-C-010



CROSS SECTION A–A
SCALE: 1"= 10.0'



CROSS SECTION B–B
SCALE: 1"= 10.0'



CROSS SECTION C–C
SCALE: 1"= 10.0'

NOTE:

1. SEE DRAWING No. 55024–C–010 FOR LOCATION OF CROSS SECTIONS A–A, B–B & C–C.

ISSUED FOR CONSTRUCTION
4/25/2000

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DRAWN BY: DEW
DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DATE: DECEMBER 1999

REV.No.	DESCRIPTION	BY	DATE
1	REVISED LEACHATE COLLECTION TRENCH DETAILS	JJD	1/24/00
2	REVISED GEOCOMPOSITE CONNECTION AT LEACHATE COLLECTION/GAS VENTING TRENCHES	JJD	2/15/00

SCALE IN FEET
0 5 10 20 30

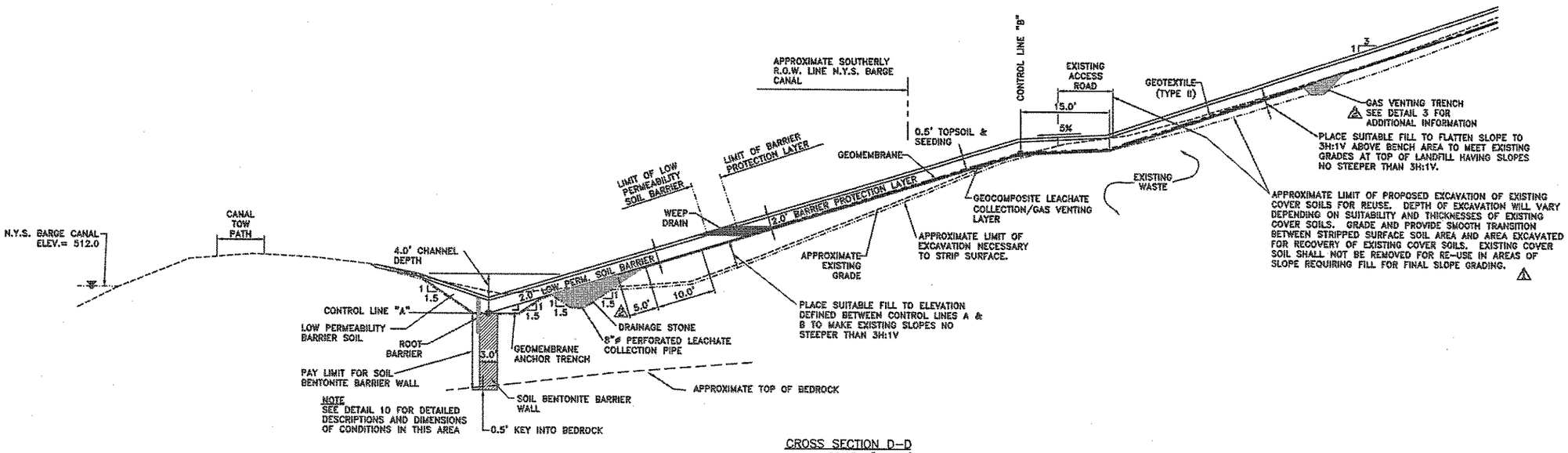
WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

CROSS SECTIONS A–A, B–B & C–C

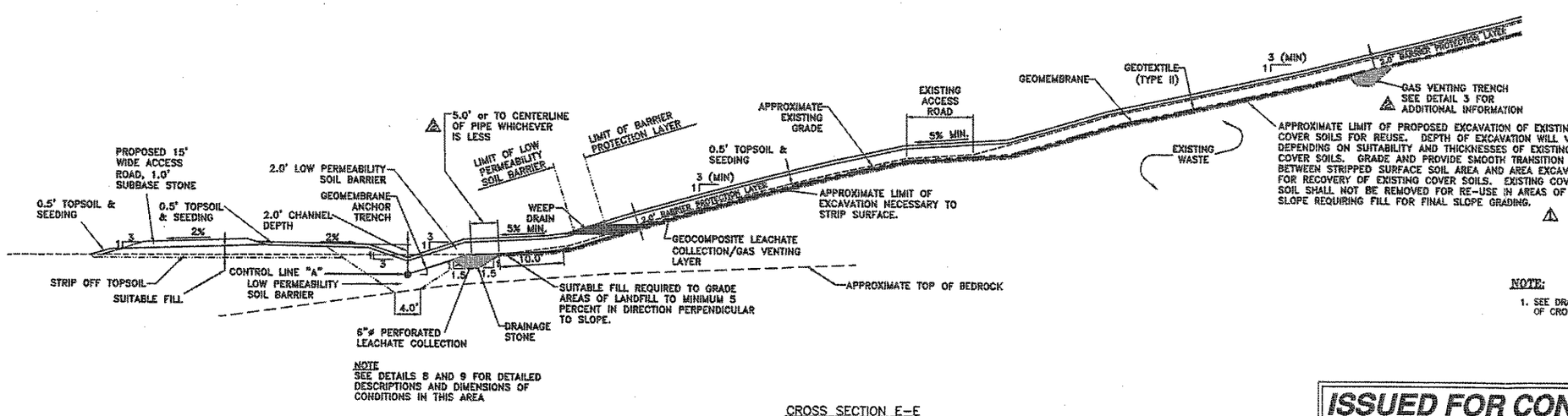
PROJECT No.
55024

DRAWING No.
55024–C–011

GZA GeoEnvironmental of New York



CROSS SECTION D-D
SCALE: 1"= 10.0'



CROSS SECTION E-E
SCALE: 1"= 10.0'

NOTE:

1. SEE DRAWING No. 55024-C-010 FOR LOCATION OF CROSS SECTIONS D-D & E-E.

ISSUED FOR CONSTRUCTION
4/25/2000

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REV.No.	DESCRIPTION	BY	DATE
1	REVISED NOTE	JJD	2/15/00
2	REVISED GEOCOMPOSITE CONNECTION AT LEACHATE COLLECTION/GAS VENTING TRENCHES	JJD	1/24/00

DRAWN BY: DEW
DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DATE: DECEMBER 1999

GZA GeoEnvironmental of New York

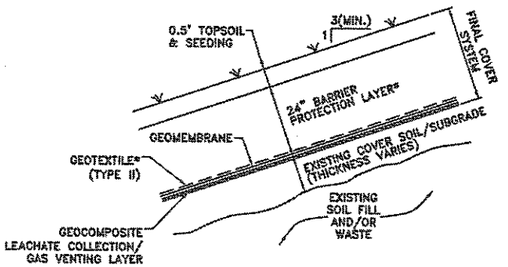
SCALE IN FEET
0 5 10 20 30

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

CROSS SECTIONS D-D & E-E

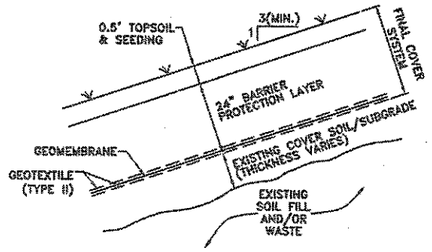
PROJECT No.
55024

DRAWING No.
55024-C-012

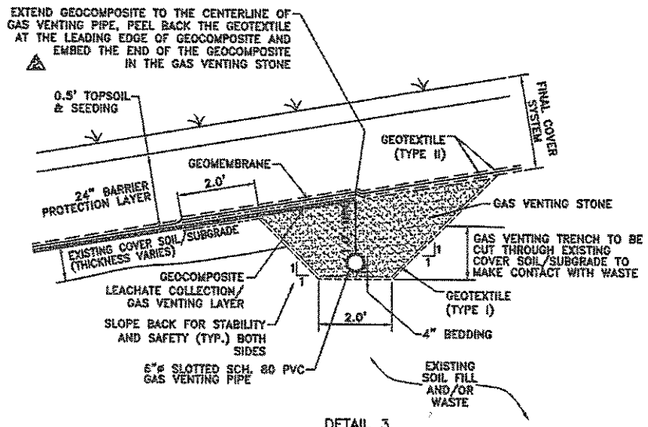


* 24" BARRIER PROTECTION LAYER AND GEOTEXTILE TYPE II SHALL BE REPLACED WITH 24 INCHES OF LOW PERMEABILITY BARRIER SOIL AT TOE OF SLOPE (i.e. OVER LEACHATE COLLECTION TRENCH) AS SHOWN ON DETAILS 10, 11 AND 12)

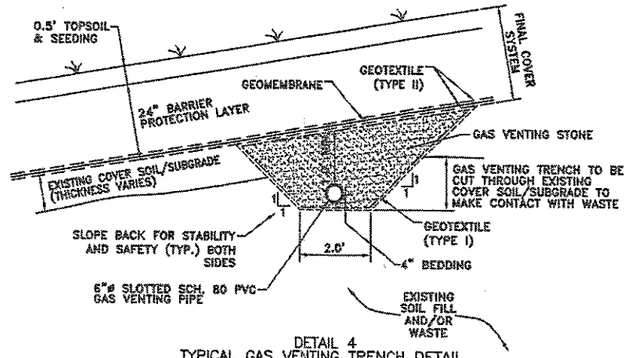
DETAIL 1
TYPICAL DETAIL OF FINAL COVER SYSTEM
LOWER PORTION OF LANDFILL
SCALE: 1"= 2.0'



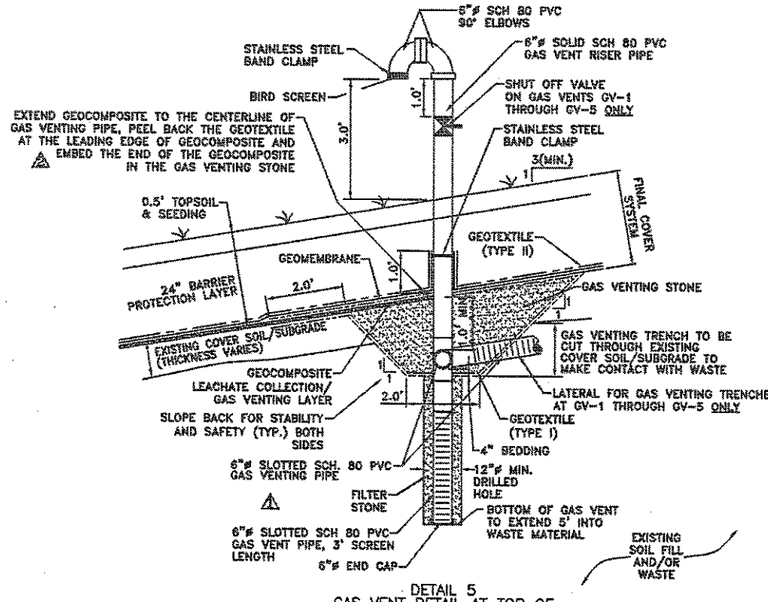
DETAIL 2
TYPICAL DETAIL OF FINAL COVER SYSTEM
UPPER PORTION OF LANDFILL
SCALE: 1"= 2.0'



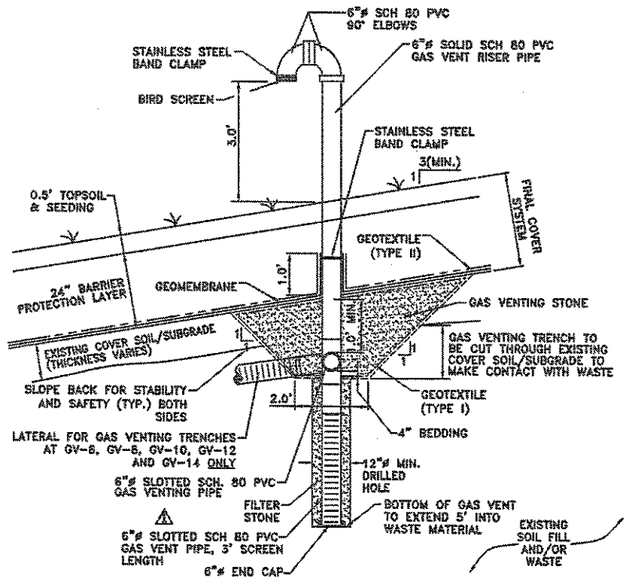
DETAIL 3
TYPICAL GAS VENTING TRENCH DETAIL AT TOP
OF LEACHATE COLLECTION/GAS VENTING LAYER
SCALE: 1"= 2.0'



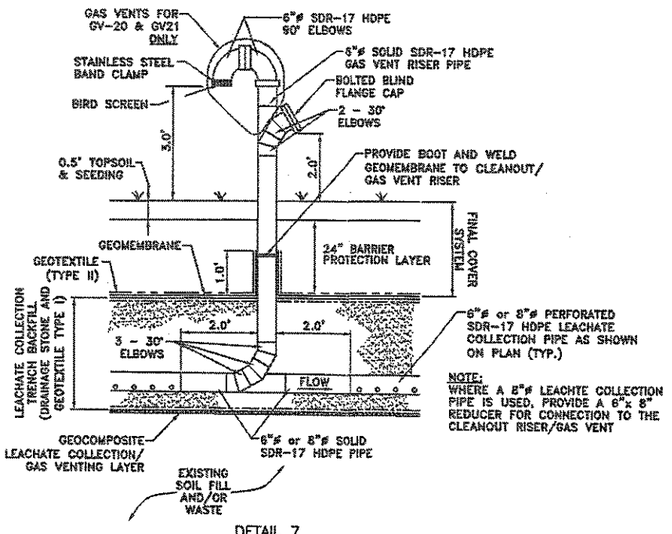
DETAIL 4
TYPICAL GAS VENTING TRENCH DETAIL
FOR UPPER PORTION OF LANDFILL
SCALE: 1"= 2.0'



DETAIL 5
GAS VENT DETAIL AT TOP OF
LEACHATE COLLECTION/GAS VENTING LAYER
SCALE: 1"= 2.0'



DETAIL 6
TYPICAL GAS VENT DETAIL
AT TOP OF LANDFILL
SCALE: 1"= 2.0'



DETAIL 7
TYPICAL LEACHATE COLLECTION PIPE
CLEANOUT RISER/GAS VENT DETAIL
SCALE: 1"= 2.0'

ISSUED FOR CONSTRUCTION
4/25/2000

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DRAWN BY: DEW
DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DATE: OCTOBER 1999

REV.No.	DESCRIPTION	BY	DATE
1	CALLED OUT FILTER STONE ON DETAILS 5 AND 6	JJD	1/24/00
2	REVISED GEOCOMPOSITE CONNECTION WITH GAS VENTING TRENCH	JJD	2/15/00

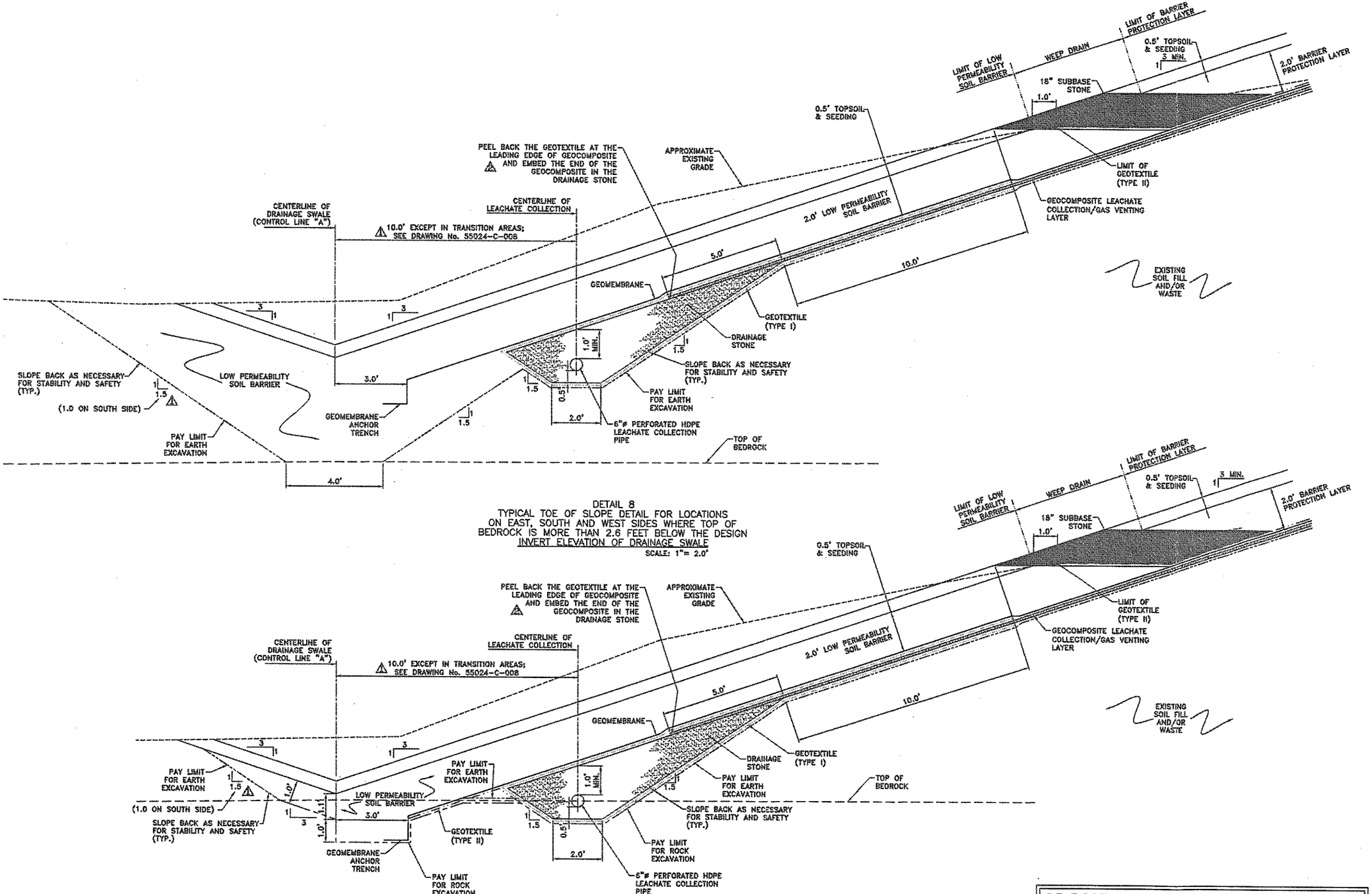
SCALE IN FEET
AS SHOWN

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

TYPICAL DETAILS

PROJECT No.
55024

DRAWING No.
55024-C-013



DETAIL 8
TYPICAL TOE OF SLOPE DETAIL FOR LOCATIONS ON EAST, SOUTH AND WEST SIDES WHERE TOP OF BEDROCK IS MORE THAN 2.6 FEET BELOW THE DESIGN INVERT ELEVATION OF DRAINAGE SWALE
SCALE: 1"= 2.0'

DETAIL 9
TYPICAL TOE OF SLOPE DETAIL FOR LOCATIONS ON EAST, SOUTH AND WEST SIDES WHERE TOP OF BEDROCK IS ABOVE OR LESS THAN 2.6 FEET BELOW THE DESIGN INVERT ELEVATION OF DRAINAGE SWALE
SCALE: 1"= 2.0'

ISSUED FOR CONSTRUCTION
4/25/2000

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DRAWN BY: DEW
DATE: DECEMBER 1999

REV. No.	DESCRIPTION	BY	DATE
1	REVISED GEOCOMPOSITE CONNECTION AT LEACHATE COLLECTION TRENCH	JJD	2/15/00
2	ADDED NOTE TO DIMENSIONS	JJD	1/24/00

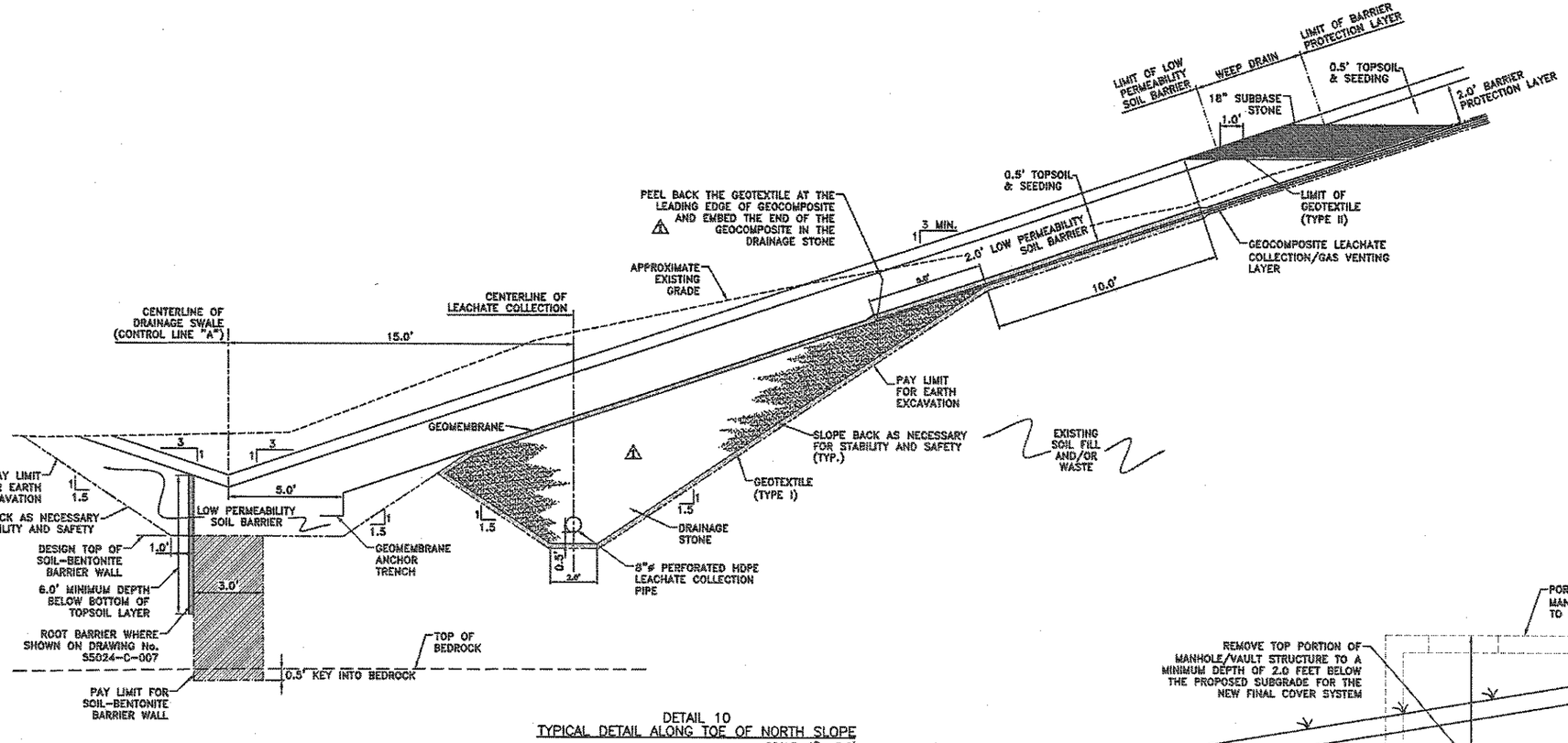
DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH

SCALE IN FEET: AS SHOWN

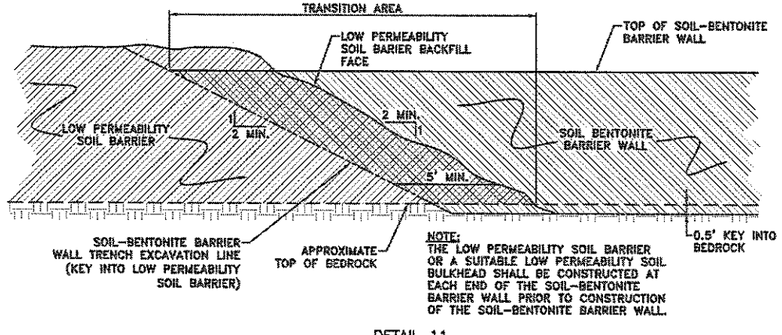
WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

TYPICAL DETAILS

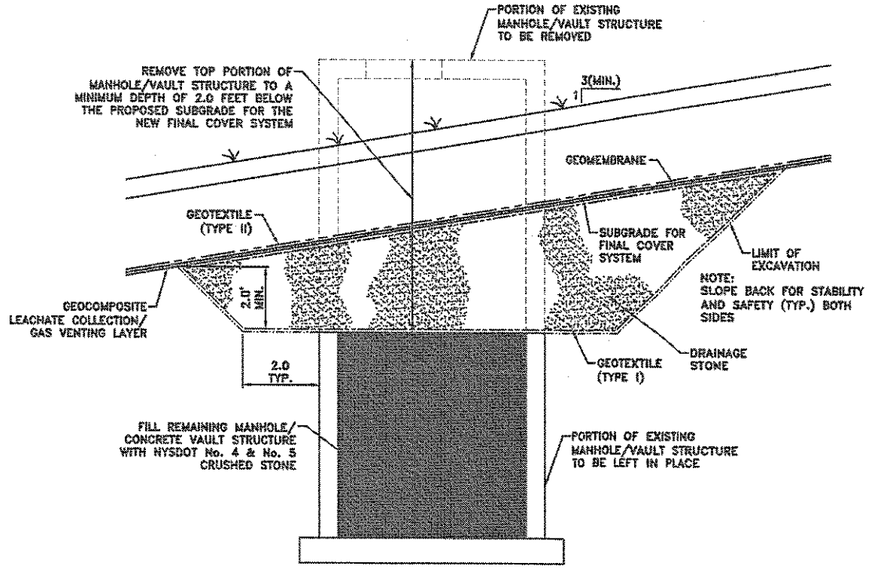
PROJECT No. 55024
DRAWING No. 55024-C-014



DETAIL 10
TYPICAL DETAIL ALONG TOE OF NORTH SLOPE
SCALE: 1"= 3.0'



DETAIL 11
TYPICAL DETAIL OF TRANSITION
BETWEEN SOIL-BENTONITE BARRIER WALL
AND LOW PERMEABILITY SOIL BARRIER
SCALE: 1"= 4.0'



DETAIL 12
TYPICAL DETAIL FOR EXISTING
MANHOLE/CONCRETE VAULT ABANDONMENT
SCALE: 1"= 2.0'

ISSUED FOR CONSTRUCTION
4/25/2000

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DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DRAWN BY: DEW
DATE:DECEMBER 1999

GZA GeoEnvironmental of New York

REV.No.	DESCRIPTION	BY	DATE
1	REVISED GEOCOMPOSITE CONNECTION AT LEACHATE COLLECTION TRENCH AND DRAINAGE STONE LIMITS ON NORTH SLOPE (DETAIL 10)	JJD	2/15/00

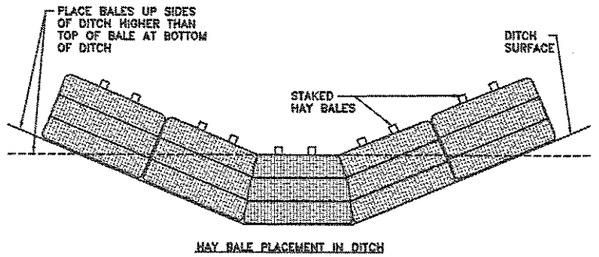
SCALE IN FEET
AS SHOWN

WASTE MANAGEMENT OF NEW YORK, LLC.
McKEENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

TYPICAL DETAILS

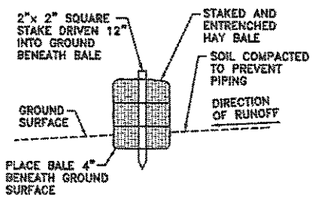
PROJECT No.
55024

DRAWING No.
55024-C-015

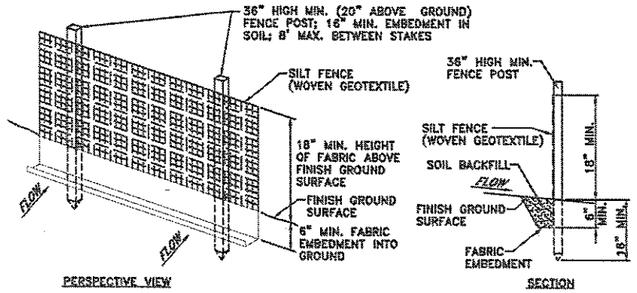


HAY BALE PLACEMENT IN DITCH

DETAIL 13
TYPICAL HAY BALE SILT FENCE
NOT TO SCALE



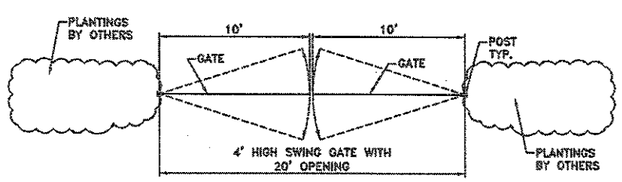
HAY BALE PLACEMENT



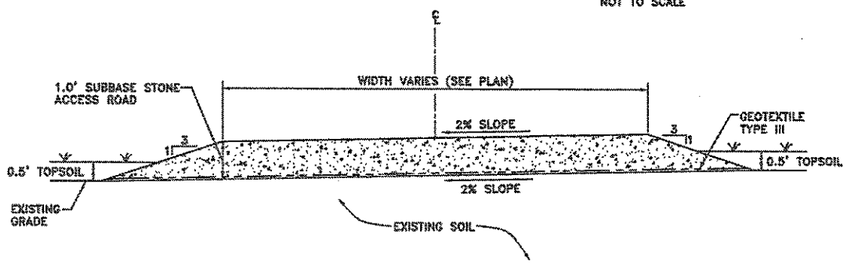
PERSPECTIVE VIEW

SECTION

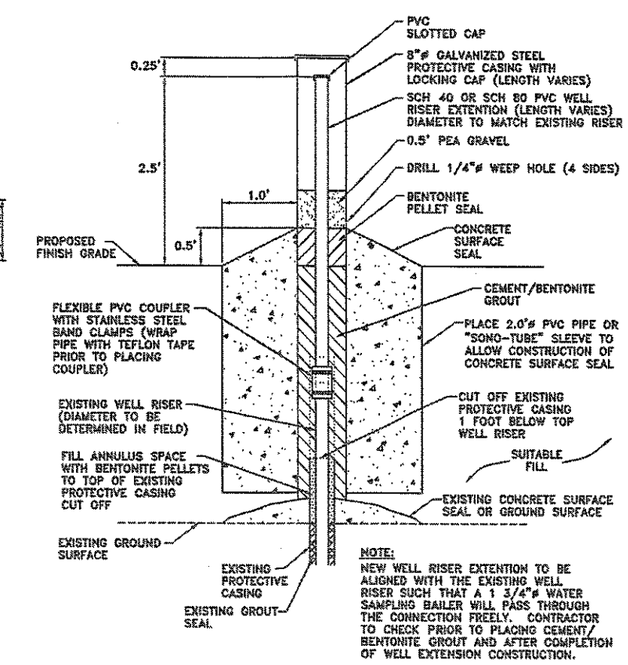
DETAIL 14
TYPICAL SILT FENCE DETAIL
NOT TO SCALE



DETAIL 16
SWING GATE STRUCTURE DETAIL
SCALE: 1"= 6.0'



DETAIL 17
TYPICAL ACCESS ROAD ⚠
SCALE: N.T.S.



NOTE:
NEW WELL RISER EXTENTION TO BE ALIGNED WITH THE EXISTING WELL RISER SUCH THAT A 1 3/4"ø WATER SAMPLING BAILER WILL PASS THROUGH THE CONNECTION FREELY. CONTRACTOR TO CHECK PRIOR TO PLACING CEMENT/ BENTONITE GROUT AND AFTER COMPLETION OF WELL EXTENSION CONSTRUCTION.

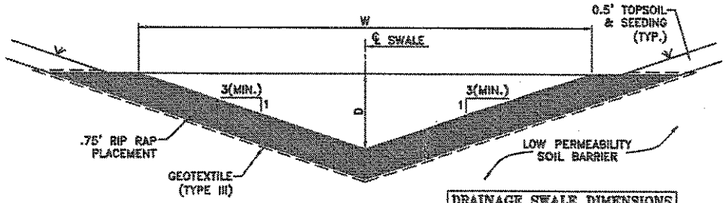
DETAIL 15
EXTENSION OF EXISTING
MONITORING WELLS DETAIL
NOT TO SCALE

DRAINAGE SWALE DIMENSIONS		
D	W	STATIONING
2'	12'	~0+15 to ~14+04
4'	24'	~19+35 to ~25+19
4'	24'	~29+05 to ~33+96

DETAIL 18
TYPICAL DETAIL OF
TOPSOIL LINED DRAINAGE SWALE
SCALE: N.T.S.

DRAINAGE SWALE DIMENSIONS		
D	W	STATIONING
2'	12'	~34+87 to ~39+05
3'	18'	~15+42 to ~16+45

DETAIL 19
TYPICAL DETAIL OF TOPSOIL AND
EROSIN CONTROL MATERIAL LINED DRAINAGE SWALE
SCALE: N.T.S.

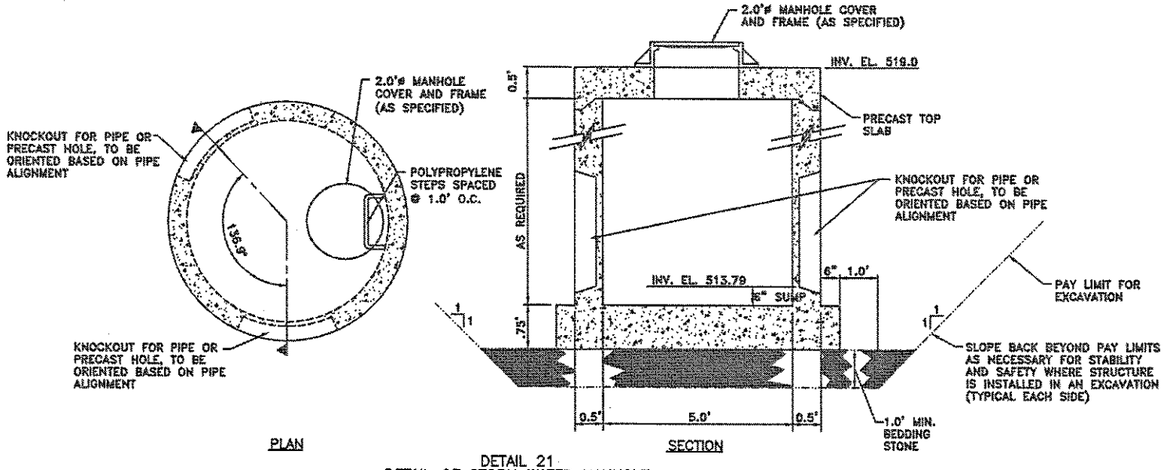


NOTE:
RIP RAP ALSO REQUIRED IN SWALE AT ENDS OF CMP's AS SHOWN ON PLAN

DRAINAGE SWALE DIMENSIONS		
D	W	STATIONING
2'	12'	~14+04 to ~15+08
2'-3"*	12'-18"*	~15+08 to ~15+19*
3'	18'	~15+19 to ~15+42

* DEPTH OF SWALE VARIES IN THIS AREA

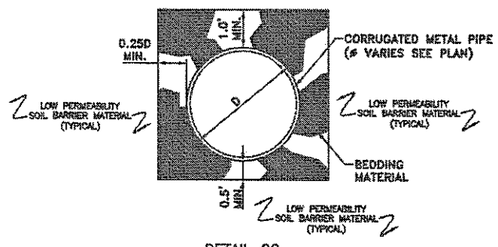
DETAIL 20
TYPICAL DETAIL OF
RIP RAP LINED DRAINAGE SWALE
SCALE: N.T.S.



PLAN

SECTION

DETAIL 21
DETAIL OF STORM WATER MANHOLE
(SEE FINAL GRADING PLAN FOR LOCATION)
NOT TO SCALE



DETAIL 22
TYPICAL CULVERT PIPE DETAIL
SCALE: N.T.S.

ISSUED FOR CONSTRUCTION
4/25/2000

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DESIGNED BY: BAK
DRAWN BY: DEW
CHECKED BY: JJD
REVIEWED BY: ERH
DATE: DECEMBER 1999

REV.No.	DESCRIPTION	BY	DATE
1	REVISED ACCESS ROAD (DETAIL 17) AND TABLES ON DETAILS 18 &19	JJD	1/24/00

SCALE IN FEET
AS SHOWN

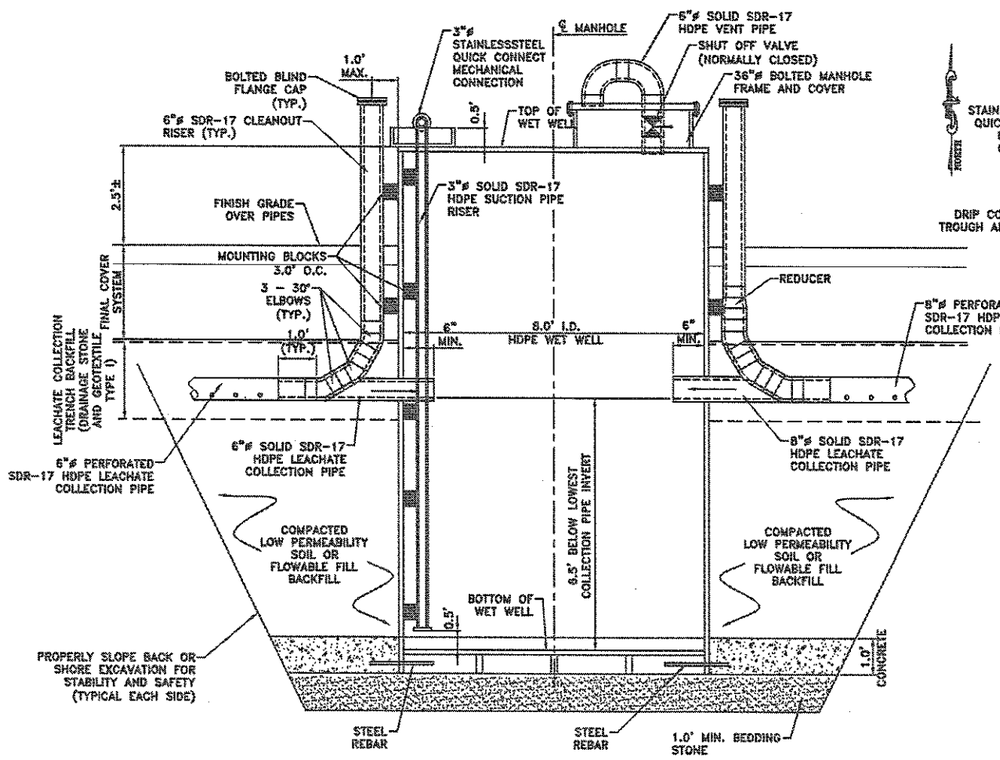
WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

TYPICAL DETAILS

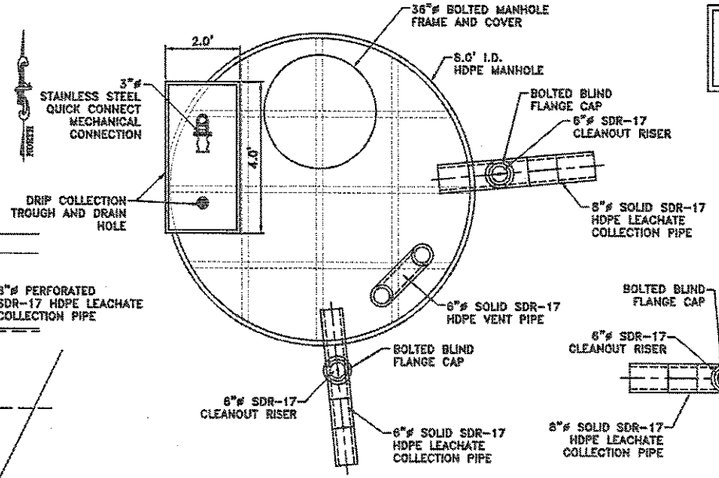
PROJECT No.
55024

DRAWING No.
55024-C-016

ISSUED FOR CONSTRUCTION
4/25/2000



TYPICAL SECTION THROUGH WET WELL #1 AND #2
SCALE: 1"= 2.0'



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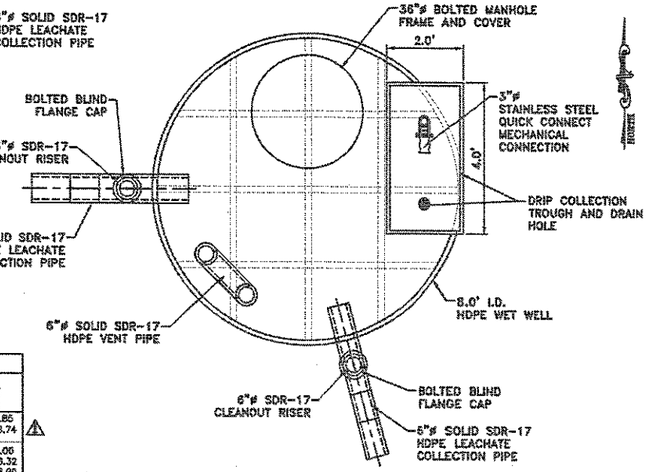
SCALE: 1"= 2.0'

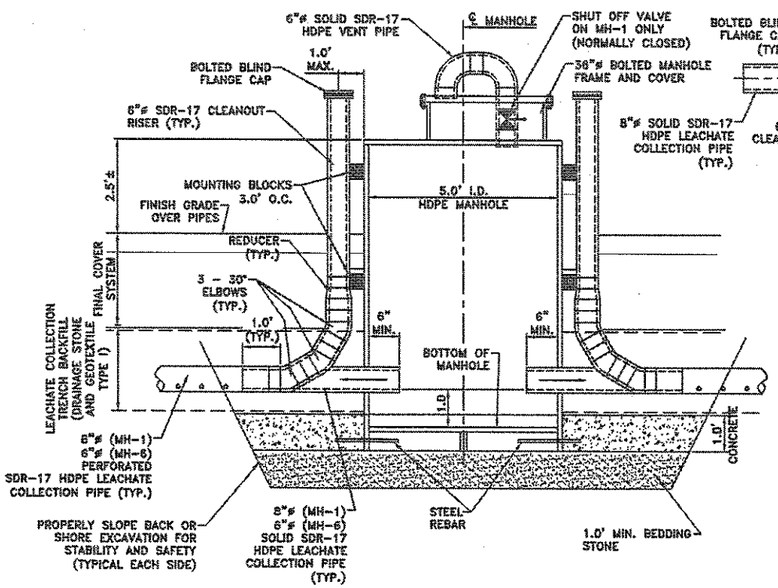


TYPICAL PLAN THROUGH WET WELL #2
SCALE: 1"= 2.0'

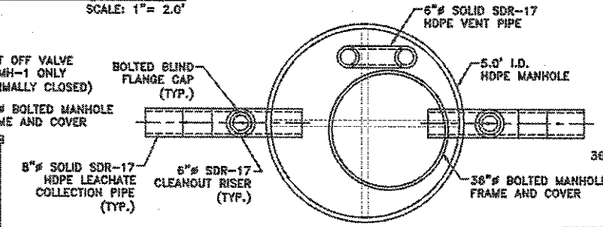
WET WELL AND MANHOLE INFORMATION

STRUCTURE NUMBER	COORDINATES NORTHING	COORDINATES EASTING	APPROXIMATE FINISH GRADE	BOTTOM OF STRUCTURE ELEVATION	TOP OF STRUCTURE ELEVATION	PIPE INVERT ELEVATIONS
WET WELL #1	4764.70	2509.74	514	501.84	516.5	E 506.04, S 506.86
WET WELL #2	4982.21	3786.70	519	502.19	521.5	SE 512.99, W 508.74
MH-1	4949.37	3159.19	517	510.00	518.5	E 510.00, W 510.00
MH-2	4675.39	3868.00	521	516.14	523.5	NW 516.14, S 516.32
MH-3	4746.12	3889.88	523	517.85	525.5	N 518.85, SW 518.99
MH-4	4604.31	3777.91	529	523.60	531.5	NE 524.60, W 524.94
MH-5	4461.48	3201.95	534	529.23	536.5	E 530.23, W 530.27
MH-6	4334.55	2922.06	539	533.98	541.5	E 534.88, W 534.98
MH-7	4291.39	2368.25	537	532.00	539.5	E 533.12, NW 533.00
MH-8	4336.13	2331.70	536	531.04	536.5	N 532.04, SE 532.46

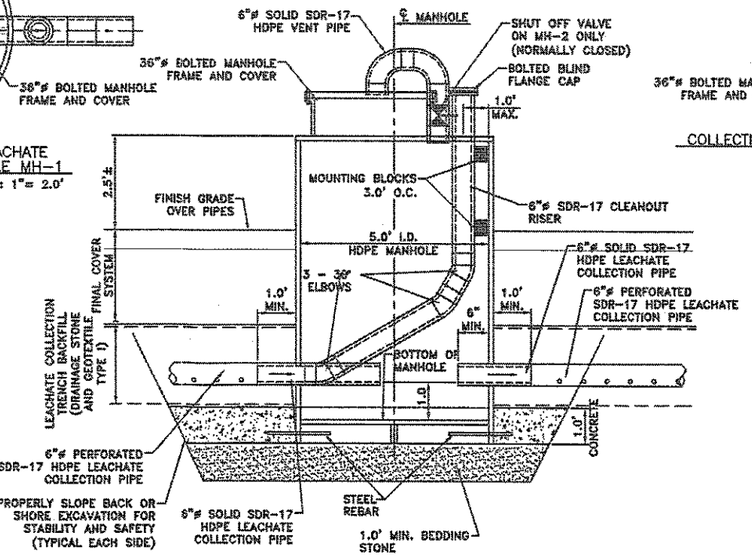
NOTE: COORDINATES AND ELEVATIONS ARE LISTED IN FEET



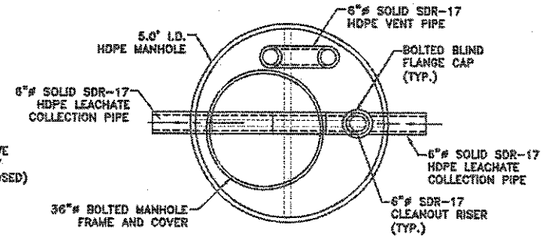
TYPICAL SECTION THROUGH LEACHATE COLLECTION SYSTEM MANHOLE MH-1 AND MH-6
SCALE: 1"= 2.0'



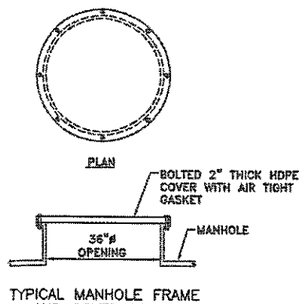
TYPICAL PLAN THROUGH LEACHATE COLLECTION SYSTEM MANHOLE MH-1
SCALE: 1"= 2.0'



TYPICAL SECTION THROUGH LEACHATE COLLECTION SYSTEM MANHOLES MH-2 THROUGH MH-5, MH-7 AND MH-8
SCALE: 1"= 2.0'



TYPICAL PLAN THROUGH LEACHATE COLLECTION SYSTEM MANHOLES MH-2 THROUGH MH-8
SCALE: 1"= 2.0'



TYPICAL MANHOLE FRAME AND COVER DETAIL
SCALE: 1"= 2.0'

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DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH
DATE: DECEMBER 1999

GZA GeoEnvironmental of New York

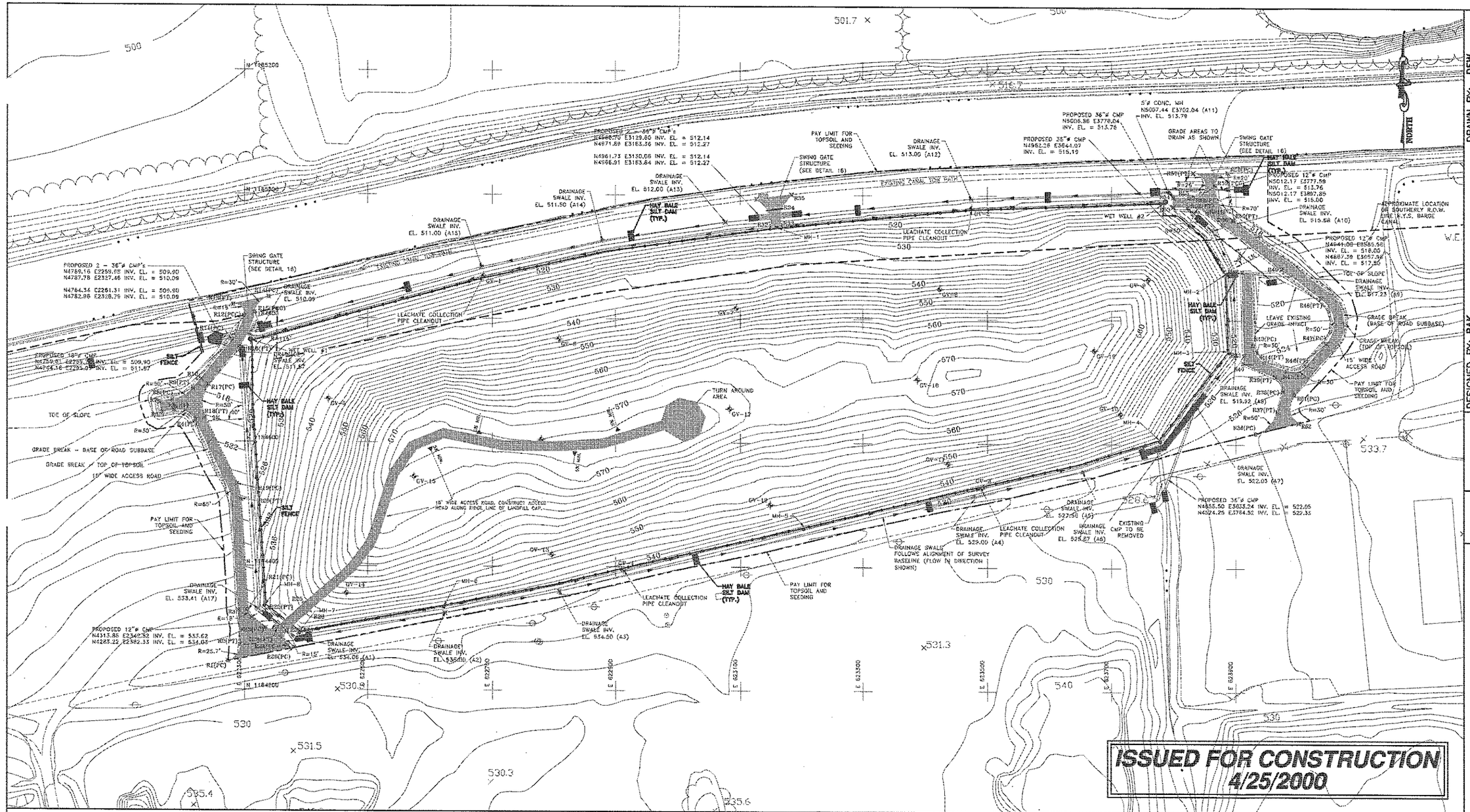
REV.No.	DESCRIPTION	BY	DATE
1	REVISED WET WELL INFORMATION TABLE	JJD	1/24/00

SCALE IN FEET: AS SHOWN

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

TYPICAL MANHOLE DETAILS

PROJECT No. 55024
DRAWING No. 55024-C-017



LEGEND:

- PROPOSED LOCATION OF SILT FENCE
- PROPOSED LOCATION OF HAY BALE SILT DAM

NOTES:

1. BASE MAP ADAPTED FROM AN AERIAL TOPOGRAPHIC MAP OF ORLEANS SANITARY LANDFILL SITE IN ALBION, NEW YORK PREPARED BY AIR SURVEY CORP. FROM AN AERIAL PHOTOGRAPH OF THE SITE FLOWN ON NOVEMBER 9, 1993. THE TOPOGRAPHIC MAP WAS PROVIDED TO GZA ON AN AUTOCAD DISK FILE BY WMNY FOR APPLICATION TO THE McKENNA LANDFILL REMEDIAL CLOSURE PROJECT.
2. THIS POST CONSTRUCTION EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE THE MINIMUM REQUIREMENTS FOLLOWING FINAL SITE RESTORATION AND TOPSOIL AND SEEDING. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN THE SILT FENCES AND HAY BALE SILT DAMS SHOWN AS A MINIMUM. THE CONTRACTOR SHALL ALSO DEVELOP AND IMPLEMENT ADDITIONAL EROSION AND SEDIMENT CONTROL PROCEDURES (i.e. ADDITIONAL SILT FENCES, HAY BALE SILT DAMS, SEEDING, etc.) AS NECESSARY TO PREVENT EROSION AND SEDIMENT MIGRATION BASED ON THE ACTUAL SITE CONDITIONS AND SURFACE WATER DRAINAGE PATTERNS AT THE TIME OF FINAL SITE RESTORATION OR AS DIRECTED BY THE OWNER.
3. ALL POST CONSTRUCTION EROSION AND SEDIMENTATION CONTROL FEATURES SHALL BE MAINTAINED BY THE CONTRACTOR FOLLOWING FINAL SITE RESTORATIONS AND SEEDING UNTIL SUITABLE VEGETATION HAS ESTABLISHED AND THE SEEDING WORK HAS BEEN ACCEPTED BY THE OWNER. FOLLOWING SUCH ACCEPTANCE, THE CONTRACTOR SHALL REMOVE SILT FENCES AND HAY BALE SILT DAMS, AS APPROVED BY THE ENGINEER AND OWNER, AND SHALL PROPERLY DISPOSE OF SUCH MATERIALS.

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DRAWN BY: DEW
DATE:DECEMBER 1999
DESIGNED BY: BAK
CHECKED BY: JJD
REVIEWED BY: ERH

REV.No. | DESCRIPTION | BY | DATE

SCALE IN FEET
0 40 80 160 240

WASTE MANAGEMENT OF NEW YORK, LLC.
McKENNA LANDFILL
ALBION, NEW YORK
REMEDIAL CLOSURE PROJECT

EROSION AND SEDIMENTATION CONTROL PLAN
(POST CONSTRUCTION)

PROJECT No.
55024

DRAWING No.
55024-C-018

APPENDIX E

EXCAVATION WORK PLAN

APPENDIX E – EXCAVATION WORK PLAN

E-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the Department. Currently, this notification will be made to:

Robert Strang, Project Manager
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, NY 12233-7017
Phone: (518) 402-8642
E-mail: robert.strang@dec.ny.gov

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work,
- A summary of the applicable components of this EWP,
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format,
- Identification of disposal facilities for potential waste streams,
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

E-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

E-3 STOCKPILE METHODS

At a minimum, the following requirements apply to the storage of materials excavated from the Site:

- Excavated materials must be staged on polyethylene sheeting;
- Mobilization of the excavated material must be prevented through the use of polyethylene sheeting to cover any stockpiles and by using appropriate erosion control methods;
- Diversion measures must be employed to prevent stormwater run-on and run-off;
- Roll-off or equivalent units used to store contaminated material must be water tight;
- Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points;
- Stockpiles must be kept covered at all times. Stockpiles must be routinely inspected, and damaged covers will be promptly replaced; and
- Stockpiles must be inspected at a minimum once each week and after every storm event. Results of inspections must be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

E-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material. Excavation will be performed in a manner that will limit spills and the potential for impacted material to be mixed with non-impacted material. All contaminated water collected from the excavation will be handled in accordance Section E-8.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and New York State Department of Transportation requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

E-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part §364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the site. Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Truck transport routes will be identified that limit transport through residential areas and past sensitive sites; use city-mapped truck routes; prohibit off-site queuing of trucks entering the facility; limit total distance to major highways; and, promote safety in accessing to highways.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

E-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all

local, State (including 6 NYCRR Part §360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, (i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc.). Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part §360-2. Material that does not meet unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6 NYCRR Part §360-15 Registration Facility).

E-7 MATERIALS REUSE ON-SITE

All soil designated for reuse on-site will be sampled at a frequency of one sample per 500 cubic yards of soil. All samples will be grab samples which are representative of the soil for reuse. The criteria established by NYSDEC for soil reuse is presented below.

ON-SITE SOIL REUSE CRITERIA

Soil on the Site Meets:	Reuse on the Site:
Unrestricted soil SCG	Without restrictions
Meets the applicable use-based and groundwater protection SCG and where appropriate protection of ecological resources soil SCGs for a site with an IC & SMP	In the soil cover/cap or as backfill within the area of the site subject to the IC
Meets site-specific background soil levels	Without restrictions (Does not apply to sites in the BCP)
Site-specific cleanup goals for subsurface soil	Placement below the soil cover/cap within the area of the site subject to the IC

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

E-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a State Pollutant Discharge Elimination System permit.

E-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the remedial design.

E-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6 NYCRR §375-6.7(d). Soils that meet 'exempt' fill requirements under 6 NYCRR Part §360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

E-11 STORMWATER POLLUTION PREVENTION

A Stormwater Pollution Prevention Plan (SWPPP) will be required for all intrusive work done on the Site. At a minimum, the SWPPP shall include:

- Potential sources of pollution which may be reasonably expected to affect the quality of stormwater discharge from the Site.
- Description of practices which will be used to reduce the pollutants in stormwater discharge from the Site.
- Compliance with terms of the New York State permit for stormwater discharge.

The SWPPP is required to ensure the prevention of contamination of surrounding surface waters and groundwater as a result of stormwater runoff.

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

E-12 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 7 of the SMP.

E-13 COMMUNITY AIR MONITORING PLAN

The air in the vicinity of all locations where intrusive work will be performed shall be monitored for volatile organic compounds, and airborne particulates (dust) in accordance with NYSDEC DER-10 and New York State Department of Health (NYSDOH) generic Community Air Monitoring Plan (CAMP).

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

E-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

E-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.

- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

E-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

APPENDIX F

HEALTH AND SAFETY PLAN

New York State Department of Environmental Conservation

Generic Health and Safety Plan

Prepared for:

New York State Department of Environmental Conservation

Standby Engineering Contract

April 2011

Prepared by:

D&B/TRC Joint Venture

db TRC
A Joint Venture

5694PW - Generic H&S Plan Cover.indd (04/19/11 - 10:59 AM)

GENERIC HEALTH AND SAFETY PLAN

Prepared for:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

STANDBY ENGINEERING CONTRACT

Prepared by:

D&B/TRC JOINT VENTURE
WOODBURY, NEW YORK

APRIL 2011

CERTIFICATION

This Health and Safety Plan (HASP) has been prepared under the supervision of, and has been reviewed by, a Certified Industrial Hygienist (CIH) certified by the American Board of Industrial Hygiene.

(Bruce Groves, CIH)
ABIH No. Cert # 2224

HEALTH AND SAFETY PLAN

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1	Health and Safety Plan Review Acknowledgment Form
2	Confined Space Operations Guidelines
3	Excavation/Trenching Operation Guidelines
4	Lockout/Tagout Guidelines
5	Care and Cleaning of Respirators
6	Air Monitoring Results Form
7	Heat/Cold Stress Guidelines
8	Incident Notification Form
9	Emergency Information
10	Postings
11	Site-Specific Information

1.0 INTRODUCTION

1.1 General

This Health and Safety Plan (HASP) is prepared to meet the requirements contained in 29 CFR §1910.120 and §1926, NIOSH/OSHA/USCG/USEPA Guidance Manual for Hazardous Waste Site Activities (NIOSH No. 85-115), USEPA "Standard Operating Safety Guides," and Superfund Amendments and Reauthorization Act (SARA), Title I, Section 126. The HASP addresses activities associated with field investigations conducted at New York State Department of Environmental Conservation (NYSDEC) Superfund sites. Compliance with the HASP is required of all on-site personnel entering and/or conducting investigation activities at the site. Personnel conducting activities at the sites will be subject to the requirements of this HASP and accountable to the authorities having jurisdiction at the site. Site-specific information regarding health and safety will be included in a site-specific work plan, if required.

1.2 Purpose and Scope of the HASP

This HASP sets forth the requirements for on-site health and safety supervision, air monitoring, medical monitoring, personal protective equipment, controls, safe work practices and proper decontamination in order to ensure health and safety during activities associated with field investigation in the restricted zones of a site.

1.3 Site Description

The sites covered under this plan include a wide variety of active and inactive commercial and industrial facilities. Specific information pertaining to each site will be provided in a site-specific work plan, if required.

2.0 PERSONNEL ORGANIZATION AND RESPONSIBILITIES

Investigation of sites will require the interaction of contractors, site facility operators and technical specialists, both on-site and off-site. The project team will comprise representatives of the New York State Department of Environmental Conservation (NYSDEC), Dvirka and Bartilucci Consulting Engineers (D&B), the environmental consultant and various contractors.

2.1 Project Director

The Project Director will have overall responsibility for implementation of the corporate and site-specific Health and Safety Plan, if required, and the supervision and monitoring of employees and contractors.

2.2 Project Manager

The Project Manager will assure that all elements of this HASP are implemented where applicable and that all project staff are protected and working in a safe manner.

2.3 Health and Safety Officer (HSO)

The HSO will be responsible for preparation of the site-specific HASP, if required, and has the final authority to resolve health and safety issues at the site. The HSO has overall responsibility for ensuring that the policies and procedures of this HASP are implemented.

The HSO will provide regular support for all health and safety activities, including recommendations for upgrading or downgrading the level of personal protection, as needed.

The HSO will be on-site as needed during the field investigation. The HSO has the authority to stop work at any time unsafe work conditions are present. Any potentially hazardous condition posing a risk beyond the defined role or mission is anticipated to require the HSO to consult with the Field Operations Manager (FOM) and Project Director.

The HSO will be a Certified Hazardous Materials Manager (CHMM), Certified Safety Professional (CSP), Certified Industrial Hygienist (CIH) or designee, and will be available off-site on an as-needed basis to provide technical support to the FOM. Any decisions requiring use or selection of personal protection equipment (PPE), or monitoring devices other than those in the HASP, will be approved by the HSO or designee.

2.4 Field Operations Manager and Alternate HSO

The FOM, or designee, will serve as the Alternative HSO and will be responsible for conducting the work and for assuring that the work is conducted in accordance with the requirements of the HASP. The FOM will be on-site as needed during the field investigation and will manage all day-to-day activities of all parties on the site.

The FOM will be responsible for implementing safety precautions and procedures during all investigation phases, and has final authority to resolve health and safety issues at the site when the HSO is not on-site.

2.5 Physician

A physician will be responsible for all medical review, diagnosis and certification of all site personnel. An on-call physician will be available for each investigation designated in the site-specific work plan, if required.

2.6 General Health and Safety Requirements for all Employees

The following general health and safety requirements will apply to all persons working at the site:

- All persons working on the investigation team will read, sign and become familiar with the HASP (a copy of the Health and Safety Plan Review Acknowledgment Form is provided in Exhibit 1). If any information is unclear, the reader will contact the

HSO for clarification prior to any field work. A copy of the plan will be available for review through the Project Manager, FOM or designee.

- No one will be allowed in active investigation areas without the prior knowledge and approval of the HSO, Project Manager or FOM. All active areas that could pose a potential threat to health and safety will be designated with warning tape or other measures to prevent access by other site personnel or the public.

- Sufficient backup personnel will be available for all site activities. At a minimum, two persons will be present at any location during investigation activities.

- All personnel involved in the investigation at the site will notify the HSO, Project Manager or FOM of any unsafe conditions or activities.

- Standard hygiene practices will be implemented, such as no smoking, eating or drinking during site investigation work activities. A thorough washing of hands and face prior to smoking, eating or drinking will be conducted.

- Workers will avoid unnecessary contamination, such as walking through, sitting on, leaning on or kneeling in areas that are known or suspected to be contaminated.

- All site personnel will observe their partners for any signs of adverse effects associated with the work activity, and will inform their partner or supervisor of any unusual signs or symptoms that they are experiencing themselves.

3.0 HAZARD ASSESSMENT AND RISK ANALYSIS

3.1 Potential Health Hazards

The general hazard potential at hazardous waste sites is characterized in Table 3-1. The primary concern at these sites is to protect workers from potential exposure to contaminated soil, vapors, dust, groundwater and other contaminated materials when conducting the field investigation. In addition to the chemical hazards, physical, biological, radiological and underground hazards may also exist. These hazards are identified on Table 3-2 and are discussed below.

3.1.1 Health Hazard Identification

A list of the chemical contaminants that are commonly found at hazardous waste sites is found in Table 3-2. These chemical contaminants may be present, along with other compounds, at levels which, upon release and contact, may result in concentrations approaching the OSHA Permissible Exposure Limits (PELs). There may also be chemicals or mixtures of chemicals for which no information at the time of preparation of this HASP have been identified. Workers should be observant of any unplanned occurrences (unusual odor, soil colorations, etc.).

3.1.2 Health Hazard Evaluation

The primary potential health hazards of concern to workers from contaminants are from the inhalation of vapors and dusts, and skin exposure to corrosive substances or skin absorptive poisons. Potential for these exposures exist when conducting field programs using various investigation techniques.

Table 3-1

SUMMARY OF CHARACTERISTICS AND HEALTH HAZARDS

Type of site	Active and inactive commercial and industrial facilities
Apparent hazard	Low-moderate (in general)
Potential source	Contaminated surface and subsurface soil, groundwater, wastewater, drainage water, surface water, sediment and sanitary waste/sludge
Contamination characteristics	Toxic, corrosive, flammable
Form of hazards	Dust, liquids, vapors
Routes of exposure	Inhalation, ingestion, dermal contact

Table 3-2

SUMMARY OF POTENTIAL HAZARDS

CHEMICAL HAZARDS	Volatile organic compounds
	Semivolatile organic compounds
	Pesticides
	PCBs
	Metals
	Cyanide
PHYSICAL HAZARDS	Noise
	Slips, trips, falls
	Deteriorated overhead surfaces
	Heavy equipment traffic
	Heat or cold stress
	Striking and struck by (heavy equipment)
BIOLOGICAL HAZARDS	Pigeon droppings
	Rabies carrying animals (rats, raccoons, etc.)
	Poisonous snakes (weather dependent)
	Stinging insects (weather dependent)
	Poisonous plants (weather dependent)
ELECTRICAL HAZARDS	Overhead or underground power lines
	Lightning
	Electrical equipment
FIRE/EXPLOSION HAZARDS	Combustible gas
OXYGEN DEFICIENCY	Working in confined spaces
RADIATION HAZARDS	Wastes
UNDERGROUND HAZARDS	Contaminated media
	Gas lines
	Water lines
	Sewer/storm lines
	Electrical lines
	Telecommunication lines

During work on-site, air monitoring will be performed in accordance with Section 7.2 – Air Monitoring. OSHA PELs and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) may be exceeded during investigation activities. A list of PELs and Health Hazards of Typical Contaminants of Concern are listed on Table 3-3. This list must be updated based on site specific contaminants of concern in the site specific Health and Safety Plan. The activities to be performed during typical site investigations are summarized in Table 3-4. Air monitoring will be performed during the implementation of these activities. Further discussion of air monitoring is provided in Section 7.2 and in the event of the potential exposure, personal protective equipment requirements are provided in Section 5.

3.1.3 Potential Exposures

Potentially contaminated samples include soil, groundwater, wastewater, sludge, storm water, surface water and sediment. The expected risk of exposure to these chemicals would be from inhalation, ingestion, skin or eye contact with volatile compounds, contaminated dusts, etc. Potential exposures can be mitigated through appropriate investigation procedures, work practices, air monitoring and personal protective equipment. Duration and frequency of exposure will be short and intermittent over a period of several weeks. All personnel related to the investigation will keep upwind of all soil disturbances and sampling activities, when possible. In addition, splashing of liquids and generation of dust should be minimized by employing careful handling practices.

3.1.4 Physical and Biological Hazards

Anticipated potential physical hazards from routine investigative work are low to moderate, but still require consideration due to their ability to cause injury. Workers may encounter sharp objects, pinch points or unsecured footing. Improper or careless use of sampling, drilling and excavation equipment increases the risks of accidents from underground and overhead utilities, and operation of the equipment. When working around machinery, there

Table 3-3

PERMISSIBLE EXPOSURE LIMITS AND HEALTH HAZARDS OF CONTAMINANTS OF CONCERN

Chemical	OSHA Permissible Exposure Limits	Primary Health Hazard (Target Organs)
Acetone	1,000 ppm, IDLH 2,500 ppm	Eyes, skin, respiratory system (RS), central nervous system (CNS)
Benzene	1 ppm, IDLH 500 ppm	Eyes, skin, RS, blood, CNS, bone marrow
Chlorobenzene	100 ppm, IDLH 1000 ppm	Eyes, skin, liver, RS, CNS
1,1-Dichloroethene	100 ppm, IDLH 3000 ppm	Skin, liver, lungs, kidneys, CNS
1,2-Dichloroethene	200 ppm, IDLH 1000 ppm	Eyes, RS, CNS
Chloroform	TLV 10 ppm, C 50 ppm	Eyes, skin, liver, Reproductive System
1,1,2-Trichloroethane	10 ppm, IDLH 100 ppm	Eyes, RS, liver, kidneys, CNS
1,1-Dichloroethylene	None (carcinogen)	Eyes, skin, blood, liver, kidneys, CNS
Trichloroethene	100 ppm, IDLH 1000 ppm	Eyes, skin, RS, heart, liver, CNS
Tetrachloroethene (Perchloroethene)	100 ppm, C 200 ppm	Eyes, RS, skin, liver, kidneys, CNS
1,1,1-Trichloroethane	350 ppm, IDLH 700 ppm	Eyes, skin, CNS, cardiovascular system (CVS), liver
Ethylbenzene	100 ppm, IDLH 800 ppm	Eyes, skin, RS, CNS
1,4-Dichlorobenzene	75 ppm, IDLH 150 ppm	Eyes, RS, liver, kidneys, skin
1,3-Dichlorobenzene	Not listed	Not listed
Ethene	Not listed	Not listed
Methane	Not listed	Not listed
Methylene Chloride	25 ppm, IDLH 2300 ppm	Eyes, skin, CVS, CNS
Toluene	200 ppm, IDLH 500 ppm	Eyes, skin, RS, CNS, liver, kidneys
Vinyl Chloride	1 ppm, C 5 ppm	Liver, CNS, blood, RS, lymphatic system

C - Ceiling Limit
IDLH - Immediately Dangerous to Life and Health
ST - Short Term Exposure Limit

Table 3-3 (continued)

PERMISSIBLE EXPOSURE LIMITS AND HEALTH HAZARDS OF CONTAMINANTS OF CONCERN

Chemical	OSHA Permissible Exposure Limits	Primary Health Hazard (Target Organs)
Benzene	1 ppm, ST* 5 ppm	Eyes, skin, respiratory system (RS), blood, central nervous system (CNS), bone marrow
Toluene	200 ppm C**300 ppm	Eyes, skin, RS, CNS, liver, kidneys
Ethylbenzene	100 ppm	Eyes, skin, RS, CNS
Xylene	100 ppm	Eyes, skin, RS, CNS, gastrointestinal (GI) tract, blood, liver, kidneys
Naphthalene	10 ppm	Eyes, skin, blood, liver, kidneys, CNS
Fluoranthene	0.2 mg/m^3	No specific hazard listed
Coal Tar Pitch (phenanthrene, anthracene, pyrene, chrysene and benzo(a)pyrene)	0.2 mg/m^3	RS, skin, bladder, kidneys
Arsenic	0.010 mg/m^3	Liver, kidneys, skin, lungs, lymphatic system
Barium	0.5 mg/m^3	Eyes, nose, throat, lungs, heart and GI tract
Cadmium	0.005 mg/m^3	RS, kidneys, prostate, blood
Chromium	0.5 mg/m^3	Eyes, skin, RS
Lead	0.050 mg/m^3	Eyes, GI tract, CNS, kidneys, blood, gingival tissue
Mercury	C**0.1 mg/m^3	Eyes, skin, RS, CNS, kidney
Selenium	0.2 mg/m^3	Eyes, skin, RS, liver, kidneys, blood, spleen
Silver	0.01 mg/m^3	Nasal septum, skin, eyes
PCBs	0.5 mg/m^3 (skin)	Skin, eyes, liver, reproductive system
Hydrogen Cyanide	10 ppm (11 mg/m^3)	CNS, CVS, thyroid, blood
Cyanide (potassium or sodium cyanide, as CN)	5.0 mg/m^3	Heart, eyes, nose, throat, skin

ST - Short Term Exposure Limit
C - Ceiling Limit

Table 3-4

ACTIVITIES TO BE PERFORMED DURING INVESTIGATIONS

Soil vapor sampling
Dry well, storm water drainage system and on-site sanitary system sampling
Test pit excavation
Surface soil sampling
Borehole construction and subsurface soil sampling
Monitoring well construction
Groundwater sampling
Surface water and surface water sediment sampling
Ambient air sampling

are also potential electrical hazards. In addition, workers may be exposed to poison ivy, stinging and biting insects, ticks and vermin. Personnel working at sites should take precautions against possible deer tick bites. Deer ticks are carrier of spirochete (borrelia bergdorfii) which causes Lyme Disease that can be transmitted to humans when bitten. To prevent tick bites, personnel should wear long pants made of light-colored, tightly woven cloth; tuck pant legs inside of socks; use an insect repellant; check themselves frequently and wash themselves thoroughly at the end of each day. Heat/cold stress, sunlight and UV radiation, and biological hazards are also potential hazards. Refer to Exhibit 6 for heat/cold stress guidelines.

Open excavations, pits, trenches, drill pit, sanitary system and other confined spaces as defined in 29 CFR 1910.14b(c)(1) and 29 CFR 1910.14b(d)(2) also represent hazards and under no circumstances will they be entered unless written procedures are in place for confined space entry. D&B's corporate confined space entry procedure is provided as Exhibit 2. Anyone performing confined space operations has received the necessary training. Oxygen content, flammable gasses or vapors and toxic air contaminants monitoring must be performed in accordance with Exhibit 2.

3.1.5 Radiological Hazards

Humans receive a continuous exposure to ionizing radiation that results from natural sources such as cosmic radiation from outer space and from radioactive materials in the earth and materials both around and within the body. This is referred to as "background radiation" and is part of the normal environment. The degree of injury inflicted on an individual by radiation exposure depends on such factors as the total dose, the rate at which the dose is received, the kind of radiation as well as the body parts receiving it.

Extensive work has been performed in an attempt to relate radiation dose to resulting damage. Based upon all the studies performed "maximum permissible levels" of exposure have been established which denote the radiation dose that can be tolerated with little chance of later development of adverse effects. A Geiger counter will be utilized as a screening tool to ensure that no source other than natural radioactive materials or background levels are present on-site.

Readings indicative of elevated radioactive activity will be cause to assess the current levels of personnel protective equipment and determine their adequacy. The HSO will be consulted immediately if investigative activities result in elevated Geiger counter readings.

3.2 Activity Safety and Health Hazard Analysis

Field activities for hazardous waste sites will include collecting samples from various locations and environmental media using techniques including:

- Soil vapor sampling;
- Dry well, storm water drainage system and on-site sanitary system sampling;
- Test pit excavation;
- Direct push sampling;
- Surface soil sampling;
- Borehole construction and subsurface soil sampling;
- Monitoring well construction;
- Groundwater sampling;
- Surface water and surface water sediment sampling; and
- Ambient air sampling.

Potential safety risks will vary with the specific activity and equipment used, and with the sampling sites themselves. When any new data is collected, potential health and safety hazards will be evaluated with respect to the current and planned activities at the site. All sampling work in which the potential hazards have not been identified may require additional precautions to assure protection against potential hazards. Any modifications of the investigation work plan will require evaluation to determine if the existing Health and Safety Plan is adequate in protecting on-site investigators.

With the installation of groundwater monitoring wells and soil borings, soil and groundwater sampling, test pit excavations, and dry well, storm water drainage system and sanitary system sampling during the investigation, some safety risks inherent with these activities may be expected. There is the potential for mechanical and physical "struck-by" hazards associated with the equipment and sampling activities. There are also potential electrical hazards from underground lines, overhead lines and use of electrical equipment and tools. The location of all underground utilities must be determined in areas where subsurface investigation is to be performed. Utility companies will be contacted to provide "mark-outs" on and off site at all investigation locations prior to initiation of subsurface activities. The property owner will also be contacted to determine utility locations on site. When conducting work inside structures, machinery lockout/tagout must be performed. A Lockout/Tagout Program has been established to protect employees from injuries that could result from the unexpected or unplanned start-up or movement of machinery or equipment during maintenance, installation, adjustment or servicing operations. This policy sets forth procedures which will be used to ensure that employees are provided with the information and equipment they need to perform these tasks safely. Exhibit 4 provides lockout/tagout procedures.

With regard to projects where excavating and trenching operations are being undertaken, personnel shall not enter the excavation for collection of a sample. D&B's corporate excavation trenching operations guidelines are provided as Exhibit 3.

The direct handling of contaminated drums, containers or concentrated/pure chemicals is not expected during the investigation. In the event that such materials are encountered during the field program, the operation will cease and uncovered drums which have been damaged will be immediately covered with soil to minimize release of volatile compounds. This condition will be recorded and reported to NYSDEC, and the field team will be instructed to secure the area until health and safety risks are properly assessed and the course of further action is determined.

The activities to be conducted at hazardous waste sites typically represent low to moderate health risk relative to the potential to encounter contaminated material. The risk

associated with safety hazards is also low to moderate. Potential levels of airborne contaminants may dictate use of appropriate personal protective equipment as deemed necessary by the HSO.

Initial work will be conducted in Level D personal protection. Monitoring equipment to be used includes: portable PID/FID, and combustible gas, oxygen, hydrogen sulfide indicator and Geiger counter. Additional instrumentation and sampling systems may be utilized if deemed necessary by the HSO or designee. The HSO or designee may modify these requirements as deemed necessary.

Proper wearing of protective equipment and employment of stringent personal hygiene practices should reduce potential health hazards.

Restricting access of on-site personnel to all equipment operations, maintaining safe distances from equipment and wearing proper safety equipment will reduce risk of injuries.

4.0 TRAINING REQUIREMENTS

4.1 General Health and Safety Training

All on-site personnel assigned to or regularly entering areas of the site other than the Support Zone (once established) will be trained in accordance with 29 CFR 1910.120. This training will be required for personnel performing or supervising work; for health, safety, security, or administrative purposes; for maintenance; or for any other site related function.

The training will include a minimum of 40 hours of general health and safety training meeting the requirements of 29 CFR 1910.120(e)(3)(i), and 8-hour annual refresher training. All management and supervisory personnel on-site must have received an additional 8 hours of training in accordance with 29 CFR 1910.120(e)(4). Instructors providing the training must meet the criteria outlined in 29 CFR 1910.120(e)(5). Documentation of all such training will be made available to the HSO, HSO designee or FOM before any person will be allowed to enter any potentially contaminated area (namely, the Exclusion Zone or the Contaminant Reduction Zone - see Section 8.0 for further discussion of Work Zones). Visitors who will enter the exclusion and contamination reduction zones must meet the training requirements listed above.

4.2 Site-Specific Training

All site personnel will attend a site-specific training meeting and will become familiar with the HASP and site-specific information, and certify their understanding of this plan (see Exhibit 1). This meeting will include, at a minimum, discussion in the following areas:

- Site specific hazard analysis (chemical/physical hazards);
- Standard safety operating procedures;
- Personal hygiene;
- Safety equipment to be used;
- Personal protective equipment to be worn, including care, use and proper fitting;

- Decontamination procedures;
- Areas of restricted access and prohibitions in work areas;
- Emergency procedures and plans;
- On-site and off-site communications;
- Hazardous materials handling procedures;
- Air monitoring instrumentation use and calibration;
- Hazardous materials recognition; and
- The "Buddy System" to be used at the site.

Visitors entering the Exclusion and Contaminant Reduction Zones will also be briefed on similar information. This briefing will be conducted by the HSO or the FOM/Alternate HSO. Abbreviated awareness briefings for visitors who remain in the Support Zone will also be provided by the HSO, HSO designee or FOM.

Documentation of training for all on-site personnel will be included in the site-specific HASP or provided to the HSO prior to commitment of field activities. Personnel who have not successfully completed the required training will not be permitted to enter the Exclusion Zone or the Contaminant Reduction Zone.

New employees involved in hazardous activities will be indoctrinated by the HSO prior to entering the site to work. All training requirements will be completed by a new employee prior to indoctrination. Indoctrination will be comprised of the site-specific refresher briefing, the task/operation safety and health risk analysis and accident prevention plan.

5.0 PERSONAL PROTECTIVE EQUIPMENT

5.1 General

All on-site personnel will be issued appropriate personal protective equipment (PPE). All PPE is to be used properly and protective clothing is to be kept clean and well maintained. The HSO or designee will maintain constant communication with the Project Director when conducting air monitoring as discussed in Section 7.2 and consult the Project Director with regard to "action levels" at which the specified minimum levels of protection are either upgraded or downgraded based upon air monitoring results and direct contact potential. Action levels are described in Section 7.2 The HSO or designee has the authority to require the use of additional equipment, if necessary, for specific operations, or may tailor PPE specifications to best fit the hazard control requirements as appropriate.

5.2 General Site Safety Equipment Requirements

The following is the basic work uniform and will be worn primarily outside the Exclusion Zone and the Contaminant Reduction Zone at the site. Equipment includes:

- Coveralls - (optional, may be disposable type);
- Boots/shoes - (OSHA compliant construction footwear);
- Hard hat with splash shield, if needed - ANSI approved; and
- Gloves (optional).

5.3 Level D Protection

Level D protection will be initially worn in the Exclusion Zone and Contaminant Reduction Zone during intrusive sampling and investigative activities. Equipment includes:

- Coveralls - One or two piece disposable suit, tyvek or equivalent;

- Gloves - Outer (neoprene, nitrile, or equivalent); Inner (nitrile);
- Boots - Outer (vulcanized rubber or equivalent); Inner (steel toe and shank) or equivalent combination (ANSI approved);
- Safety glasses or goggles (ANSI approved);
- Hard hat with splash shield, if needed (ANSI approved); and
- Hearing protection (if work is near heavy or noisy equipment).

5.4 Level C Protection

Level C protection will be selected when a modified level of respiratory protection is needed. Selection will be made when air monitoring results for the site or individual work areas exceed the action level criteria as described in Section 7.2 of this HASP. Equipment includes:

- Respirators - Full facepiece, air purifying respirator with combination organic vapor and particulate (P100) air cartridges (OSHA/NIOSH approved);
- Coveralls- Hooded one or two piece chemical resistant suit, PE - Tyvek or equivalent (modification of protective suits may be made upon the approval of the HSO);
- Gloves - Outer (nitrile or equivalent); Inner (nitrile);
- Boots - Outer (neoprene or equivalent), Inner (steel toe and shank) or equivalent combination (ANSI approved);
- Two-way radio communications (for remote operations);
- Hard hat with splash shield (ANSI approved); and
- Hearing protection (if work is near heavy or noisy equipment).

5.5 Level B Protection

Level B protection requires full chemical resistant clothing with a full facepiece SCBA or supplied air respirator. Generally, this level of protection is generally not expected for investigations at hazardous waste sites. However, provision will be made to have this equipment available should its use be determined to be required based on all monitoring as performed in

accordance with Section 7.2 of this HASP. Investigation activities which may result in this level of protection being required will not be implemented until the equipment has been transported to the site. The HSO will be notified should air monitoring indicate this level of protection is required. The use of Level B protection will only be implemented when sufficiently trained personnel (minimum of two) are available on-site.

5.6 Confined Spaces

Under no circumstances will confined spaces be entered unless discussed with the Project Director and HSO, and the site-specific HASP is prepared to incorporate additional safety requirements, and all personnel are trained appropriately to deal with confined space hazards. D&B's corporate confined space entry procedure is provided as Exhibit 2.

5.7 Standing Orders

5.7.1 Eye Protection

Prescription lens inserts will be provided or personal contact lenses may be used for full-face respirators. All eye and face protection will conform to OSHA 1910.133.

5.7.2 Respiratory Protection

Programs for respiratory protection will conform to OSHA 1910.134 and ANSI Z88.2-1980. A respiratory program addressing respirator care and cleaning is described in Exhibit 5.

5.7.3 Respirator Fit-testing

Personnel unable to pass a fit-test will not engage in any investigation activities that will require level C or higher protection.

5.7.4 Respirator Maintenance and Repair

Each respirator will be individually assigned and not interchanged between workers without cleaning and sanitizing. Cartridges/canisters and filters will be changed daily or upon breakthrough, whichever occurs first. If breakthrough occurs, a reevaluation by the HSO of the protection level will be made. A procedure for assuring periodic cleaning, maintenance, and change of filters will be followed by each respirator wearer. This procedure is described in Exhibit 5.

5.7.5 Head Protection

A hard hat will be worn by all personnel. All head protection will conform to the requirements in OSHA 1910.135.

5.7.6 Reuse and Retirement of PPE

All non-disposable Level D or C personal protective equipment worn on-site will be decontaminated before being reissued. The FOM, HSO or designee is responsible for ensuring all non-disposable personal protective equipment is decontaminated before being reissued. Disposable PPE will be properly disposed of according to NYSDEC requirements and regulations.

5.7.7 Foot Protection

All safety boots will conform to OSHA 1910.136.

5.7.8 Noise Protection

Power equipment may generate excessive noise levels (in excess of 85 decibels). Proper ear protection will be provided and used in accordance with OSHA 1926.52.

6.0 MEDICAL SURVEILLANCE

All on-site personnel involved in hazardous waste operations will have satisfactorily completed a comprehensive medical examination prior to the initiation of investigation activities at the site. Medical examinations are required for any and all personnel entering Exclusion or Contamination Reduction Zones.

Medical examinations are not required for people making periodic deliveries provided they do not enter Exclusion or Contamination Reduction Zones.

The date of physical examination of each site worker will be documented. A specific Medical Data Sheet for each individual will be filed with the HSO or designee prior to commencing operations and with the Project Manager.

All personnel who will enter the Exclusion Zone or the Contaminant Reduction Zone will be provided with medical surveillance at the start of their employment (entrance examination) and at the end of the on-site personnel's employment (exit examination). Medical surveillance protocol is the physician's responsibility, but will meet the requirements of OSHA Standard 29 CFR 1910.120 for all personnel. The protocol will be selected by the physician. Additional clinical tests may be included at the discretion of the attending physician performing the medical examination. Non-scheduled medical exams may be conducted as determined necessary by the physician, but will be conducted:

- After acute exposure to any toxic or hazardous material.
- At the discretion of the Project Director and/or the physician, when an employee has been exposed to potentially dangerous levels of toxic or hazardous materials.
- At the discretion of the Project Director and/or the physician, and at the request of an employee with demonstrated symptoms of exposure to toxic or hazardous materials.

In addition to non-scheduled exams, any medical, biological or radiological monitoring required by an OSHA standard when OSHA Action Levels are exceeded will be performed.

Companies contracted to perform work on-site in the Exclusion Zone or Contaminant Reduction Zone will provide equivalent medical surveillance to their on-site personnel and supply documentation to that effect.

6.1 Documentation and Record Keeping

The examining physician will notify the Project Director in writing that the individual has received a medical examination and advise as to any specific limitations upon such individual's ability to work at the project site, which were identified as a result of the examination. Appropriate action will be taken in light of the advice given pursuant to this paragraph.

The ability of on-site personnel to wear respiratory protection during hazardous waste activities will be certified by the physician. Cardiopulmonary system examination and pulmonary function testing are minimum requirements.

The physician will maintain and provide access for employees to his medical surveillance records according to OSHA requirement 29 CFR 1910.120.

7.0 ENVIRONMENTAL AND PERSONAL MONITORING PROGRAM

7.1 General

In order to protect site workers from harmful levels of airborne toxic materials, potentially explosive gases, or excessively cold conditions, regular environmental and personnel monitoring will be accomplished to document exposures and to decide when to increase protective measures.

7.2 Air Monitoring

Particular phases of work will require the utilization of specific air monitoring equipment to detect relative levels of contaminants or identify unknown environments.

Air monitoring will be conducted by the HSO, FOM or designee for the express purpose of safeguarding the health and welfare of site workers and the general public residing in the vicinity of the site.

7.2.1 Air Monitoring Instrumentation

On-site air monitoring will be performed using the following direct reading instruments:

- Portable photo ionization device (PID) for the detection of organic vapors
- Portable combustible gas/oxygen/hydrogen sulfide detector will be available for determining lower explosive limits, oxygen and hydrogen sulfide levels in any identified confined spaces. Under no circumstances will confined spaces be entered unless discussed with the Project Director, the HASP is revised to incorporate additional safety requirements and all personnel are trained appropriately to deal with confined space hazards.
- Geiger counter for detecting radiological contamination (if appropriate)
- Colorometric detector tubes for detecting specific contaminants.
- Respirable dust monitor(s) will be used to monitor particulate emissions.

All monitoring and surveillance equipment will be operated, maintained and calibrated each working day in accordance with the manufacturer's instructions and quality assurance procedures. Organic vapor monitoring will be conducted by trained field staff prior to, during and following sampling, and disturbance of soils or sediments at a sampling site. Should contamination levels indicate high hazard potential, the HSO will review monitoring procedures and results.

A daily air monitoring form or entries in a daily log book will be used to record monitoring data. (See Exhibit 6.)

Instruction and calibration manuals for the proper use of these, as well as other field instrumentation, will be provided as a separate document available for use at the site.

Monitoring and surveillance equipment can be impacted by cold weather, communication transmissions and possibly high voltage electrical transmission wires and other interferences. Any unusual meter responses will be noted on the air monitoring form and a diagnosis of potential influencing factors made to determine and eliminate the cause.

7.2.2 Air Monitoring Locations and Action Level Criteria

The primary areas to be monitored during the site investigation are the work zones established around sampling, drilling or excavation locations. Air monitoring protocols for each area will differ, since target populations, contaminant concentrations and atmospheric conditions will vary. Monitoring will be conducted within these work zones and at the site perimeter.

Air monitoring conducted at the sampling locales will focus on workers' breathing zones and may include personal breathing zone samples. Air monitoring just outside of these locations will consist of instruments attempting to quantify the types and degrees of emissions originating from sampling sites.

7.2.2.1 - Duration, Frequency and Protocol

Monitoring will be conducted daily or as deemed necessary by the HSO or designee during all activities in the Exclusion Zone, particularly during intrusive activities. The HSO or designee may modify the work zone sampling frequency upon review of previously analyzed work zone samples.

7.2.2.2 - Background Air Monitoring

Background monitoring for contaminants will be conducted at the upwind perimeter of the Exclusion Zone prior to allowing workers to enter the Exclusion Zone. Monitoring will occur continuously, or at the discretion of the HSO or designee, downwind and crosswind while work is occurring in the Exclusion Zone. Data will be annotated in the Air Monitoring Form for that day. Indoor air quality monitoring will also be conducted when working inside.

Changes in wind direction will require reassessment of air monitoring locations. Wind directions may be determined with the aid of a wind sock (if appropriate). Levels of contaminants that warrant use of respiratory protection by site workers may require initiation of site perimeter and personal sampling as deemed necessary by the HSO or designee.

7.2.2.3 - Exclusion Zone Air Monitoring

Air monitoring conducted in the Exclusion Zone will focus on real time measurement of toxic compounds that pose inhalation hazards, levels of flammable compounds for explosive hazards, and oxygen deficient atmospheres. A summary of the action levels are provided in Table 7-1.

Table 7-1

ACTION LEVELS FOR INVESTIGATIONS

Action Level	Action To Be Taken
PID	
Background	**Level D** (See Section 5.3)
Background to 5 units* above background in breathing zone, and no vinyl chloride or benzene present.	Halt work, evacuate area and allow area to ventilate prior to resuming work. Should levels persist, upgrade to **Level C** protection (See Section 5.4) if required upon approval by HSO and FOM.
Greater than 5 units* above background in breathing zone, and no vinyl chloride or benzene present.	Halt work, evacuate work area and allow area to ventilate prior to resuming work. Should levels persist, contact FOM and upgrade to **Level B** (See Section 5.5) protection if required upon approval by HSO and FOM.
DRAEGER COLORIMETRIC TUBE	
Positive color change for vinyl chloride or benzene ≤ 0.5 ppm	Halt work, evacuate area and allow area to ventilate prior to resuming work. Contact FOM. If levels persist, upgrade to **Level C** protection if required upon approval by HSO and FOM.
Vinyl chloride or benzene 0.5 - 1.0 ppm	Halt work, evacuate area and allow area to ventilate prior to resuming work. Contact FOM. If levels persist, upgrade to **Level B** protection if required upon approval by HSO and FOM.
Vinyl chloride or benzene > 1 ppm	Shut down work activities. Monitor site to check for off-site migration.
COMBUSTIBLE GAS METER	
Greater than 10% Lower Explosive Limit (LEL)	Halt work, evacuate area and allow area to ventilate to below 10% LEL prior to resuming work. Notify FOM.
OXYGEN	
Less than 20.5%	Continuous monitoring. Consider engineering controls.
Less than 19.5%	Evacuate work area. Institute ventilation and engineering controls. Maintain site conditions for at least 15 minutes before proceeding. Notify FOM.

* Units equal total ionizable organic/inorganic vapors and gases.
** Reading sustained for 1 minute (60 seconds) or longer.

Table 7-1 (continued)

ACTION LEVELS FOR INVESTIGATIONS

Action Level	Action To Be Taken
OXYGEN (continued)	
Greater than 22%	Continuous monitoring and identify combustion sources.
Greater than 23.5%	Evacuate and institute engineering controls as necessary before proceeding. Explosive condition may be present. Notify FOM.
HYDROGEN SULFIDE	
Less than 10 ppm at breathing zone	**Level D** and continuous monitoring.
Above 10 ppm at breathing zone	Halt work, evacuate area and allow area to ventilate to below 10 ppm. If levels persist, upgrade to **Level B** protection if required upon approval by HSO and FOM.
GEIGER COUNTER	
Above background	Halt work, evacuate work area and confer with HSO
DUST MONITOR	
Respirable dust >100 ug/m^3 above BKGD	Implement dust suppression techniques to reduce dust levels
Respirable dust >150 ug/m^3	Monitoring upwind background levels and implement dust suppression techniques. If levels persist, halt work, contact HSO and FOM. Work can only resumed if control measures can be implemented to remedy the situation.

* Units equal total ionizable organic/inorganic vapors and gases.
** Reading sustained for 1 minute (60 seconds) or longer.

Vapor Emission

If the ambient air concentration of total organic vapors exceeds 5 ppm (or 5 units) above background at the perimeter of the Exclusion Zone, work at that location will be stopped, and the area evacuated until a review of work procedures, air monitoring needs, and use of appropriate respiratory protection and equipment is performed by the HSO or FOM. In addition, downwind monitoring at the site perimeter will be performed to determine whether off-site contaminant migration is occurring. Work will proceed only after review and approval by the HSO or FOM, and the appropriate corrective action is taken or level of protection established. More frequent intervals of monitoring will be conducted as directed by the HSO, including Draeger tube screening for specific contaminants.

If the organic vapor level decreases to below 5 ppm (5 units), and vinyl chloride and benzene are not present, activities can resume, but more frequent intervals of monitoring, as directed by the HSO, must be conducted and must include monitoring for vinyl chloride and benzene. If the organic vapor levels are greater then 5 ppm but less than 25 ppm over background at the perimeter of the Exclusion Zone, activities can resume provided Level B protection is worn and the area is monitored for vinyl chloride until levels fall below background.

If the organic vapor level is above 25 ppm at the perimeter of the Exclusion Zone, work activities must be shut down. When work shutdown occurs, downwind air monitoring as directed by the HSO will be implemented to ensure that vapor emissions do not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

7.2.2.4 - Community Air Monitoring Plan

Air monitoring for volatile organic compounds will be accomplished at the upwind and downwind perimeter of the Exclusion Zone to document real time levels of contaminants which might be moving off-site. The plan must include the following:

- VOCs will be monitored at the downwind perimeter of the Exclusion Zone daily at 2-hour intervals. If total organic vapor levels exceed 5 ppm above background, activities must be halted and monitoring continued under the provisions of Major Vapor Emission Response Plan (see below). All readings must be recorded and be available for NYSDEC and New York State Department of Health (NYSDOH) personnel to review.

Major Vapor Emission

If organic levels greater than 5 ppm (or 5 units) above background are identified 200 feet downwind from the Exclusion Zone or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If, following cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind, or half the distance to the nearest residential or commercial property from the Exclusion Zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (10-foot zone).

If either of the following criteria are exceeded in the 20-foot zone, then the Major Vapor Emission Response Plan will be implemented:

- Organic vapor levels approaching 5 ppm above background for a period of more than 30 minutes; or
- Organic vapor levels greater than 10 ppm above background for any time period.

Major Vapor Emission Response Plan

Upon activation, the following actions will be undertaken:

1. The local emergency response will be immediately contacted by the HSO and advised of the situation.

2. Frequent air monitoring will be conducted at 30 minute intervals within the 20 foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the HSO.

3. All emergency contacts will go into effect as appropriate.

Off-Site Migration Procedures

The same procedures and protocols practiced by on-site workers will aid in preventing any potential adverse conditions with respect to areas adjacent to the site. That is, these procedures are designed to assist in eliminating or minimizing the potential for extensive off-site migration. In the unlikely event that such migration occurs, the following notification procedures and work procedures are listed below:

1. Notification of local police, fire and rescue personnel advising them of the remedial investigation activities and the schedule of events on-site.

2. Immediate notification of NYSDEC, NYSDOH and local officials in the event of a threatening hazardous condition that may effect the health and safety of on-site workers and the surrounding community.

3. Decontamination procedures for equipment to prevent off-site migration of contaminants.

4. Use of a flame or photo ionization detector to monitor volatile organic vapors and potential off-site migration of contaminants.

5. Wetting down the ground surface or using clean cover material or calcium chloride to suppress particulate dust in the event that dust levels in the air of the work area are exceeded.

General visual observation will also be used during all intrusive activities to identify airborne releases (vapors, smoke, etc.), changes in the coloration of excavated materials, changes to the structural integrity of the surface or mechanical integrity of the equipment. Should such conditions be noticed or encountered, work will be halted, and the area evacuated until such time the FOM can be contacted and specific procedures for characterizing and handling the hazard can be developed.

The HSO or designee will observe site conditions daily with special attention to the aforementioned conditions. Depending on site conditions, additional personal protection measures will be implemented during the course of site work.

7.2.3 Heat/Cold Stress Monitoring

Heat/cold stress guidelines are described in detail in Exhibit 7.

7.3 Quality Assurance and Control

All monitoring instruments will be protected from surface contamination during use to allow easy decontamination. All instrumentation will be calibrated before and after use, and operational checks conducted periodically in the field over the duration of the day's field activities.

The following data will be recorded by the HSO or designee on the Air Monitoring Data form (Exhibit 3):

- Date and time of monitoring;
- Air monitoring location;
- Instrument, model number, serial number;
- Calibration/background levels; and
- Results of monitoring.

Interpretation of the data and any further recommendations will be made by the HSO or designee.

Air monitoring results will be provided verbally to the FOM following each site scan that indicates volatile organic vapor concentrations in excess of the action levels. Results will then be documented in writing and provided to the FOM by the end of that work day.

8.0 SITE CONTROL MEASURES

8.1 Work Zones

Site investigations will be subject to the designation of work zones. The Restricted Zone (RZ) will be identified as the area within which all project operations take place. At each sampling site, three work areas will be established: the Exclusion Zone (EZ), Contaminant Reduction Zone (CRZ) and Support Zone (SZ). Only authorized personnel will be allowed in the RZ. Typically, a 5-foot wide (or distance determined by the HSO or FOM) strip of land bordering the EZ is considered the CRZ. In addition to this strip of land, a specially demarcated area that connects the decontamination area to the CRZ is treated as an extension of the CRZ. All other areas inside the restricted area that are not an active Exclusion or Contaminant Reduction Zone are treated as a Support Zone.

8.1.1 Exclusion Zone

The Exclusion Zone includes the intrusive activities and isolates the area of contaminant generation, and restricts (to the extent possible) the spread of contamination from active areas of the site to support areas and off-site locations. This area will encompass all intrusive work. The Exclusion Zone is demarcated by the Hot Line (i.e., a tape or rope line or physical barrier). Personnel entering the Exclusion Zone must:

- Enter through a controlled access point (the Contaminant Reduction Zone);
- Wear the prescribed level of protection; and
- Be authorized to enter the Exclusion Zone.

Personnel, equipment and materials exiting the Exclusion Zone will be subject to decontamination in the containment reduction zone. Equipment and materials (e.g., drill rods) will be decontaminated at decontamination facilities.

Specific access for emergency services to areas of specific site operations will be established by the HSO prior to commencing any operation. The delineated area of the Exclusion Zone may vary with task.

8.1.2 Contaminant Reduction Zone

The extent and configuration of the CRZ will be at the discretion of the HSO or FOM. Certain safety equipment (e.g., emergency eye wash, fire extinguisher and first aid kit) will be located near the sampling location.

The level of protection to be used for decontamination will typically be Level D. However, the HSO will determine appropriate levels of protection based upon air monitoring readings, and visual inspection of personnel and equipment operations in the Exclusion Zone. Equipment operators (e.g., truck drivers) physically performing tasks outside the EZ may be exempt from this requirement as approved by the HSO or FOM. Personnel shall remove all personal protective equipment in the CRZ.

8.1.3 Support Zone

Equipment and materials, paperwork, MSDS, emergency equipment and communications equipment will be stored in the Support Zone. A log of all persons entering the site will be maintained by the FOM.

8.2 Operations Start-Up

No personnel will be positioned downwind of Exclusion Zone during intrusive activities and sampling, if possible.

8.3 Buddy System

All on-site personnel will utilize a buddy system when any task performed at the site requires:

- Personnel to assist in performing an activity;
- Intrusive work performed in the Exclusion Zone;
- Use of protective clothing; and
- Communication between the Exclusion Zone and outside the Exclusion Zone.

The FOM, HSO or designee will enforce the buddy system and has the authority to modify the criteria stated above to deal with changing site-specific and environmental conditions.

In order to ensure that help will be provided in an emergency, all on-site personnel will be in line-of-sight contact or in communication with the HSO or FOM when working in the Exclusion Zone.

8.4 Site Communications Plan

- Internal communications on-site should be instituted prior to initiating any task in the Exclusion Zone.
- Internal communications will be used by on-site supervisory personnel.
- The FOM, HSO or designee will ensure that all site personnel are trained to use internal communications to:
  - alert personnel on-site of emergencies;
  - pass along safety information (such as for heat stress, cold stress control, or rest period time, etc.);
  - changes in work scope, scheduling or sequencing of operations; and
  - maintain site control (such as notification of vandalism, intruders or violations of HASP protocol).

- Verbal communications and hand signals will be used for all tasks associated with the project. However, for those tasks performed in Level D or Level C, radio communications may be used.

- Any Exclusion Zone work activity being performed out of the line of sight may require use of radio communications.

- Air horns will be positioned at any Exclusion Zone work area to be used for emergency response only. The HSO or designee will designate air horn blast sequences for identification of work location, type of emergency and need for evacuation of all personnel.

- Wind direction indicators will be installed such that a line-of-sight is maintained with all personnel in all work zones. The HSO or designee will designate specific locations for wind direction indicators.

- All moving machinery, bulldozers, cranes, dump trucks, etc. will have working backup alarms.

- External communications (outside the site) will be maintained and used to coordinate emergency response, report to management and maintain contact with essential off-site personnel.

- All on-site personnel will be informed of external communications hardware (such as telephone, etc.) and the necessary telephone numbers to contact in the event of an emergency situation (fire, police, ambulance, etc.).

- All emergency numbers will be available at the site (see the site specific work plan for listing of important telephone numbers).

- Appropriate action will be taken should any hazardous environmental condition be observed on site. These conditions and the appropriate action to be taken will be as follows:

Observation	Potential Hazard	Action
Muddy condition	Personnel slip, equipment instability	Monitor work until condition improves
Lightning	Electrocution	Stop work until condition subsides
Horn blasts or other notification by site personnel	Site emergency	Stop work - evacuate to van or trailer - follow emergency notification procedures
Personal injury	Other personnel may be affected	Follow emergency notification procedures
Personal fatigue	Cold stress	Follow cold stress guidelines

Observation	Potential Hazard	Action
Windy condition	Overhead hazards, visual impairment	Stop work until condition subsides

8.5 Medical Assistance and General Emergency Procedures

Site-specific information regarding medical assistance and emergency numbers will be listed in the site-specific HASP. Emergency medical information for substances potentially present on-site will be addressed, if known.

8.5.1 General Emergency Procedures

The following standard emergency procedures will be used by on-site personnel. The HSO or designee will be notified of any on-site emergencies and will be responsible for ensuring that the appropriate procedures are followed.

- Personnel Injury: Personnel holding a current first aid/CPR certification shall administer first aid and/or CPR, if appropriate. Arrange for medical attention.
- Fire/Explosion: Alert the fire department. Personnel will move a safe distance from the involved area.

8.6 Safe Work Practices

Workers will adhere to established safe work practices for their respective specialties. The need to exercise caution in the performance of specific work tasks is made more acute due to:

- Physical, chemical and toxicological properties of contaminated material present;
- Other types of hazards present, such as heavy equipment, falling objects, loss of balance or tripping;
- Weather restrictions;

- Restricted mobility and reduced peripheral vision caused by the protective gear itself;
- Need to maintain the integrity of the protective gear; and/or
- Increased difficulty in communicating caused by respirators.

Work at the site will be conducted according to established protocols and guidelines for the safety and health of all involved. Among the most important of these principles are the following:

8.6.1 General

- In any unknown situation, always assume the worst conditions and plan responses accordingly.
- Because no personal protective equipment is 100 percent effective, all personnel must minimize contact with contaminated materials. Plan work areas, decontamination areas and procedures accordingly.
- Smoking, eating, chewing gum or tobacco, or drinking in the Contaminant Reduction Zone and the Exclusion Zone will not be allowed. Oral ingestion of contaminants is the second most likely means of introducing toxic substances into the body (inhalation is the first).
- Work breaks should be planned to prevent stress related accidents or fatigue related to wearing protective gear.
- Medicine and alcohol can increase the effects from exposure to toxic chemicals and cold stress. Prescribed drugs should not be taken if working in the Contaminant Reduction Zone or Exclusion Zone, unless approval has been given by the physician. Alcoholic beverage consumption will be prohibited on the site.
- Personnel must be observant of not only one's own immediate surrounding, but also those of others. Everyone will be working under constraints; therefore, a team effort is needed to notice and warn of impending dangerous situations. Extra precautions are necessary when working near heavy equipment and while utilizing personal protective gear because vision, hearing and communication will be restricted.
- All facial hair that interferes with the respirator facepiece fit, must be removed prior to donning a respirator for all tasks requiring Level C or Level B protection.

- Personnel must be aware that chemical contaminants may mimic or enhance symptoms of other illnesses or intoxication. Avoid use of alcohol or working while ill during the duration of task assignment.

8.6.2 Site Personnel

- All personnel at the site will be identified to the HSO and FOM.
- All personnel operating in respective work zones will dress according to the protection levels set forth in this HASP.
- No red head wooden matches or lighters of any kind will be allowed in the Contaminant Reduction Zone or Exclusion Zone.
- All personnel will notify the HSO or FOM of any unusual occurrences that might effect the overall safe operation of the site.
- Any time a fire extinguisher is used, personnel will notify the HSO or FOM of what took place.
- All injuries and accidents will be immediately reported to the HSO or FOM and the appropriate reports filed.

8.6.3 Traffic Safety Rules

- Any vehicles that will not be involved in the site operations will be secured and the motor shut down.
- Only personnel assigned to this remedial investigation will be allowed to enter the site. Any other people, whether from OSHA, USEPA or vendors supplying equipment, etc., will have to be met prior to entering the site.
- At no time will any equipment be allowed to block any access road. If in the moving of equipment, a temporary blockage will exist, that equipment will have an operator available to move that equipment.
- The locations of all fire fighting equipment, valves, hydrants, hose storage places and fire extinguishers will be indicated to all personnel so that they will not be inadvertently blocked at any time.
- Project personnel may be required to wear safety vests when working on or adjacent to roadways and must comply with all applicable rules and regulations for traffic safety.

8.6.4 Equipment Safety Rules

- Proper loading and operation of trucks on-site will be maintained in accordance with DOT requirements covering such items as grounding, placarding, driver qualifications and the use of wheel locks.

- Operation of heavy construction equipment will be in accordance with OSHA regulations 29 CFR 1910 and 1926.

- All equipment that is brought on-site will be available for inspection by the HSO.

- The HSO, or designee, will assign protective equipment to all site personnel and this equipment will be made available for inspection at anytime.

- All equipment will be installed with appropriate equipment guards and engineering controls. These include rollover protective structures.

- Safe distances will be maintained when working around heavy equipment.

- All equipment and tools to be operated in potentially explosive environments will be intrinsically safe and not capable of sparking or be pneumatically or hydraulically driven. Portable electric tools and appliances can be used where there is no potential for flammable or explosive conditions use three-wire grounded extension cords to prevent electric shocks. Ground fault interrupters will be used as well.

- With hydraulic power tools, fire-resistant fluid that is capable of retaining its operating characteristics at the most extreme temperatures will be used.

- Cutting or welding operations will not be carried out without the approval of the HSO and FOM.

- At the start of each work day and on a weekly basis, inspection of brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, and splash protection will be made by the equipment operators.

- All non-essential personnel will be kept out of the work area.

- Loose-fitting clothing, loose long hair and wearing of jewelry around moving machinery will be prohibited.

- Cabs will be free of all non-essential items and all loose items will be secured.

- The rated load capacity of a vehicle will not be exceeded.

- Dust control measures will be employed to prevent the movement of dust from contaminated areas to clean areas. The method employed will be determined and reviewed by the HSO and the FOM.

- Equipment operators will report to their supervisor(s) any abnormalities such as equipment failure, oozing liquids, unusual odors, etc.

- When an equipment operator must negotiate in tight quarters, a second person will be used to ensure adequate clearance.

- A signalman will be used to direct backing as necessary.

- Refueling will be done in safe areas. Engines will not be fueled while vehicle is running. Ignition sources near a fuel area will be prohibited.

- All blades and buckets will be lowered to the ground and parking brakes set before shutting off the vehicles.

- An ongoing maintenance program for all tools and equipment will be implemented by the responsible subcontractor equipment supervisor. All tools and moving equipment will be regularly inspected to ensure that parts are secured and intact with no evidence of cracks or areas of weakness, that the equipment turns smoothly with no evidence of wobble, and that it is operating according to manufacturer's specifications.

- Tools will be stored in clean, secure areas so that they will not be damaged, lost or stolen.

- All heavy equipment that is used in the Exclusion Zone will be kept in that zone until the investigation is complete or the equipment is decontaminated. Equipment will be completely decontaminated before moving it into the Support Zone.

8.6.5 Drilling and Excavation and Equipment Safety Rules

Drill rig and excavator operation, maintenance and safety will be the responsibilities of the drill rig/excavator operator.

8.6.6 Electrical Safety

Electrical hazards can exist at sites because of downed power lines, contact with subsurface utilities or improper use of electrical equipment. The presence of underground electric lines will be checked before any digging or excavating is undertaken. When using cranes

or material handlers, care will be taken that the machinery does not come in contact with any energized lines. Equipment must maintain the following distances from energized overhead power lines:

- 10 feet up to 50 kV
- 10 feet plus 4 inches for every 10 kV over 50 kV

The following should be used for protecting personnel from electrical shocks:

- Ground equipment
- Double-insulating tools
- Over-current devices such as fuses and circuit breakers
- Ground fault circuit interrupter
- Tools and flexible cords will be inspected for damage that could lead to shock

8.6.7 Daily Housekeeping

The site and all work zones will be kept in an orderly fashion and the site is to be left safe and secure upon completion of each day's work.

8.6.8 Site Personnel Conduct

- All site personnel will conduct themselves properly and in accordance with generally accepted good work practice.
- At all times, the HSO will monitor all safe operations at the site. Any operation not within the scope of the HASP will be discussed fully before that operation begins.

9.0 PERSONAL HYGIENE AND DECONTAMINATION

9.1 General

- All personnel performing or supervising remedial work within a hazardous work area, or exposed or subject to exposure to hazardous chemical vapors, liquids or contaminated solids, will observe and adhere to the personal hygiene-related provisions of this section.

- Any personnel found to be repeatedly disregarding the personal hygiene-related provisions of the HASP will be barred from the site by the HSO.

- All on-site personnel will wear personal protective equipment as required at all times whenever entering the Exclusion Zone or the Decontamination Area.

- Personal hygiene and decontamination facilities, in accordance with OSHA 29 CFR 1910.120 (N), will be provided on-site, when necessary, and include the following:

  - Storage and disposal containers for used disposable outerwear.

  - Hand washing facilities.

  - An uncontaminated lunch area.

  - An uncontaminated rest/break area.

  - Chemical toilet, if no other facilities are located on-site.

- All personnel must enter and leave the work site through the facilities. The portable chemical toilet (if required), if possible, will be located in the Support Zone.

- The personal hygiene and decontamination facilities will be provided so that any personnel leaving the Exclusion Zone may perform decontamination, safely remove all protective outer clothing, and wash face and hands.

- Decontamination will be performed prior to taking breaks, eating lunch or leaving the work site.

- All site personnel will be given orientation training to the use and operation of the personal hygiene and decontamination facilities.

9.2 Contamination Prevention

To minimize contact with contaminated substances and lessen the potential for contamination, the following will be adhered to:

- Personnel will make every effort not to walk through any areas of obvious contamination (i.e., liquids, discolored surfaces, smoke/vapor clouds, etc.).
- Personnel will not kneel or sit on the ground in the Exclusion Zone and/or the Decontamination Area.

9.3 Personal Hygiene Policy

- Smoking and chewing tobacco will be prohibited except in a designated break area.
- Eating and drinking will be prohibited except in the designated lunch or break area.
- All outer protective clothing (e.g., chemically protective suits, gloves, and boots) will be removed and personnel will thoroughly cleanse their hands and other exposed areas before entering the break or lunch area.
- Drinking of replacement fluids will be permitted in a designated area outside the Exclusion Zone. Personnel will, as a minimum, remove outer and inner gloves, respirator and coverall top, and wash hands prior to drinking replacement fluids.
- All personnel should change into fresh clothing after each working period or shift. Showering is mandatory upon return to each individual's rest place.

9.4 Personnel Decontamination Procedures

Decontamination procedures are followed by all personnel leaving the Exclusion Zone. Generalized procedures for decontamination follow. All procedures apply for Level C personal protection, however for Level D only steps 2, 3, and 8 apply. The HSO may modify these procedures based on site conditions.

Step 1 Drop tools, monitors, samples, and trash at designated drop stations (i.e., plastic containers or drop sheets).

Step 2 Scrub outer boots and outer gloves with decon solution or detergent and water. Rinse with water.

Step 3 Remove tape from outer boots (if applicable) and remove boots and discard tape in disposal container. Place boots on boot rack.

Step 4 Remove tape from outer gloves (if applicable) and remove only outer gloves and discard in disposal container.

Step 5 This is the last step in the decontamination procedure if the worker has left the Exclusion Zone to exchange the cartridges on his/her air purifying respirator. The cartridges should be exchanged, new outer gloves and boot covers donned, the joints taped, if necessary, and the worker returns to duty.

Step 6 Remove outer garments and discard in disposal container. New outer garments will be issued at the beginning of each work day or as deemed necessary by the HSO.

Step 7 Remove respirator and place or hang in the designated area.

Step 8 Remove inner gloves and discard in disposal container.

Note: Disposable items (i.e., coveralls, gloves, and boots) will be changed on a daily basis unless there is reason to change more frequently. Dual respirator cartridges will be changed daily, unless more frequent changes are deemed appropriate by site surveillance data or by assessments made by the HSO.

Pressurized sprayers or other designated equipment will be available in the decontamination area for wash down and cleaning of samples and equipment.

A waterless hand cleaner and paper towels may be used for hands, arms and any other skin surfaces potentially in contact with contaminated material.

Respirators (if used) will be decontaminated daily and taken from the drop area. The masks will be disassembled, the cartridges set aside and all other parts placed in a cleansing solution. After an appropriate time in the solution, the parts will be removed and rinsed with tap water. Old cartridges will be discarded in the contaminated trash container for disposal. In the morning, the masks will be reassembled and new cartridges installed, if appropriate. Personnel will inspect their own masks and readjust the straps for proper fit.

9.5 Emergency Decontamination

Decontamination will be delayed if immediate medical treatment is required to save a life. Decontamination will then be performed after the victim is stabilized. When decontamination can be performed without interfering with medical treatment, or a worker has been contaminated with an extremely toxic or corrosive material that could cause additional injury or loss of life, decontamination will be performed immediately.

When decontamination cannot be done, the victim will be wrapped in a chemical protective barrier (clothing or sheeting) to reduce contamination of other personnel. Emergency and off-site medical personnel will be informed of potential contamination and will be instructed about specific decontamination procedures. When the victim is transported off the site, personnel knowledgeable of the incident, the site and decontamination procedure will accompany the victim.

9.6 General Equipment Decontamination

- All vehicles and equipment used in the Exclusion Zone will be decontaminated prior to leaving the site.
- No vehicles will leave the decontamination area until they are properly inspected and approved by the HSO or FOM for general cleanliness of frame and tires.
- No vehicle will leave the site unless it is in a broom-clean condition and free of loose dirt or material on tailgates, axles, wheels, etc.
- The HSO or designee will monitor all vehicles to confirm proper decontamination prior to exiting. Approval will be based on visual inspection of all exposed surfaces.
- Equipment decontamination wash water residues will be collected for disposal.
- Personnel engaged in vehicle decontamination will wear Level C or Level D equipment with respiratory protection consistent with the air monitoring results collected by the HSO, and perform personal decontamination at the completion of equipment decontamination.
- Only clean water will be used for personnel, equipment and vehicle decontamination.

9.7 Small Equipment Decontamination Procedures

Small equipment will be protected from contamination as much as possible by draping, masking or otherwise covering the instruments with plastic (to the extent feasible) without hindering operation of the unit. For example, the photoionization detector can be placed in a clear plastic bag to allow reading the scale and operation of the controls.

Step 1 Remove coverings from equipment left in the drop area and place the coverings in appropriate waste containers.

Step 2 Brush or wipe any soil or moisture with a disposal paper wipe. Place soiled wipes in appropriate containers.

Step 3 Place bare units in a clean plastic tub and wiped off with a damp, clean, disposable wipe. Equipment will then be allowed to air dry.

Step 4 Following decontamination, check and recharge equipment, as necessary, for the next day's operations.

Step 5 Prior to entering the Exclusion Zone, recover all small equipment with new, protective coverings, if necessary.

9.8 Heavy Equipment Decontamination Procedures

A decontamination area for the drill rig and excavator will be set up. A wash/rinse will be performed on all surfaces that came in contact with contaminants (e.g., augers). Prior to removing any heavy equipment or vehicles from the Exclusion Zone, they must be thoroughly decontaminated. Specific procedures are as follows:

Step 1 Initially, inspect equipment/vehicles to determine if gross decontamination is required first. Particular attention must be paid to tires, under surfaces, points of contact with the ground, and horizontal surfaces where dust or aerosols might settle.

Step 2 If visible contamination is present, the equipment/vehicle must be moved to the decontamination pad where gross contamination will be scraped, brushed or swept off.

Step 3 Following gross decontamination, or if visible contamination is no longer present, wash the equipment/vehicle with high pressure washer as deemed necessary by the

HSO or designee. Efforts should be made to minimize water usage to reduce wastewater quantities.

Step 4 Prior to releasing any heavy equipment or vehicles from the Contaminant Reduction Zone, decontamination personnel will contact the HSO for final approval.

10.0 EMERGENCY RESPONSE AND CONTINGENCY PLAN

10.1 General

This plan has been prepared in accordance with 29 CFR 1910.120 (l) and will address the following potential emergencies:

- Emergencies outside the site.
- Emergencies within the site.
- Chemical exposures.
- Site evacuation.

10.2 Emergency Equipment

Specially marked and readily accessible emergency equipment will be provided on-site.

10.3 Special Requirements

- The Project Director or FOM will be on-call for any after hour emergencies resulting from adverse weather conditions. Incidents resulting from adverse weather will be reported to the HSO who will in turn contact the Project Director.
- First aid kit locations will be specially marked and have adequate water and other supplies necessary to cleanse and decontaminate burns wounds, or lesions. First aid stations will also stock buffer solutions for treating acid and caustic burns.

10.4 Emergency/Accident Reporting and Investigation

In the event of an emergency associated with the site work, the HSO or FOM will, without delay take: 1) diligent action to remove or otherwise minimize the cause of the emergency; 2) alert the Project Director; and 3) institute whatever measures are necessary to prevent any repetition of any conditions or actions leading to, or resulting in, the emergency.

Notification of the Project Director will occur immediately and initially be verbal with written notification occurring within 24 hours of the incident (i.e., accident, explosion, serious exposure, etc.). The Incident Notification Form, provided in Exhibit 8, will be used for written notifications and documentation.

10.5 Emergency Medical Care

- Site-specific emergency medical information will be provided in the site-specific investigation work plan.
- The hospital will be informed by the HSO or FOM of potential medical emergencies that could result from site operations and advised on the types of hazardous materials that are on site. In the event of an incident requiring their assistance, specific details of hazardous materials should be provided to the hospital medical staff, if available.
- A list of emergency information and a map to the nearest medical facility/hospital will be posted at every work site telephone. Copies of this map will also be available to be placed in vehicles used to transport injured personnel to the medical facility.

10.6 Emergencies Outside the Site

- All work in the site area will stop when advised by any authorized personnel and will remain so until otherwise instructed.
- The HSO and FOM will be fully advised of any work that may affect the safety of on-site employees or property.
- Actions to be taken by on-site personnel in the event of an outside emergency will include:
  - All operations will cease immediately and all equipment will be shut down and secured.
  - All personnel will leave vehicles in work zone in a safe manner making sure any remaining vehicles will not hamper any emergency traffic in the area or block any fire hydrants or foam supply systems.
  - All personnel will evacuate to a prearranged muster area.
  - All personnel will remain in the muster area to await further instructions.

10.7 Emergencies Within the Site

- The HSO will monitor all operations from the roadway and assist any emergency personnel responding to an emergency within this work zone.
- It will be the HSO's responsibility to maintain communications with public works personnel.
- In the event of an emergency within the work zone at the site, the emergency notification procedures will be followed.
- In all emergency situations, it will be the responsibility of the HSO to ensure that all site personnel are accounted for.

10.8 Personnel Exposures

The emergency procedures which will be used in the event of acute exposure (eyes, skin contact, inhalation) are described in Exhibit 9.

10.9 Site Evacuation

The site area will be evacuated, and fire and police departments will be notified in the event of fire, explosion or their potential. Depending on the cause and magnitude of the conditions requiring evacuation, three stages have been designated. See Exhibit 9 for details.

11.0 POSTINGS

Postings will be available on-site. These postings will cover four specific areas:

- Use of personal protective equipment;
- Personal hygiene;
- Provisions for smoking, eating, chewing and drinking; and
- Emergency information.

These postings may be added to, based on need to disseminate information or policy. All postings will be coordinated for approval prior to posting. The specified postings are provided in Exhibit 10. The site-specific emergency information for each site will be included on Exhibit 11 and will be posted at each site.

EXHIBIT 1

HEALTH AND SAFETY PLAN REVIEW ACKNOWLEDGEMENT FORM

INSTRUCTIONS: This form is to be completed by each person working on the subject work-site. Upon completion, this form is to be given to the HSO.

JOB NUMBER: _____

CLIENT/PROJECT: _____

DATE: _____

I represent that I have read and understand the contents of the above mentioned Health and Safety Plan and agree to perform my work in accordance with this plan:

_____
Signature

_____
Name Printed

_____
Company/Office

_____
Date Signed

EXHIBIT 2

CONFINED SPACE OPERATIONS GUIDELINES

1.0 PURPOSE

To establish safe procedures for employees of D&B who have potential to be exposed to the hazards of a confined space pursuant to 29 CFR 1910.146

2.0 SCOPE

Applies to the activities of all employees of D&B/WFC exposed to the hazards of a confined space.

3.0 DEFINITIONS

Attendant - A trained individual stationed outside the confined space who monitors the authorized entrant.

Authorized Entrant - A trained individual who's name is listed on the entry permit and who is authorized by the employer to enter a confined space.

Confined Space – A space that:

1) Is large enough and so configured that an employee's entire body can enter and perform assigned work (for example, storage tanks, stacks, pits, basements, silos, boilers, ventilation and exhaust ducts, manholes, sewers, tunnels, underground utility vaults); and
2) Has limited or restricted means for entry or exit; and
3) Is not designed for continuous employee occupancy.

Emergency – any occurrence or event internal or external to the permit space that could endanger entrants.

Engulfment – the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry – The act of intentionally passing through an opening into a confined space. Entry occurs as soon as any part of the entrant's body breaks the plane of the opening into the space.

Entry Permit – A written or printed document provided by the employer that authorizes the confined space entry and identifies acceptable conditions for entry into a confined space. At a multi employer site all affected employers must be in agreement regarding who will issue a Permit.

EXHIBIT 2 (continued)

CONFINED SPACE OPERATIONS GUIDELINES

Entry Supervisor – the person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned for authorizing entry, overseeing entry operations, and for terminating the confined space entry.

Hazardous Atmosphere – an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:

1) Flammable gas, vapor, or mist in excess of 10% of its lower flammable limit (LFL)
2) Airborne combustible dust at a concentration that meets or exceeds its LFL
3) Atmospheric oxygen concentration below 19.5% or above 23.5%
4) Atmospheric concentration of any substance for which a dose or a permissible exposure limit (PEL) is published in OSHA 1919 Subpart Z, Toxic and Hazardous Substances, which could result in employee exposure in excess of its dose or permissible exposure limit
5) Any other atmospheric condition that is immediately dangerous to life or health.

Hot Work Permit – the employer's written authorization to perform operations (for example, welding, cutting, burning and heating) capable of providing a source of ignition.

Immediately Dangerous to Life or Health (IDLH) – any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit required confined space.

Isolation – the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding, blocking, bleeding, and lockout or tagout of all sources of energy.

Line Breaking – the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Oxygen Deficient Atmosphere – an atmosphere containing less than 19.5 % oxygen.

Oxygen Enriched Atmosphere – an atmosphere containing greater than 23.5 % oxygen.

Permit Required Confined Space (PRCS) – a confined space that has one or more of the following characteristics:

1) contains or has potential to contain a hazardous atmosphere, or
2) contains a material with the potential for engulfment of an entrant, or
3) has inwardly converging walls or floors that could trap or asphyxiate an entrant, or

4) contains any other recognized serious safety or health hazard.

Permit System – the employer's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.
Prohibited Condition – any condition in a permit system that is not allowable by the permit during the period when entry is authorized.

Rescue Service – the personnel designated to rescue employees from permit required spaces.

Retrieval System – the equipment used for non-entry rescue of persons from permit required spaces.

Testing – the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

4.0 RESPONSIBILITIES

Entry Supervisor - The entry supervisor is responsible for:

1) Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure.
2) Completing the Entry Permit, verify that all requirements of the Permit have been met and all equipment specified in the permit is in place before endorsing the permit and allowing entry to begin.

Health and Safety Coordinator (HSC) - The HSC is responsible for:

1) Coordinating training for personnel designated as an Authorized Entrant, Attendant or Entry Supervisor.
2) Reviewing and updating this program annually to include new revisions by OSHA.
3) Conducting annual field audits of this program.

On-Site Health and Safety Representative (HSR) - The HSR is responsible for:

1) Making sure that the Permit requirements are implemented
2) Reporting all incidents or PRCS guidelines deficiencies
3) Making on-site H&S decisions related to field operations

HSR may take on an Entry Supervisor's responsibilities, if assigned.

Authorized Entrant - The authorized entrant is responsible for:

1) Knowing the hazards and understanding the consequences of exposure

2) Maintaining contact with the Attendant
3) Understanding and utilizing the provided personal protective equipment
4) Exiting the permit space if evacuation is ordered by the Attendant
5) Alert the Attendant whenever:
   - the entrant recognizes any warning sign or symptom of exposure to a dangerous situation
   - the entrant detects a prohibited condition
6) Exit from the permit space as quickly as possible whenever:
   - An order to evacuate is given by the Attendant or the entry supervisor
   - The entrant recognizes any warning sign or symptom of exposure to a dangerous situation
   - The entrant detects a prohibited condition
   - An evacuation alarm is activated

Attendant – The Attendant is responsible for:

1) Knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure
2) Continuously maintaining an accurate count and identity of authorized entrants in the permit space.
3) For remaining outside the permit space until relieved by another Attendant.
4) Maintaining continuous communication with all Authorized Entrants
5) Monitoring activities inside and outside the space to determine if it is safe for entrants to remain in the space and ordering the authorized entrants to evacuate the permit space immediately under any of the following conditions:
   - If the Attendant detects a prohibited condition of the entry
   - If the Attendant detects the behavioral effects of hazard exposure in an Authorized Entrant
   - If the Attendant detects a situation outside the space that could endanger the Authorized Entrants
   - If the Attendant cannot effectively and safely perform all of his or her required duties
6) Summoning rescue or emergency services as soon as the Attendant determines that authorized entrants may need assistance to escape from permit required confined space (PRCS) hazards
7) Perform non-entry rescue as specified in the rescue procedure.

5.0 GUIDELINES

D&B/WFC will use these guidelines for any entry into a PRCS for testing, maintenance, inspection, or repair activities.

5.1 General

In general, the HSC or HSR should evaluate the workplace and identify the number, type and location of all confined space areas within the site that personnel may need to enter to perform work. Once the confined spaces have been identified, as defined in Section 3.0, a determination must be made if the space(s) requires an Entry Permit.

If a confined space has been defined as a PRCS, the HSC, HSR or his/her designee must inform site personnel of the existence, location and danger posed by the space. This can be accomplished by posting a danger sign with appropriate language (e.g. DANGER – PERMIT REQUIRED CONFINED SPACE).

NO ENTRY INTO A PRCS SHALL OCCUR WITHOUT A PERMIT.

5.2 Reclassifying Permit-Required Confined Spaces

PRCS can be temporarily reclassified as either a Non-Permit Confined Space or Alternate Space, providing the following is met.

5.2.1 Reclassification to a Non-Permit Confined Spaces

Some identified confined spaces are classified PRCS based solely upon the space containing hazards which can effectively be eliminated through lockout/tagout procedures. For a PRCS to be temporarily reclassified as a non-permit space, there must be no potential for the space to contain other hazards. The permit space may be reclassified as a non-permit confined space for as long as the hazards remain eliminated. All measures for eliminating hazards within the space should be documented and reviewed by the HSC. Upon work completion and after the control measures have been removed, the space must be reclassified as a PRCS.

5.2.2 Reclassifying PRCS to Alternate Space

If the only hazard in a PRCS is a hazardous atmosphere, then it is possible to potentially reclassify the space as an Alternate Space. In order to consider such spaces as non-permit spaces, all atmospheric hazards must be eliminated without entry into the space. Monitoring and inspection data, collected during routine entry operations, must show that the atmospheric hazards were effectively abated through the use of ventilation equipment. The HSC or HSR shall verify an evaluation of designated Alternate Spaces. Although an Entry Permit is not required for entrance into an Alternate Space, the following precaution must be followed:

- Entrants must be trained in the potential hazards of the space
- Continuous ventilation shall be established and maintained throughout the entry period. The ventilation must be sufficient to maintain the space safe for entry
- Prior to entry the space must be tested for oxygen content, flammable gases and vapors, potential toxic air contaminants
- If a hazardous atmosphere is detected entrants must evacuate the space and the space then becomes a PRCS.

5.3 Hazard Identification

The Hazard Assessment Form in Appendix A can be used to assess the hazards of each confined space prior to entry.

5.4 Entry Permit

The Entry Permit (Appendix B) is a checklist designed to ensure that the proper precautions are implemented prior to entry.

All blocks on the permit must be completed. If an item is not applicable then "N/A" must be written in the space. NO blank spaces are to appear on the permit. The permit must be signed by the Entry Supervisor and posted at the entrance to the confined space until the entry is completed or the work shift ends. The permit is applicable for a single work shift. The entry permit will serve as safety briefing outline before entry and will be available for review by all affected employees.

The entry permit will identify:

1. The location of the confined space, a description of the entry task, date of entry and duration of permit.

2. Known and potential hazards that may be encountered during the confined space entry.

3. All mechanical apparatus within the confined space such as agitators and pumps, which if activated could injure the worker.

4. Isolation procedures to be implemented.

    a. Blanking and/or disconnecting of all lines
    b. Electrical lockout and tagout
    c. Mechanical isolation and tagout
    d. Mechanical ventilation (volumes)

EXHIBIT 2 (continued)

CONFINED SPACE OPERATIONS GUIDELINES

5. Safety and protective equipment required (specify routine and emergency requirements):

    a. Level of respiratory protection
    b. Personal protective equipment
    c. Safety harness and/or lifelines
    d. Extraction devices
    e. Tools and equipment to be taken into the confined space by the entrant.

6. Pre-entry atmospheric monitoring and acceptable levels of contaminants:

    a. Oxygen level (19.5 – 23.5 %)
    b. Combustible gas/vapor level (< 10% LEL)
    c. Toxic substances level less than established TLV, PEL

7. Provisions for continuous atmospheric monitoring:

    a. Equipment
    b. Evacuation criteria

8. Equipment/procedures to maintain acceptable atmospheric conditions:

    a. Purging, ventilation, flushing, inerting

9. Identification of entry team (authorized and eligible):

    a. Personnel to make entry (authorized entrant)
    b. Personnel on stand-by (Attendant)

10. Emergency procedures and first aid:

    a. Communication procedures
    b. Equipment location
    c. Rescue team

11. Training required (Specifics beyond Section 5.8 should be noted):

    a. Authorized Entrant, Attendant and Entry Supervisor
    b. Non-entry rescue
    c. Respirator use

d. PPE

5.5 Work Practices

5.5.1 Pre-Entry

As part of the pre-entry procedure, the Entry Supervisor, HSC or HSR will review the entry permit with all authorized entrants and Attendants. The Entry Supervisor, HSC or HSR must make sure that all the necessary steps have been taken to ensure that there are safe conditions prior to issuing an entry permit. These steps include:

- *Pre-entry briefing*:
- *Preparation of the Entry Permit including:*
  - ✓ ***Initial Atmospheric Testing*** as necessary for oxygen deficiency or enrichment, for combustible gases, and for toxic gases and vapors
  - ✓ ***Hazard Control/Elimination*** to ensure that proper hazard control/elimination measures have been taken
  - ✓ ***Space Preparation and Site Control*** to ensure that unauthorized personnel do not impact the entry operation, that all necessary entry equipment can be staged effectively, that housekeeping at the entry location and in the space itself is adequate and that rescue services can locate and access the entry space as needed
  - ✓ ***Training*** which identifies the level of training required for all personnel involved with the entry
  - ✓ ***Emergency Rescue Procedures*** identifying the level and type of emergency services required for the entry
  - ✓ ***Equipment and Instrumentation*** required for monitoring, hazard control, safety, rescue

5.5.2 Purging and Ventilation

All confined space enclosures containing a hazardous atmosphere shall be subject to purging and continuous ventilation prior to an entry. Continuous ventilation may not be required if the confined space meets all of the following criteria:

1. No oxygen deficiency or enrichment (19.5 - 23.5 %)

2. LEL measurements are less than 10%

3. Toxicity measurement is less than 10% of the established IDLH of the airborne contaminant present

5.5.3 Isolation/Lockout and Tagging

Except for such confined spaces as manholes, sewers, and tunnels, where complete isolation is not physically possible, all confined spaces shall be completely isolated from all other systems by such means as lockout/tagout, double block and bleed, or physical disconnection of all lines into the confined space.

5.5.4 Buddy System

All tasks involving confined space entry will by performed by a team of not less than two (2) persons with specific duties as described in Section 4.0 Responsibilities.

5.5.5 Communication

The Authorized Entrants and the Attendant must maintain continuous communication with each other during the entire confined space entry. If visual contact and/or verbal communication cannot be maintained, the following code may be used which utilizes the lifeline:

Person Outside Confined Space	Person In Confined Space
1 Pull - Come out	1 Pull - Send help
2 Pulls- Back out	2 Pulls- Keep slack out of line
3 Pulls- Advance	3 Pulls- I am going ahead
4 Pulls- Are you okay?	4 Pulls- I am okay

If the person inside the confined space does not respond to the pull code, assume that there is trouble and begin effecting emergency procedures.

5.5.6 Testing and Monitoring

When preparing for an entry into a PRCS, appropriate initial testing must be conducted to assure that the atmosphere in the confined space is safe. Monitoring will be conducted for oxygen content, combustible gases/vapors, toxic contaminants, and any other contaminants identified. Air monitoring should be conducted continuously while personnel are within the confined space.

EXHIBIT 2 (continued)

CONFINED SPACE OPERATIONS GUIDELINES

Entry into a confined space without proper personal protective equipment will not be permitted under the following conditions:

1. Oxygen concentrations less than 19.5% (148 mm Hg*) or greater than 23.5% (178 mm Hg*) * *Based on Atmospheric Pressure of 760 mm HG (Sea Level)*

2. Flammability measurements greater than 10% of the lower explosive limits (LEL)

3. Toxicity measurements indicating an IDLH atmosphere's existence in the confined space.

Initial atmospheric samples shall be drawn while outside the confined space at the following locations:

1. Outside the entry point(s)

2. Immediately inside the entry point(s)

3. Every four feet from the entrance.

All initial-monitoring results will be recorded on the entry permit.

5.6 Equipment

Equipment necessary for safe entry, including testing, monitoring, communication, and personal protective equipment must be available prior to entry. Personnel using the equipment must be trained in proper use and maintenance of such equipment.

5.6.1 Safety Equipment

Additional safety equipment such as safety belts, body harnesses, or wristlets with lifelines shall be provided and used for all confined space entries, as determined by Entry Supervisor, HSC or HSR. If necessary, lifelines shall be attached to a mechanical extraction device outside the confined space so the Attendant can perform non-entry rescue.

5.6.2 Illumination

Illumination must be provided, as necessary, pursuant to 29 CFR 1910.120(m).

5.6.3 Equipment Requirements

All tools and other equipment, including monitoring instruments, for use in PRCS shall be inspected for compliance with the following requirements:

1. Tools and equipment will be kept clean and in a good state of repair.

2. All electrical equipment including portable tools, lighting, and power cords should meet approvals in accordance with OSHA regulations found in 29 CFR 1910 subpart S, including provisions for ground fault circuit interruption.

3. Only explosion proof temporary lighting listed by the Underwriters Laboratory should be used during PRCS entry and be equipped with all necessary guards.

4. Air activated tools must be used where flammable liquids are present and be bonded to the confined space.

5. Compressed gas cylinders, except those that are part of SCBA or resuscitation equipment, shall never be permitted inside a confined space. Cylinders used to supply compressed gases to a confined space shall be turned off at the cylinder valve when not in use and the supply lines will be removed.

6. Ladders, scaffolding, and staging shall be adequately designed and secured in conformance with OSHA regulations found in 29 CFR 1910 subpart D.

7. Any equipment or instrumentation subject to use in a confined space where flammable atmospheres may occur shall be listed as explosion proof or intrinsically safe by a recognized testing laboratory.

5.7 Rescue

If it becomes necessary to remove a worker from a confined space, the Attendant should act in accordance with the predetermined emergency rescue plan as follows:

A. The Attendant will communicate through the predesignated communication network and request assistance. The following information should be given:

   1. The location of the confined space

   2. Request for emergency oxygen supply and first-aid kit

3. Request for self-contained air supply with full-face mask, safety harness, and lifeline

4. Call for professional medical assistance

B. The Attendant will only attempt a non-entry rescue. At no time will the Attendant place himself/herself inside the confined space to perform an in-space rescue.

C. If the person within the confined space is secured to a winch, begin hauling him/her out. This procedure must be performed at speed that will not further injure the person.

D. If the lifeline is not secured to a winch, the Attendant will secure lifeline.

5.8 Employee Information and Training

Employees shall be trained to recognize confined spaces, the hazards of working in a confined space, and demonstrate understanding, knowledge, and skills necessary for the safe performance of their assigned duties during any confined space entry. The HSC will also ensure employees are trained before an employee is assigned the duties of Entrant, Attendant or Entry Supervisor.

Training shall include:

1. Hazard recognition associated with confined space operations

2. Emergency entry and egress procedures

3. Respiratory Protection

4. First aid

5. Cardiopulmonary resuscitation

6. Lockout and tagout procedures

7. Personal Protective Equipment

8. Rescue operations

9. The Permit System

10. Work practices (see Section 5.4)

5.9 Subcontractors

Subcontractors shall be provided with all available information on existing confined spaces, their hazards, necessary permits (if applicable), and any other workplace hazards, safety rules and emergency procedures necessary to complete the task safely.

5.10 Recordkeeping

Copies of the entry permits and personnel exposure record will be maintained by the HSC as required under 29 CFR 1910.20.

6.0 REFERENCES

1. ANSI Z117.1-1989 "Safety Requirements for Confined Space"
2. 29 CFR 1910.146, Proposed Rulemaking "Permit Required Confined Spaces"
3. 29 CFR 1910.120(m) Hazardous Waste Operations (Illumination)
4. 29 CFR 1910 Subpart S (Electrical)
5. 29 CFR 1910 Subpart D (Walking-Working Surfaces)

7.0 APPENDICES

Appendix A- Hazard Assessment Form
Appendix B- Entry Permit

EXHIBIT 3

EXCAVATION/TRENCHING OPERATIONS GUIDELINES

1.0 PURPOSE

To establish safe operating procedures for employees working in or near excavation or trenching operations at D&B work sites.

2.0 SCOPE

Applies to all D&B activities where excavation or trenching operations take place.

3.0 DEFINITIONS

Adjacent area – The horizontal surface area surrounding the excavation, which extends outward from the excavation edge up to a distance that is half the depth of the excavation.

Competent Person – A competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate the hazard.

Excavation – Any manmade cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal and producing unsupported earth conditions by reasons of the excavation.

Protective system – Shoring, Shielding, Sloping or equivalent.

Trench – A narrow excavation made below the earth's surface. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet.

4.0 RESPONSIBILITIES

Health and Safety Coordinator (HSC) responsible for revising the Trenching and Excavation program to include new OSHA updates. The HSC is also responsible for ensuring trenching and excavation training is available for applicable D&B employees. The HSC or a designee may conduct site inspections of all trenching and excavations that D&B employees will be exposed to.

All Site Personnel must follow these procedures when working in or around an excavation or trench.

EXHIBIT 3 (continued)

EXCAVATION/TRENCHING OPERATIONS GUIDELINES

5.0 GUIDELINES

D&B personnel may be providing oversight on projects where excavation and trenching operations are being undertaken. ***D&B WILL NEVER BE PLACED IN THE ROLE OF THE DESIGNATED "COMPETENT PERSON", MAKING DECISIONS ON THE SAFETY CONDITIONS AND PROCEDURES OF THE EXCAVATION AND TRENCHING OPERATIONS***. D&B personnel should identify the contractor/subcontractor/sub-consultant "Competent Person". D&B personnel will also understand the basic H&S requirements for excavating and trenching to protect themselves and other D&B personnel.

5.1 Hazards Associated with Excavation/Trenching

The principle hazards associated with excavation/trenching are:

- Suffocation, crushing or other injury from falling material.
- Damage/failure of installed underground services and consequent hazards.
- Tripping, slipping or falling.
- Possibility of explosive, flammable, toxic or oxygen-deficient atmosphere in excavation.

5.2 Requirements for Protective Systems

- Whenever there is a potential for cave-in.
- The excavation is 5 or more feet in depth, as determined by the competent person, pursuant to 29 CFR Part 1926.501.

5.3 Inspections

The designated "competent person" from the contractor/subcontractor/sub-consultant will perform inspections pursuant to 29 CFR 1926.651 k(1) when employee exposure to hazards are reasonably anticipated:

- Each day before employees enter the excavation,
- After every rain storm,

- As needed throughout the shift, or
- As soil conditions change.

During the inspection the "competent person" must:

- Ensure the protective system is adequate for the soil classification and the external loads placed on the adjacent area,
- Evaluate the excavation, the adjacent area and the protective system, for
  - Hazardous atmosphere
  - Potential situations that could lead to cave-in
  - Indications of failure of a protective system
  - Cracks in the ground parallel to the top of the excavation
  - Any other hazardous conditions
- Verify that ladders or other means of access/egress to excavations shall be provided at:
  - maximum spacing of 100 feet on the perimeter of open excavations and
  - maximum spacing of 25 feet for trench excavations greater than 4 feet in depth.

5.4 Entering the Excavation

D&B employee shall ***NOT*** enter an excavation unless the D&B site supervisor has coordinated with the contractor/subcontractor/sub-consultant competent person to ensure the excavation has been inspected and is safe.

6.0 REFERENCES

1. OSHA Regulations 29 CFR 1926 Subpart P - Excavations

EXHIBIT 4

LOCKOUT/TAGOUT GUIDELINES

1.0 PURPOSE

Lockout/Tagout guidelines have been established to protect D&B employees from injuries that could result from the unexpected or unplanned start-up or movement of machinery or equipment during inspections, maintenance, installation, adjustment, or servicing operations. These guidelines provide D&B personnel with information regarding the hazards and control measures associated with the release of such hazardous energy pursuant to OSHA Standard 29 CFR 1910.147.

If D&B is expected to take measures to control hazardous energy for site-specific operations, then a written Energy Control Procedure must be prepared for each site. Such procedures will include steps for equipment shutdown, isolation, application of locks and tags, dissipation of stored energy, verification of equipment isolation, removal of locks and tags, and restoration of energy to machines.

The components of the Lockout/Tagout Program include:

a. Energy Control Procedures, if applicable

b. Employee notification

c. Contractor activities

d. Employee training

e. Periodic audits of the Energy Control Procedures, if applicable

2.0 SCOPE

These guidelines apply to all D&B employees who perform activities (such as surveying, construction, installation, set-up, adjustment, inspection, maintenance, and repair) where a hazardous energy release potential exists. This applies to any source of electrical, hydraulic, pneumatic, potential (stored), chemical, thermal, or other energy.

3.0 DEFINITIONS

Affected Employee - an employee who performs job duties in an area in which lockout or tagout is performed. An affected employee **does not** perform servicing or maintenance on machines or

equipment and **is not** responsible for implementing energy control procedures or applying locks or tags.

Authorized Employee - an employee who performs servicing or maintenance on machines or equipment and who implements energy control procedures, including the application of locks or tags. (Note: A single employee may be both authorized and affected if he/she performs servicing or maintenance under Lockout/Tagout on a machine or equipment he/she normally operates).

Capable of Being Locked Out - an energy isolating device is considered to be capable of being locked out if it meets **one** of the following criteria:

- it is designed in such way so that a lock can be attached
- it is designed with any other integral part through which a lock can be affixed
- it has a locking mechanism built into it
- it can be locked without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability. (For example, although many valves are not designed with an integral locking device, they can be secured with chains, blocking braces, or wedges, which can then be locked).

Energized - machines and equipment are energized when they are connected to an energy source or they contain residual or stored energy.

Energy-Isolating Device - a mechanical device that physically prevents the transmission or release of energy -- including, but not limited to: manually operated circuit breakers; disconnect switches; valves, and blocks. The term does not apply to pushbuttons, selector switches, or other control circuit devices.

Energy Source - any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Energy Control Procedure - a written procedure which contains the information and steps an Authorized Employee needs to follow in order to safely isolate equipment to perform servicing or maintenance under Lockout/Tagout. Note, only Authorized Employees are permitted to use the Energy Control Procedures.

Lockout - the act of padlocking and tagging an energy-isolating device in the off or safe position. In cases where more than one employee is involved, provision will be made so that each Authorized Employee can affix his/her own lock and tag.

"Other" Employees - all D&B employees who are not Authorized or Affected Employees.

EXHIBIT 4 (continued)

LOCKOUT/TAGOUT GUIDELINES

Tagout - the act of placing an energy-isolating device in the off or safe position and placing a tag on it to indicate that the equipment **may not** be operated until the tag is removed.

4.0 RESPONSIBILITIES

The ***Health and Safety Coordinator (HSC)*** has an overall responsibility for the Lockout/Tagout Program. The HSC will coordinate Lockout/Tagout training for all authorized and affected employees, if necessary, and assess authorized employee's knowledge of the Lockout/Tagout Program.

The ***On-Site Health and Safety Representative (HSR)*** will:

- Be knowledgeable about the types and magnitude of hazardous energy sources and the hazards associated with the unexpected or unplanned start-up or movement of machinery or equipment during maintenance, installation, adjustment, or servicing operation.
- Be knowledgeable in the methods to control hazardous energy, verify that each authorized and affected D&B personnel has received Lockout/Tagout training before they begin work in an area where Energy Control Procedures are used
- Ensure that D&B /WFC personnel correctly obtain, review and apply the appropriate Energy Control Procedures, when required, and maintain adequate supply of Lockout devices and equipment
- Be responsible for developing new or modify existing Energy Control Procedures for each job site, if required, and attached them to the Site-Specific Health and Safety Plan (HASP)
- Coordinate Lockout/Tagout operations which, involve outside contractors.

Authorized Employees – D&B Authorized Employees, if designated, are responsible to correctly apply Energy Control Procedures, including the application of locks or tags. Authorized employees will:

- Be knowledgeable about the types and magnitude of hazardous energy and the hazards employed with the unexpected or unplanned start-up or movement of machinery or equipment during maintenance, installation, adjustment, or servicing operations

- Be knowledgeable in the methods used to control hazardous energy (Energy Control Procedures)
- Notify affected employees prior to application of Lockout/Tagout devices and after the devices are removed
- Coordinate the Lockout/Tagout activities when a Lockout/Tagout operation continues beyond one (1) shift.

Affected and "other" employees are generally responsible for operating or working near machines upon which Lockout/Tagout operations are performed. Affected employees will:

- Understand the purpose of Energy Control Procedures and the importance of not attempting to start-up or use machines that have been locked or tagged.
- Recognize when Energy Control Procedures are being implemented.

5.0 GUIDELINES FOR LOCKOUT/TAGOUT

5.1 General

It is anticipated that for most jobs, D&B personnel will not be responsible for developing Energy Control Procedures. However, when working in the areas of potential hazardous energy release, each employee must recognize the types and magnitudes of hazardous energy sources and the hazards associated with the unexpected or unplanned start-up or movement of machinery or equipment. They must also observe safe work practices.

Only authorized employees are permitted to implement the Energy Control Procedures.

5.2 Work Practices

Following is a typical sequence to implement the Lockout/Tagout procedures.

a. *Prepare for Shutdown* - Authorized employees must review the applicable Energy Control Procedure. If a specific Energy Control Procedure does not exist for a machine then the HSC or designee must ensure that a procedure is developed

b. *Notify Affected Employees* - Authorized employees must verbally notify affected employees prior to application of lockout or tagout devices

c. *Shut Down Machinery or Equipment*

d. *Isolate Machinery or Equipment from Energy Source* - Place manually operated circuit breakers, disconnect switches, valves and related equipment into the "off" or safe position. Place blocks where necessary to physically isolate the machinery or equipment from its energy source to prevent the transmission or release of energy.

e. *Apply Lockout and/or Tagout Devices* - Each authorized employee or outside contractor involved in the work which requires the use of Lockout/Tagout must personally place his/her lock and identification tag on each identified energy isolating device. The tag must be filled out with the authorized employee's name, the date it was placed, and the reason for the Lockout/Tagout operation. Each authorized employee must maintain possession of the key to his/her lock during the entire work operation. Where an energy-isolating device is not designed to accept a lock, a signed and dated tag may be used according to procedures specified in Section 5.4. After applying locks and tags, the energy isolating devices must be tested to make certain they cannot be moved into the "on" position.

f. *Release Stored Energy* in air lines, water lines, etc by bleeding off excess pressure. Bleed-off valves must be locked and/or tagged out in the open position. Disconnected lines must be tagged out. Restrain potential energy using safety blocks.

g. *Verify that Machinery or Equipment is De-energized* - Using normal operating controls, attempt to start the machinery or equipment to make sure that it has been completely de-energized.

5.3 Release from Lockout/Tagout

Upon completion of work requiring the use of Lockout/Tagout procedures, the following sequence can be used to restore machinery or equipment to service:

a. *Check Equipment* - Following completion of the work, the authorized employees who performed the work must inspect the area around the machinery or equipment to ensure that all tools or other nonessential items have been removed, machine guards have been reinstalled, and the machinery or equipment components are operationally intact and safe to energize.

b. *Check Work Area* - The authorized employees who performed the work must inspect the work area to make certain all employees are safely positioned away from the machinery or equipment.

c. *Removal of Lockout/Tagout Devices* - Locks and/or tags must be removed from each energy isolating device by the authorized employee or outside contractor who placed it. If the authorized employee or outside contractor is not available to remove his/her own lockout/tagout device, use the Emergency Lock or Tag Removal Procedures described in Section 5.7.

d. *Restore Energy to Machinery/Equipment* - Place manually operated circuit breakers, disconnect switches, valves, etc. into the "on" position. Remove safety blocks

e. *Notify Affected Employees* - Authorized employees must verbally notify affected employees following removal of locks and tags and the re-energization of the machinery or equipment.

5.4 Use of a Tagout System Only

In cases where machinery or equipment **is not** capable of being locked out, it will be necessary to use a completed "Do Not Operate" tag to provide the highest level of safety available without the use of locks. The tag must be filled out with the authorized employee's name, the date it was placed, and the reason for the Tagout operation. Note that tags alone **may not** be used as a substitute when the use of locks is specified in the applicable Energy Control Procedure. Only authorized employees are permitted to implement tagout. The following conditions apply to the use of tags without locks:

a. Only authorized D&B employees are permitted to place a "Do Not Operate" tag;

b. The tag must be placed at the same location that a lock would have been attached with a self-locking plastic or nylon tie wrap capable of withstanding at least 50 pounds of force;

c. The lockout tag can only be removed by the authorized employee who installed it. If the authorized employee is not available to remove his/her own tag, use the emergency lock or tag removal procedures in section 5.7.

5.5 Energy Control Procedures

Generally, Energy Control Procedures are developed by the client or the owner of the equipment and made available to D&B project personnel. If such procedures are not available, D&B can develop, if required, a site-specific written Energy Control Procedure, which will contain the steps and techniques to be used by authorized employees to properly de-energize machinery and equipment prior to the initiation of work.

When the operations involves more than one (1) authorized employee or outside contractor, provision must be made to ensure that each individual can place his/her lock and tag on each energy isolating device identified in the applicable Energy Control Procedure.

5.6 Shifts or Personnel Change

When Lockout/Tagout must continue beyond one (1) shift or when there is personnel change, the following procedures apply:

a. At the end of the shift, each authorized employee who is leaving work must remove his/her "Do Not Operate" tag(s) from each energy isolating device. Each oncoming authorized employee must affix his/her own personal "Do Not Operate" tag(s) on the padlock(s) to which his/her key corresponds and maintain possession of the padlock key(s)

b. Verify that machinery or equipment is de-energized using the procedures described in Section 5.2 g

c. Proceed with operations.

5.7 Emergency Lock or Tag Removal

In the event that the authorized employee or outside contractor who attached a lock or tag is not available to unlock or remove a lock or tag, the HSC, HSR or a designee may remove the lock or tag only using the following procedures:

a. Verify that the authorized employee or outside contractor who placed the lock or tag is not at the facility

b. Attempt to contact the authorized employee or outside contractor whose lock is still in place

c. Ensure that all work has been completed and the equipment machinery is safe to return to service

d. The HSC, HSR or a designee may cut the lock off using a saw or bolt cutters. Where tagout only is being used, tags may be removed by designated personnel using appropriate methods

e. Ensure that the authorized employee or outside contractor whose lock or tag has been removed is informed before he/she returns to work

f. Review the lockout/tagout requirements with the authorized employee or outside contractor who left their lock or tag on the isolated equipment

5.8 Testing and Positioning of Machines and Equipment

In some situations, it may be necessary for authorized employees to operate equipment for testing or positioning before it is ready to be used. These situations require the temporary removal of Lockout/Tagout devices only during the limited time necessary for the testing or positioning. Use the following procedures for testing and positioning of machines or equipment:

a. Release the machine, equipment or component from Lockout/Tagout

b. Perform the testing and positioning

c. De-energize and re-apply locks and tags.

5.9 Hardware and Tags

If Logout/Tagout will be employed by D&B authorized employees, the HSC is responsible for providing the resources to ensure that an adequate supply of Lockout/Tagout devices and equipment will be maintained for each project site. Lockout/Tagout hardware is issued to all authorized employees for use with this program. The HSC or his/hers designee will maintain a master list of all lockout padlocks and keys.

6.0 EMPLOYEE TRAINING

An initial training program will be provided to all authorized and affected employees, as required. The HSC has overall responsibility for coordinating employee training, including as needed "refresher" training.

Each HSR must verify that all employees have received initial lockout/tagout training prior to starting work involving the control of hazardous energy. The HSC must identify any employees who require re-training when there is a change in Energy Control Procedures, a change in equipment or processes which presents a new hazard, or when observations reveal that there are inadequacies in employees' knowledge or use of Energy Control Procedures.

EXHIBIT 4 (continued)

LOCKOUT/TAGOUT GUIDELINES

Authorized employees will receive site specific training in the recognition of hazardous energy, the sources, types and magnitudes of energy and the elements of the Energy Control Procedures. Affected employees will receive training in the purpose and use of Energy Control Procedures.

7.0 CONTRACTORS/SUBCONTRACTORS

Outside contractors and subcontractors performing operations which require the use of Lockout/Tagout must use ***THEIR OWN*** Energy Control Procedures

8.0 PERIODIC INSPECTIONS OF ENERGY CONTROL PROCEDURES

D&B will conduct periodic evaluations of the Lockout/Tagout Program including a review of Energy Control Procedures, as applicable. Authorized Employee(s) (other than those utilizing the Energy Control Procedure) will perform periodic inspections.

EXHIBIT 5

CARE AND CLEANING OF RESPIRATORS

General Requirements

Any organization using respirators on a routine basis should have a program for their care and cleaning. The purpose of a program is to assure that all respirators are maintained at their original effectiveness. If they are modified in any way, their Protection Factors may be voided. Usually one person in an organization is trained to inspect, clean, repair, and store respirators.

The program should be based on the number and types of respirators, working conditions, and hazards involved. In general, the program should include:

- Inspection (including a leak check)
- Cleaning and Disinfection
- Repair
- Storage

Inspection

Inspect respirators after each use. Inspect a respirator that is kept ready for emergency use monthly to assure it will perform satisfactorily.

On air-purifying respirators, thoroughly check all connections for gaskets and "O" rings and for proper tightness. Check the condition of the facepiece and all its parts, connecting air tubes, and headbands. Inspect rubber or elastic parts for pliability and signs of deterioration.

Maintain a record for each respirator inspection, including date, inspector, and any unusual conditions for findings.

EXHIBIT 5 (continued)

CARE AND CLEANING OF RESPIRATORS

Cleaning and Disinfection

Collect respirators at a central location. Brief employees required to wear respirators on the respirator program and assure them that they will always receive a clean and sanitized respirator. Such assurances will boost morale. Clean and disinfect respirators as follows:

- Remove all cartridges, canisters, and filters, plus gaskets or seals not affixed to their seats.
- Remove elastic headbands.
- Remove exhalation cover.
- Remove speaking diaphragm.
- Remove inhalation valves.
- Wash facepiece and breathing tube in cleaner/sanitizer powder mixed with warm water, preferably at 120 to 140°F. Wash components separately from the facemask, as necessary. Remove heavy soil from surfaces with a hand brush.
- Remove all parts from the wash water and rinse twice in clean, warm water.
- Air dry parts in a designated clean area.
- Wipe facepieces, valves, and seats with a damp lint-free cloth to remove any remaining soap or other foreign material.

Note: Most respirator manufacturers market their own cleaners/sanitizers as dry mixtures of a bactericidal agent and a mild detergent. One-ounce packets for individual use and bulk packages for quantity use are usually available.

EXHIBIT 5 (continued)

CARE AND CLEANING OF RESPIRATORS

Repairs

Only a trained person with proper tools and replacement parts should work on respirators. No one should ever attempt to replace components or to make adjustments or repairs beyond the manufacturers' recommendations. It may be necessary to send high pressure side components of SCBA's to an authorized facility for repairs.

Make repairs as follows:

- Disassemble and hand clean the pressure-demand and exhalation valve assembly (SCBA's only). Exercise care to avoid damage to the rubber diaphragm.
- Replace all faulty or questionable parts or assemblies. Use parts only specifically designed for the particular respirator.
- Reassemble the entire respirator and visually inspect the completed assembly.
- Insert new filters, cartridges, or canisters, as required. Make sure that gaskets or seals are in place and tightly sealed.

Storage

Follow manufacturers' storage instructions, which are always furnished with new respirators or affixed to the lid of the carrying case. In addition, these general instructions may be helpful:

- After respirators have been inspected, cleaned, and repaired, store them so to protect against dust, excessive moisture, damaging chemicals, extreme temperatures, and direct sunlight.

EXHIBIT 5 (continued)

CARE AND CLEANING OF RESPIRATORS

Storage (continued)

- Do not store respirators in clothes lockers, bench drawers, or tool boxes. Place them in wall compartments at work stations or in a work area designated for emergency equipment. Store them in the original carton or carrying case.

- Draw clean respirators from storage for each use. Each unit can be sealed in a plastic bag, placed in a separate box, and tagged for immediate use.

EXHIBIT 5 (continued)

RESPIRATORY CERTIFICATION RECORDS

RESPIRATORY PROTECTION PROGRAM
RECORD OF RESPIRATOR USE

Name _____ Date _____

Social Security Number _____ Age _____

Location _____

Department _____ Supervisor _____

Area to be used in _____

Type of Respirator _____ Fitted By _____

Medical Approval Date _____

Medical Facility/Physician _____

Specific contaminants for which respiratory protection is necessary:

EMPLOYEE STATEMENT

I, an employee of _____, have received the above-referenced respirator. I have been fitted and properly instructed on its uses and limitations. I, also, understand that it is my responsibility to properly clean, maintain and store my respirator in a clean area unless other arrangements have been made to assure maintenance and care of the respiratory protection.

Signature _____

Date _____

EXHIBIT 6

AIR MONITORING RESULTS REPORT

Date: _____

Duration of Monitoring: _____

Work Location and Task: _____

_____

Instrument Reading _____ (Time)	Instrument Reading _____ (Time)	Instrument Reading _____ (Time)
_____	_____	_____
_____	_____	_____

(Note: If instruments have recorders, just attach tape to report. Also note any action levels when exceeded.)

Instrument Calibration: _____

Perimeter Samples Collected: _____

_____

Personnel Samples Collected: _____

_____

Perimeter and Personnel Sample Results From Previous Day (attach data once received):

_____

Comments: _____

_____

_____ _____

Name Title (Site Safety Officer)

Signature _____

EXHIBIT 7

HEAT/COLD STRESS GUIDELINES

1.0 WORKING CONDITIONS AS RELATED TO HEAT STRESS

1.1 Personal Protective Clothing

All of the protective ensemble does not lend itself to the release of body heat generated during work. With this in mind, the following will be taken into consideration during the work schedule so as to minimize the heat stress to all personnel:

- All personnel will be advised to wear lightweight undergarments with short sleeves, under the chemical protective coverall.
- Personnel will be advised that extra clothing be on-site for use as the workday progresses due to the clothing becoming wet from perspiration.
- Dressing-out will be done in a designated trailer and be scheduled so as not to extend time in the protective ensembles.
- The dress-out area will have a table with fresh water and/or other water replenishing liquids along with disposable cups. All personnel will be expected to drink liquids before each work cycle. The SSO will supervise the dressing and water intake.
- As the job progresses and more information becomes available as to the materials that the workers are coming in contact with, consideration as to modifications to the protective ensemble will be examined. Such things as allowing personnel to keep the protective garment's hood down allowing for the release of heat. All decisions regarding the protective ensemble will be the SSO's decision based on available information.
- After completion of each work cycle, personnel will pass through personnel decontamination and remove their protective ensembles in the designated area. All personnel will then be medically monitored, if deemed necessary by the SSO. Liquid replenishment will be mandatory after each work cycle.
- Eating facilities will allow for meal periods to be taken in the designated lunch area. On days of extreme temperatures, the use of air conditioning in the decontamination trailer will be limited so as not to have personnel exposed to temperature extremes.

HEAT/COLD STRESS GUIDELINES

1.2 Causes of Heat Stress

Wearing the expected levels of protection on-site can put personnel at risk of developing heat stress. This section will discuss heat stress and what steps will be taken to monitor personnel for the signs of it.

The body's chemical activities take place in a limited temperature range. Heat is generated by these processes. Any heat not needed to sustain the activities must be lost from the body to maintain a balance. HYPOTHERMIA is an abnormally high body temperature. The three main avenues for the release of body heat are:

- Respiration is our breathing pattern. Care should be taken that the body is not fooled into believing it is cool based on skin temperature.
- Radiation is how heat is released from the skin. Blood will pool on the surface of the skin as body temperatures increase. The protective ensemble specified for this site will not allow for this type of heat release.
- Evaporative Heat Loss normally allows for a body to cool itself by the evaporation of perspiration. Because the protective ensemble stops any contact with moving air the sweat coming off of the body will not evaporate.

If any of these release mechanisms is out of balance, the following conditions can occur and may be considered emergencies needing care:

- **HEAT RASH** is a common occurrence in areas where body parts rub causing friction. The level of protection will heighten its effects. Proper treatment would be personal washing of the affected areas and administering powder to help healing.
- **HEAT CRAMPS** occur when people are exposed to heat for extended periods of time. Due to the wearing of the required protective ensemble, this will be expected. The person will sweat heavily and drink large quantities of water. The more the person sweats, the more electrolytes are lost. If enough body salts are lost, the individual will begin to experience body cramps and pain in the extremities.

EXHIBIT 7 (continued)

HEAT/COLD STRESS GUIDELINES

Proper treatment includes slow replenishment of body fluids augmented by a proper salt solution along with cooling the individual down, taking care not to expose the person to extreme cooling measures. The worker will not be allowed to return to work until the SSO has monitored and approved re-entry.

- **HEAT EXHAUSTION** occurs as the blood pools at the skin surface in an attempt to cool the body. Sweating is profuse, skin is moist and cool, and the patient will experience dizziness, nausea, or fainting. This condition is an indicator of overwork in the environmental conditions. Treatment includes all for heat cramps with an extended rest period before re-entry. Depending on the worker's physical condition, rest periods may be from 30-60 minutes. After experiencing heat exhaustion, the worker should be closely monitored for symptoms reoccurring.

- **HEAT STROKE** can occur if heat exhaustion is not cared for. This occurs when the body loses its ability to regulate its temperature. Sweating stops and, if not treated, can lead to death. Signs and symptoms include dry red skin with no perspiration along with nausea, dizziness and confusion. A strong, rapid pulse should be carefully monitored as this condition can lead to coma. Proper treatment begins by understanding that this is a true medical emergency and requires activating the emergency medical system as covered in other sections. When notifying the Emergency Medical Response organization, emphasis should be placed on the words HEAT STROKE and the need for rapid transportation to the medical facility. (See Appendix A of the SSHP). Emergency medical treatment in the field includes immediate cooling of the body with total body immersion preferable. Water temperature should be cool enough to absorb the high body heat but not cold. Ice packs can be applied to the person's head area and under the arms. Due to the personnel needed to treat the patient while awaiting emergency medical care, all work will stop and all attention will be devoted to the person in stress. The First Aid Technician will evaluate all personnel after the patient is transported to determine if they also are showing signs of heat stroke.

To facilitate treatment of all of the above, the trailer, with its air conditioning, fresh water supply and shower, will be used if necessary. In all cases requiring treatment, emergency decontamination procedures based on the individual's degree of contamination will be done before entry into the trailer. Remember: *You* are your own best indicator of signs of heat stress.

HEAT/COLD STRESS GUIDELINES

2.0 COLD STRESS

The purpose of this section is to make all workers on-site aware of the problems associated with cold weather operations. As with heat related emergencies, cold weather injuries are progressive. That means that if the worker is aware of the problems beforehand he may prevent further damage and remain working.

Cold related injuries may be divided into two types:

- LOCAL COOLING affects the particular part of the body coming in direct contact with the cold air. This is commonly known as FROSTBITE.
- GENERAL COOLING affects the entire body and is known as HYPOTHERMIA. Hypothermia is a true medical emergency and should be recognized as such and treated immediately by trained medical personnel.

As stated, cold related injuries are progressive. The body loses heat either by CONDUCTION or direct transfer of body heat into the cold environment. An example would be an unprotected head allowing the surface area of the head to come in direct contact with the colder air. The other means by which the body loses heat is by CONVECTION. This occurs when colder air is allowed to pass over the body surface. When that air is also moist or the garments work become wet, a WATER CHILL or more commonly recognized WIND CHILL occurs. An example of wind chill would be a 20 mph wind during a 10 degree day would produce the same effect as -25 degree temperature. Both of these conditions may be easily prevented by proper work attire and safe work practices. Hardhat liners prevent the wind from blowing under the brim but will also affect your hearing ability.

EXHIBIT 7 (continued)

HEAT/COLD STRESS GUIDELINES

Lose layers of work clothes rather than bulky garments will allow the wearer to adapt to changing conditions. Use of rubber overboots will prevent leather workboots from getting wet and are excellent for stationary work to stop cold penetration.

Signs to Look For:

FROSTNIP, the first stage of frostbite occurs when a body part comes in direct contact to a cold object or cold air. This condition is not serious and can be remedied by warming of the region. The real problem is that a numbing effect can occur and keep the worker from realizing that he is going into the next stage SUPERFICIAL FROSTBITE.

The skin and under layers become effected. If not treated this can become a FREEZING condition in which the deeper structures of the body become effected.

CONDITION	SKIN SURFACE	TISSUE UNDER SKIN	SKIN COLOR
frostnip	soft	soft	red-white
frostbite	hard	soft	white/waxy
freezing	hard	hard	white/gray

HYPOTHERMIA occurs when the body is unable to maintain its proper temperature of 98.6 degrees. It is important for the worker to realize that this can occur in temperatures of 50 degrees and below. Submersion of a body part in cold water will also cause hypothermia very quickly. Some early signs are:

1. Shivering
2. Numbness in extremities
3. Drowsiness

4. Slow breathing and pulse rates
5. Failing eyesight
6. Loss of coordination, inability to do easy tasks
7. Freezing of body parts

Proper treatment begins by activation of emergency medical service procedure. Hypothermia required prompt qualified medical treatment. Initial site action would revolve around getting the affected worker out of the weather and begin the warming process. The most important thing to realize is that Hypothermia is a MEDICAL EMERGENCY.

Workers exposed to cool temperatures for extended period of time can experience lesions in the form of red swollen areas that seem hot and itchy. These chronic lingering lesions are known as CHILBLAINS. Although not an emergency, the Chilblains indicate that the worker in not adequately protecting the affected area.

A common problem in wet work areas is TRENCH FOOT. The worker whose feet remain unprotected by leather footwear in water close to freezing will have swollen limbs that appear waxy and mottled in color. The affected limb will appear cold to the touch. Basic treatment revolves around getting the worker to a warm place and slowly removing the wet footwear. The obvious way to prevent TRENCH FOOT is to wear rubber protective footwear.

Some suggestions to prevent cold weather operation problems:

1. Plan ahead as to the proper work clothes to be worn.
2. Avoid early overheating which dampens clothes and hastens the release of body heat by evaporation.
3. Use of windbreaks in the work zone.

4. Elimination of standing water or avoid prolonged immersion in that water.

5. Provision of heated rest area (i.e., trailer or vehicle).

6. Avoid overheating of the rest area. Extreme temperature differentials between the work area and the rest area will lead to chilling upon return to work.

7. Proper diet and eating habits.

8. Avoid or cut down smoking which constricts the blood vessels.

REMEMBER, YOU ARE THE BEST PROVIDER OF INFORMATION ABOUT HOW YOU FEEL. THE BEST WAY TO PREVENT INJURIES FROM COLD WEATHER OPERATIONS IS TO RECOGNIZE THE EARLY SIGNS AND PREVENT SERIOUS INJURY.

EXHIBIT 8

INCIDENT NOTIFICATION FORM

TO: Project Manager

Date: _____

FROM: HSO and/or _____
(someone who has direct knowledge of the incident)

1. Contractor's Name: _____

2. Organization: _____

3. Telephone Number: _____

4. Location: _____

5. Reporter Name: _____

6. Name of Injured: _____ Birth date: _____

7. Company Employing Injured: _____

8. Date of Incident: _____

9. Company Employing Injured: _____

10. Location of Incident: _____

11. Brief Summary of Incident (provide pertinent details including type of operation at time of incident):

_____

_____

_____

12. Cause, if known: _____

13. Casualties, if any: _____

EXHIBIT 8 (continued)

INCIDENT NOTIFICATION FORM

14. Details of Any Existing Chemical Hazards or Contamination:

_____

_____

15. Estimated Property Damage: _____

16. Affect on Contract Schedule: _____

17. Actions Taken by Contractor: _____

18. What Medical Help was Given: _____

_____

_____

19. Doctor and/or Hospital (if known): _____

_____

20. When did Employee Return to Work: _____

21. Other Damages/Injuries Sustained (public or private):

_____

_____

22. Additional Information:

_____

_____

_____

EXHIBIT 9

EMERGENCY INFORMATION

1. Emergencies Within the Site

- Contact the HSO On-Site
- Contact the FOM
- Contact Public Works
- Report the following:
  - Location of emergency in relation to a specific recognizable landmark.
  - Nature of emergency:
    - **FIRE**, if so of what kind and what equipment is involved.
    - **EMERGENCY MEDICAL INCIDENT, ALL INJURIES, ACCIDENTS OR FIRES.**
      Communication will include:
      - Number of injured people.
      - Nature of injuries.
      - If Project Field Team Members can't handle injuries with its resources, what emergency medical services will be needed.
    - If any outside personnel must enter the site, any hazards will be communicated and those people will be supervised by the HSO.
    - In the event that any site personnel wearing protective equipment in the Exclusion Zone becomes injured, the HSO or designated individual will do whatever decontamination is necessary to remove that equipment.
    - Any emergency treatment information dealing with the injury will accompany the injured party so that those treating that person will have any and all information.
    - **REQUEST FOR POLICE**. If any person entering the site who does not belong there becomes a problem, Police will be notified. If that person either endangers the safe operation of Project Field Team members or himself, the HSO will suspend all work until that person can be removed.
  - If site personnel will be evacuating the site due to emergency.

2. Personnel Exposures Within the Site

- Contact the HSO On-Site
- Contact the FOM
- Provide treatment as follows:
  - Eye Exposure - treat by immediate flushing with distilled water (portable eyewash). Transport for examination and treatment. Site-Specific hospital information can be found in Section 5.1.1.
  - Skin Exposure - remove contaminated clothing and treat by washing with soap and water.

- Inhalation - if a person inhales a large amount of organic vapor, the person will be removed from the work area to fresh air and artificial respiration will be administered if breathing has ceased. The affected person will be transported to the hospital by ambulance or emergency vehicle if overexposure to lungs has occurred.
- Personal Injuries - in case of severe injury, the victim will receive emergency first aid at the site, as appropriate, and will be transported by ambulance or emergency vehicle to the hospital. An accident form must be completed for any accident or occupational exposure and forwarded to the Project Manager.

3. Evacuating the Site

- Contact the HSO On-Site
- Contact the FOM
- Follow the directions below:
  - Upwind withdrawal - withdraw to a safe upwind location if:
    - Air quality concentration contain excessive concentrations of volatile organics, combustible gases, or oxygen percentage above or below safe levels for the level of protection being worn. The field team will withdraw to a safe upwind location determined by the HSO.
    - A minor accident occurs. The victim will undergo decontamination procedures and be transported to a safe upwind location. Field operations will resume after first aid and/or decontamination procedures have been administered to the affected individual.
    - Protective clothing and/or respirator malfunctions.
  - Withdrawal from site - evacuate the site if:
    - Explosive levels of combustible gases, toxic gases, or volatile organics are recorded.
    - A major accident or injury occurs.
    - Fire and/or explosion occurs.
    - Shock-sensitive, unstable, or explosive materials are discovered.
    - High levels of radioactive materials are discovered.

- Evacuation of nearby facilities - a continuous release of toxic, flammable, or explosive vapors from the site could affect people off-site. Air quality should be monitored downwind to assess the situation. The FOM, or on-site designee, is responsible for determining if circumstances exist for any level of off-site contamination warranting concern for people off-site. he should always assume worst case conditions until proven otherwise. If conditions are marginal, evacuation should be conducted until acceptable conditions resume. Key personnel identified in the HASP should be contacted when evacuation of nearby facilities becomes necessary.

EXHIBIT 9 (continued)

EMERGENCY INFORMATION

TABLE I

EMERGENCY SIGNALS

In most cases, field personnel will carry portable radios for communications. If this is the case, a transmission that indicates an emergency will take priority over all other transmissions. All other site radios will yield the frequency to the emergency transmissions.

Where radio communication is not available, the following air-horn and/or hand signals will be used:

EMERGENCY AIR-HORN SIGNALS

HELP!	Three short blasts	. . .
EVACUATION!	Three long blasts	— — —
ALL CLEAR!	Alternating long and short blasts	— . — .

EMERGENCY HAND SIGNALS

OUT OF AIR, CAN'T BREATH	Hand gripping throat
LEAVE AREA IMMEDIATELY, NO DEBATE!	Grip partner's wrist or place both hands around waist
NEED ASSISTANCE	Hands on top of head
OKAY! - I'M ALRIGHT! - I UNDERSTAND!	Thumbs up
NO! - NEGATIVE!	Thumbs down

EXHIBIT 9 (continued)

EMERGENCY INFORMATION

TABLE II

LOCATION OF EMERGENCY EQUIPMENT

EQUIPMENT	**TYPE**	**LOCATION(S)**
Fire Extinguisher Dry Chemical	20A-80B:C	
First Aid Kit		
Eye Wash	Portable	
Emergency Sprayer	Portable	
Communication	Air Horns Each work area.	
Map	Hospital Route	

EXHIBIT 10

POSTING 1 - USE OF PERSONAL PROTECTIVE EQUIPMENT

WHO This posting applies to all site workers, supervisors, and visitors, *without exception.*

WHEN Prior to entering the Contaminant Reduction Zone (CRZ) or Exclusion Zone (EZ) provisions of this posting will be followed.

WHAT This posting outlines the initial forms of PPE required to be worn while working in the CRZ and EZ. Particular types or forms of PPE may be altered based on the authority of the HSO. Specific guidelines are provided in Section 7.0 of this HASP. Disposable PPE will not be worn more than one work shift of workday. In some instances disposable PPE may have to be replaced more than once during a workday. The HSO will determine the frequency of replacing disposable PPE. Reusable PPE will be properly decontaminated, cleaned, sterilized (if appropriate), and stored. Doubts regarding what to wear will be directed to the HSO for resolution.

WHY The levels of protection specified in the SSHP were chosen to protect individuals from potentially harmful exposures to chemicals or physical hazards. No changes to PPE specifications are authorized without the permission of the HSO.

EXHIBIT 10 (continued)

POSTING 2 - PERSONAL HYGIENE

WHO This posting applies to all site workers, supervisors, and visitors, but is intended primarily for site workers.

WHEN Before beginning work, during scheduled breaks, and at the end of a workday.

WHAT This posting summarizes the policy on personal hygiene that applies to all site personnel. Personal hygiene includes those activities such as washing hands, showering, shaving, etc., that are conducive to keeping one's body clean and mind refreshed. For the individual's sake, and his/her coworkers, each worker will be responsible for maintaining a high level of personal hygiene. This is especially critical prior to breaks where food, beverages, or smoking will occur. If proper personal hygiene is not followed, potential ingestion, absorption, or inhalation of toxic materials may occur. Particular attention must be paid to close shaving whenever respirators are worn. Facial hair and long hair will interfere with respirator fit and will allow excessive contaminant penetration.

WHY To avoid accidental ingestion, absorption, or inhalation of hazardous materials. To maintain an elevated state of awareness, thus reducing potential mental errors and accidents.

EXHIBIT 10 (continued)

POSTING 3 - PROVISIONS FOR SMOKING, EATING, CHEWING, AND DRINKING

WHO This posting applies to all site workers, supervisors, and visitors, *without exception.*

WHEN At all times personnel are on-site. This regulation will specifically apply during breaks and rest periods.

WHAT Site personnel are forbidden to smoke, eat, chew, or drink in the Exclusion Zone or Contaminant Reduction Zone. Only those areas specified as break areas or common areas in the Support Zone may be used for smoking, eating, chewing, or drinking. The rest/break facility and office trailers in the Support Zone may be used. Individuals found to be repeatedly disregarding these provisions will be released.

The only exception to this posting involves access to electrolytic fluids in the Contaminant Reduction Zone when the HSO has determined heat stress warrants regular replenishing of lost body fluids.

WHY To protect personnel from accidental exposures to hazardous materials, smoking, eating, chewing, and drinking is prohibited everywhere except designated break areas. To avoid potential fires and explosions, smoking is prohibited everywhere except designated break areas and office trailers.

EXHIBIT 11

SITE-SPECIFIC INFORMATION

The following site-specific information will be filled out by project personnel for each site and will be posted on-site:

Site Name: _____
Address: _____

Telephone: _____
Date of HASP Preparation: _____
Dates of Field Investigation: _____
Entry Objectives: _____

	Name	Phone
Site Organizational Structure:		
Project Director:		
Project Manager:		
HSO:		
FOM/Alternate HSO:		
Field team staff:		
Subcontractors:		

Medical Assistance
Physician: _____
Hospital: _____
Address: _____

EXHIBIT 11 (continued)

SITE-SPECIFIC INFORMATION

Emergency Telephone: _____

Directions: _____

_____

_____

_____

_____

Please attach a route to hospital

Emergency Telephones

Agent/Facility	Telephone	Emergency No.
EMS - Ambulance		911
Police Department		911
Fire Department		911
Hospital		
Poison Control Center		

Additional site related information (may include special hazards, site control, waste storage and disposal, PPE, decon area location, special engineering controls, etc.).

_____

_____

_____

_____

APPENDIX G

BORING/WELL CONSTRUCTION LOGS

Driller: Parratt-Wolff G. Lansing, R. Wavis Jr.
Inspector: G. Gould
Rig Type: Diedrich D-90 ATV
Drilling Method: 4¼" HSA, HQ Core

Dvirka and Bartilucci Boring Log

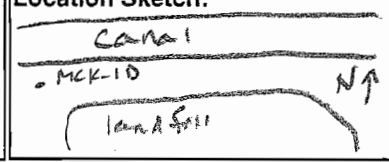
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 20.0'

Boring ID : MCK-10
Sheet 1 of 1
Location:

	Groundwater Observations		
Date			
Time			
DTW			
Casing/Total Depth			

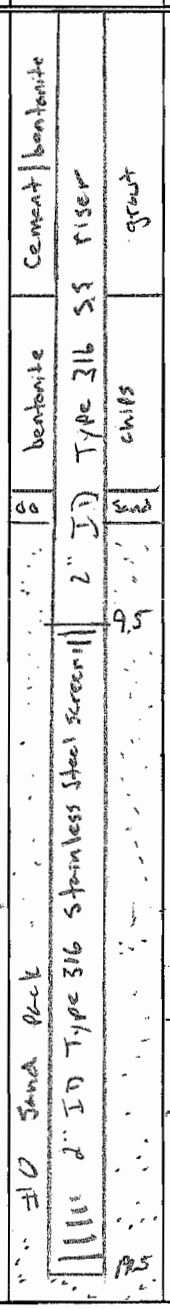
Start (Date & Time): 2/11/02 9:60
Finish (Date & Time): 2/11/02 14:00
Weather: Sunny, clear, 13° F
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description
0-2	SS-1	3		0 moist brown silt some f. sand
Rec:	2.5	3		
		3		
		4		
2-4	SS-2	3		moist brown silt, little f. sand
Rec:	1.2	7		
		6		
		6		
4-6	SS-3	2		moist red-brown silt, little f. sand
Rec:	1.6	1		5
		4		
		3		
6-8	SS-4	3		moist red-brown silt, little f. sand, little fine gravel subrounded
Rec:	1.3	6		
		19		
		21		
8-10	SS-5	11		moist red-brown silt, some f. sand
Rec:	1.8	14		
		19		
		18		
10-12	SS-6	6		10 moist red-brown f sand little silt
Rec:	1.4	11		
		16		
		17		
12-14	SS-7	16		wet red, brown f. sand little silt
Rec:	1.5	19		
		33		
		35		
14-15	SS-8	50/6"		
Rec:	0.0			
15-20	C-1			15 gray green sandstone
Rec:	5.0			
Rate	1-2 cfm			
HX Core				
				20 bottom of boring 20.0'

Well Schematic



Comments

4.5'
7.5'
8.0'
9.5'
19.5'

8 spoons
15' augers
5' HX core

Photos 18, 19, 20

10' SS screen
11½ SS riser
1 prot. casing
1 site map

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing, D. Lewis
Inspector: G. Gould DdB
Rig Type: Diedrich D-90 ATV
Drilling Method: 4 1/4" HSA

Dvirka and Bartilucci Boring Log

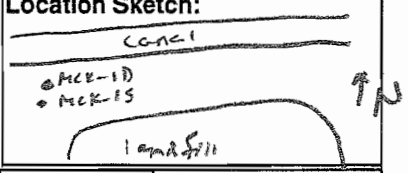
Project Name: McKenna Landfill
Project #: 1921
Boring Depth:

Boring ID : MCK-5
Sheet 1 of 1
Location:

Groundwater Observations			
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time): 14:20 2/11/07
Finish (Date & Time): 16:00 2/11/07
Weather: Sunny, clear, 15°F
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
				0 no sampling (see MCK-1D log) auger to 12 1/2 feet 5 10	grout; bentonite; 2" ID SS riser Type 316; chips; 2.0'; 5.0'; sand; 5.5'; #0 sand pack; 2" ID Type 316 SS screen; 7.0; 12.0	
				bottom of boring 12.5'		12.5' 1 site mob 12 1/2' augers 5' SS screen 9' SS riser 1 prot. casing

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing / D. Waris
Inspector: ~~G. Gould~~ Sean Pepling
Rig Type: Diedrich D-90 ATV
Drilling Method: 4 1/4 HSA / HX Core

Dvirka and Bartilucci Boring Log

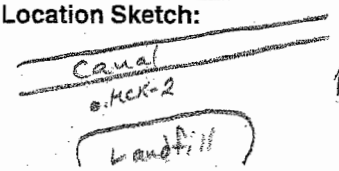
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 20.0

Boring ID: MCK-2D
Sheet 1 of 1
Location:

Groundwater Observations			
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time): 2/8/08 - 0750
Finish (Date & Time): 2/8/08 - 1055
Weather: M, Cloudy, low 30's F
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0						
0-2	SS#1	2		dark red brown SILT, little f. sand (moist)		stick up procasing
	0750	3				
	Rec=0.4	4				
		4				
2-4	SS#2	4		dark red brown SILT, some f. sand, little f-c gravel (subrounded) (damp)		
	0752	17				
	Rec=0.6	18				
		12				
4-6	SS#3	4		red-red brown SILT, some f. Sand, trace clay (damp)		
	0804	4				4.5
5	Rec=0.8	4		5		
		4				
6-8	SS#4	7		Med brown - red brown SILT, some f. Sand, trace clay, trace m. gravel (subround) (moist)		
	0807	8				
	Rec=0.8	6				7.5
		4				
	SS#5	6		Red brown SILT, some f. Sand trace clay, trace m. gravel (subrnd) (moist)		8.0
	0812	7				
	Rec=1.5	7		Lt. med brown f. SAND, some Silt, little f. gravel (moist)		
		8				9.5
10				10		
10-12	SS#6	12		Lt. med brown f. SAND, some Silt, trace f. gravel (subrounded) (wet)		
	0834	16				
	Rec=1.6	21				
		16				
12-14	SS#7	12		Lt-med brown f. SAND, little silt, trace f. gravel (subrounded) (wet)		
	0840	50/3				
	Rec=0.8			auger to 15 ft		
15				15		
15.0-20.0	C-1			red and green sandstone w/ horizontal fractures and cross bedding		
	0925					
	Rec=3.9					
	ROD = 20%	3.9 = 62%				
20						19.5
						20

Soil Stratigraphy Summary: end of boring @ 20.0 ft

Well Schematic: cement/bentonite grout; 2" ID Type 316 SS Riser; bentonite chips; #0 SAND PACK; 2" ID Type 316 SS Screen

Comments:
4 1/4 HSA - 15'
Spl. spoons - 7
HX Core - 5'
SS End Cap - 1
2" SS Screen - 10
2" SS Riser - 12
SS Plug + Lock - 1
Procasing - 1

Driller: Parratt-Wolff G.Lansing / D.Weeks
Inspector: ~~G. Gould~~ S. Popline
Rig Type: Diedrich D-90 ATV
Drilling Method: 4¼ HSA

Dvirka and Bartilucci Boring Log

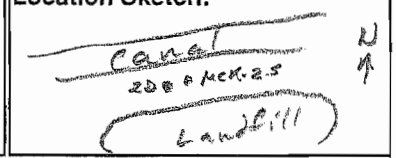
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 12.5

Boring ID : MCK-25
Sheet 1 of 1
Location:

Groundwater Observations			
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time): 2/8/02 - 1110
Finish (Date & Time): 2/8/02 - 1240
Weather: M, Sunny, mid 30°F
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0						Stickup Protecting
				Auger to 12.5' no samples (see MCK-2D)		2.0
5			5		bentonite chips 2" ID Type 304 SS Riser Sand	5.0 5.5
					#0 SAND PACK 12" ID Type 304 SS Screen	7.0
10			10			12.0
				bottom of boring @ 12.5'		4¼ HSA - 12.5' SS End Cap - 1 SS Screen - 5' SS Riser - 9.5' Protecting - 1 SPlug+Lock - 1
15			15			
20						

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing, D. Wearris
Inspector: ~~G. Gould~~ Sean Pepling
Rig Type: Diedrich D-90 ATV
Drilling Method: 4 1/4 HSA / HX Core

Dvirka and Bartilucci Boring Log

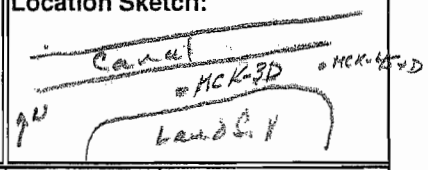
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 22.5'

Boring ID : MCK-3D
Sheet 1 of 2
Location:

Groundwater Observations			
Date	2/8/02		
Time	1131		
DTW	11.21		
Casing/Total Depth	24.09		

Start (Date & Time): 2/7/02 / 1050
Finish (Date & Time): 2/7/02 / 1525
Weather: M. Cloudy, windy 40°F
Elevation of Ground Surface: _____

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0-2	SS-1	2		DK brown SILT, little f. sand, trace f. gravel, trace clay (damp)	Cement/bentonite grout	Stick up Pro Casing
	1053	2				
	Rec=0.5	4				
		5				
2-4	SS-2	3		DK brown SILT and CLAY (damp)		
	1057	4				
	Rec=0.5	5				
		8				
4-6	SS-3	9		Med red brown SILT and f. SAND trace m. gravel (damp)		
	1107	17				
5	Rec=0.7	8		5		
		7				
6-8	SS-4	4		Med red brown f. SAND, some silt, trace m gravel (subrounded) (damp-moist)		
	1110	6				
	Rec=0.8	7				
		6				
8-10	SS-5	5		Med-dk red brown SILT, little f. sand, trace f-m gravel (subrounded) (moist)		
	1115	6				
	Rec=1.2	6				
		18		10 28 same w/ little clay	Bentonite	10.0
10-12	SS-6	16		Med-dk red brown SILT, some f. sand little clay, trace m gravel (subrounded) trace weathered RK (moist)	#00	Sand 10.5
	1123	16				
	Rec=1.8	21				
		30				12
12-14	SS-7	31		Med-dk red brown f. SAND and SILT little clay, trace m-c gravel (subrounded) (moist)	#0 SAND	
	1135	47				
	Rec=1.1	50/4				
14-16	SS-8	50/2		same w/ weathered red sandstone		
	1148			15 Spoon bouncing on rock auger to 17.5'		
15	Rec=0.2					
17.5-22.5	C-1					
	1310					
	Rec=5.0			red and green sandstone w/ horizontal fractures and cross bedding		
	RQD=3.7/5.0 =		74%			
20						

2" ID Type 316 SS Riser
2" ID Type 316 SS Screen
Chips

Soil Stratigraphy Summary _____

Driller: Parratt-Wolff G. Lansing/D. Waris
Inspector: G. Gould S. Pepling
Rig Type: Diedrich D-90 ATV
Drilling Method: 4¼ HSA / HX Core

Dvirka and Bartilucci Boring Log

Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 22.5

Boring ID : MCK-3D
Sheet 2 of 2
Location:

Groundwater Observations			
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time):
Finish (Date & Time): 1 of 2
Weather: see pg. 1
Elevation of Ground Surface:

Location Sketch:
See p. 1 of 2

Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
20					#0 SAND PACK; 2" ID SS Screen	
				bottom of boring 22.5'		4¼ HSA - 17.5' Split Spoons - 8 HX Core - 5' SS end cap - 1 2" SS Screen - 10' 2" SS Riser - 14.5' J Plug + Lock - 1 Pro Case - 1
25				25		

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing / D. Wan's
Inspector: ~~G. Gould~~ S. Pepling
Rig Type: Diedrich D-90 ATV
Drilling Method: 4¼ HSA

Dvirka and Bartilucci Boring Log

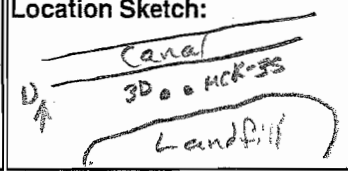
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 12.5'

Boring ID : MCK-35
Sheet 1 of 1
Location:

Groundwater Observations			
Date	2/8/02		
Time	1135		
DTW	10.85		
Casing/Total Depth	14.57		

Start (Date & Time): 2/7/02 / 1530
Finish (Date & Time): 2/7/02 / 1635
Weather: M. Cloudy, upper 30°sF
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0						Stick Up Pro Casing
				Auger to 12.5' no samples (see MCK-3D)	grout	
					bentonite	2.5
5				5	chips	
					#00	5.5
					SAND	6.0
					2" ID SS Riser	7.0
10				10	#0 Sand Pack	
					2" ID SS Screen	12.0
				bottom of boring @ 12.5'		Auger to 12.5' 5' SS Screen 9.5' SS Riser 1 Pro Casing 1 end cap 1 J-Plug + Lock
15				15		
20						

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lensing, D. Wavis
Inspector: G. Gould
Rig Type: Diedrich D-90 ATV
Drilling Method: 4¼ HSA/HX Core

Dvirka and Bartilucci Boring Log

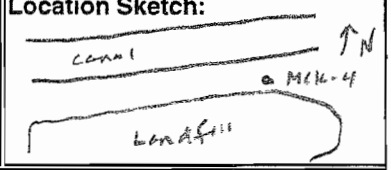
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 22.5

Boring ID: MCK-4D
Sheet 1 of 2
Location:

Groundwater Observations			
Date	2/7/02	2/7/02	2/8/02
Time	0730	1023	1139
TOC – DTW	9.35	10.33	10.49
Casing/Total Depth	NM	24.25	24.25

Start (Date & Time): 1330 2/6/02
Finish (Date & Time): 1705 2/6/02
Weather: m. sunny
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0-2	SS-1	3		0 moist red brown silt, little f-m subrounded gravel, tr. clay, tr. sand	cement/bentonite grout	
Rec=	0.5	3				
		3				
		6				
2-4	SS-2	8		moist red brown silt, little f-m subrounded gravel, tr. sand tr clay		
Rec=	1.5'	9				
		14				
		18				
4-6	SS-3	13		moist lt. brown silt and		
Rec =	1.1'	8		5 f. sand, tr. clay		
		8				
		7				
6-8	SS-4	7		moist lt. brown f. sand and silt		
Rec =	0.8	5				
		3				
		3				7.0
8-10	SS-5	1		moist brown f. sand	bentonite	2" ID Type 316 SS Riser
Rec=	0.1	1				
		3				6 bags
		2		10		
10-12	SS-6	1		moist red-brown silt	00	Sand 10.0
Rec=	1.0	1				10.5
		2		moist black-brown silt with roots - organic odor		
		2				
12-14	SS-7	50/0"		(peat) Spoon bouncing on rock		12
Rec=	0			auger to 17½		
				15		
17½-22½	C-1	2 min/ft		red + green sandstone		
Rec=	4.8'			with horizontal fractures		
RQD =	26/48 = 54%			and cross bedding		

2" ID Type 316 SS Screen 10 slot

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing/D. Wares
Inspector: G. Gould
Rig Type: Diedrich D-90 ATV
Drilling Method: 4¼ HSA / Hx Core

Dvirka and Bartilucci Boring Log

Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 22.5

Boring ID: MLL-4D
Sheet 2 of 2
Location: See p. 1/2

Groundwater Observations			
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time):
Finish (Date & Time): see p. 1 of 2
Weather: see p. 1 of 2
Elevation of Ground Surface:

Location Sketch:

See p. 1 of 2

Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
				20		
				bottom of boring 22.5'		4¼ HSA - 17.5' Split Spoons - 7 Hx Core - 5' 2" SS Screen - 10' 2" SS Riser - 14.5' SS End Cap - 1 SS Plug + Lock - 1 Pro Case - 1

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing, D. Harris, C. Hayden Sean Peplay
Inspector: ~~G. Gould~~
Rig Type: Diedrich D-90 ATV
Drilling Method: 4 1/4 HSA

Dvirka and Bartilucci Boring Log

Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 12.5'

Boring ID : MCK-4S
Sheet 1 of 1
Location:

Groundwater Observations			
Date	2/7/02	2/8/02	
Time	1019	1142	
DTW	11.52	10.00	
Casing/Total Depth	14.73	14.73	

Start (Date & Time): 2/7/02 / 0733
Finish (Date & Time): 2/8/02 / 0900
Weather: M. cloudy, low 30°s F
Elevation of Ground Surface:

Location Sketch:

Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0				Auger to 12.5' no samples (see MCK-4D)	grout 0-2.5; bentonite 2.5-5.5; chips 5.5-6.0; sand 6.0-7.0; 2" ID SS Riser; 2" ID SS Screen; #0 Sand pack 7.0-12.0	Stickup Pro casing
5						
10				bottom of boring @ 12.5'		Auger to 12.5ft 5' SS Screen 9.5' SS Riser 1 Pro Casing 1 end cap 1 SS Plug + Lock
15						
20						

Soil Stratigraphy Summary

Driller: Parratt-Wolff Glen Lansing / Dick Morris
Inspector: G. Gould D&B
Rig Type: Diedrich D-90
Drilling Method: 4¼" HSA, HQ Core

Dvirka and Bartilucci Boring Log

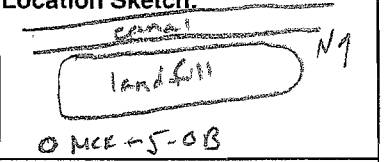
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 11.5'

Boring ID: MCK-55
Sheet 1 of 1
Location:

Groundwater Observations			
Date	2/5/02	2/7/02	2/8/02
Time	7:30	1008	1114
DTW	1.0' ice	3.53	3.57
Casing/Total Depth	2.5/7.5	NM	13.36

Start (Date & Time): 2/4/02 13:00
Finish (Date & Time): 2/5/02 10:30am
Weather: cold, windy
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0-2	SS-1	1		0 moist red-brown Silt, little rounded to subrounded f-m gravel tr sand, tr clay (bedrock)		
Rec=	0.7'	2				10
		50/3"				
2.5-7.5	C-1			red sandstone w/ cross bedding 4.0 4.5		C-1 coring rate 1' min/ft
Run=	5.0'					
Rec=	4.7'					
RQD=	3.1/4.7 =	66%		5		
7.5-11.5	C-2			red highly weathered siltstone and shale		C-2 coring rate 1½ min/ft.
Run=	4.0					
Rec=	4.3					
RQD=	3.7/4.3 =	86%		10		
				bottom of boring 11.5'		
				15		1 spoon 2½' augers 9' HQ core 5' SS screen 2" 8' SS riser 2" 1 prot. casing
				20		

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing, Dickwarrs
Inspector: G. Gould D & B
Rig Type: Diedrich D-90
Drilling Method: 4¼ HSA

Dvirka and Bartilucci Boring Log

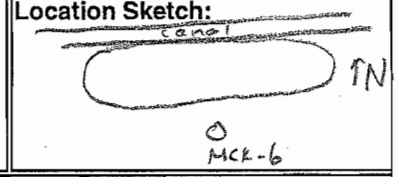
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 9.7

Boring ID : MCK-65
Sheet 1 of 1
Location:

	Groundwater Observations		
Date	2/5/02	2/7/02	2/8/02
Time	14:00	10:11	11:17
DTW	dry	3.74	3.64
Casing/Total Depth	10/10	UM	11.87

Start (Date & Time): 2/5/02 12:30
Finish (Date & Time): 2/5/02 15:00
Weather: windy, cold, P.cl, wind 20-30 mph from West
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0-2	SS-1	11		0 moist red-brown f. sand & silt tr, f-m sub-rounded gravel	grout / bentonite chips	auger through weathered bedrock to 9.7' - auger refusal
Rec =	0.75'	20				
		35		red sandstone rock chip		
		50/4"				
				Weathered	3.0 / 3.5	
				bedrock		
5-7	SS-2	50/.1		(red sandstone)	4.5	
Rec =	0.1				9.5'	
				bottom of boring 9.7'		

2 spoons
10' augers 4.25"
5' SS Screen
7' SS riser
1 pro. casing

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing
Inspector: G. Gould
Rig Type: Diedrich D-90
Drilling Method: 4¼ HSA / HQ core

Dvirka and Bartilucci Boring Log

Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 17.5

Boring ID : MK-7-D
Sheet 1 of 1
Location:

Groundwater Observations			
Date	2/6/02	2/7/02	2/8/02
Time	7:45	1016	1120
DTW	3.5	12.04	12.19
Casing/Total Depth	12' / 12.5'	NM	19.46

Start (Date & Time): 2/5/02 16:25
Finish (Date & Time): 2/6/02 10:45
Weather: M. cl. windy 28° F
Elevation of Ground Surface:

Location Sketch:

Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0-2	SS-1	2		0 moist red brown silt, little f-m subrounded gravel	grout	
Rec =	1.5	3				
		17				
		12				
2-4	SS-2	14		moist red brown silt, little f-m subrounded gravel		
Rec =	0.8	18				
		16				
		50/2"		red sandstone chips		
				5	bentonite / chips	
					6.0 sand	end of R/stem 2 spoons 12¼" augers
				auger through alternating resistant + soft weathered red sandstone	2" ID SS riser	
					7.0	
					#0 sand pack	
				10		Photos 9, 10, 11, 12 Rock core + drilling
				12.5' auger refusal	2" ID Type 316 stainless steel screen	
12.5-17.5	C-1			red sandstone w/ cross bedding		
Rec =	5.0					
RQD =	3.11/5.0 =	62%				
2 min/ft				some soft silty zones		
				15 green zones 2"+1" long		
					17.0	
				bottom of boring 17.5'		end of 2/6/02 5' HQ core 10' SS Screen 9' SS riser 1' pvc casing
				20		

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing, Rinaldi
Inspector: G. Gould DdB
Rig Type: Diedrich D-90 ATV
Drilling Method: 4.25" HSA / HQ core

Dvirka and Bartilucci Boring Log

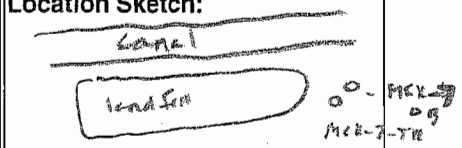
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 9.5

Boring ID : MCK-7S
Sheet 1 of 1
Location:

Groundwater Observations			
Date	2/7/02	2/8/02	
Time	1014	1122	
DTW	7.15	7.24	
Casing/Total Depth	DM	11.83	

Start (Date & Time): 2/6/02 11:30
Finish (Date & Time):
Weather: sunny 32°F wind 5-15 mph west
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
				0 auger to 9½' no samples (see MCK-7-TR)	1.0 bentonite grout; 2.5 2" I DSS Riser; 3.0 chips; 4.0 #0 sand pack; 9.0 1 1/2" I DSS Screen	
				10 bottom of boring 9.5'		Auger 9½ ft 5' SS. screen 6' SS. riser 1 Pro. Casing

Soil Stratigraphy Summary

Driller: Parratt-Wolff G. Lansing, D. Waris
Inspector: G. Gould
Rig Type: Diedrich D-90 ATV
Drilling Method: HSA 4.25"

Dvirka and Bartilucci Boring Log

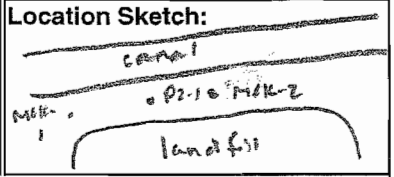
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 17.5

Boring ID : PZ-1
Sheet 1 of 1
Location:

	Groundwater Observations		
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time): 2/12/02 11:45
Finish (Date & Time): 2/12/02 15:15
Weather: windy cloudy
wind 30-40 mph from W
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
0-2	SS-1	3		0 moist red-brown silt and f. sand	grout	
Rec=	1.0	3				
		4				
		4				
2-4	SS-2	9		moist red brown silt and f. sand	bent.	2.0
Rec=	1.2	10			2" PVC riser	
		10				
		11			chips	3.0
4-6	SS-3	10		moist red brown silt and f.		
Rec=	1.4	4		5 sand		4.0'
		4				
		4		moist f. sand red-brown some silt		
6-8	SS-4	9				
Rec=	0.8	7				
		4				
		7				
8-10	SS-5	11		moist red-brown f. sand, some silt		
Rec=	0.9	7				
		9				
		9				
10-12	SS-6	6		10 wet red-brown f. sand some silt	#0 Sand pack	
Rec=	1.2	10				
		4				
		8				1 site mob
12-14	SS-7	12		wet red brown f. sand some silt	2" PVC Screen 10 slot	17.5' augers
Rec=	1.1	17				13' PVC screen
		14				6½ PVC riser
		28				1 prot. casing
14-16	SS-8	38		wet red-brown f. sand some silt		8 S pours
Rec=	0.2	50/3"		15		
					17.0	
				bottom of boring 17.5'		

Soil Stratigraphy Summary

Driller: Parratt-Wolff - G. Lansing, D. Waris, C. Heyden
Inspector: G. Gould - DEP
Rig Type: Diedrich D-90 ATV
Drilling Method: 4.25" HSA

Dvirka and Bartilucci Boring Log

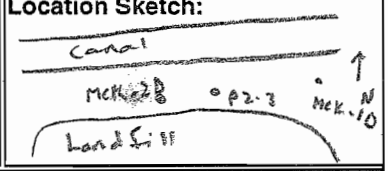
Project Name: McKenna Landfill
Project #: 1921
Boring Depth: 17.0

Boring ID : PZ-3
Sheet 1 of 1
Location:

Groundwater Observations			
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time): 2/12/02 7:00
Finish (Date & Time): 2/12/02 10:00
Weather: M. cloudy, windy 15-25 from SW
Elevation of Ground Surface:

Location Sketch:



Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments
				0		Concrete mix 1.5
					bent. chips	2.5
					sand	3.0
						4.0
				5	2" ID PVC Riser	

APPENDIX H

QUALITY ASSURANCE PROJECT PLAN

New York State Department of Environmental Conservation

Generic Quality Assurance Project Plan

Prepared for:

New York State Department of Environmental Conservation

Standby Engineering Contract

April 2011

Prepared by:

D&B/TRC Joint Venture

db TRC
A Joint Venture

5694PW - Generic QA Plan Cover.indd (04/19/11 - 10:58 AM)

GENERIC QUALITY ASSURANCE
PROJECT PLAN

Prepared for:

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Prepared by:

D&B/TRC JOINT VENTURE
WOODBURY, NEW YORK

APRIL 2011

GENERIC QUALITY ASSURANCE PROJECT PLAN

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1.0 INTRODUCTION

The purpose of this Generic Quality Assurance Project Plan (QAPP) is to describe the detailed sample collection and analytical procedures that, when implemented, will result in the acquisition of documented, high-quality valid data, which will be legally defensible (should the need exist), for use in field investigations conducted for work assignments issued to Dvirka and Bartilucci Consulting Engineers (D&B)/TRC Engineers, Inc. (TRC) Joint Venture by the New York State Department of Environmental Conservation (NYSDEC) under the Standby Contract for Engineering Services D007620. The QAPP provides general information and references standard operating procedures applicable to the analytical sampling program detailed in each site-specific Work Plan. This information includes definitions and generic goals for data quality and required types and quantities of Quality Assurance/Quality Control (QA/QC) samples. The procedures address field documentation; sample handling, custody, and shipping; instrument calibration and maintenance; auditing; data reduction, validation, and reporting; corrective action requirements; and QA/QC reporting specific to the analyses performed by the contracted laboratory.

The field sampling program may include some or all of the following specific activities and environmental matrices:

- Background soil sampling;
- Surface soil sampling;
- Exploratory test pits and subsurface soil sampling;
- Soil borings and subsurface soil sampling;
- Soil vapor survey;
- Geophysical survey;
- Surface water, sediment and wetland sampling;
- On-site field screening analysis of surface and subsurface soil utilizing immunoassay colorimetric quantification;

- Monitoring well installations;
- Groundwater sampling;
- Bedrock core sampling;
- In-situ hydraulic conductivity testing and short-term aquifer testing;
- Downhole logging;
- Geotechnical logging and analyses;
- Air screening survey;
- Ambient air sampling;
- Indoor air sampling;
- Vapor Intrusion Sampling;
- Wipe Sampling;
- Fish and wildlife resources impact sampling and analyses including toxicity testing sampling, bioassay sampling and biota tissue sampling;
- Asbestos bulk sampling;
- Paint chip sampling;
- Lead field analysis utilizing an x-ray fluorescence (XRF) analyzer; and,
- Investigative-derived waste characterization and handling.

If any of the collection procedures, sample analysis or sample matrices are modified for a specific site investigation, detailed information regarding the changes and rationale for the change will be provided in a Site-Specific QAPP.

This document has been prepared in conformance with the NYSDEC guidelines for preparation of QAPP Plans, including the 2005 Analytical Services Protocol (ASP).

2.0 DATA USE OBJECTIVES

The data generated from the field investigations will be used to determine the nature, extent and source(s) of contamination at the site, prepare a qualitative human health risk and environmental assessment/site hazard assessment, and develop a cost-effective, environmentally sound, long-term remediation plan consistent with the planned use of the site. The data will also be utilized to monitor for the health and safety of workers at the site and potential off-site receptors.

2.1 Site Hazard Assessment Report

A Site Hazard Assessment Report may be prepared, if requested by the NYSDEC and/or is warranted by the work assignment. The assessment report may include one or more of the following recommendations:

- No additional actions required.
- Additional sampling is required.
- Remediation and additional sampling are required.

2.2 Data Quality Requirements and Assessment

Data quality requirements and assessments are provided in the 2005 NYSDEC ASP, which includes the detection limit for each parameter and sample matrix. Note that quantification limits, estimated accuracy, accuracy protocol, estimated precision and precision protocol are determined by the laboratory and will be in conformance with the requirements of the 2005 NYSDEC ASP, where applicable. Table 2-1 presents a summary of the data quality requirements.

Table 2-1

DATA QUALITY REQUIREMENTS

Parameter	Sample Matrix	CRDL*	Estimated Accuracy	Accuracy Protocol**	Estimated Precision	Precision Protocol**
Volatile Organics	Liquid Solid	10 10	0.87 - 1.18 ug/l	Vol. IV, Part XIX, Method 8260, Table 7	0.11 - 0.84 ug/l	Vol. IV, Part XIX, Method 8260, Table 7
Base Neutrals	Liquid Solid	10-50 330-1600	0.29 - 1.23 ug/l	Vol. IV, Part XIX, Method 8270, Table 7	0.13 - 1.05 ug/l	Vol. IV, Part XIX, Method 8270, Table 7
Acid Extractables	Liquid Solid	10-50 330-1600	0.29 - 1.23 ug/l	Vol. IV, Part XIX, Method 8270, Table 7	0.13 - 1.055 ug/l	Vol. IV, Part XIX, Method 8270, Table 7
Pesticides/PCBs	Liquid Solid	0.5-1.0 8.0-160	0.66 - 0.97 ug/l	Vol. IV, Part XIX, Method 8081/8082, Table 4	0.15 - 0.47 ug/l	Vol. IV, Part XIX, Method 8081/8082, Table 4
Metals	Liquid Solid	0.2-5000 0.2-5000	--	Vol. III, Part XIV, Method 200.7*** Table 4	--	Vol. III, Part XIV, Method 200.7*** Table 4
Cyanide	Liquid Solid	10 10	85% - 102% of recovery	Vol. III, Part XV, Method 335.2, Subpart 10	±0.005 - +0.094 mg/l	Vol. III, Part XV, Method 335.2, Subpart 10

*Contract Required Detection Limits - units are ug/l for liquid samples, ug/kg for solid samples.
** Reference: NYSDEC 7/05 ASP.
***If trace ICP is not used, then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 2-1 (continued)

DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION, ACCURACY, AND COMPLETENESS

Matrix/Parameter	Precision (%)	Accuracy (%)
Soil/Sediment		
VOCs[(a)]	See Table 2-1a	See Table 2-1a
Extractables[(a)]	See Table 2-1b	See Table 2-1b
Pesticides/PCBs	See Table 2-1c	See Table 2-1c
Metals[(b)(c)]	± 25	75-125
Water		
VOCs[(a)]	See Table 2-1a	See Table 2-1a
Extractables[(a)]	See Table 2-1b	See Table 2-1b
Pesticides/PCBs	See Table 2-1c	See Table 2-1c
Metals[(b)(c)]	± 25%	75-125

NOTES:

(a) Accuracy will be determined as percent recovery of surrogate spike compounds and matrix spike compounds. Surrogate and matrix spike compounds for VOCs, extractables, and pesticides/PCBs are listed in Table 2-2a, 2-2b and 2-2c, respectively. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.

(b) Accuracy will be determined as percent recovery of matrix spikes when appropriate or the percent recovery of a QC sample if spiking is inappropriate. Precision will be determined as relative percent difference of matrix spike duplicate samples, or duplicate samples if spiking is inappropriate.

(c) Precision will be determined as the average percent difference for replicate samples. Accuracy will be determined as the percent recovery of matrix spike samples or laboratory control samples, as appropriate.

Source: 2005 NYSDEC ASP

Table 2-1a

DATA QUALITY REQUIREMENTS
ACCURACY REQUIREMENTS FOR VOCs

	Spike Recovery Limits (%)	
	Water	Low/Medium Soil
Surrogate Compound		
Toluene-d8	88-110	84-138
4-Bromofluorobenzene	86-115	59-113
1,2-Dichloroethane-d4	76-114	70-121
Matrix Spike Compound		
1,1-Dichloroethene	61-145	59-172
Trichloroethane	71-120	62-137
Chlorobenzene	75-130	60-133
Toluene	76-125	59-139
Benzene	76-127	66-142

Source: NYSDEC ASP

Table 2-1b

DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION AND ACCURACY
OF EXTRACTABLE COMPOUNDS
BASED UPON RECOVERY OF SURROGATE AND
MATRIX SPIKE COMPOUNDS*

Surrogate Compounds	Matrix	Precision	Accuracy %
d5-Nitrobenzene	Water	≤ 20	35-114
	Solid	≤ 25	23-120
2-Fluorobiphenyl	Water	≤ 20	43-116
	Solid	≤ 25	30-115
d14-Terphenyl	Water	≤ 20	33-141
	Solid	≤ 25	18-137
d5-Phenol	Water	≤ 20	10-110
	Solid	≤ 25	24-113
2-Fluorophenol	Water	≤ 20	21-110
	Solid	≤ 25	25-121
2,4,6-Tribromophenol	Water	≤ 20	10-123
	Solid	≤ 25	19-122
2-Chlorophenol-d4 (Advisory)	Water	≤ 20	33-110
	Solid	≤ 25	20-130
1,2-Dichlorobenzene-d4 (Advisory)	Water	≤ 20	16-110
	Solid	≤ 25	20-130

Table 2-1b (continued)

DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION AND ACCURACY
OF EXTRACTABLE COMPOUNDS
BASED UPON RECOVERY OF SURROGATE AND
MATRIX SPIKE COMPOUNDS*

	Matrix	Precision	Accuracy %
Matrix Spike Compounds			
1,2,4-Trichlorobenzene	Water	≤ 20	39-98
	Solid	≤ 25	38-107
Acenaphthene	Water	≤ 20	46-118
	Solid	≤ 25	31-137
2,4-Dinitrotoluene	Water	≤ 20	24-96
	Solid	≤ 25	28-89
Pyrene	Water	≤ 20	26-127
	Solid	≤ 25	35-142
N-Nitroso-Di-n-Propylamine	Water	≤ 20	41-116
	Solid	≤ 25	41-126
1,4-Dichlorobenzene	Water	≤ 20	36-97
	Solid	≤ 25	28-104
Pentachlorophenol	Water	≤ 20	9-103
	Solid	≤ 25	17-109
Phenol	Water	≤ 20	12-110
	Solid	≤ 25	26-90
2-Chlorophenol	Water	≤ 20	27-123
	Solid	≤ 25	25-102

Table 2-1b (continued)

DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION AND ACCURACY
OF EXTRACTABLE COMPOUNDS
BASED UPON RECOVERY OF SURROGATE AND
MATRIX SPIKE COMPOUNDS*

	Matrix	Precision	Accuracy %
Matrix Spike Compounds (continued)			
4-Chloro-3-methylphenol	Water	≤ 20	23-97
	Solid	≤ 25	26-103
4-Nitrophenol	Water	≤ 20	10-80
	Solid	≤ 25	11-114

* Accuracy will be determined as percent recovery of these compounds. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.

Source: NYSDEC ASP

Table 2-1c

ADVISORY RECOVERY LIMITS
SURROGATE AND MATRIX SPIKE COMPOUNDS
FOR PESTICIDES/PCBs*

	Advisory Recovery Limits (%)	
	Water	Soil/Sediment
Surrogate Compound		
Decachlorobiphenyl	60-150	60-150
Tetrachloro-m-xylene	60-150	60-150
Matrix Spike Compound		
Lindane	56-123	46-127
Heptachlor	40-131	35-130
Aldrin	40-120	34-132
Dieldrin	52-126	31-134
Endrin	56-121	42-139
4,4'-DDT	38-127	23-134

*Samples do not have to be reanalyzed if these recovery limits are not met.

Source: NYSDEC ASP

In addition to meeting the requirements provided in the 2005 NYSDEC ASP, the data must be of sufficient quality to ensure that sampling data accurately characterizes site conditions. Data obtained during the site investigations will be compared to specific Standards, Criteria and Guidelines (SCGs). The SCGs to be utilized on a preliminary basis for screening purposes include:

Matrix	**SCG**
Groundwater and Surface Water	NYSDEC Division of Water Technical and Operational Guidance Series (TOGs) (1.1.1) - Ambient Water Quality Standards and Guidance Values, dated June 1998, addendum April 2000.
Surface and Subsurface Soil, Sediment and Sludge	NYSDEC 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives, effective December 14, 2006. **AND** NYSDEC Commissioner Policy CP-51 on Soil Cleanup Guidance, effective December 3, 2010.
Air	NYSDEC DAR-1, Guidelines for the Control of Toxic Ambient Air Contaminants, dated November 1997* and Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York dated October 2006.

* Including Complete and HAP Listings, AGCs, SGCs and Air Quality Standards for the DAR-1 Software Program.

Final selection of SCGs for site remediation and development will be based on the intended use of the property, potential receptors and potential contaminant migration pathways. These SCGs would consider the United States Environmental Protection Agency (USEPA) Region III Risk-Based Concentration Table.

The methods of analysis will be in accordance with the 2005 NYSDEC ASP. Specific analytical procedures and laboratory QA/QC descriptions are not included in this QAPP Plan, but will be available upon request from the laboratory selected to perform the analyses. The

laboratory will be New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified for organic and inorganic analyses.

2.2.1 Data Precision

Precision is the mutual agreement among individual measurements of the same property and is a measure of the random error component of the data collection process. The overall precision of the data is the sum of that due to sampling and analysis. The sampling precision is assessed by the collection of field duplicates. To determine the analytical precision of the method and/or laboratory analyst, a routine program of laboratory control sample analyses is performed and precision is determined using a moving range value. The results of the replicate sample analyses are used to calculate the relative percent difference (RPD), which is then used to evaluate precision associated with sampling and analysis.

For replicate results R_1 and R_2:

$$RPD = (2[R_1 - R_2]/ [R_1 + R_2]) \times 100$$

2.2.2 Data Accuracy

Accuracy is the agreement between a measurement and the true value. It is a measure of the bias or systematic error of the entire data collection process. Sampling accuracy is assessed by evaluating the results of field and trip blank samples. To determine the accuracy of an analytical method and/or the laboratory analyst, a periodic program of laboratory control sample spiking is conducted. The results of sample spiking are used to calculate the percent recovery (%R) as a measurement bias associated with the sample matrix.

$$\%R = 100(S_1 - S_2]/ T_1$$

where

S_1 = Observed spiked sample concentration;

S_2 = Sample concentration without spike addition; and,

T_1 = True concentration of the spike.

2.2.3 Data Representativeness

Representativeness is the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a quantitative parameter that is used to assess the design and implementation of the sampling program. The sampling program has been designed so that the samples collected are as representative as possible of the medium being sampled and that a sufficient number of samples will be collected. Representativeness is addressed by the description of the sampling techniques and the rationale used to select the sampling locations.

Representative samples will be collected as follows:

- Soil Vapor - Samples will be collected from decontaminated stainless steel or dedicated tubing soil probes after the soil vapor has reached equilibrium. Samples will be collected using a certified clean Summa canister with dedicated regulator and polyethylene tubing. See Section 6.3, Soil Vapor Collection Procedures.
- Surface Soil - Samples will be collected at a depth of 0-6 inches using a dedicated polystyrene scoop or sterile wooden tongue depressor.
- Concrete Chip – Samples will be collected at a depth of 0-2 inches using a decontaminated chisel.
- Subsurface Soil (Test Pit) - Samples will be collected from the center of the decontaminated bucket of the backhoe using a dedicated scoop or sterile wooden tongue depressor.
- Subsurface Soil (Monitoring Well/Soil Boring) - Samples will be collected using a decontaminated steel split spoon sampler during monitoring well or soil boring construction.
- Subsurface Soil (Probe) - Samples will be collected using a decontaminated screen point sampler and dedicated acetate tube liner.

- Sediment/Sludge (Dry Well/Drainage System) - Samples will be collected from the center of the dry well, wastewater disposal/sanitary system, or catch basin and storm drain (if possible) after the drainage/storm water sample is obtained in order not to introduce sediment into the water column. Samples will be collected utilizing a decontaminated long handle scoop (if possible) or from a soil probe or split spoon sampler.

- Wastewater/Drainage Water - Samples will be collected from the center of the wastewater disposal/sanitary system (if possible) and at a depth of 6 inches below the surface of standing water (if possible) using a dedicated disposable bailer or decontaminated long handle scoop.

- Storm Water - Samples will be collected from the center of the drainage system or storm drain (if possible) at a depth of 6 inches below the surface of standing water (if possible) using a dedicated polyethylene bailer or decontaminated polyethylene scoop.

- Groundwater (Probe) - Samples will be collected immediately upon installation of the probe using dedicated tubing equipped with a bottom check valve.

- Groundwater (Hydropunch) - Samples will be collected immediately upon installation of the hydropunch screen using a dedicated small diameter bailer or hydropunch sampler.

- Groundwater (Monitoring Well) - Samples will be collected with a dedicated/disposable bailer or decontaminated low-flow submersible pump after the monitoring well has been purged of three to five well casing volumes until field measurements for pH, conductivity, temperature and turbidity have stabilized, or until the well is purged dry (whichever comes first) and the well has been allowed to recharge.

- Water Supply - Samples will be collected from the water supply wells, from an accessible point prior to any treatment systems (if possible) and will be collected directly into the sample container.

- Air (Ambient/Indoor)- Samples will be collected using a certified clean Summa canister equipped with a dedicated flow regulator.

- Asbestos – Bulk samples of building materials that are characterized during field inspection as suspect asbestos-containing materials (ACMs) will be collected utilizing decontaminated stainless steel tools (i.e., chisel, wire snips, scissors, hatchet, crack hammer, sledge hammer, etc.) from sampling points that are pre-moistened with a light mist of amended water and placed into zipper-sealed plastic bags.

- Paint Chip – Paint chip samples will be collected utilizing a decontaminated chisel /scraper from a sampling point that has been pre-measured utilizing the appropriate template and placed into a zipper-sealed plastic bag or clean sample container.

- Wipes – Wipe samples will be collected from selected surfaces utilizing an appropriate wipe (gauze, ghost wipe etc.) moistened with the media designated solvent (i.e. hexane). The samples will be collected from a location which has been pre-measured using a template and the wipe placed in a clean sample container.

- Equipment Calibration - Field equipment used for air monitoring will be calibrated daily before use according to the manufacturer's procedures.

- Equipment Decontamination – Non-dedicated sampling equipment will be decontaminated prior to use at each location according to the procedures described in Section 7.0 of this QAPP Plan.

2.2.4 Data Comparability

Comparability is the extent to which comparisons among different measurements of the same quantity or quality will yield valid conclusions. For NYSDEC projects, comparability among measurements will be achieved through the use of standard procedures and uniform concentration units. All data will be presented in the units designated by the methods specified by a NYSDOH ELAP certified laboratory, and the 2005 NYSDEC ASP. In addition, sample locations, collection procedures and analytical methods from earlier studies will be evaluated for comparability with current procedures/methods.

2.2.5 Data Completeness

Completeness is the adequacy in quantity of valid measurements to prevent misinterpretation and to answer important questions. Percent completeness is calculated as the ratio of usable data to total data. The acceptability of 100% of the data is desired as a goal for this project. The acceptability of less than 100% complete data, meeting all laboratory QA/QC protocols/ standards, will be evaluated on a case-by-case basis.

3.0 SAMPLING DESIGN

The following presents a general discussion of the sampling that may be conducted during field investigations for work assignments.

- Soil Vapor - Soil vapor samples will be collected during soil vapor surveys or subslab sampling programs to locate/confirm the source and extent of contamination on-site.

- Surface Soil - Surface soil samples will be collected on-site to determine the nature and extent of on-site surface soil contamination.

- Subsurface Soil - Subsurface soil samples will be collected during construction of monitoring wells and borings, test pits or at direct-push probe locations to determine the nature and extent of on-site subsurface soil contamination.

- Sediment/Sludge - Sediment and sludge samples will be collected from dry wells, storm drainage systems and/or wastewater disposal/sanitary systems located on-site to determine if collection/disposal systems are a source of contamination.

- Wastewater/Drainage Water - Waste water and drainage water samples will be collected from dry wells and/or wastewater disposal/sanitary systems located on-site to determine if these wells/systems are a source of contamination.

- Storm Water - Storm water samples will be collected from catch basins and storm drains located on-site to determine if the storm water system has been contaminated or is a source of contamination.

- Groundwater - Groundwater samples will be obtained from monitoring wells, direct-push probes or hydropunch sampling devices, which will be installed as part of the site investigation, or from monitoring wells, which were installed previously at the site, to determine if disposal of waste material on-site has impacted groundwater.

- Water Supply - Water supply samples will be collected from private water supply systems to determine if these systems are impacted by on-site (or off-site) contamination.

- Air - Ambient air samples will be collected on-site, particularly in structures, to determine potential exposure to vapor emissions as a result of on-site waste disposal or contaminated soil and/or groundwater underlying the site.

- Asbestos – Bulk suspect ACM samples of building materials will be collected from the interior and exterior of site buildings and structures to determine the locations, quantities, friability and condition of any ACM present.

- Paint Chip – Paint chip samples will be collected from the interior and exterior of site buildings and structures to determine if lead based paint is present.

- Wipes – Wipe samples will be collected from the interior and exterior surfaces of site buildings and structures to evaluate surface contamination and/or the effectiveness of decontamination activities.

4.0 SAMPLING AND ANALYSES

4.1 Field Duplicates

Field duplicate samples may be collected to demonstrate the accuracy of field screening and un-validated laboratory data with limited analytical deliverables. If all environmental samples are analyzed by ASP methods, duplicate samples (if collected) will be taken at a frequency of at least 5% (1 in 20). However, if duplicate samples are collected for confirmation of field screening and laboratory data with limited analytical deliverables, at least 20% of the samples will be verified with duplicate samples analyzed by ASP methods for Target Analyte List (TAL) and Target Compound List (TCL) analytes. These ASP method duplicate sample requirements apply to each distinct matrix.

4.2 Matrix Spikes/Matrix Spike Duplicates and Spiked Blanks

Matrix spike samples are quality control procedures, consistent with 2005 NYSDEC ASP specifications, used by the laboratory as part of its internal Quality Assurance/Quality Control program. The matrix spikes (MS) and matrix spike duplicates (MSD) are aliquots of a designated sample (water or soil) which are spiked with known quantities of specified compounds. MS/MSD samples are used to evaluate the matrix effect of the sample upon the analytical methodology, as well as to determine the precision of the analytical method used. Samples to be analyzed as MS/MSDs may be designated in the field (that is, additional aliquots of a particular sample from the site may be collected) or they may be selected by the laboratory.

A matrix spike blank is an aliquot of analyte-free water, prepared in the laboratory, and spiked with the same solution used to spike the MS and MSD. The matrix spike blank (MSB) will be subjected to the same analytical procedure as the MS/MSD and used to indicate the appropriateness of the spiking solution by calculating the spike compound recoveries. The procedure and frequency regarding the MS, MSD and MSB samples are defined in the NYSDEC ASP.

4.3 Analytical Parameters

All soil, sediment, or surface water samples collected during site characterization (SC) or remedial investigation (RI) activities will be properly labeled and shipped under chain of custody documentation to the laboratory for analysis. Unless noted otherwise, all samples will be analyzed by a NYSDOH Environmental Laboratory Accreditation Program (ELAP) approved laboratory by an analytical method utilizing the most current NYSDEC Analytical Services Protocol (ASP) for the following Department of Environmental Remediation (DER)-10 required analytical parameters:

- Target compound list (TCL) volatile organic compounds (VOCs) plus the 10 highest concentration tentatively identified compounds (TICs)
- TCL SVOCs plus 20 TICs;
- TCL Pesticides and Herbicides;
- TCL PCBs;
- Target Analyte List (TAL) metals;
- Cyanide;
- For investigations of known petroleum releases, utilize the suite of contaminants in the fuel oil and gasoline tables (i.e., Tables 2 and 3) of the NYSDEC Commissioner Policy CP-51 on Soil Cleanup Guidance and Spill Guidance Manual; and,
- For investigations of non-petroleum releases, sample analysis will use methods appropriate for the stored or discharged material.

When sampling soil vapor, sub-slab vapor, crawl space air, indoor air or outdoor air, all samples will be analyzed by a NYSDOH ELAP approved laboratory in accordance with USEPA approved analytical methods utilizing the most current version of NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Issued October 2006)

When sampling biota tissue, analysis of lipid content is required for all organochlorine compounds using USEPA Method 3540C Soxhlet extraction with a 1:1 hexane/acetone ratio or

other approved method. The percent lipids will be quantified by the laboratory from the same aliquot as that used to quantify organochlorine concentrations.

Table 4-1 presents a summary of the parameters/sample fraction to be analyzed together with the sample location, type of sample, sample matrix, type of sample container, method of sample preservation, holding time and analytical method. Superfund category deliverables are required for all analytical results in order to perform complete validation of the results.

4.4 Field Blank (Field Rinsate Blank)/Equipment Blank

Field blanks are samples of water used for field decontamination purposes. Specifically, field blanks will include potable, site-supplied water used in decontamination activities and laboratory-supplied, reagent-grade, deionized water used for the final rinse in decontamination activities. Based upon discussions with the NYSDEC, field blanks will not be required for field investigations in which dedicated, disposable sampling equipment (for example, bailers or sterile scoops) are being utilized for sample collection. However, an equipment blank is required when a split spoon is utilized since it will be decontaminated on-site after each use. Equipment blanks will be collected at a rate of one per day and analyzed for the same parameters as that of the samples collected with that equipment. The equipment blank will be collected by pouring laboratory supplied deionized water over/through the decontaminated equipment early in the field effort to assess the quality of the potable water supply used in decontamination activities.

4.5 Trip Blanks (Travel Blanks)

Trip blanks are containers of reagent-grade deionized water which are kept with the field sample containers from the time they leave the laboratory until the time they are returned to the laboratory. The primary purpose of a trip blank is to detect sources of contamination which may be introduced into the sample during sample collection or transit that might potentially influence contaminant values reported in actual samples, both quantitatively and qualitatively. The following have been identified as potential sources of contamination:

Table 4-1

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time	Analytical Method
On-site/ Off-site	Grab	Ambient Air	Volatile Organics	Certified Clean Summa Canister	None	7 days	EPA/600/4-89/017 Method T015
On-site/ Off-site	Grab	Soil Vapor	Volatile Organics	Certified Clean Summa Canister	None	7 days	EPA/600/4-89/017 Method T015

*Holding time based upon VTSR (Verified Time of Sample Receipt).

Table 4-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Water Supply Wells, Monitoring Wells, and Probe and Hydropunch Locations	Grab	Groundwater	Volatile Organics	Glass, clear/ 40 mL/3 ICHEM 300 series or equivalent	Cool to 4°C or	5 days after VTSR for analysis	7/05 NYSDEC ASP, Method 8260B
	Grab	Groundwater	Base Neutral and Acid Extractable Organics	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, Method 8270C
	Grab	Groundwater	Pesticides/PCBs	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, Method 8081A/8082
	Grab	Groundwater	Metals	Plastic/1L/1 ICHEM 300 series or equivalent	HNO_3 to pH <2 Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	7/05 NYSDEC ASP, Method 6010/7470A**
	Grab	Groundwater	Cyanide	Plastic/1L/1 ICHEM 300 series or equivalent	NaOH to pH >12 Cool to 4°C	12 days after VTSR for analysis	7/05 NYSDEC ASP, Method 9010B

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the NYSDEC 7/05 ASP

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 4-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Dry Wells, Storm Drainage Systems, and Wastewater Disposal/Sanitary Systems	Grab	Sediment/Sludge	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for analysis	7/05 NYSDEC ASP, Method 8260B
	Grab	Sediment/Sludge	Base Neutral and Acid Extractable Organics	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, Method 8270C
	Grab	Sediment/Sludge	Pesticides/PCBs	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, Method 8081A/8082
	Grab	Sediment/Sludge	Metals	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	7/05 NYSDEC ASP, Method 6010/7471A**
	Grab	Sediment/Sludge	Cyanide	Glass, amber/ ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	7/05 NYSDEC ASP, Method 9010B

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the NYSDEC 7/05 ASP

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 4-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
On-site Off-site Soil	Grab	Surface Soil	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for analysis	7/05 NYSDEC ASP, Method 8260B
	Grab	Surface Soil	Base Neutral and Acid Extractable Organics	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, Method 8270C
	Grab	Surface Soil	Pesticides/PCBs	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, Method 8081A/8082
	Grab	Surface Soil	Metals	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	7/05 NYSDEC ASP, Method 6010B/7471A**
	Grab	Surface Soil	Cyanide	Glass, amber/ ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	7/05 NYSDEC ASP, Method 9010B

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the NYSDEC 7/05 ASP

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 4-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Monitoring Wells Soil Borings, and Probe and Hydropunch Locations	Grab	Subsurface Soil	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for analysis	7/05 NYSDEC ASP, Method 8260B
	Grab	Subsurface Soil	Base Neutral and Acid Extractable Organics	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, Method 8270C
	Grab	Subsurface Soil	Pesticides/PCBs	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	7/05 NYSDEC ASP, Method 8081A/8082
	Grab	Subsurface Soil	Metals	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	7/05 NYSDEC ASP, Method 6010B/7471A**
	Grab	Subsurface Soil	Cyanide	Glass, amber/ 150 mL/1 ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	7/05 NYSDEC ASP, Method 9010B

VTSR - Verified Time of Sample Receipt at the laboratory

*Holding times based on the NYSDEC 7/05 ASP

**If Trace ICP is not used then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 4-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Site	Trip Blank	Water	Volatile Organics	Glass, clear/ 40 mL/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for analysis	7/05 NYSDEC ASP, Method 8260B
Site	Asbestos	Bulk Building Materials	Asbestos fibers	Resealable plastic zipper bags	None	None	NYSDOH Method 198.1 (friable materials) NYSDOH Method 198.6 (non-friable materials) NYSDOH Method 198.4 (non-friable confirmation)
Site	Lead Paint	Paint Chips	Lead	Resealable plastic zipper bags	None	6 months	USEPA SW-846 Method 3050B/6010B
Site	Lead	Wipe	Lead	Ghost Wipe/Gauze 4 oz/1 ICHEM 200 series or equivalent	None	6 months	USEPA SW-846 Method 3050B/6010B
Site	PCB	Wipe	PCB	Ghost Wipe/Gauze 4 oz/1 ICHEM 200 series or equivalent	None	6 months	USEPA SW-846 Method 8082B

VTSR - Verified Time of Sample Receipt at the laboratory

- Laboratory reagent water;
- Sample containers;
- Cross contamination in shipment;
- Ambient air or contact with analytical instrumentation during preparation and analysis at the laboratory; and
- Laboratory reagents used in analytical procedures.

A trip blank will consist of a set of 40 ml sample vials filled at the laboratory with laboratory demonstrated analyte free water. Trip blanks will be handled, transported and analyzed in the same manner as the samples acquired that day, except that the sample containers themselves are not opened in the field. Rather, these sample containers only travel with the sample cooler. The temperature of the trip blanks will be maintained at 4°C while on-site and during shipment. Trip blanks will return to the laboratory with the same set of bottles they accompanied in the field.

The purpose of a trip blank is to control sample bottle preparation and blank water quality as well as sample handling. Thus, the trip blank will travel to the site with the empty sample bottles and back from the site with the collected samples in an effort to simulate sample handling conditions. Contaminated trip blanks may indicate inadequate bottle cleaning or blank water of questionable quality. Trip blanks will be implemented only when collecting water samples, including field blanks, and analyzed for volatile organic compounds only.

4.6 Method Blanks/Holding Blanks

A method blank is an aliquot of laboratory water or soil which is spiked with the same internal and surrogate compounds as the samples. The purpose of the method blank is to define and determine the level of laboratory background contamination. Frequency, procedure and maximum laboratory containment concentration limits are specified in the 2005 NYSDEC ASP. A holding blank is an aliquot of analyte-free water that is stored with the environmental samples

in order to demonstrate that the samples have not been contaminated during laboratory storage. This blank will be analyzed using the same analytical procedure as the samples.

5.0 STANDARD OPERATING PROCEDURES

Environmental samples will be collected from different locations as part of the field investigation. These may include but are not limited to: groundwater, wastewater, storm/drainage water, sediment/sludge, subsurface soil, surface soil, soil vapor and ambient air, concrete chips and/or cores, wipes. Sample locations will consist of monitoring wells, water supply wells, dry wells, wastewater disposal/sanitary systems, direct push probe locations, hydropunch locations, storm water drainage systems, soil borings, surface soils, test pits, soil vapor points and ambient air. Actual locations will be determined on a site-specific basis.

General sampling approaches and equipment are described in this section. A summary of the sampling program, including sample media, depths, equipment, rationale and analytical parameters, is provided in Table 5-1.

When taking soil samples, an attempt will be made to maintain sample integrity by preserving its physical form and chemical composition to as great an extent as possible. An appropriate sampling device (i.e., decontaminated or dedicated equipment) will be utilized to transfer the sample into the sample container. The sample will reflect and contain a good representation of the matrix from which it was collected. The sample will be transferred into the sample container as quickly as possible, with no mixing, to ensure that the volatile fraction is not lost.

The materials involved in groundwater sampling are critical to the collection of high quality monitoring information, particularly where the analyses of volatile, pH sensitive or reduced chemical constituents are of interest. The materials for bailers and pump parts will be PTFE (e.g., Teflon^{R}), stainless steel and/or polyethylene.

Table 5-1

SUMMARY OF SAMPLING PROGRAM

Environmental Media	Sample Location	Sample Point	Sample Depth	Equipment	Rationale	Sample Analysis
Soil Vapor	On-site or Off-site	Soil vapor survey point	3 feet below soil surface	Decontaminated or disposable soil vapor rods/ tubing, dedicated regulator and certified clean Summa canister	To determine subsurface contamination	TCL volatile parameters EPA 600/4-89/017 Method T015
Surface Soil	On-site or Off-site	Throughout site	0-6 inches below soil surface	Disposable polyethylene scoop and/or sterile wooden tongue depressor	To determine surface soil contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Subsurface Soil	On-site or Off-site	Test pit	Dependent on visual charac-teristics and total organic vapor field screening	Decontaminated backhoe bucket, disposable polyethylene scoop and sterile wooden tongue depressor	To determine subsurface soil contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Sediment/Sludge	On-site or Off-site	Dry well/catch basin/wastewater/ sanitary system/storm drain	0-6 inches below sediment surface	Decontaminated polyethylene scoop or split spoon sampler	To determine sediment contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Wastewater	On-site or Off-site	Wastewater/ Sanitary System	6 inches below water surface	Decontaminated long handle polyethylene scoop or polyethylene bailer	To determine drainage wastewater contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Drainage/Storm Water	On-site or Off-site	Dry well/catch basin/ storm drain	6 inches below water surface	Decontaminated long handle polyethylene scoop or polyethylene bailer	To determine storm water contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP

Table 5-1 (continued)

SUMMARY OF SAMPLING PROGRAM

Environmental Media	Sample Location	Sample Point	Sample Depth	Equipment	Rationale	Sample Analysis
Subsurface Soil	On-site or Off-site	Monitoring well borehole/soil boring	Dependent on visual characteristics and total organic vapor field screening	Auger, decontaminated split spoon and sterile wooden tongue depressor and decontaminated stainless steel tools	To determine subsurface soil contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Subsurface Soil	On-site or Off-site	Probe location	Dependent on visual characteristics and total organic vapor field screening	Decontaminated probe and polyethylene tube liner	To determine subsurface soil contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Groundwater	On-site or Off-site	Probe location	At surface of water in probe	Disposable polyethylene tubing with bottom check valve	To determine groundwater contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Groundwater	On-site or Off-site	Hydropunch location	At surface of water in screen	Disposable polyethylene - small diameter bailer	To determine groundwater contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Groundwater	On-site or Off-site	Monitoring well	At surface of water in well	Disposable polyethylene bailer (after purge of three well volumes)	To determine groundwater contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Water Supply	On-site or Off-site	Prior to treatment system, if possible, or from faucet	NA	Sample container directly after running water for 5 minutes	To determine water supply contamination	TCL +30 and TAL parameters + CN 2005 NYSDEC ASP
Air	On-site or Off-site	Ambient Air	Breathing Zone	Certified clean Summa canister and dedicated regulator	To determine air contamination and worker exposure	TCL VOC EPA 600/4-89/017 T015

Table 5-1 (continued)

SUMMARY OF SAMPLING PROGRAM

Environmental Media	Sample Location	Sample Point	Sample Depth	Equipment	Rationale	Sample Analysis
Air	On-site	Drilling and sample locations	In the breathing zone and at point of sample collection	Photoionization and/or flame ionization detector	To screen for air contamination	Total organic vapors
Building Materials	On-site	Building interior and exterior	Sampling of multi-layered building systems as determined by NYSDOL-licensed asbestos inspector	Decontaminated stainless steel tools	To determine asbestos fiber count	Asbestos Standard Methods
Painted Building Components	On-site	Building interior	Sampling of multi-layered painted Surfaces	Decontaminated stainless	To determine lead content in paint	Lead 2005 NYSDEC ASP
Building surfaces	On-site Lead/PCBs	Floors/walls	Surface	Pre-moistened wipe, template	To verify decontamination activities	Lead/PCB 2005 NYSDEC ASP

NA - Not applicable.

There will be several steps taken after the transfer of the soil or water sample into the sample container that are necessary to properly complete collection activities. Once the sample is transferred into the appropriate container, the container will be capped and, if necessary, the outside of the container will be wiped with a clean paper towel to remove excess sampling material. The container will not be submerged in water in an effort to clean it. Rather, if necessary, a clean paper towel moistened with distilled/deionized water will be used.

The sample container will then be properly labeled. Information such as sample number, location, collection time and sample description will be recorded in the field log book. Associated paper work (e.g., Chain of Custody forms) will then be completed and will stay with the sample. The samples will be packaged in a manner that will allow the appropriate storage temperature to be maintained during shipment to the laboratory. Samples will be delivered to the laboratory within 24 to 48 hours of collection, depending on required analysis.

5.1 Sample Identification

All samples collected will be labeled with a sample identification code that is compatible with the NYSDEC EQuIS format. The code will identify the site, sample location, sample matrix and series numbers for sample locations with more than one sample. Samples will be labeled according to the following system:

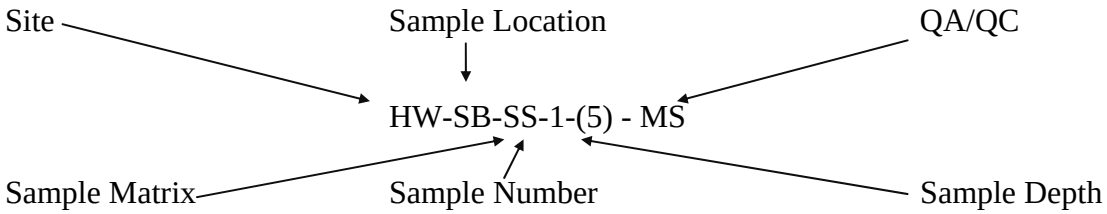
- Site: - Site name (i.e., Hazardous Waste "HW")
- Sample Location:
  - Soil Boring "SB"
  - Monitoring Well "MW"
  - Water Supply "WS"
  - Dry Well "DW"
  - Surface Soil "SS"
  - Hydropunch "H"
  - Probe "P"
  - Test Pit "TP"
  - Wetland "WET"
- Sample Matrix (as listed in NYSDEC EQuIS reference values):
  - AE – Vapor Extraction Well Effluent
  - AI – Indoor Ambient Air
  - AO – Outdoor ambient Air
  - AQ - Air Quality Control Matrix

- AS – Soil Vapor
- CA – Bottom Ash
- CF – Fly Ash Cinder
- DC – Drill Cuttings
- GE – Gaseous Effluent (Stack Gas)
- GL – Headspace of Liquid sample
- LD – Drilling Fluid
- LE – Liquid Emulsion
- LF – Floating/Free Product LNAPL
- LS - DNAPL
- SE - Sediment
- SF – Filter Sandpack
- SL – Sludge
- SN – Miscellaneous Solid Materials
- SO – Soil
- SS – Surface Soil
- SW – Swab or Wipe
- TA – Animal Tissue
- TP –Plant Tissue
- TQ – Tissue Quality Control Matrix
- U – Unknown
- WC – Drilling Water (for well construction)
- WD – Well Development Water
- WE – Estuary – Brackish Surface Water
- WG – Groundwater
- WH – Rinsate
- WI – Interstitial Water
- WL – Leachate
- WO – Ocean Water – Saline Surface Water
- WP – Drinking Water
- WQ - Water Quality Control Matrix
- WS – Surface Water
- WW – Waste Water
- WZ – Special Water Quality Control Matrix

- Sample Number: - For circumstances where more than one sample of the same type and/or from the same location will be collected, a consecutive sample number will be assigned. When more than one sample is collected from a borehole in a sampling round at different depths, the depth will be indicated on the sample container and in the field log book.

- Quality Assurance/ Quality Control (QA/QC): - Matrix Spike "MS"
  - Matrix Spike Duplicate "MSD"
  - Field Blank "FB"
  - Trip Blank "TB"

Based upon the above sample identification procedures, an example of a sample label may be:



5.2 Sample Handling, Packaging and Shipping

All samples will be placed in the appropriate containers as specified in the 2005 NYSDEC ASP. The holding time criteria identified in the 7/05 NYSDEC ASP Exhibit I will be followed as specified in Table 4-1.

Prior to packaging any samples for shipment, the sample containers will be checked for proper identification and compared to the field log book for accuracy. The samples will then be wrapped with a cushioning material and placed in a cooler (or laboratory shuttle) with a sufficient amount of bagged ice or "blue ice" packs in order to keep the samples at 4°C until arrival at the laboratory.

All necessary documentation required to accompany the sample during shipment will be placed in a sealed plastic bag and taped to the underside of the cooler lid. The cooler will then be sealed with fiber (duct) or clear packing tape, and custody seals will be placed in such a manner that any opening of the cooler prior to arrival at the laboratory can be detected.

All samples will be shipped to ensure laboratory receipt within 24-48 hours of sample collection in accordance with NYSDEC and method specific requirements. The laboratory will be notified prior to the shipment of the samples.

5.3 Soil Vapor

Sample protocols for the collection of soil vapor samples will consist of the following minimum procedures:

1. Be certain that the sample location is noted on Location Sketch (see Section 8.1).
2. Concrete coring may be required prior to advancing the vapor probes. Water will be applied to the coring to prevent dust generation.
3. Drive the decontaminated stainless steel probe with removable inner rod into the ground to the desired depth.
4. Seal the space between the probe rods and ground surface from the ambient air with plastic sheeting and bentonite, bees' wax or modeling clay.
5. The adequacy of the seal must be tested before and after sampling. Place a 5-gallon bucket over the probe rods and seal with plastic sheeting and bentonite, bees' wax or modeling clay. Fill interior of bucket with tracer gas (helium). Monitor probe with a helium gas detector. Readings of less than 10% are sufficient to verify a tight seal.
6. Connect regulator to Summa canister and verify canister vacuum (reading should be -20 to -33 inches Hg).
7. Connect new tubing to the probe and certified clean Summa canister. Open canister/regulator and keep open until pressure gauge reads <5 inches Hg. Samples should be collected at a rate of 0.2 L per minute for a period of 30 minutes.
8. Close valve on canister, disconnect tubing and remove regulator.
9. Record initial and final pressure on Chain of Custody.
10. Extract probe from the ground and decontaminate according to the procedures in Section 6.0.

5.4 Soil (Surface)

Sampling protocols for the collection of surface soil samples will consist of the following minimum procedures:

1. Be certain that the sample location is noted on Location Sketch (see Section 8.1).

2. If a dedicated sampling device is not used, be certain that the sampling equipment has been decontaminated utilizing the procedures outlined in Section 6.0.

3. Remove laboratory precleaned sample container from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form (see Section 8.0).

4. .At the sample location, clear surface debris (e.g., vegetation, rocks, twigs, etc.). Collect sample at a depth of 0 to 2 inches below the vegetative cover. If the area is paved, samples will be collected 0 to 2 inches below the pavement. If VOCs are the only COC, then the surface soil sample will be collected at a depth of 0 to 6 inches below the vegetative cover. If assessing the impact of soil contamination on ecological resources, then the surface soil sample will be collected from a depth of 0 to 6 inches below the vegetative cover and from a deeper soil interval at 1 to 2 feet below ground surface.Collect an adequate amount of soil using a decontaminated or disposable scoop, and/or sterile wooden tongue depressor. Transfer the sample directly into the sample container.

5. Return the sample container to the cooler.

6. If reusable, decontaminate the sampling equipment according to the procedures described in Section 6.0.

7. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.5 Sediment

Sediment samples may be collected from a variety of structures and physical features, including but not limited to, the following:

- Surface water bodies such as rivers, natural or man-made streams, lakes, ponds, or wetlands;
- Swales, gullies, culverts, and troughs;
- Catch basins;
- Dry Wells;
- Storm drains;
- Floor drains or associated collection systems;

- Plumbing and piping;
- Trenches;
- Gutters and roof leader discharge points;
- Sumps;
- Storm sewer and spill containment collection systems;
- Boiler and compressor discharges;
- Surface impoundments; and,
- Discharge and waste disposal systems (i.e., above-ground treatment systems, and underground wastewater treatment systems such as tanks, septic tanks, separators, neutralization pits, septic leach fields, cesspools, seepage pits, and dry wells).

Sampling protocols for the collection of sediment samples will consist of the following minimum procedures:

1. Be certain that any nondisposable sampling equipment (e.g., long handle polyethylene scoop, stainless steel tools) has been decontaminated utilizing the procedures outlined in Section 6.0.
2. Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.
3. Insert scoop slowly at 0-6 inches into the sediment and remove sample. Sample sediment only after surface water samples have been taken to avoid introduction of sediment into the water.
4. If depth to sediment is greater than the reach of a long handled scoop, the sample may need to be collected utilizing the soil probe or split spoon sampler (see Sections 5.8 and 5.9, respectively).
5. With a sterile wooden tongue depressor, decontaminated stainless steel tool or disposable polyethylene scoop, transfer the sample into the open sample container taking care not to spill sample on the outside of the container or overfill container and replace cover on the sample container.
6. Return sample container to sample cooler.

7. If necessary, decontaminate the sampling equipment according to the procedures outlined in Section 6.0.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.6 Drainage Water/Wastewater/Storm Water

Drainage water, wastewater and storm water samples may be collected from a variety of structures and physical features, including but not limited to, the following:

- Swales, gullies, culverts, and troughs;
- Dry Wells;
- Catch basins;
- Storm drains;
- Floor drains or associated collection systems;
- Plumbing and piping;
- Trenches;
- Gutters and roof leader discharge points;
- Sumps;
- Storm sewer and spill containment collection systems;
- Boiler and compressor discharges;
- Surface impoundments; and,
- Discharge and waste disposal systems (i.e., above-ground treatment systems, and underground wastewater treatment systems such as tanks, septic tanks, separators, neutralization pits, septic leach fields, cesspools, seepage pits, and dry wells).

Sampling protocols for the collection of drainage water/wastewater/storm water samples will consist of the following minimum procedures:

1. Be certain sample location is noted on Location Sketch (see Section 8.1).

2. Be certain that all nondisposable sampling equipment (e.g., long handled polyethylene scoop, stainless steel tool) has been decontaminated utilizing the procedures outlined in Section 6.0.

3. Remove laboratory precleaned sample bottles from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

4. Lower the scoop or disposable bailer slowly into the water making sure that the sample is taken just below the surface of the water (or at the water/air interface if there is a sheen present) and raise the sample out of the water. Sample water before sediment to avoid introduction of sediment into the water.

5. Gently pour the sample into the sample container, taking care not to spill the sample on the outside of the container or overfill, and replace cover on the sample container. For volatile organic samples, make sure that there are no air bubbles in the sample vial after it has been capped. This is accomplished by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If the bubbles appear, reopen the vial, remove septum and add more sample (or resample). Replace septum, recap and check for bubbles. Continue until vial is bubble-free.

6. Return sample container to sample cooler. If sample is obtained directly with a sample container, dry the exterior of the container before placing into cooler.

7. If reusable, decontaminate the sampling equipment according to the procedures outlined in Section 6.0.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.7 Soil (Test Pit)

Test pit excavation will be conducted using a backhoe or excavator. Sampling protocols for the collection of subsurface soil samples from test pit excavations will consist of the following minimum procedures:

1. Be certain that the sample location is noted on Location Sketch (see Section 8.1).

2. Be certain that the sampling equipment, including the backhoe/excavator bucket, is decontaminated utilizing the procedures outlined in Section 6.0.

3. Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

4. Set aside top 2 feet of soil.

5. Lower the bucket into the test pit and remove soil/waste material.

6. Immediately upon retrieval of the soil/waste material, obtain an organic vapor measurement with a PID or FID.

7. Depending upon the organic vapor measurement, odors and visual characteristics,obtain a soil sample from the backhoe bucket with a disposable or decontaminated scoop and/or sterile wooden tongue depressor, place into the open sample containers and replace the container covers.

8. Fill out Test Pit Log Form, including a description of soil/waste with location, depth and material sampled.

9. Return the sample container to the cooler.

10. Backfill test pit using the top 2 feet of soil that was set aside as the top layer.

11. If reusable, decontaminate the sampling equipment according to the procedures described in Section 6.0.

12. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.8 Soil (Probe)

Sampling protocols for the collection of subsurface soil samples from hydraulic direct-push sampling probes will consist of the following minimum procedures:

1. Be certain that the sample location is noted on Location Sketch (see Section 8.1).

2. Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

3. Drive the probe to the desired sampling depth.

4. Retrieve the soil probe and immediately after opening it, obtain an organic vapor measurement with a FID or PID.

5. Remove a sample aliquot from the soil probe using a disposable scoop, decontaminated stainless steel tool or sterile tongue depressor, place into the open sample container and replace the container cover. If the NYSDEC requests that VOC's be collected utilizing the Encore sampling method than the VOC fraction will be collected immediately from the probe using the Encore sampling method in accordance with USEPA Method 5035. The remaining soil fraction will be homogenized prior to collecting the samples for the remaining parameters. Remove a sample aliquot from the soil probe using a disposable scoop or sterile wooden tongue depressor, place into the open sample container and replace the container cover. Sample container shall be filled in the following order after the collection of the soil fraction for VOC analysis; SVOCs, pesticides/PCBs, metals and cyanide.

6. Return the sample container to the cooler.

7. If reusable, decontaminate the sampling equipment according to the procedures described in Section 6.0.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.9 Soil (Borehole, Split Spoon)

Sampling protocols for the collection of subsurface soil samples from split spoons in soil borings will consist of the following minimum procedures:

1. Be certain that the sample location is noted on Location Sketch (see Section 8.1).

2. Be certain that the sampling equipment (split spoon) has been decontaminated utilizing the procedures outlined in Section 6.0.

3. Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form (see Section 8.0).

4. Drill into the soil to the desired depth and drive the split spoon sampler.

5. Retrieve the split spoon and immediately after opening the split spoon, obtain an organic vapor measurement with a PID or FID and fill out Boring Log Form (see Section 8.0).

6. Remove a sample aliquot from the soil probe using a disposable scoop, decontaminated stainless steel tool or sterile tongue depressor, place into the open sample container and replace the container cover. If the NYSDEC requests that VOC's be collected utilizing the Encore sampling method than the VOC fraction will

be collected immediately from the probe using the Encore sampling method in accordance with USEPA Method 5035. The remaining soil fraction will be homogenized prior to collecting the samples for the remaining parameters. Remove a sample aliquot from the soil probe using a disposable scoop or sterile wooden tongue depressor, place into the open sample container and replace the container cover. Sample container shall be filled in the following order after the collection of the soil fraction for VOC analysis; SVOCs, pesticides/PCBs, metals and cyanide.

7. Return the sample container to the cooler.

8. If reusable, decontaminate the sampling equipment according to the procedures described in Section 6.0.

9. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.10 Soil (Immunoassay Colorimetric Field Quantification of Analytes)

On-site field screening analysis, when deemed appropriate, will utilize methanol extraction of soils, and immunoassay colorimetric quantification of selected analytes to provide real-time screening results. The selected analytes may include, but are not limited to, Total Benzene, Toluene, Ethylbenzene, and Xylenes (Total BTEX), Naphthalene, Total Petroleum Hydrocarbons (TPH), Polynuclear Aromatic Hydrocarbons (PAHs), and Polychlorinated Biphenyls (PCBs). Immunoassay field-screening analyses will be accomplished using the Total BTEX/Naphthalene/TPH RaPID Assay, PAH RaPID Assay, and PCB RaPID Assay field kits supplied by Strategic Diagnostics, Inc. of Newark, Delaware, or equivalent. These kits produce a field analytical system capable of detecting very low levels of BTEX/Naphthalene, PAHs, and PCBs. Specific sample detection limits are provided with instructions supplied by Strategic Diagnostics, Inc. that are specific for each analysis. Site-specific sampling locations will be provided in the Site-Specific Work Plan.

The standard protocols for conducting on-site field screening utilizing RaPID Assay field test kits should strictly adhere to manufacturer's specification/instructions.

5.11 Groundwater (Probe)

Sampling protocols for the collection of groundwater samples from probes will consist of the following minimum procedures:

1. Be certain sample location is noted on Location Sketch (see Section 8.1).

2. Remove the laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

3. Obtain a sample by using dedicated polyethylene tubing equipped with a bottom check valve.

4. Gently pour the sample into the sample container taking care not to spill on the outside of the container or overfill container and replace cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is accomplished by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

5. After sample collection, obtain field measurements including pH, conductivity, temperature and turbidity.

6. If a sample is to be collected for metals analysis, the turbidity must be less than 50 NTUs. If the turbidity cannot be reduced to less than 50 NTUs, the sample will be filtered in the field or by the laboratory. Both filtered (soluble metals) and unfiltered (total metals) samples will be analyzed.

7. Return sample containers to sample cooler.

8. Place all disposable personal protective equipment and disposal sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.12 Groundwater (Hydropunch)

Sampling protocols for the collection of groundwater samples from hydropunch equipment will consist of the following minimum procedures:

1. Be certain sample location is noted on Location Sketch (see Section 8.1).

2. Using hydropunch equipment drive/punch screen to desired depth.

3. Remove inner sleeve and lower down decontaminated hydropunch bailer or remove filled hydropunch sampler from borehole.

4. Remove the laboratory precleaned sample container from the sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody form.

5. Obtain a volatile organic sample by using a hydropunch bailer or from hydropunch sampler. Gently pour the sample into the sample container taking care not to spill on the outside of the container or overfill container and replace cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is accomplished by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

6. Obtain a sample and analyze for field parameters (pH, conductivity, temperature and turbidity).

7. Turbidity must be less than 50 NTUs prior to collection of a sample for metals analysis. If the turbidity of the sample is greater than 50 NTUs, the sample will be filtered in the field or by the laboratory. Both filtered (dissolved metals) and unfiltered (total metals) samples will be analyzed.

8. Collect remaining samples. Gently pour the sample into the sample container, taking care not to spill water on the outside of the container or overfill the container. Replace cover on the sample container.

9. Return sample container to sample cooler.

10. Punch down to next depth and repeat items 3 through 9.

11. Decontaminate hydropunch equipment as described in Section 6.0.

12. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.13 Groundwater (Monitoring Well)

Sampling protocols for the collection of groundwater samples from monitoring wells will consist of the following minimum procedures:

1. Measure the depth of water using a decontaminated water level indicator and compute the volume of standing water in the well.

2. Remove three to five times the volume of standing water from the well until field measurements (pH, conductivity, temperature and turbidity) stabilize, or until the well is dry, whichever occurs first. Turbidity should be less than 50 NTUs prior to collection of a sample for metals analysis.

3. Remove the laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form.

4. Obtain a sample by using a disposable polyethylene bailer.

5. If the turbidity of the sample is greater than 50 NTUs, the metals; (iron and manganese) portion of the sample will be filtered in the field or by the laboratory. Both the filtered (soluble metals) and unfiltered (total metals) samples will be analyzed.

6. Gently pour the sample into the sample container taking care not to spill on the outside of the container or overfill container and replace the cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

7. Return sample container to sample cooler.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.14 Private Water Supply

Sampling protocols for the collection of groundwater samples from private potable water supply wells will consist of the following minimum procedures:

1. Fill out Water Supply Information Record (see Section 8.0).

2. Remove the laboratory precleaned sample container from the sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody form.

3. If there is a treatment system, identify a location to sample that is ahead of any in-line water treatment unit, if possible. If samples are to be collected from a faucet, disassemble any screens and/or purification system that may be on the faucet, if possible. Note these conditions on the Sample Information Record Form.

4. Allow the cold water to run for approximately five minutes to adequately flush the line before sampling.

5. Collect the cold water directly in the sample container, taking care not to spill on the outside of the container or overfill container, and replace cover on the sample container. Samples for volatile organic analyses will have no air space in the sample vial prior to sealing. This is accomplished by filling the vial such that there is a meniscus on top. Carefully slide the septum, Teflon side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

6. Return sample to sample cooler.

7. Reattach water line that may have been disconnected ahead of treatment devise and reassemble screens and/or treatment systems that may have been removed.

5.15 Ambient Air (Summa Canister)

Sampling protocols for the collection of air samples in summa canisters will consist of the following minimum procedures:

1. Be certain sample location is noted on Location Sketch (see Section 8.1).

2. Verify vacuum of Summa canister and connect dedicated regulator. Regulator should be set at a flow rate of <0.2L/min.

3. Label canister and fill out Sample Information Record and Chain of Custody Form.

4. Set canister in breathing zone, approximately 3-4 feet above ground surface.

5. Open valve on canister and monitor the canister vacuum rate at half-hour intervals during the duration of sampling.

6. Close valve on canister and disconnect the regulator.

7. Place canister in shipping containers.

8. Place all disposable personal protective equipment and disposable sampling equipment into a 55-gallon drum and store in a secure area (fenced, if possible).

5.16 Methane Gas Survey

Protocols for conducting methane gas surveys will consist of the following minimum procedures:

1. Be certain that the sample location is noted on Location Sketch.

2. Drive the decontaminated stainless steel probe with removable inner rod into the ground to the desired depth.

3. Remove inner rod and immediately replace with a stainless steel cap equipped with a sampling port.

4. Connect new silicon tubing to the probe and the methane gas meter. Turn on meter.

5. Record initial, highest and steady-state methane readings.

6. Shut off meter and disconnect tubing.

7. Extract probe from the ground and decontaminate according to the procedures described in Section 6.0.

5.17 Radiological Survey

Protocols for conducting radiological surveys will consist of the following minimum procedures:

1. Lay out transect lines/grid in area to be surveyed using site-specific spacing. Record location on Location Sketch.

2. Turn on calibrated radiation meter (Geiger counter) and evaluate meter operation using test source.

3. Record radiation reading at background location.

4. Slowly walk along transect/grid lines with radiation meter in front, moving meter probe from side to side during traverses. Note radiation readings along traverses, including both areas higher and lower than the background reading. Readings significantly below background levels may indicate that the background location does not represent background conditions.

5. Mark any areas of elevated radiation readings in field notebook or on Location Sketch, utilizing transect/grid point designations or other reference points, and/or mark on ground utilizing marker flags, marker stakes or paint. DO NOT PROCEED PAST ANY LOCATION WITH A RADIATION READING EXCEEDING TWO TIMES BACKGROUND LEVELS UNLESS A QUALIFIED HEALTH PHYSICIST ADVISES OTHERWISE. If possible, delineate the areas of elevated radiation readings by approaching these areas from multiple directions.

6. If warranted, consult with a qualified health physicist regarding confirmation of radiation results, source determination and sample collection.

5.18 Asbestos Survey

An asbestos survey may be completed in order to determine the presence, extents and condition of ACM that may be present within buildings. The asbestos survey will be performed by a New York State Department of Labor (NYSDOL) licensed Asbestos Inspector (Inspector) in a manner consistent with accepted principles and practices established and prescribed by the USEPA and NYSDOL Industrial Code Rule 56 (ICR-56). Asbestos bulk sampling protocols will be performed in accordance with ICR-56 protocols for multi-layered building systems and materials and utilizing the following sampling methodologies:

- Prior to collecting samples of suspect ACMs, the Inspector shall ensure that the required personal protective equipment (PPE; such as respirator, gloves, etc.), lagging materials or an approved encapsulant is at hand and ready for use in repairing surfaces disturbed during the collection process;

- The Inspector will collect a bulk sample consisting of a few grams of the suspect ACM in a resealable, zipper plastic bag for laboratory submittal;

- If the material being sampled is friable in nature (i.e., pipe lag insulation, spray-on fireproofing, plaster/spackling finishes, etc.), the immediate area surrounding the point of sample collection will be sprayed with a light mist of amended water. Non-friable materials rendered friable during the sample collection process will also be sprayed with a light mist of amended water;

- Where possible, sample collection will be performed adjacent to a point of existing damage in an attempt to avoid or minimize any unnecessary contact or disturbance;

- Sampling locations will be repaired by filling the hole where the bulk sample was collected with patching materials listed by the manufacturer as non-asbestos, such as lagging cloth, silicone, putty, construction tape, or acrylic adhesive;

- To avoid possible sample cross-contamination, the Inspector will ensure that tools (i.e., knife, chisel, etc.) used to collect the sample are properly cleaned using a damp rag following the collection of each individual sample; and,

- In the event additional fragments or pieces of the suspect ACM being sampled break off during sample collection, the associated debris will be collected using a damp rag or HEPA-equipped vacuum. Unless otherwise proven through subsequent analysis, residual suspect ACM debris will be double-bagged in NYSDOL-approved 6 mil polyethylene asbestos disposal bags as investigative derived waste.

Many suspect ACMs are located in concealed areas such as wall cavities, below ground level, and other hidden spaces. The Inspector will conduct a destructive investigation, as necessary, to gain access to these hidden spaces and to inspect them for suspect ACMs. The following guidelines constitute reasonable criteria for locating concealed materials:

- Identify the different building systems which may involve concealed suspect ACM such as heating/cooling systems, water lines, steam lines, roof drainage lines, miscellaneous piping lines, underlying roof materials, foundation waterproofing materials, etc.;

- Expose hidden areas and inspect each system in at least three locations for each area of construction;

- Focus the inspection on likely areas of occurrence of suspect ACMs (i.e., where insulated pipe enters walls or ceilings, behind heating units, etc.);

- Collection of bulk samples of suspect ACMs will undergo multi-layered sample analysis of individual suspect ACM layers in accordance with ICR-56;

- The Inspector will examine additional areas if results of the initial inspection are inconsistent;

- The Inspector will clearly list all concealed areas that have not been inspected, and explain why they were not inspected. Examples of reasons for not inspecting concealed areas may include, but are not limited to:

  – Records showing recent access to such spaces and sample results;

  – Safety restrictions (i.e., confined spaces) or safety hazards (i.e., unsafe breathing atmosphere, active hot surfaces, etc.); and,

  – Restrictions imposed by the property owner.

- For those asbestos surveys that include inaccessible concealed spaces, a qualified licensed asbestos professional will be available during the project to address the potential of unidentified suspect materials becoming disturbed during the course of the asbestos survey.

Upon completion of the bulk sample collection, the samples will be properly labeled and shipped under Chain of Custody to the laboratory for analysis. The samples will be analyzed by Polarized Light Microscopy (PLM) utilizing NYSDOH ELAP Method 198.1 for friable suspect materials, and Non-Friable Organically Bound (NOB) PLM utilizing NYSDOH ELAP Method 198.6 for non-friable suspect materials. Confirmation analysis of NOB materials will be performed, where necessary, utilizing Transmission Electron Microscopy (TEM) via NYSDOH ELAP Method 198.4. TEM is required by NYSDOH to prove that a NOB material is non-ACM, when the material is initially determined to be non-ACM by PLM and the sample has an acid insoluble inorganic phase of greater than 1.0 percent.

5.19 Lead-Based Paint and Lead-Based Coatings

A lead survey to determine the presence, extents and condition of lead-based paint (LBP) and lead based coatings (LBC) that may be present within buildings may be completed. A

USEPA certified lead risk assessor (Assessor) will conduct lead surveys of on-site buildings. The lead survey will performed utilizing the applicable provisions of the USEPA and United States Department of Housing and Urban Development (HUD) standards.

The lead survey will be conducted by either the physical collection of paint chip samples for laboratory analysis or field analysis utilizing an x-ray fluorescence (XRF) analyzer. Paint chip sampling is slightly destructive to building materials, while the XRF sampling activities are non-destructive. Whether paint chip or XRF sampling methodologies are employed, the Assessor will collect samples of a representative group of selected paints on various substrates and building components throughout the building. During the lead survey, all accessible portions of the building will be visually assessed to identify all coated building components. The coated components will be grouped by the same color, texture, and substrate material. The Assessor will be selective in the screening process of various coated building components such as wood, metal, concrete, plaster, and gypsum wall board, amongst others, to provide a representative profile of potential LBP and LBC substrates. In addition, since LBP and LBC were used up to the time lead was banned in 1978, older painted surfaces and coatings and multi-layered painted surfaces will be targeted for screening over individual layers of newer paint.

When paint chip sample collection is employed, one sample will be collected of each suspect LBP and LBC from each substrate type for laboratory analysis. During sample collection, all layers of the coating present will be collected with the substrate material excluded. Following collection of each paint chip sample, the Assessor will note the location from where each sample was collected on a sample location plan. When XRF field analysis is selected as the method of lead analysis, a Niton® SL3t XRF (or equivalent), equipped with a 50kV x-ray tube will be utilized as the on-site XRF field analysis and will be used in accordance with the manufacturer specifications and the following additional procedures:

- In order to measure concentrations of lead in a material, the desired sample is positioned in front of the XRF probe window;
- Field measurements can be obtained using either in-situ or intrusive analysis modes. If operated in the in-situ mode, the probe window is placed in direct contact with the paint, coating, sediment, or soil surface to be analyzed. When the XRF analyzer is

operated in intrusive mode, a soil or sediment sample must be collected, prepared, and placed in a sample cup. The sample cup is then placed on top of the window inside a protective cover for analysis;

- XRF sample analysis is then initiated by exposing the sample to primary radiation from the sample source. The measurement time of each sample is user-selectable. Shorter sample measurement times (i.e., up to 30 seconds) are generally used for initial screening and hot spot delineation, and longer measurement times (i.e., up to 300 seconds) are typically used to meet higher precision and accuracy requirements;

- Field personnel operating the XRF analyzer will pay close attention to lead data patterns on various substrates. When the presence of LBP and LBC is confirmed on similar colored substrates on a building component (i.e., white paint metal window sash) at 2 to 3 sample locations, no additional XRF sampling will be necessary on that substrate and component type. In order to provide a statistical basis for the absence of LBP and LBC on similar colored substrates on a building component, field personnel will analyze up to 5 sample locations on each substrate and component type; and,

- Analytical data will be downloaded from the XRF analyzer to a computer hard-drive at the end of each sampling day and tabulated in an Excel document.

Once paint chip or XRF analysis is completed, any paint, coating, sediment, or soil surface with a lead concentration greater than or equal to 1.0 mg/cm^2 utilizing an XRF, or greater than or equal to 0.5 percent or 5,000 parts per million (ppm) [a.k.a. milligrams per kilogram (mg/kg)] will be classified as a lead contaminated material.

5.20 Fish and Wildlife Sampling

An investigation of the nature and extent of ecological impacts to biota (i.e., plant, invertebrate and/or fish) will be conducted via field sampling of biota tissue and laboratory analysis of COECs. The following procedures and sampling protocols will be used to collect biota samples:

- Plant Tissue Sampling- Plant tissue samples will be collected in the following manner:

  – Samples of native plants will be collected from subsample locations selected during a field reconnaissance in consultation with NYSDEC;

- Each composite tissue sample will consist of approximately 50 grams of tissue gathered from several subsample locations;

- It is not expected that the same plant species will be collected from each subsample location. The type of plant will be identified and recorded at each subsample location;

- Field personnel will use a dedicated pair of disposable nitrile gloves prior to initiating sampling at each location;

- Field personnel will use clean dedicated stainless steel scissors, pruners or garden snips to cut off a representative portion of a selected plant at each subsample location;

- The plant subsamples will be placed on a new sheet of clean aluminum until approximately 50 grams of plant material is gathered;

- The aluminum foil will be closed by folding the foil over the plant material, placed in an iced cooler, and transported under chain-of-custody documentation to a qualified laboratory for analysis of the target list of COECs .

- Invertebrate and Vertebrate Sampling- Invertebrate and vertebrate tissue sampling and analysis may be conducted on benthic invertebrates (i.e., polychaete worms, bivalve; aquatic insects; gastropods; benthic arthropods including crayfish, crab, and others; etc.), mid-water planktonic invertebrates (i.e., copepods; amphipods, larvae, etc.) and mid-water planktonic vertebrates (i.e., fish, frogs, etc.). All types of invertebrates will be collected whole in the following manner:

  - When sampling benthic invertebrate tissue samples, hand-held dragging mesh nets or similar will be used to stir up the sediment allowing any benthic invertebrates to float downstream into the net and hoist them to the surface;

  - When sampling mid-water planktonic invertebrates and vertebrates, trawling mesh nets or similar will be used to surround the organisms and hoist them to the surface;

  - The type of invertebrate or vertebrate will be identified and recorded at each sample location;

  - Preparation of benthic invertebrates will consist of removing the invertebrates from the surrounding sediment by placing them in a pre-cleaned stainless steel bowl filled with a sufficient volume of distilled or deionized water to cover the sample. The benthic invertebrates will be removed from the sediment in the bowl using clean stainless steel tweezers and placed in a clean sample jar and inside an iced cooler. Shells of bivalves will be removed, retaining only the mussel and mantel tissues in the sample jar;

- All remaining benthic invertebrates, and mid-water planktonic invertebrates and vertebrates will be retained whole in clean sample jars by handling with nitrile gloves and stainless steel tools;

- Collected invertebrate or vertebrate organisms will be shipped to the qualified laboratory under chain-of-custody documentation, where the organisms will be homogenized whole. Each homogenized tissue sample will be analyzed for the target list of COECs.

6.0 DECONTAMINATION PROCEDURES

Whenever possible, all field sampling equipment should be sterile/disposable and dedicated to a particular sampling point. In instances where this is not possible, a field cleaning/ decontamination procedure will be used in order to mitigate cross contamination between sample locations. A decontamination station/pad will be established for all field activities. This will be an area located away from the source of contamination so as not to adversely impact the decontamination procedure, but close enough to the sampling locations to keep equipment transport handling to a minimum after decontamination.

6.1 Field Decontamination Procedures

All nondisposable equipment will be decontaminated at appropriate intervals (e.g., prior to initial use, prior to moving to a new sampling location and prior to leaving the site). Different decontamination procedures are used for various types of equipment that are used to collect samples. When using field decontamination, sampling should commence in the area of the site with the lowest contamination, if known or probable, and proceed through to the areas of highest contamination.

6.2 Decontamination Procedure for Drilling/Probing Equipment

All equipment such as drill rigs and other mobile equipment will receive an initial cleaning prior to use at the site. The frequency of subsequent cleanings while on-site will depend on how the equipment is actually used in relation to collecting environmental samples. Decontamination fluids generated during steam cleaning/decontamination activities, will be collected in New York State Department of Transportation (NYSDOT) approved 55-gallon drums. The drums will be labeled as investigation-derived wastewater and temporarily stored in a secured area of the site on wooden pallets in a plastic-lined containment area pending characterization and proper disposal.

After the initial decontamination, cleaning may be reduced to those areas that are in close proximity to materials being sampled. Drill rig/probe items such as augers, drill/probe rods and drill bits will be cleaned in between sample locations.

Drilling/probing equipment will be decontaminated in the following manner:

- Wash thoroughly with nonresidual detergent (alconox) and tap water using a brush to remove particulate matter or surface film. This is necessary in order to remove any solids buildup on the back of the rig, auger flights, drill rods, drilling head, etc. Any loose paint chips, paint flakes and rust must also be removed.
- Steam clean (212°F).
- Once decontaminated, remove all items from the decontamination area.

Also, following the general cleaning procedures described above, all downhole/drilling items, such as split spoon samplers, Shelby tubes, rock corers, or any other item of equipment which will come in direct contact with a sample during drilling, will be decontaminated by steam cleaning.

6.3 Decontamination Procedure for Sampling Equipment

Teflon, PVC, polyethylene and stainless steel sampling equipment decontamination procedures will be the following:

- Wash thoroughly with nonresidual detergent (alconox) and clean potable tap water using a brush to remove particulate matter or surface film.
- Rinse thoroughly with tap water.
- Rinse thoroughly with acid (HNO_3) (only if metals samples are to be collected).
- Rinse thoroughly with distilled water.
- Rinse in a well ventilated area with methanol (pesticide grade) and air dry.
- Rinse thoroughly with distilled water and air dry.

- Wrap completely in clean aluminum foil with dull side against the equipment. For small sampling items, such as scoops, decontamination will take place over a drum specifically used for this purpose.

The first step, a soap and water wash, will be performed to remove all visible particulate matter and residual oils and grease. This step will be followed by a tap water rinse and a distilled/deionized water rinse to remove the detergent. Next, a high purity solvent rinse will be used for trace organics removal. Methanol has been chosen because it is not an analyte of concern on the Target Compound List. The solvent will be allowed to evaporate and then a final distilled/deionized water rinse will be performed. This rinse removes any residual traces of the solvent. The aluminum wrap will protect the equipment and keep it clean until it is used at another sampling location.

6.4 Decontamination Procedure for Well Casing and Development Equipment

Field cleaning of well casings will consist of a manual scrubbing to remove foreign material and steam cleaning, inside and out, until all traces of oil and grease are removed. This material will then be stored in such a manner so as to preserve it in this condition. Special attention to threaded joints will be necessary to remove cutting oil or weld burn residues.

Materials and equipment that will be used for the purposes of well development will also be decontaminated by steam cleaning. An additional step will involve flushing the interior of any hose, pump, etc. with a nonphosphate detergent solution and potable water rinse prior to the development of the next well. This liquid waste will be disposed of on-site, if possible after testing.

7.0 LABORATORY SAMPLE CUSTODY, SAMPLE RECEIPT, STORAGE, SECURITY, AND DISPOSAL PROCEDURES

A NYSDOH ELAP certified laboratory meeting the requirements for sample custody procedures, including cleaning and handling sample containers and analytical equipment, will be used to analyze samples collected during the site investigation. Upon receipt of shipped samples at the laboratory, the laboratory's sample custodian will inspect the samples for integrity and check the shipment against the chain-of-custody. Discrepancies are reported to the laboratory's project manager who contacts the D&B project manager for resolution.

When the shipment and the chain-of-custody are in agreement, the sample custodian will enter the samples into the Laboratory Information Management System and will assign each sample a unique laboratory number. This number will be affixed to each sample bottle. The sample custodian will then enter the sample and analysis information into the laboratory computer system.

The selected laboratory must satisfy the sample chain-of-custody requirements by implementing the following standard operating procedure for laboratory/sample security within the laboratory facility:

- Samples are stored in a secure area;
- Access to the laboratory is through a monitored area;
- Visitors sign a visitor's log and are escorted while in the laboratory;
- Only the designated sample custodians have keys to sample storage area(s); and,
- Transfers of samples in and out of storage are documented.

While in the laboratory, samples that require storage at $4^{\circ}C \pm 2^{\circ}C$ will be stored in a locked refrigerator unless they are being used for analysis. The laboratory's sample custodian will be responsible for sample storage and security to ensure that:

- Samples and extracts are stored for 60 days after the final analytical data report has been forwarded to D&B. The samples, extracts, and sample digestion byproducts are then discarded in accordance with Occupational Safety and Health Administration guidance; and,

- Samples are not stored with standards or sample extracts.

The selected laboratory's Standard Operating Procedures will be made available upon request.

8.0 SAMPLE DOCUMENTATION

Proper management and documentation of field and sampling activities is essential to ensure that all necessary work is conducted in accordance with the sampling plan and QAPP in an efficient and high quality manner. Field management procedures will include following proper chain of custody procedures to track a sample from collection through analysis, noting when and how samples are split (if required); preparing a Location Sketch; completing Sample Information Records; completing Chain of Custody Forms' completing Boring, Well and Test Pit Construction Logs; maintaining a daily Field Log Book; preparing Daily Field Activity Reports; completing Field Change Forms; and filling out a Daily Air Monitoring Form. Copies of each of these forms are provided in Appendix A. Proper completion of these forms and the field log book are necessary to support the consequent actions that may result from the sample analysis. This documentation will support that the samples were collected and handled properly.

8.1 Location Sketch

For each sampling point, a Location Sketch will be completed using permanent references and distances to the sampling point noted, if possible.

8.2 Sample Information Record

At each sampling location, a Sample Information Record Form is filled out including, but not limited to, the following information:

- Site name
- Sample crew
- Sample location
- Field sample identification number
- Date
- Time of sample collection

- Weather conditions
- Temperature
- Sample matrix
- Method of sample collection and any factor that may affect its quality adversely
- Well information (groundwater only)
- Field test results
- Analysis to be performed
- Remarks

8.3 Chain of Custody

The Chain of Custody Form will be completed and is initiated at the laboratory with container preparation and shipment to the site. The form remains with the sample at all times and bears the name of the person assuming responsibility for the samples. This person is tasked with ensuring secure and appropriate handling of the containers and samples. When the form is complete, it will indicate that there was no lapse in sample accountability.

A sample is considered to be in an individual's custody if any of the following conditions are met:

- It is in the individual's physical possession, or
- It is in the individual's view after being in his or her physical possession, or
- It is secured by the individual so that no one can tamper with it, or
- The individual puts it in a designated and identified secure area.

In general, Chain of Custody Forms are provided by the laboratory selected to perform the analytical services. At a minimum, the following information will be provided on these forms:

- Project name and address
- Project number
- Sample identification number
- Date
- Time
- Sample location
- Sample type
- Analysis requested
- Number of containers and volume taken
- Remarks
- Type of waste
- Sampler(s) name(s) and signature(s)
- Spaces for relinquished by/received by signature and date/time.

For this particular study, forms provided by the laboratory will be utilized.

The Chain of Custody Form will be filled out and signed by the person performing the sampling. The original of the form will travel with the sample and will be signed and dated each time the sample is relinquished to another party, until it reaches the laboratory or analysis is completed. The field sampler will keep one copy and a copy will be retained for the project file. The sample bottle will also be labeled with an indelible marker with a minimum of the following information:

- Sample number
- Analysis to be performed
- Date of collection

A copy of the completed form will be returned by the laboratory with the analytical results.

8.4 Split Samples

Whenever samples are being split with another party, a Receipt for Samples Form will be completed and signed. A copy of the Chain of Custody Form will accompany this form.

8.5 Field Log Book

Field log books will be bound and have consecutively numbered water resistant pages. All pertinent information regarding the site and sampling procedures will be documented. Notations will be made in log book fashion, noting the time and date of all entries. Information recorded in this logbook will include, but not be limited to, the following:

The first page of the log will contain the following information:

- Project name and address
- Name, address and phone number of field contact
- Waste generator and address, if different from above
- Type of process (if known), generating waste
- Type of waste
- Suspected waste composition, including concentrations

Daily entries will be made for the following information:

- Purpose of sampling
- Location of sampling point

- Number(s) and volume(s) of sample(s) taken
- Description of sampling point and sampling methodology
- Date and time of collection, arrival and departure
- Collector's sample identification number(s)
- Sample distribution and method of storage and transportation
- References, such as sketches of the sampling site or photographs of sample collection
- Field observations, including results of field analyses (e.g., pH, temperature, specific conductance), water levels, drilling logs, and organic vapor and dust readings
- Signature of personnel responsible for completing log entries.

8.6 Daily Field Activity Report

At the end of each day of field work, the Field Operations Manager, or designee, will complete this report noting personnel on-site and summarizing the work performed that day, equipment, materials and supplies used, results of field analyses, problems and resolutions. This report will be signed and subject to review.

8.7 Field Changes and Corrective Actions

Whenever there is a required or recommended investigation/sampling change or correction, a Field Change Form will be completed by the Field Operations Manager and approved by the Project Manager.

9.0 CALIBRATION PROCEDURES AND PREVENTIVE MAINTENANCE

Periodic preventive maintenance may be required for all equipment. Instrument manuals will be kept on file for reference if equipment needs repair. The troubleshooting section of factory manuals may be used in assisting personnel in performingroutine/minor maintenance tasks. The frequency of preventative maintenance for field equipment is indicated in each operating instruction manual.

The following information regarding equipment will be maintained at the project site:

1. Equipment calibration and operating procedures which will include provisions for documentation of frequency, conditions, standards and records reflecting the calibration procedures, methods of usage and repair history of the measurement system. Calibration of field equipment will be performed daily at the sampling site so that any background contamination can be taken into consideration and the instrument calibrated accordingly.

2. A schedule of preventive maintenance tasks, consistent with the instrument manufacturer's specific operation manuals that will be carried out to minimize down time of the equipment.

3. Critical spare parts, necessary tools and manuals will be on hand to facilitate equipment maintenance and repair.

Calibration procedures and preventive maintenance, in accordance with the NYSDEC 2005 ASP for laboratory equipment, will be contained in the laboratory's standard operating procedures (SOP), which will be available upon request.

10.0 PERFORMANCE OF FIELD AUDITS

During field activities, the QA/QC officer will accompany sampling personnel into the field, in particular in the initial phase of the field program, to verify that the site sampling program is being properly conducted, and to identify problems so that corrective action can be taken early in the field program. Prior to an audit, the designated lead auditor will prepare an audit checklist. During an audit and upon its completion, the auditor will discuss the findings with the individuals audited and discuss and agree on corrective actions to be initiated. All findings will be documented in an audit report and provided to the Field Operations Manager.

The Field Operations Manager will then prepare and submit, to the QA/QC Officer and Project Manager, a plan for implementing the corrective action to be taken on non-conformances indicated in the audit report, the date by which the corrective action will be completed, and actions taken to prevent reoccurrence. If the corrective action has been completed, supporting documentation will be attached to the reply. The auditor will ascertain, through a re-audit or other means, if appropriate and timely corrective action has been implemented.

A copy of the Field Audit Form is provided in Appendix A. Records of audits will be maintained in the project files.

11.0 CONTROL AND DISPOSAL OF CONTAMINATED MATERIAL

During construction and sampling of the monitoring wells and soil borings, contaminated waste, soil and water may be generated from drill cuttings, drilling fluids, decontamination water, development water and purge water.

11.1 Decontamination Fluids

It is anticipated that decontamination fluids will be generated during steam cleaning activities, which will be collected in New York State Department of Transportation (NYSDOT) approved 55-gallon drums. The drums will be labeled as investigation-derived wastewater and temporarily stored in a secured chain-link fence area of the site on wooden pallets in a plastic-lined containment area pending characterization and proper disposal.

11.2 Drill Cuttings

It is presumed that all drill cuttings generated during soil boring and monitoring well installation activities are contaminated. Therefore, all drill cuttings will be managed in accordance with DER-10 as follows: contained in NYSDOT approved 55-gallon drums or stored on protective sheeting and covered with protective sheeting if cuttings remain on the ground of the day, as stipulated in the Site specific work plan. The soil may also be disposed on site within the borehole that it was generated within 12 inches of the surface (24 inches if site is residential). If the soil is drummed it will be segregated by drill location as is practical. The drums will be labeled as investigation-derived waste soil from the corresponding boring or source area and temporarily stored in a secured area of the site on wooden pallets in a plastic-lined containment area pending characterization and proper disposal. Disposal of IDW will be in accordance with applicable federal, state and local regulations as specified in DER-10.

11.3 Development and Purge Water

It is anticipated that development and purge water will be generated during development and sampling of the monitoring wells. Development and purge water will be contained in NYSDOT approved 55-gallon drums. Groundwater from several monitoring wells maybe combined provided they are associated with the same disposal site and aquifer. The drums will be labeled as investigation-derived wastewater from the corresponding well and temporarily stored in a secured area of the property on wooden pallets in a plastic-lined containment area pending characterization and proper disposal As defined in DER-10 and the approved site specific work plan. It should be noted that NAPL shall never be discharged to the ground.

11.4 Personal Protective Equipment

Personal protective equipment (PPE) will be placed in 55-gallon drums or roll-off containers and secured on-site for proper disposal.

11.5 Dedicated Sampling Equipment

In general, all dedicated soil sampling equipment (Macrocore sampler liners and catchers), groundwater sampling equipment (dedicated disposable polyethylene bailer and dedicated polypropylene line) and soiled disposable sampling equipment (i.e., bailers, tongue depressors, scoops, etc.) will be be placed in 55-gallon drums or roll-off containers and secured on-site for disposal.

12.0 DOCUMENTATION, DATA REDUCTION AND REPORTING

A NYSDOH ELAP certified laboratory meeting the New York State requirements for documentation, data reduction and reporting will be used. All data will be cataloged according to sampling locations and sample identification nomenclature which is described in Section 5.1 of this QAPP Plan. The laboratory analysis will be reported in the NYSDEC ASP Category B deliverables format. In addition the laboratory will be providing an electronic data deliverable (EDD) for each data set in the most current NYSDEC EQuIS format.

NYSDEC "Sample Identification and Analytical Requirement Summary" and "Sample Preparation and Analysis Summary" forms (for organic and inorganic analysis) will be completed and included with each data package. These forms are contained in Appendix B of this QAPP. The sample tracking forms are required and supplied by the 2005 NYSDEC ASP.

13.0 DATA VALIDATION

Data validation will be performed in order to define and document analytical data quality in accordance with USEPA and NYSDEC requirements that investigation data must be of known and acceptable quality. The analytical and validation processes will be conducted in conformance with the NYSDEC 2005 ASP and NYSDEC DER-10.

Since the NYSDEC Analytical Services Protocol is based on the USEPA CLP, the USEPA Functional Guidelines for Evaluating Organics and Inorganics Analyses for the Contract Laboratory Program (CLP) will assist in formulating standard operating procedures (SOPs) for the data validation process. The data validation process will ensure that all analytical requirements specific the QAPP are followed. Procedures will address validation of routine analytical services (RAS) results based on the NYSDEC Target Compound List and Target Analyte List for standard sample matrices.

The data validation process will provide an informed assessment of the laboratory's performance based upon contractual requirements and applicable analytical criteria. The report generated as a result of the data validation process will provide a base upon which the usefulness of the data can be evaluated by the end user of the analytical results. The overall level of effort and specific data validation procedure to be used will be equivalent to a “100% validation” of all analytical data in any given data package.

During the review process, it will be determined whether the contractually required laboratory submittals for sample results are supported by sufficient back-up data and QA/QC results to enable the reviewer to conclusively determine the quality of data. Each data package will be checked for completeness and technical adequacy of the data. Upon completion of the review, the reviewers will develop a QA/QC data validation report for each analytical data package.

“Qualified” analytical results for any one field sample will be established and presented based on the results of specific QC samples and procedures associated with its sample analysis

group or batch. Precision and accuracy criteria (i.e., QC acceptance limits) will be used in determining the need for qualifying data. Where test data have been reduced by the laboratory, the method of reduction will be described in the report. Reduction of laboratory measurements and laboratory reporting of analytical parameters will be verified in accordance with the procedures specified in the NYSDEC and USEPA program documents for each analytical method (i.e., recreate laboratory calculations and data reporting in accordance with the method specific procedure).

The standard operating guideline manuals and any special analytical methodology required will specify documentation needs and technical criteria and will be taken into consideration in the validation process. Copies of the complete data package and the validation report, including the laboratory results data report sheets, with any qualifiers deemed appropriate by the data reviewer, and a supplementary field QC sample result summary statement, will be provided with the site investigation report.

The following is a description of the two-phased approach to data validation which will be used in the remedial investigation. The first phase is called checklisting and the second phase is the analytical quality review, with the former being a subset of the latter.

- Checklisting - The data package will be checked for correct submission of the contract required deliverables, correct transcription from the raw data to the required deliverable summary forms and proper calculation of a number of parameters.

- Analytical Quality Review - The data package will be closely examined to recreate the analytical process and verify that proper and acceptable analytical techniques have been performed. Additionally, overall data quality and laboratory performance will be evaluated by applying the appropriate data quality criteria to the data to reflect conformance with the specified, accepted QA/QC standards and contractual requirements.

At the completion of the data validation, a Summary Data Validation/Usability Report will be prepared as part of the site investigation report.

If the NYSDEC decides that a complete validation is not required, a Data Usability Summary Report (DUSR) will be prepared.

The DUSR is prepared by reviewing and evaluating the analytical data. The parameters to be evaluated in reference to compliance with analytical method protocols include all chain-of-custody forms, holding times, raw data (instrument print out data and chromatograms), calibrations, blanks, spikes, controls, surrogate recoveries, duplicates and sample data. If available, field sampling notes should also be reviewed and any quality control problems should be evaluated as to their effect on the usability of the sample data.

The DUSR shall describe the samples and analysis parameters reviewed. Data deficiencies, analytical protocol deviations and quality control problems shall be described and their effect on the data discussed.

Resampling and reanalysis recommendations will be made, if necessary. Data qualifications are documented for each sample analyte following the NYSDEC ASP 7/05 guidelines.

14.0 PERFORMANCE AND SYSTEM AUDITS

A NYSDOH ELAP certified laboratory which has satisfactorily completed performance audits and performance evaluation samples will be used to perform sample analyses for the investigation.

15.0 CORRECTIVE ACTION

A NYSDOH ELAP certified laboratory will meet the requirements for corrective action protocols, including sample “clean up” to attempt to eliminate/mitigate matrix interference.

The 2005 NYSDEC ASP includes both mandatory and optional sample cleanup and extraction methods. Cleanup is required by the 2005 NYSDEC ASP in order to meet contract required detection limits. There are several optional cleanup and extraction methods noted in the 2005 NYSDEC ASP. These include: florisil column cleanup, silica gel column cleanup, acid-base partition, steam distillation and sulfuric acid cleanup for PCB analysis.

High levels of matrix interference may be present in waste, soil and sediment samples. This interference may prevent the achievement of ASP detection limits if no target compounds are found. In order to avoid unnecessary dilutions, the optional cleanup methods noted in the 2005 NYSDEC ASP will be required to be performed by the laboratory as necessary.

It should be noted that if these optional cleanup and extraction methods are utilized, holding time requirements will not be exceeded due to negligence of the laboratory. Subsequent to selection of the analytical laboratory for this project, a meeting or conference call will be undertaken with the laboratory to discuss these issues and establish procedures to ensure effective and timely communications among all parties.

APPENDIX A

FIELD FORMS

db TRC
A Joint Venture

BORING LOG

BORING
SHEET OF

JOB NAME/ CLIENT	PROJECT NO.	AREA OF CONCERN	
ADDRESS		ELEVATION/DATUM	
DRILLING CONTRACTOR	DRILLER	INSPECTOR	
DRILLING RIG	TYPE/SIZE BIT	START DATE	END DATE
SAMPLER TYPE	HAMMER WEIGHT/DROP	TOTAL DEPTH	WATER LEVEL

SAMPLES			DEPTH	WATER	DESCRIPTION OF SOILS	REMARKS
NUMBER	RECOVERY IN FEET	BLOWS PER 6"			(SAA = Same As Above) f - fine m - medium c - coarse lt - light dk - dark tr - trace ltl - little	(PID, STAINING, ODORS, ETC.) FP = Free Product N/S = No Staining, N/O = No odors SO = Slight Odor, MO = Moderate Odor STO = Strong Odor
1						
			4			
2						
			8			
3						
			12			
4						
			16			
5						
			20			

A Joint Venture

Purging and Sampling Log

WELL NUMBER	WELL INFORMATION					Date:
MW	Well Diameter (inches)	Total (1) Depth (ft)	Depth to Water TOC (ft)	Depth to Product TOC (ft)	PID (ppm)	Personnel:
PERMIT NUMBER						Site Name:
NA						Site Location:
						Job Number:

(1) Use a previously determined total depth. Confirm the total depth of wel after sampling.
TOC = top of casing

PURGING INFORMATION							WATER QUALITY METER CALIBRATION READINGS		
Pump Type	Tubing Type	Pump (2) Intake Depth (ft)	Purge Start Time	Purge Stop Time	Flow Rate (ml/m)	Total Purge Vol. (L)	Temp:	pH:	Cond:
							D.O.:	ORP:	Turbidity:
							Rental Meter Name:		
							Rental Meter Serial No.:		

(2) Below TOC

PURGING PARAMETERS (measurements are to be taken approximately every 5 minutes)										
	Criteria:	<0.3 ft	± 3%	± 0.1 su	± 3%	± 10%	± 10 mv	± 10%(3)		
Time	Flow Rate (ml/m)	Depth to Water (ft)	Temp (ºC)	pH (su)	Cond (mS/cm)	D.O. (ppm)	ORP (mv)	Turbidity (NTU)	Initials	Water Conditions/Comments
Sample Name:			Sample Time:			Number of Bottles:				
Analytical Parameters:									Sample Start Time: Sample Finish Time:	
Weather Conditions:										

Revised 01/05

(3) For values greater than 1.
Note: Indicator parameters have stabilized when 3 consecutive readings taken every 5 mins are within criteria abov

FIELD CHANGE FORM

Project Name:_____

Project Number:_____ Field Change Number:_____

Location: _____ Date:_____

Field Activity Description:_____

_____

_____

_____

Reason for Change:_____

_____

_____

_____

Recommended Disposition:_____

_____

_____

_____

_____ _____

Field Operations Officer (D&B Consulting Engineers) (Signature) Date

Disposition:_____

_____

_____

_____

_____ _____

On-site Supervisor (NYSDEC) (Signature) Date

Distribution: Project Manager (D&B) Others as Required:_____
Project Manager (NYSDEC) _____
Field Operations Officer _____
On-site Supervisor (NYSDEC) _____

db TRC A Joint Venture	**Project No.:** **Project Name:**	**Test Pit No.:** **Sheet of** **By**:
Contractor: **Operator:** **Equipment:**	**Geologist:** **Test Pit Method:** **Date Started:** **Date Completed:**	**Test Pit Completion Depth:** **Ground Surface Elevation:** **Test Pit Dimension(s):**

Weather Conditions:

Depth *(ft.)*	OVA *(ppm)*	PID *(ppm)*	Description of Materials	Remarks
-0-				
-1-				
-2-				
-3-				
-4-				
-5-				
-6-				
-7-				
-8-				
-9-				
-10-				

NOTES:

Date: _____

SAMPLE INFORMATION RECORD

Site: _____ **Sample Crew:** _____

Sample Location/Well No. _____

Field Sample I.D. Number _____ **Time** _____

Weather _____ **Temperature** _____

Sample Type:

Groundwater _____ **Sediment** _____

Surface Water/Stream _____ **Air** _____

Soil _____ **Other (describe, i.e. water, septage, etc.)** _____

Well Information (fill out for groundwater samples)

Depth to Water _____ **Measurement Method** _____

Depth of Well _____ **Measurement Method** _____

Volume Removed _____ **Removal Method** _____

Field Test Results

Color _____ **pH** _____ **Odor** _____

Temperature (°F) _____ **Specific Conductance (umhos/cm)** _____

Other (OVA, Methane Meter, etc. _____

_____

Constituents Sampled

_____ _____ _____ _____

_____ _____ _____ _____

Remarks:

_____

_____

_____

Well Casing Volumes

GAL/FT	**1¼" = 0.077**	**2" = 0.16**	**3" = 0.37**	**4" = 0.65**
	1½ =0.10	**2½ " = 0.24**	**3½ = 0.50**	**6" = 1.46**

Date:

AIR MONITORING FORM

Project Name: _____

Project Number: _____ Instrument: _____

Recorded by: _____ Calibration Date: _____

Weather Conditions: _____

Time	Location	Wind Speed and Direction	Reading	Observations

Recording Procedures/Remarks: _____

Date: _____

LOCATION SKETCH

Project _____ Sample Crew _____

Sample(s) Locations(s) _____

Sample(s) and/or Well Number(s) _____

Location of sample points, wells, borings, etc., with reference to three permanent reference points. Measure all distances, clearly label roads, wells and permanent features.

N

Date: _____

DAILY FIELD ACTIVITY REPORT

Report Number: _____ Project Number: _____

Field Log Book Page Number: _____

Project: _____

Address: _____

Weather: (AM) _____ Rainfall: (AM) _____ Inches

(PM) _____ (PM) _____ Inches

Temperature: (AM) _____ ºF Wind Speed: (AM) _____ MPH Wind Direction: (AM) _____

(PM) _____ ºF (PM) _____ MPH (PM) _____

Site Condition: _____

Personnel On Site:	Name	Affiliation	Arrival Time	Departure Time

Subcontractor Work Commencement: (AM) _____ (PM) _____

Subcontractor Work Completion: (AM) _____ (PM) _____

Date: _____

DAILY FIELD ACTIVITY REPORT

Work Performed by subcontractor(s) (includes equipment and labor breakdown):

Date: _____

DAILY FIELD ACTIVITY REPORT

General work performed today by D&B Engineers:

List specific inspection(s) performed and results (include problems and corrective actions):

List type and location of tests performed and results (include equipment used and monitoring results):

Verbal comments received from subcontractor (include construction and testing problems, and recommendations/resulting actions):

Prepared by: _____ Reviewed by: _____

db TRC
A Joint Venture

WELL CONSTRUCTION LOG

WELL:

SHEET OF

PROJECT NAME: _____ WELL NUMBER: _____

ADDRESS: _____ DRILLING METHOD: _____

INSTALLATION DATE: _____ DRILLER: _____

DEVELOPMENT DATE: _____ GAUGING DATE: _____

HEIGHT OF STICK-UP: _____ DEPTH TO WATER[2]: _____

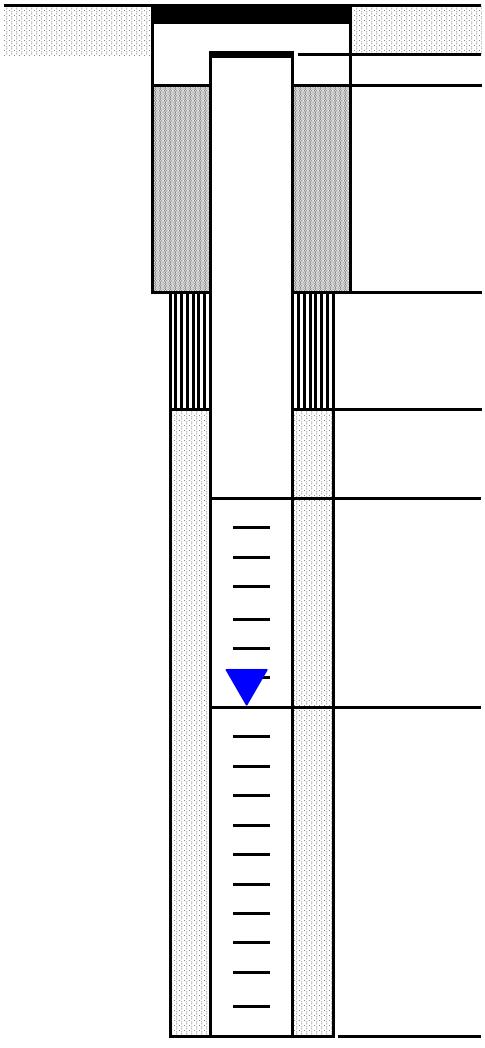
ELEVATION[1]: _____

DATUM: _____ DEPTH TO PRODUCT[2]: _____

CASING MATERIAL: _____ SCREEN MATERIAL: _____

FILTER PACK TYPE: _____ SEAL TYPE: _____

Depth from Ground Surface (feet)	Elevation[1]	
		Manhole Cover, Ground Surface
		Top of Casing (TOC)
		Top of Concrete Collar
		Top of Bentonite Slurry/Bottom of Concrete Collar
		Top of Sand Pack/ Bottom of Bentonite Slurry
		Top of Well Screen
		Slot Size: .
		Depth to Water
		End of Well Screen
		End of Boring



Not to Scale

Notes:

[1]Feet above datum

[2]Feet below top of casing

NOT TO SCALE

Date: _____

DAILY EQUIPMENT CALIBRATION LOG

Project Name: _____

Project Number: _____ Calibrated by: _____

Instrument Name and Model Number	Calibration Method	Time	Readings and Observations

MITKEM LABORATORIES

A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page _____ of _____

Special Handling:

TAT- Indicate Date Needed: _____

- All TATs subject to laboratory approval. Min. 24-hour notification needed for rushes.
- Samples disposed of after 30 days unless otherwise instructed.

Report To: _____

Project Mgr.: _____

Invoice To: _____

P.O. No.: _____ RQN: _____

Project No.: _____

Site Name: _____

Location: _____ State: _____

Sampler(s): _____

1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid 7=CH_3OH
8= $NaHSO_4$ 9=_____ 10=_____ 11= _____

List preservative code below:

Notes:

DW=Drinking Water GW=Groundwater WW=Wastewater
O=Oil SW= Surface Water SO=Soil SL=Sludge A=Air
X1=_____ X2=_____ X3=_____

G=Grab C=Composite

Lab Id:	Sample Id:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analyses:								

QA/QC Reporting Level

☐ Level I ☐ Level II
☐ Level III ☐ Level IV
☐ Other _____

State specific reporting standards:

_____

☐ E-mail to _____

EDD Format _____

_____

Condition upon receipt: ☐ Iced ☐ Ambient ☐ °C _____

Relinquished by:	Received by:	Date:	Time:

175 Metro Center Boulevard • Warwick, RI 02886-1755 • 401-732-3400 • Fax 401-732-3499 • www.mitkem.com

FIELD AUDIT FORM

Site: _____ Date: _____

Persons On-site: _____ QA/QC Officer Conducting Audit: _____

_____ Project: _____

_____

1. Is safety equipment in use (hardhats, respirators, gloves etc.): YES NO

2. Is a decontamination station, equipment and supplies on-site and in working order:

Methanol	YES	NO
Alconox	YES	NO
D.I. Water	YES	NO
Scrub Brushes	YES	NO
Steam Cleaner	YES	NO

Comments: _____

_____

_____

3. Is the decontamination pad set up so water is contained: YES NO

Comments: _____

_____

_____

4. Is the site/investigation areas secured (fence, markers, etc.) or otherwise in accordance with project requirements: YES NO

Comments: _____

_____

_____

FIELD AUDIT FORM
(continued)

5. Is contaminated material properly stored and in a secure area or otherwise in accordance with project requirements: YES NO
   Are the drums of waste (water, soil, ppe) labeled properly: YES NO

   Comments: _____

   _____

   _____

6. Are field forms filled out properly, legibly and timely:

Field Log Book	YES	NO
Chain of Custody	YES	NO
Equipment Calibration Log	YES	NO
Daily Field Activity Report	YES	NO
Location Sketch	YES	NO
Sample Information Record	YES	NO
Equipment Usage Form	YES	NO
Boring Logs	YES	NO

   Comments: _____

   _____

   _____

7. Is the proper sampling and field measurement equipment, including calibration supplies on-site: YES NO

   Comments: _____

   _____

   _____

FIELD AUDIT FORM
(continued)

8. Are there adequate sample containers, including deionized water for QA/QC:

Field Blanks	YES	NO
Trip Blanks	YES	NO

Comments: _____

_____

_____

9. Is the equipment decontaminated in accordance with project requirements:

Sampling equipment	YES	NO
Construction equipment	YES	NO

Comments: _____

_____

_____

10. Is field measurement equipment calibrated:

Daily	YES	NO
Properly	YES	NO

Comments: _____

_____

_____

11. Are samples collected and labeled properly: YES NO

Comments: _____

_____

_____

FIELD AUDIT FORM
(continued)

12. Are samples stored at 4°C: YES NO

Comments: _____

_____

_____

13. Are coolers properly sealed and packed for shipment including Chain of Custody taped to underside of lid: YES NO

Comments: _____

_____

_____

14. Is a copy of the Field Investigation Work Plan available on-site: YES NO

Comments: _____

_____

_____

15. Is a copy of each equipment manual on-site: YES NO

Comments: _____

_____

_____

16. Is a copy of the QA/QC Plan available on-site: YES NO

Comments: _____

_____

_____

FIELD AUDIT FORM
(continued)

17. Are investigation personnel familiar with the Work Plan and QA/QC Plan: YES NO

Comments: _____

_____

_____

18. Are quality control samples taken:

Trip Blanks	YES	NO
Field Blanks	YES	NO

19. Are samples shipped in a timely and appropriate manner: YES NO

Comments: _____

_____

_____

20. Has the laboratory been contacted regarding planned shipment of samples: YES NO

Comments: _____

_____

_____

21. Certification - Based upon my audit at the above project, I hereby certify/do not certify compliance with QA/QC requirements for the project:

_____ _____

Dated Signed

FIELD AUDIT FORM
(continued)

General Comments: _____

_____

_____

_____

APPENDIX B

NYSDEC SAMPLE IDENTIFICATION, PREPARATION AND ANALYSIS SUMMARY FORMS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-I

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

NYSDEC Sample ID/Code	Laboratory Sample ID/Code	Analytical Requirements					
		VOA GC/MS (Method #)	BNA GC/MS (Method #)	VOA GC (Method #)	Pest PCBs (Method #)	Metals (Method #)	Other (Method #)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IIa

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IIb

SAMPLE PREPARATION AND ANALYSIS SUMMARY
VOLATILE (VOA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IIc

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-III

SAMPLE PREPARATION AND ANALYSIS SUMMARY
MISCELLANEOUS ORGANIC
ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	Dil/Conc Factor

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

FORM S-IV

SAMPLE PREPARATION AND ANALYSIS SUMMARY
INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Metals Requested	Date Rec'd at Lab	Date Digested	Date Analyzed

APPENDIX C

TARGET COMPOUND AND TARGET ANALYTE LISTS

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples

	Volatile Analyte	CAS Number	Trace Water By SIM (µg/L)	Trace Level Water (µg/L)	Low Level Water (µg/L)
1.	Dichlorodifluoromethane	75-71-8		0.50	5.0
2.	Chloromethane	74-87-3		0.50	5.0
3.	Vinyl Chloride	75-01-4		0.50	5.0
4.	Bromomethane	74-83-9		0.50	5.0
5.	Chloroethane	75-00-3		0.50	5.0
6.	Trichlorofluoromethane	75-69-4		0.50	5.0
7.	1,1-Dichloroethene	75-35-4		0.50	5.0
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		0.50	5.0
9.	Acetone	67-64-1		5.0	10.0
10.	Carbon Disulfide	75-15-0		0.50	5.0
11.	Methyl Acetate	79-20-9		0.50	5.0
12.	Methylene chloride	75-09-2		0.50	5.0
13.	trans-1,2-Dichloroethene	156-60-5		0.50	5.0
14.	Methyl tert-Butyl Ether	1634-04-4		0.50	5.0
15.	1,1-Dichloroethane	75-34-3		0.50	5.0
16.	cis-1,2-Dichloroethene	156-59-2		0.50	5.0
17.	2-Butanone	78-93-3		5.0	10.0
18.	Bromochloromethane	74-97-5		0.50	5.0
19.	Chloroform	67-66-3		0.50	5.0
20.	1,1,1-Trichloroethane	71-55-6		0.50	5.0
21.	Cyclohexane	110-82-7		0.50	5.0
22.	Carbon tetrachloride	56-23-5		0.50	5.0
23.	Benzene	71-43-2		0.50	5.0
24.	1,2-Dichloroethane	107-06-2		0.50	5.0
25.	1,4-Dioxane	123-91-1	1.0	25	125
26.	Trichloroethane	79-01-6		0.50	5.0

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Volatile Analyte	CAS Number	Trace Water By SIM (µg/L)	Trace Level Water (µg/L)	Low Level Water (µg/L)
27.	Methylcyclohexane	108-87-2		0.50	5.0
28.	1,2-Dichloropropane	78-87-5		0.50	5.0
29.	Bromodichloromethane	75-27-4		0.50	5.0
30.	cis-1,3-Dichloropropene	10061-01-5		0.50	5.0
31.	4-methyl-2-pentanone	108-10-1		5.0	10.0
32.	Toluene	108-88-3		0.50	5.0
33.	Trans-1,3-Dichloropropene	10061-02-6		0.50	5.0
34.	1,1,2-Trichloroethane	79-00-5		0.50	5.0
35.	Tetrachloroethene	127-18-4		0.50	5.0
36.	2-Hexanone	591-78-6		5.0	10.0
37.	Dibromochloromethane	124-48-1		0.50	5.0
38.	1,2-Dibromoethane	106-93-4	0.05	0.50	5.0
39.	Chlorobenzene	108-90-7		0.50	5.0
40.	Ethylbenzene	100-41-4		0.50	5.0
41.	Xylenes (Total)	1330-20-7		0.50	5.0
42.	Styrene	100-42-5		0.50	5.0
43.	Bromoform	75-25-2		0.50	5.0
44.	Isopropylbenzene	98-82-8		0.50	5.0
45.	1,1,2,2-Tetrachloroethane	79-34-5		0.50	5.0
46.	1,3-Dichlorobenzene	541-73-1		0.50	5.0
47.	1,4-Dichlorobenzene	106-46-7		0.50	5.0
48.	1,2-Dichlorobenzene	95-50-1		0.50	5.0
49.	1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.50	5.0
50.	1,2,4-Trichlorobenzene	120-82-1		0.50	5.0
51.	1,2,3-Trichlorobenzene	87-61-6		0.50	5.0

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
1.	Benzaldehyde	100-52-7		5.0
2.	Phenol	108-95-2	0.10	5.0
3.	Bis-(2-chlorothyl) ether	111-44-4		5.0
4.	2-Chlorophenol	95-57-8	0.10	5.0
5.	2-Methylphenol	95-48-7	0.10	5.0
6.	2,2'-Oxybis (1-chloropropane)[3]	108-60-1		5.0
7.	Acetophenone	98-86-2		5.0
8.	4-Methylphenol	106-44-5	0.10	5.0
9.	N-Nitroso-di-n-propylamine	621-64-7		5.0
10.	Hexachloroethane	67-72-1		5.0
11.	Nitrobenzene	98-95-3		5.0
12.	Isophorone	78-59-1		5.0
13.	2-Nitrophenol	88-75-5	0.10	5.0
14.	2,4-Dimethylphenol	105-67-9	0.10	5.0
15.	Bis (2-chloroethoxy) methane	111-91-1		5.0
16.	2,4-Dichlorophenol	120-83-2	0.10	5.0
17.	Naphthalene	91-20-3	0.10	5.0
18.	4-Chloroaniline	106-47-8		5.0
19.	Hexachlorobutadiene	87-68-3		5.0
20.	Caprolactam	105-60-2		5.0
21.	4-Chloro-3-methylphenol	59-50-7	0.10	5.0
22.	2-Methylnaphthalene	91-57-6		5.0
23.	Hexachlorocyclopentadiene	77-47-4		5.0
24.	2,4,6-Trichlorophenol	88-06-2	0.10	5.0
25.	2,4,5-Trichlorophenol[4]	95-95-4	0.20	10.0
26.	1,1'-Biphenyl	92-52-4		5.0
27.	2-Chloronaphthalene	91-58-7		5.0

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
28.	2-Nitroaniline[4]	88-74-4		10.0
29.	Dimethylphthalate	131-11-3		5.0
30.	2,6-Dinitrotoluene	606-20-2		5.0
31.	Acenaphthylene	208-96-8	0.10	5.0
32.	3-Nitroaniline[4]	99-09-2		10.0
33.	Acenaphthene	83-32-9	0.10	5.0
34.	2,4-Dinitrophenol[4]	51-28-5	0.20	10.0
35.	4-Nitrophenol[4]	100-02-7	0.20	10.0
36.	Dibenzofuran	132-64-9		5.0
37.	2,4-Dinitrotoluene	121-14-2		5.0
38.	Diethylphthalate	84-66-2		5.0
39.	Fluorene	86-73-7	0.10	5.0
40.	4-Chlorophenyl-phenyl ether	7005-72-3		5.0
41.	4-Nitroaniline[4]	100-01-6		10.0
42.	4,6-Dinitro-2-methylphenol[4]	534-52-1	0.20	10.0
43.	N-Nitrosodiphenylamine	86-30-6		5.0
44.	1,2,4,5-Tetrachlorobenzene	95-34-3		5.0
45.	4-Bromophenyl-phenylether	101-55-3		5.0
46.	Hexachlorobenzene	100-52-7		5.0
47.	Atrazine	108-95-2	0.10	5.0
48.	Pentachlorophenol	111-44-4	0.20	10.0
49.	Phenanthrene	95-57-8	0.10	5.0
50.	Anthracene	95-48-7	0.10	5.0
51.	Carbazole	108-60-1		5.0
52.	Di-n-butylphthalate	98-86-2		5.0

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
53.	Fluoroanthene	106-44-5	0.10	5.0
54.	Pyrene	621-64-7		5.0
55.	Butylbenzylphthalate	67-72-1		5.0
56.	3,3'-Dichlorobenzidine	98-95-3		5.0
57.	Benzo (a) anthracene	78-59-1		5.0
58.	Chrysene	88-75-5	0.10	5.0
59.	Bis (2-ethylhexyl) phthalate	105-67-9	0.10	5.0
60.	Di-n-octylphthalate	111-91-1		5.0
61.	Benzo (b) fluoranthene	120-83-2	0.10	5.0
62.	Benzo (k) fluoranthene	91-20-3	0.10	5.0
63.	Benzo (a) pyrene	106-47-8		5.0
64.	Indeno (1,2,3-cd) pyrene	87-68-3		5.0
65.	Benzo (a,h) anthracene	105-60-2		5.0
66.	Benzo (g,h,i) perylene	59-50-7	0.10	5.0

Semivolatile Notes

[1] CRQLs for optional analysis of water and soil samples using SIM (Selected Ion Monitoring) techniques for PAHs and phenols.

[2] Denotes soil, sediment, tissue, or mixed phase samples.

[3] Previously known as bis (2-Chloroisoproply) ether.

[4] Seven semivolatile compounds are calibrated using only a four point initial calibration, eliminating the lowest standard. Therefore, the CRQL values for these eight compounds are 2 times higher for all matrices and levels.

Pesticide Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples

	Pesticide Analyte	CAS Number	Water (µg/L)	Solids[1] (µg/Kg)
1.	alpha-BHC	319-84-6	0.050	1.7
2.	beta-BHC	319-85-7	0.050	1.7
3.	delta-BHC	319-86-8	0.050	1.7
4.	gamma-BHC (Lindane)	58-89-9	0.050	1.7
5.	Heptachlor	76-44-8	0.050	1.7
6.	Aldrin	309-00-2	0.050	1.7
7.	Heptachlor epoxide[2]	1024-57-3	0.050	1.7
8.	Endosulfan I	959-98-8	0.050	1.7
9.	Dieldrin	60-57-1	0.10	3.3
10.	4,4'-DDE	72-55-9	0.10	3.3
11.	Endrin	72-20-8	0.10	3.3
12.	Endosulfan II	33213-65-9	0.10	3.3
13.	4,4'-DDD	72-54-8	0.10	3.3
14.	Endosulfan sulfate	1031-07-8	0.10	3.3
15.	4,4'-DDT	50-29-3	0.10	3.3
16.	Methoxychlor	72-43-5	0.10	3.3
17.	Endrin ketone	53494-70-5	0.10	3.3
18.	Endrin aldehyde	7421-93-4	0.10	3.3
19.	alpha-Chlordane	5103-71-9	0.050	1.7
20.	gamma-Chlordane	5103-74-2	0.050	1.7
21.	Toxaphene	8001-35-2	5.0	34

Pesticide Notes

[1] There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of pesticides.

[2] Only the exo-epoxy isomer (isomer B) of heptachlor epoxide is reported on the data reporting forms (Exhibit B).

PCB Aroclor Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples

	Aroclor Analyte	CAS Number	Water (µg/L)	Solids[1] (µg/Kg)
1.	Arochlor-1016	12674-11-2	1.0	33
2.	Arochlor-1221	11104-28-2	1.0	33
3.	Arochlor-1232	11141-16-5	1.0	33
4.	Arochlor-1242	53469-21-9	1.0	33
5.	Arochlor-1248	12672-29-6	1.0	33
6.	Arochlor-1254	11097-69-1	1.0	33
7.	Arochlor-1260	11096-82-5	1.0	33
8.	Arochlor-1262	37324-23-5	1.0	33
9.	Arochlor-1268	11100-14-4	1.0	33

Aroclor PCB Notes

[1] There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of Aroclor PCBs.

Inorganic Target Compound List (TCL) and Contract Required Quantitation Limits (CRQLs) For Aqueous and Solid Samples

	Analyte	CAS Number	ICP-AES[1] CRQL for Water (µg/L)	ICP-AES[1] CRQL for Solids (mg/Kg)	ICP-MS[1] for Water (µg/L)
1.	Aluminum	7429-90-5	200	40	30
2.	Antimony	7440-36-0	60	12	2
3.	Arsenic	7440-38-2	15	3	1
4.	Barium	7440-39-3	200	40	10
5.	Beryllium	7440-41-7	5	1	1
6.	Cadmium	7440-43-9	5	1	1
7	Calcium	7440-70-2	5000	1000	--
8.	Chromium	7440-47-3	10	2	2
9.	Cobalt	7440-48-4	50	10	0.5
10.	Copper	7440-50-8	25	5	2
11.	Iron	7439-89-6	100	20	--
12.	Lead	7439-92-1	10	2	1
13.	Magnesium	7439-95-4	5000	1000	--
14.	Manganese	7439-96-5	15	3	0.5
15.	Mercury[2]	7439-97-6	0.2	0.1	--
16.	Nickel	7440-02-0	40	8	1
17.	Potassium	7440-09-7	5000	1000	--
18.	Selenium	7782-49-2	35	7	5
19.	Silver	7440-22-4	10	2	1
20.	Sodium	7440-23-5	5000	1000	--
21.	Thallium	7440-28-0	25	5	1
22.	Vanadium	7440-62-2	50	10	1
23.	Zinc	7440-66-6	60	12	1
24.	Cyanide[2]	57-12-5	10	1	--

Inorganic Notes

[1] Any analytical method specified in Exhibit D, may be utilized as long as the documented instrument or method detection limits (IDLs or MDLs) are less than one half the Contract Required Quantitation Level (CRQL) requirements. Higher quantitation levels may only be used in the following circumstance:

If the sample concentration exceeds five times the quantitation limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the Contract Required Quantitation Limit. This is illustrated in the example below:

For lead:
Method in use = ICP
Instrument Detection Limit (IDL) = 40
Sample concentration = 220
Contract Required Quantitation Level (CRQL) = 3

The value of 220 may be reported even though instrument detection limit is greater than Contract Required Quantitation Limit. The instrument or method detection limit must be documented as described in Exhibit E.

[2] Mercury is analyzed by cold vapor atomic absorption. Cyanide is analyzed by colorimetry/spectrophotometry.