# PERIODIC REVIEW REPORT (2013)
# LUDLOW'S SAND AND GRAVEL
# NYSDEC SITE NO. 633014

# WORK ASSIGNMENT NO. D007619-24

**Prepared for:**

## New York State Department of Environmental Conservation
**Albany, New York**

**Prepared by:**

**MACTEC Engineering and Consulting, P.C.**
**Portland, Maine**

**MACTEC: 3612132273**

**FEBRUARY 2014**

**Enclosure 1**
**Engineering Controls - Standby Consultant/Contractor Certification Form**

**Site Details** **Box 1**

**Site No. 633014**

**Site Name Ludlow's Sand and Gravel**

Site Address: HOLMAN CITY ROAD Zip Code: 13322
City/Town: Paris T
County: Oneida
Site Acreage: 20.0

Reporting Period: January 1, 2011 to December 31, 2013

| | YES | NO |
|---|---|---|
| 1. Is the information above correct? | ☒ | ☐ |
| If NO, include handwritten above or on a separate sheet. | | |
| 2. To your knowledge has some or all of the site property been sold, subdivided, merged, or undergone a tax map amendment during this Reporting Period? | ☐ | ☒ |
| 3. To your knowledge has there been any change of use at the site during this Reporting Period (see 6NYCRR 375-1.11(d))? | ☐ | ☒ |
| 4. To your knowledge have any federal, state, and/or local permits (e.g., building, discharge) been issued for or at the property during this Reporting Period? | ☐ | ☒ |
| **If you answered YES to questions 2 thru 4, include documentation or evidence that documentation has been previously submitted with this certification form.** | | |
| 5. To your knowledge is the site currently undergoing development? | ☐ | ☒ |

**Box 2**

| | YES | NO |
|---|---|---|
| 6. Is the current site use consistent with the use(s) listed below? Closed Landfill | ☒ | ☐ |
| 7. Are all ICs/ECs in place and functioning as designed? | ☒ | ☐ |

**IF THE ANSWER TO EITHER QUESTION 6 OR 7 IS NO, sign and date below and contact the DEC PM regarding the development of a Corrective Measures Work Plan to address these issues.**

Mark Stelmack February 6, 2014

**SITE NO. 633014** **Box 3**

**Description of Institutional Controls**

| Parcel | Owner | Institutional Control |
|---|---|---|
| **377.000-2-31.2** | Ludlows Sand and Gravel Co., Inc. | Soil Management Plan<br>Landuse Restriction<br>Ground Water Use Restriction<br>Monitoring Plan<br>Site Management Plan<br>O&M Plan<br>IC/EC Plan |

The property is subject to an environmental easement (EE)filed with Oneida County. The EE specifies restrictions on landuse and groundwater use. In addition, the parcel is regulated by a site management plan (SMP) with an IC/EC plan, a soil management plan, a monitoring plan and an O&M plan.

| | | |
|---|---|---|
| **377.000-2-32** | Ludlows Sanitary Landfill, Inc. | Ground Water Use Restriction<br>Landuse Restriction<br>Building Use Restriction<br>Monitoring Plan<br>Site Management Plan<br>O&M Plan<br>IC/EC Plan |

The property is subject to an environmental easement(EE)filed with Oneida County. The EE specifies restrictions on landuse and groundwater use. In addition, the parcel is regulated by a site management plan (SMP) with an IC/EC plan, a soil management plan, a monitoring plan and an O&M plan.

| | | |
|---|---|---|
| **377.000-2-34** | Ludlows Sanitary Landfill | Soil Management Plan<br>Monitoring Plan<br>Site Management Plan<br>O&M Plan<br>IC/EC Plan<br>Ground Water Use Restriction<br>Landuse Restriction |

The property is subject to an environmental easement (EE)filed with Oneida County. The EE specifies restrictions on landuse and groundwater use. In addition, the parcel is regulated by a site management plan (SMP) with an IC/EC plan, a soil management plan, a monitoring plan and an O&M plan.

| | | |
|---|---|---|
| **378.000-1-11** | Ludlows Sand and Gravel Co., Inc. | Landuse Restriction |

The property is subject to an environmental easement (EE)filed with Oneida County. The EE specifies restrictions on landuse and groundwater use. In addition, the parcel is regulated by a site management plan (SMP) with an IC/EC plan, a soil management plan, a monitoring plan and an O&M plan.

**Box 4**

**Description of Engineering Controls**

| Parcel | Engineering Control |
|---|---|
| **377.000-2-31.2** | Cover System |
| Monitoring Well Network | |
| Vegetated cover at the North Gravel Pit (NGP) filled area. | |
| **377.000-2-32** | Cover System<br>Leachate Collection<br>Fencing/Access Control |
| The main engineering control (EC) is an engineered landfill cover system with gas venting and a leachate collection system. The site also has access control (fencing) and a network of groundwater monitoring wells. The leachate collection and treatment system is not currently being operated. | |
| **377.000-2-34** | Cover System<br>Leachate Collection<br>Fencing/Access Control |
| The main engineering control (EC) is an engineered landfill cover system with gas venting and a leachate collection system. The site also has access control (fencing) and a network of groundwater monitoring wells. The leachate collection and treatment system is not currently being operated. | |

Box 5

**Periodic Review Report (PRR) Certification Statements**

1. I certify by checking "YES" below that:

   a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification, including data and material prepared by previous contractors for the current certifying period, if any;

   b) 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 is accurate and compete.

| YES | NO |
|---|---|
| ☒ | ☐ |

2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:

   (a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;

   (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;

   (c) nothing has occurred that would constitute a failure to comply with the Site Management Plan, or equivalent if no Site Management Plan exists.

| YES | NO |
|---|---|
| ☒ | ☐ |

**IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and contact the DEC PM regarding the development of a Corrective Measures Work Plan to address these issues.**

Mark Stilmack
Signature of Standby Consultant/Contractor

February 6, 2014
Date

## IC/EC CERTIFICATIONS

Box 6

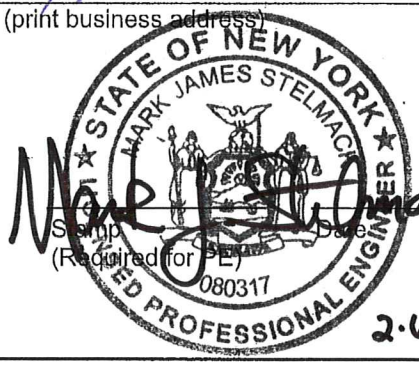
### Professional Engineer Signature

I certify that all information in Boxes 2 through 5 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 Mark Stelmack at MACTEC Engineering & Consulting, PC
print name

511 Congress St., Suite 200
Portland, ME 04101
(print business address)

am certifying as a Professional Engineer.




Signature of Professional Engineer

Stamp (Required for PE)

Date 2·6·14

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Prepared for:

New York State Department of Environmental Conservation
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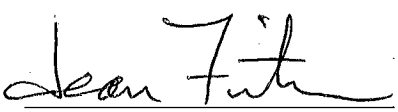
FEBRUARY 2014

Submitted by:



Jean Firth, C.G.
Project Manager

Approved by:

Mark J. Stelmack, P.E.
Principal Professional

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## GLOSSARY OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| EC | engineering controls |
| FDR | field data record |
| IC | institutional controls |
| LTM | long term monitoring |
| MACTEC | MACTEC Engineering and Consulting, P.C. |
| NGP | North Gravel Pit |
| NYS | New York State |
| NYSDEC | New York State Department of Environmental conservation |
| OU | operable unit |
| PCBs | polychlorinated biphenyls |
| ppm | part(s) per million |
| PRR | Periodic Review Report |
| ROD | Record of Decision |
| Site | Ludlow's Sand and Gravel site |
| SM | site management |
| SMP | site management plan |
| TAL | target analyte list |
| USEPA | United States Environmental Protection Agency |
| VOC | volatile organic compound |

## EXECUTIVE SUMMARY

The Ludlow's Sand and Gravel (Site No. 633014; herein referred to as the Site) is a 21-acre site located at 2000 Holman City Road in Paris, approximately six miles south of Utica in Oneida County, New York. The Site is comprised of two waste disposal areas, an approximately 20 acre closed landfill and a one acre gravel pit (North Gravel Pit [NGP]). The Site was remediated in accordance with the Record of Decision (ROD) for Operable Unit 1 (OU1) the landfill site (referred to as "source control" in the ROD) (United States Environmental Protection Agency, 1988). Another ROD for OU2 NGP (referred to as "Off-site Impacts" in the 1988 ROD) was signed on March 2003 (New York State Department of Environmental Conservation [NYSDEC], 2003). OU 1 includes an engineered landfill cover system which overlies wastes contaminated with polychlorinated biphenyls (PCBs), volatile organic compounds, phenols and metals. OU2 consists of PCB contaminated soil that was solidified in place. Remedial requirements in the RODs for the Site were established to prevent direct contact with contaminated soil and/or groundwater, and to prevent contaminated surface water and groundwater from migrating off-site. In accordance with the Site Management (SM) Plan (MACTEC Engineering and Consulting, P.C. [MACTEC], 2013), current SM requirements for monitoring the performance and effectiveness of the remedial measures completed at the Site consist of semi-annual Site inspections and environmental monitoring at 15-month intervals.

This Periodic Review Report summarizes SM activities completed at the Site during 2013 and includes an evaluation of the effectiveness of the remedial actions. During the reporting period, SM requirements were met. Although concentrations of metals and phenols in site media are above the New York State standards, the remedial requirements for the Site are being achieved. MACTEC concludes that the remedy for the Site is appropriate, and added measures to current SM requirements are not recommended at this time.

# 1.0 SITE HISTORY

The Ludlow's Sand and Gravel site (Site) is located at 2000 Holman City Road in Paris, approximately six miles south of Utica in Oneida County, New York (Figure 1.1). The Site is comprised of two waste disposal areas, an approximately 20 acre closed landfill which is enclosed by a chain link fence and a one acre gravel pit. The landfill accepted municipal and industrial wastes including bulk liquid waste containing polychlorinated biphenyls (PCBs). The one acre North Gravel Pit, a portion of Operable Unit 2 (OU2) located approximately 900 feet north of the landfill (at 2000 Holman City Road), was also periodically used for waste oil disposal. A site plan is shown on Figure 1.2

The Site is bound to the west by Holman City Road and to the east by Mohawk Street. Surrounding the landfill is an operational gravel pit, rural residential property and agricultural land. The landfill (OU1) abuts a New York State (NYS) designated wetland to the south and east (New York State Department of Environmental Conservation [NYSDEC], 1998).

The Site was owned by James Ludlow and operated as a landfill and gravel pit beginning in the late 1960's. The Site includes a closed landfill covering an approximate 20 acre area that accepted municipal and industrial wastes from the 1960's until 1988, including industrial wastes containing PCBs.

Remedial investigation/feasibility study investigations were conducted from 1986 to 1988 by O'Brien and Gere Consulting Engineers, Dunn Geoscience, and Camp Dresser and McKee Inc. Results of these investigations indicate that landfill materials are contaminated with volatile organic compounds (VOCs) ranging from 0.012 to 657 parts per million (ppm) total VOCs, PCBs at concentrations of up to 6,100 ppm, and total phenols (semi-VOCs) ranging from less than 0.1 to 89 ppm. During these investigations samples of landfill leachate, wetland sediments, and surface water were observed to contain PCBs. Groundwater monitoring wells exhibited low level detections of metals and organic compounds.

## 2.0 SITE MANAGEMENT STATUS

This Periodic Review Report (PRR) documents the site management (SM) activities conducted by MACTEC Engineering and Consulting, P.C. (MACTEC) and its subcontractors during 2013:

- October 2013 water level measurements
- October 2013 Site Inspection
- October 2013 Long Term Monitoring (LTM)
- November 2013 installation of groundwater monitoring wells

This PRR was completed using site specific documentation, which includes the Site's Records of Decision (RODs) (United States Environmental Protection Agency [USEPA], 1988 and NYSDEC, 2003), and the Site Management Plan (SMP) (MACTEC, 2013) October 2013 LTM results, the 2013 October 2013 Inspection Report (MACTEC, 2013a) and Field Data Records (FDRs) for installation of the new monitoring wells. This PRR was prepared to document that established controls required by the SMP are operational and effective, that the SMP is being implemented and conducted accordingly, and that the remedy remains protective of the environment and/or public health.

SM requirements as detailed in the SMP are provided in Table 2.1. These include:

- semi-annual review/inspection of institutional/engineering controls (IC/EC) at the Site, and
- LTM and analysis of groundwater, surface water, water from components of the leachate collection system and drinking water supply wells (Figure 2.1).

Existing shallow and deep monitoring wells are monitored to evaluate contaminant concentrations in groundwater as compared to site cleanup goals (NYS Class GA Standards [6 New York Codes, Rules and Regulations (6 NYCRR) Parts 700-705] for VOCs, target analyte list [TAL] metals and PCBs (NYSDEC, 1999). Surface water sample results are monitored for comparison to site cleanup goals PCBs (Technical and Operational Guidance Series 1.1.1, "Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations" [NYSDEC, 1998]). Private and public drinking water supply wells are monitored to confirm that site related contaminants are not present at levels exceeding the GA Standards.

SM activities completed during the reporting period and an evaluation of the performance, protectiveness, and effectiveness of the remedy are summarized below.

## 2.1 INSTITUTIONAL CONTROLS/ENGINEERING CONTROLS PLAN

Because contaminated soil exists beneath the ground surface, IC/ECs are required to protect human health and the environment. ICs required per the Declaration of Environmental Covenants, Restrictions and Environmental Easement (Oneida County, 2013) include:

- Activities that could affect the integrity of the landfill cover including without limitation, excavation, digging, and construction activities are prohibited on any portion of the Controlled Property unless NYSDEC and USEPA have given their prior written consent to any such intrusive activity.
- Groundwater wells for drinking water shall not be installed or used on any portion of the Site.
- The Site shall not be used for "Residential Use" or "Restricted Residential Use" as defined by NYSDEC Regulation 6 NYCRR Part 375 – 1.8(g)(2)(i) and (ii). Allowable uses include "Commercial Use" and "Industrial Use" as defined in NYSDEC Regulations 6 NYCRR Part 375 – 1.8(g)(2)(iii) and (iv).
- Vegetable gardens and farms including cattle and dairy farming are prohibited on the Site.
- All future activities on the Site that will disturb remaining contaminated material are prohibited unless they are conducted in accordance with the SMP.
- The Site may not be used for a less restrictive use without additional remediation and amendment of the SMP by the NYSDEC.
- NYSDEC retains the right to access the Site at any time in order to evaluate the continued maintenance of any and all controls.

ECs at OU1 include:

- an engineered landfill cover system,
- site access controls,
- a landfill gas collection system, and
- the Site storm water drainage system.

Exposure to remaining contamination in soil/waste at the Site is prevented by an engineered landfill cover system placed over a portion of the Site. The road providing access to the landfill area is equipped with locked gates. The site is enclosed by a perimeter fence to restrict access by

animals, people, and vehicles, thus preventing damage to the cover system. These controls prevent trespassing on the Site, limit future development at the Site, and prevent direct contact with the contaminated soil/waste. The storm water drainage system consists of surface drainage swales which divert surface water flow off of the landfill.

ECs at OU2 include:

- a cover system, and
- control of surface erosion and run-off.

Exposure to remaining contamination at OU2 is prevented by a soil cover; erosion and drainage are controlled by a culvert which prevents surface water from flowing across the Site.

During the reporting period, the ECs at OU1 were inspected in October 2013 in accordance with the SMP. These controls are in place; however during the site inspection the following conditions were noted:

- Most of the wells were missing locks;
- The northeast entrance gate does not have a lock;
- The standpipes at manhole MH-15 and vents G-1, V-1 and V-9 are missing;
- Monitoring well protective casing caps and concrete collars are damaged or missing as listed on Table 2.2.

In addition, there continues to be areas of rutting and ponding on the Site. A site walk was held in October to review each of the areas to evaluate potential corrective actions. A technical memo with the findings of this site walk and alternatives for repairing each area will be prepared by MACTEC and submitted to the NYSDEC in 2014.

There are currently no requirements in the SMP for inspections at OU2.

## 2.2 LONG TERM MONITORING PLAN

The LTM program detailed in the SMP includes groundwater elevation monitoring; monitoring well inventory and repair; groundwater sampling and analysis; surface water sampling and analysis; and private and public water supply monitoring. Since January 2008, monitoring locations have been sampled at 15 month intervals (see Table 2.1). The LTM program was

conducted between October 14 and 17, 2013. The Site monitoring locations are shown on Figure 2.1. Table 2.3 summarizes the sampling and analysis plan for site monitoring locations.

### 2.2.1 Groundwater Elevation Monitoring

Groundwater elevations obtained from the site monitoring wells are summarized in Table 2.4. As shown on Figures 2.2 and 2.3, groundwater elevations measured during the reporting period illustrate a southwest groundwater flow direction from the landfill towards Holman City Road.

### 2.2.2 Monitoring Well Inventory and Repair

During the inspection/monitoring event conducted in October several monitoring wells were noted as needing repairs to concrete collars and stand pipes (Table 2.2). In November 2013 three new monitoring wells (MW-101, MW-102 and MW-103) shown on Figure 2.1, were installed upgradient of OU1 to provide:

- upgradient monitoring locations, and better distributed monitoring points for evaluation of groundwater flow.

FDRs for the monitoring wells installed in November are included in Appendix A. Appendix B includes photos taken during the 2013 inspection event.

### 2.2.3 Environmental Sampling and Analysis

Samples of groundwater, surface water, and water from the leachate collection system were collected in October 2013 and were analyzed for VOCs, PCBs, phenols and TAL metals.

Compounds detected in these samples were tabulated and compared to applicable NYS criteria. Environmental monitoring results in excess of NYS standards are discussed below and presented in Tables 2.5, 2.6, and 2.7 and are shown on Figure 2.4.

#### 2.2.3.1 Groundwater and "Other Water"

During the reporting period, 24 water samples were collected from the Site. Groundwater monitoring wells were sampled using low flow sampling techniques and the "other water" samples

(MH-manhole and PS- pump station) were grab samples. Samples were collected and analyzed as follows:

- OU1 – 14 groundwater monitoring wells and two "other water" samples for VOCs by USEPA Method 8260, phenols by method 8270, PCBs by method 8082, and TAL metals by USEPA Method 6010B/7470.
- OU2 – eight groundwater monitoring wells for PCBs by method 8082.

Three monitoring wells at OU1 had detections of VOCs. Of the four VOCs detected, toluene was the only compound detected above the GA standard. 4-Chloro-3-methylphenol was also detected in MW-06D at a concentration exceeding the GA standard. Metals, including antimony, iron, manganese, magnesium, and sodium were detected above NYS GA standards in all but one monitoring well sampled at OU 1. Exceedances are shown on Figure 2.4

Iron and manganese were detected above the GA standard in both the MH-1 and PS-2 ("other water") samples. 4-methyl phenol was also detected above the standard in MH-1. Exceedances are shown on Figure 2.4

A comparison to historical results of the contaminants which exceed the GA standards in 2013 for OU 1 are presented in Table 2.8.

Monitoring well samples from OU 2 were non-detect for PCBs.

2.2.3.2 Surface Water

One surface water sample was collected in October 2013, from the wetland at the southern end of the landfill in accordance with the SMP and analyzed for PCBs; no PCBs were detected.

2.2.3.3 Drinking Water Supply Wells

Three private residential and one public water supply (Clayville) well samples were collected on October 18th in accordance with the SMP. Samples were analyzed for VOCs, TAL metals and PCBs. No VOCs or PCBs were detected. Several metals were detected, however only iron was detected above the GA standard, in PW-26.

## 2.3 O&M PLAN

According to the SMP, inspections of OU 1 are required semi-annually and include inspection of the landfill cover system, stormwater collection and drainage, landfill gas vents, and monitoring wells.

During the reporting period an inspection was conducted in October 2013 in accordance with the SMP as shown in Table 2.1. The Site's SMP requirements have been met with respect to content and the frequency at which the tasks are performed since the Work Assignment was issued in August 2013. Inspection observations were recorded using Post Closure Inspection Forms, photographic logs, and field notes included with the Semi-annual Inspection Reports – October 2013 (MACTEC, 2013). Findings are discussed in Section 2.1 of this report.

# 3.0 CONCLUSIONS AND RECOMMENDATIONS

Current SM activities being conducted at the Site are in compliance with the requirements of the Site's SMP (see Table 2.1). As shown in Tables 2.5 and 2.6, results from the 2013 monitoring event show that concentrations of several metals in groundwater at the Site exceed established guidance values at monitoring well locations throughout OU 1. Figure 2.4 illustrates the location and distribution of these exceedances at the Site. Drinking water supply well results did not exceed the guidance values for VOCs, and PCBs were not detected; however, iron was detected above the GA standard, in PW-26. The surface water sample collected from the wetland south of the Site was non-detect for PCBs. These findings are similar to those reported previously for the Site with respect to location and distribution of contaminants above guidelines.

Groundwater elevations measured at the Site continue to illustrate an interpreted groundwater flow direction from the landfill to the west towards Holman City Road (see Figures 2.2 and 2.3). Groundwater from the Site is interpreted to flow away from adjacent residences. Based on the interpreted groundwater flow direction and presence of public utilities (sewer and water) in the vicinity of the Site, adverse affects from the groundwater on the residences is unlikely.

Based on the findings presented in this PRR, the following recommendations are provided:

ICs/ECs Plan - Based on a review of the environmental easement and site inspection reports, the following actions are needed relative to the ICs/ECs:

- Repair areas of the landfill cover system where ponding has occurred.
- Repair rutted areas on the landfill cover system.
- Repair monitoring well cement collars and standpipes as previously noted.
- Update the SMP to include inspections of the soil cover and drainage system at OU 2.

Monitoring Plan

- LTM activities should continue as scheduled (next 15 month sampling event is scheduled for January 2015)

Based on the findings presented herein, adherence to the SMP requirements for the Site is effective in monitoring the status of remedial requirements established in the ROD because:

- direct contact with the waste at the Site is eliminated
- migration of contaminants via groundwater is prevented
- migration of contaminants via surface water is prevented.

Additional corrective measures for the Site beyond those currently being planned or implemented are not recommended or needed at this time.

## 4.0 REFERENCES

MACTEC Engineering and Consulting, P.C. (MACTEC), 2013. Ludlow's Sand & Gravel Site, Oneida County, New York, Site Management Plan. September 2013.

MACTEC, 2013a. October 2013 Inspection Report, Ludlow's Sand & Gravel Site (Site No. 633014). November 27, 2013

NYSDEC, 2003. Record of Decision. Ludlow's Sand and Gravel North Gravel Pit (OU2), Town of Paris, Oneida County, New York, Site No. 633014. March 2003.

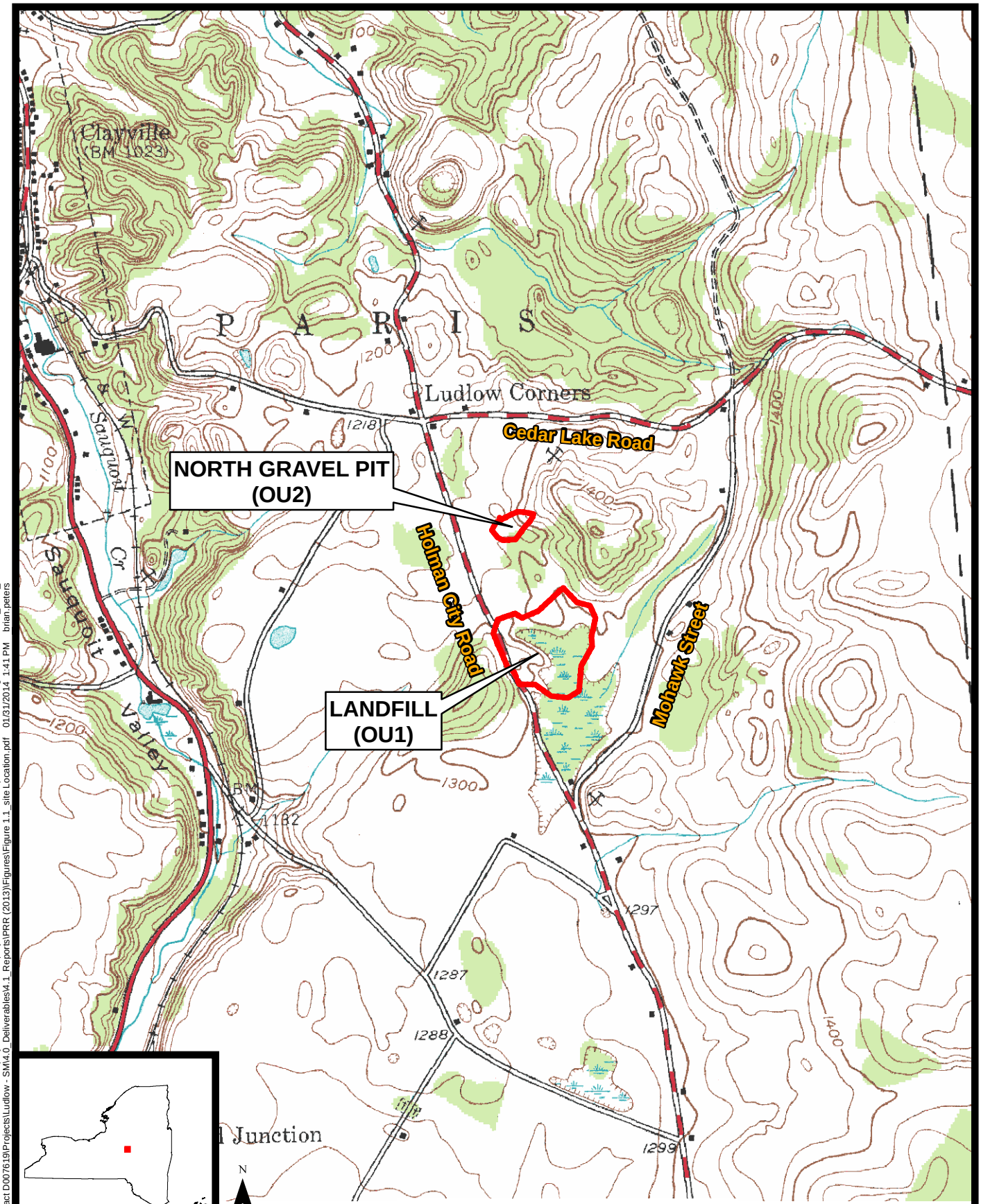
NYSDEC, 1999. 6 NYCRR Part 703, Surface Water and Groundwater Quality Standards and Effluent Limitations. August, 1999.

NYSDEC, 1998. Division of Water Technical and Operational Guidance Series (TOGS) (1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. October 1998 (revised).

Oneida County, 2013. R2013-001123, Declaration of Environmental Covenants, Restrictions and Environmental Easement. August 9, 2013.

Untied States Environmental Protection Agency (USEPA), 1988. Record of Decision. Ludlow Landfill, Town of Paris, Oneida County, New York, Site No. 633014. September 1988

# FIGURES




1:24,000 scale digital topographic map obtained from Cornell University Geospatial Information Repository (CUGIR) at: http://cugir.mannlib.cornell.edu

Prepared/Date: BRP 01/31/14
Checked/Date: JMF 01/31/14

PERIODIC REVIEW
REPORT (2013)
LUDLOW SAND & GRAVEL SITE
PARIS, NEW YORK

MACTEC

SITE LOCATION MAP

Project 3612132273 Figure 1.1

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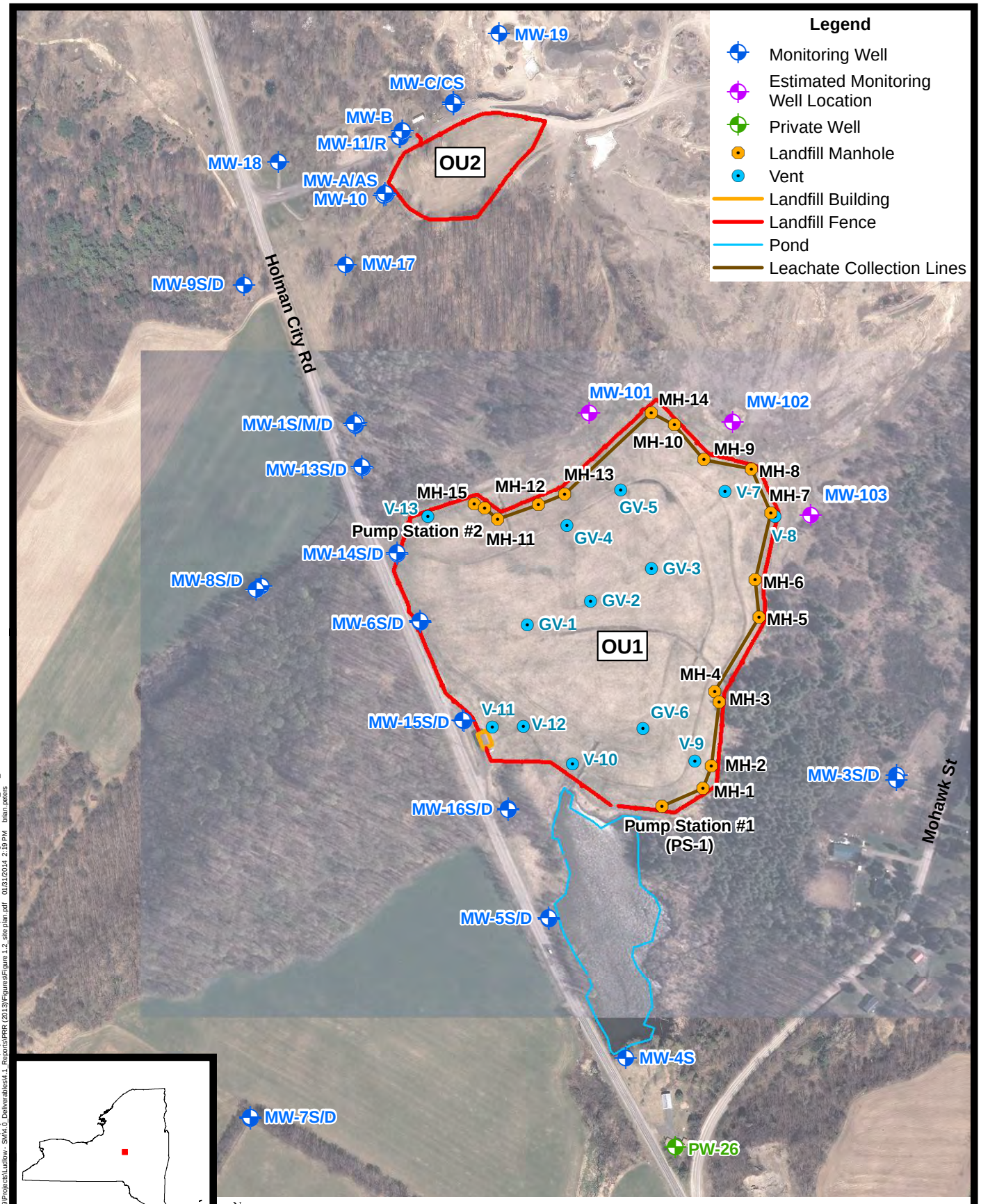



Oneida County color digital orthoimagery (2008) obtained from New York State GIS Clearinghouse at: http://www.nysgis.state.ny.us

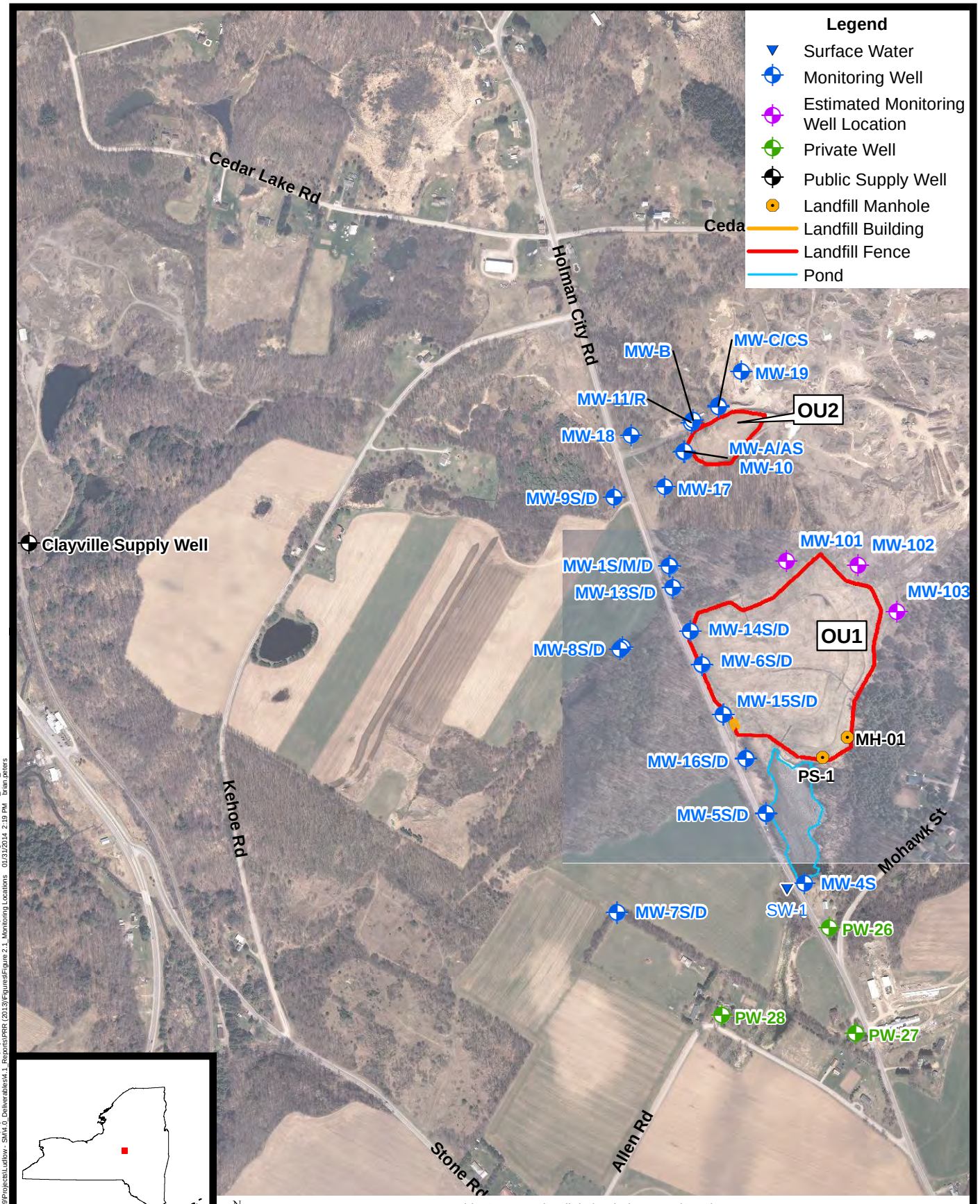
Prepared/Date: BRP 01/31/14
Checked/Date: JMF 01/31/14

PERIODIC REVIEW REPORT (2013)
LUDLOW SAND & GRAVEL SITE
PARIS, NEW YORK

MACTEC

SITE PLAN

Project: 3612132273 Figure 1.2

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Prepared/Date: BRP 01/31/14
Checked/Date: JMF 01/31/14

PERIODIC REVIEW REPORT (2013)
LUDLOW SAND & GRAVEL SITE
PARIS, NEW YORK

MACTEC

LONG TERM MONITORING LOCATIONS

Project: 3612132273 Figure 2.1

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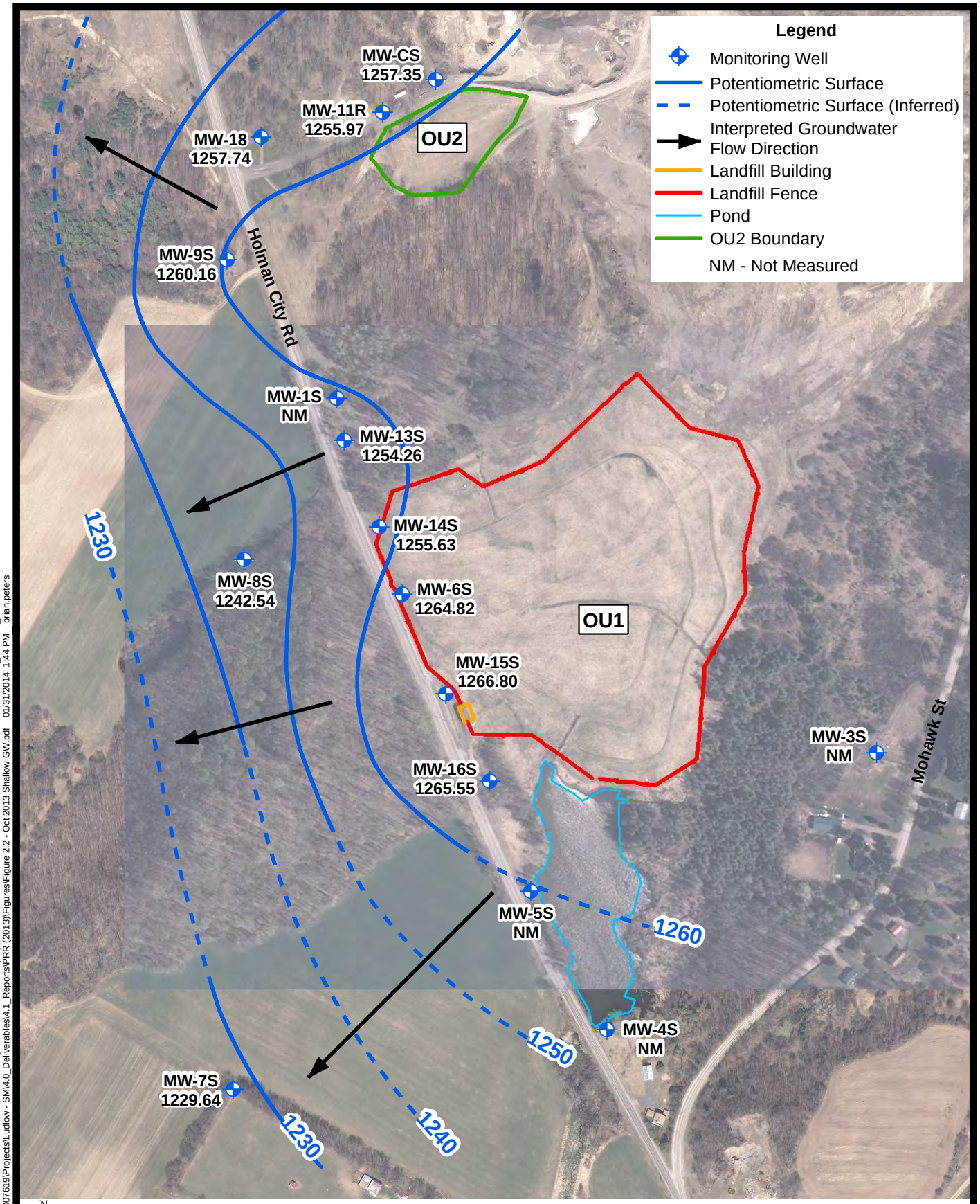


Oneida County color digital orthoimagery (2008) obtained from New York State GIS Clearinghouse at: http://www.nysgis.state.ny.us

Prepared/Date: BRP 01/06/14
Checked/Date: BPW 01/06/14

PERIODIC REVIEW REPORT (2013)
LUDLOW SAND & GRAVEL SITE
PARIS, NEW YORK

MACTEC

OCTOBER 2013 SHALLOW GROUNDWATER INTERPRETED POTENTIOMETRIC SURFACE MAP
Project: 3612132273 Figure 2.2

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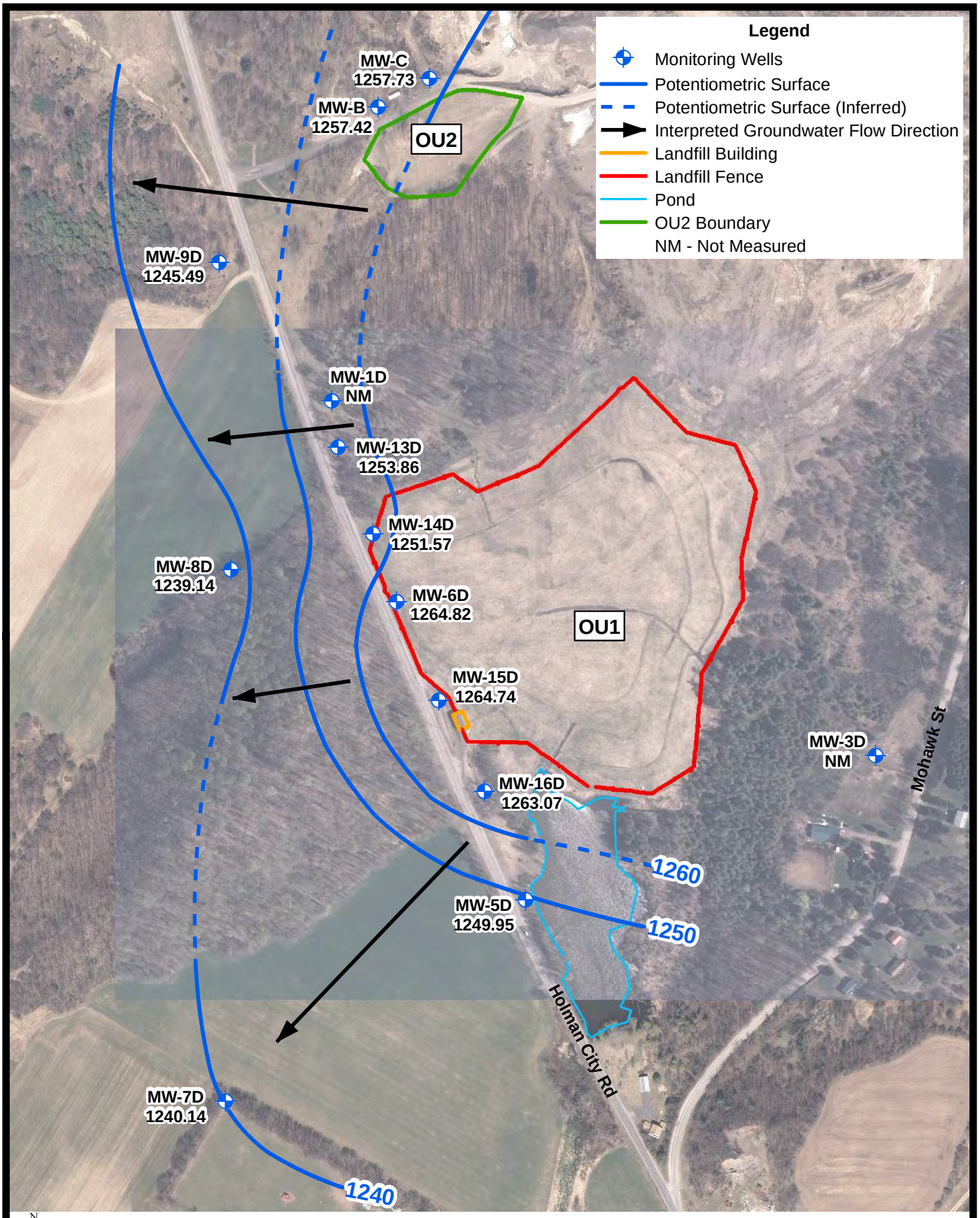


Oneida County color digital orthoimagery (2008) obtained from New York State GIS Clearinghouse at: http://www.nysgis.state.ny.us

Prepared/Date: BRP 01/06/14
Checked/Date: BPW 01/06/14

PERIODIC REVIEW REPORT (2013)
LUDLOW SAND & GRAVEL SITE
PARIS, NEW YORK

MACTEC

OCTOBER 2013 DEEP GROUNDWATER INTERPRETED POTENTIOMETRIC SURFACE MAP
Project: 3612132273 Figure 2.3

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Kehoe Rd

Holman City Rd

MW-9S/D

| MW-9S | |
|---|---|
| Iron | **876** |
| Manganese | **500** |

| MW-9D | |
|---|---|
| Sodium | **73200** |

MW-1S/M/D

MW-101

MW-102

| MW-13S | |
|---|---|
| Sodium | **27800** |

MW-13S/D

| MW-13D | |
|---|---|
| Manganese | **1740** |

MW-103

| MW-8S | |
|---|---|
| Sodium | **27600** |

MW-8S/D

MW-14S/D

| MW-14D | |
|---|---|
| Iron | **1060** |
| Magnesium | **49300** |
| Manganese | **2230** |
| Sodium | **126000** |

| MW-6S | |
|---|---|
| Toluene | **19** |
| Iron | **5780** |
| Magnesium | **61900** |
| Manganese | **2710** |
| Sodium | **73500** |

MW-6S/D

OU1

| MW-6D | |
|---|---|
| 4-Chloro-3-methylphenol | **2.1** |
| Antimony | **9.7** |
| Iron | **4480** |
| Magnesium | **70300** |
| Manganese | **424** |
| Sodium | **156000** |

| MW-15D | |
|---|---|
| Iron | **6280** |
| Magnesium | **46400** |
| Sodium | **115000** |

MW-15S/D

| MH-1 | |
|---|---|
| 4-Methylphenol | **1.7** |
| Iron | **22600** |
| Manganese | **469** |

MW-3S/D

MH-1

MW-16S/D

Pump Station #1
(PS-1)

| PS-1 | |
|---|---|
| Iron | **6500** |
| Manganese | **320** |

| MW-16D | |
|---|---|
| Iron | **576** |
| Manganese | **382** |

MW-5S/D

| MW-5D | |
|---|---|
| Iron | **7650** |

Mohawk St

MW-4S

| MW-7S | |
|---|---|
| Iron | **577** |

MW-7S/D

| MW-7D | |
|---|---|
| Iron | **731** |

**Legend**

- Monitoring Well
- Estimated Monitoring Well Location
- Landfill Manhole
- Landfill Building
- Landfill Fence
- Pond
- Leachate Collection Lines

Samples collected 10/8/13 - 10/10/13
Results shown in µg/L

N

0 150 300 Feet

Oneida County color digital orthoimagery (2008) obtained from New York State GIS Clearinghouse at: http://www.nysgis.state.ny.us

Prepared/Date: BRP 01/31/14
Checked/Date: JMF 01/31/14

PERIODIC REVIEW REPORT (2013)
LUDLOW SAND & GRAVEL SITE
PARIS, NEW YORK

MACTEC

CONTAMINANTS EXCEEDING GA STANDARDS IN GROUNDWATER OCTOBER 2013
Project: 3612132273 Figure 2.4

# TABLES

## Table 2.1: Site Management Plan Requirements

| Component | Action | Required Frequency |
|---|---|---|
| **Landfill** | | |
| Landfill Cap Integrity | Inspection | Annually |
| Landfill Cover System | Mowing | Semiannually (spring and summer) |
| Landfill Components - Manholes, Pump Stations and Monitoring Wells | Inspection | Semi-annually |
| Landfill Seep Inspections | Inspection | Semiannually |
| Site Security - Fencing, Gates and Site Access | Inspection | Annually |
| Leachate Treatment Building | Inspection | Annually |
| Landfill Gas Collection System | Inspection | Annually |
| Landfill Methane Monitoring | Measurements | Annually |
| Groundwater Elevation Measurements | Measurements | Semianually |
| **Environmental Monitoring** | | |
| Long Term Monitoring Groundwater Program | | |
| 32 monitoring well locations | Low-flow and grab groundwater sampling | Every 15 months |
| 2 additional monitoring locations[1] | Water grab sampling | Every 15 months |
| Surface Water Monitoring Program | | |
| 1 monitoring location | Surface water grab sampling | Every 15 months |
| **Private Water Supply Monitoring Program** | | |
| 3 downgradient residences | Grab sample | Every 15 months |
| **Public Water Supply Monitoring Program** | | |
| Claryville water supply well | Grab sample | Every 15 months |

**Notes:**
Annual = October
Semiannual = May and October
1- Pump station and manhole water samples

**Table 2.2: Monitoring Well and Gas Vent Observations**
**Ludlow Sand & Gravel**
**October 2013**

| Monitoring Well ID | Condition | Comments |
|---|---|---|
| MW-1S | Missing | Could not find. |
| MW-1M | Missing | Could not find. |
| MW-1D | Missing | Could not find. |
| MW-6S | Needs Repair | No well cap. No lock, casing dented. Casing and concrete collar are damaged. |
| MW-6D | Needs Repair | No well cap. No lock. Concrete collar is damaged. |
| MW-8S | Needs Repair | No well cap. No lock. Casing cap broken. Casing and concrete collar are damaged. |
| MW-8D | Needs Repair | No well cap. No lock. Casing cap broken. Needs a new casing and concrete collar. |
| MW-13S | Needs Repair | No well cap. No lock. Concrete collar is damaged. |
| MW-13D | Needs Repair | No well cap. No lock. Concrete collar is damaged. |
| MW-14S | Fair | Needs lock. |
| MW-14D | Fair | Needs lock. |
| MW-15S | Needs Repair | No well cap. No lock. Casing cap broken. Casing and concrete collar are damaged. No plow protection. |
| MW-15D | Needs Repair | No well cap. No lock. Casing cap broken. Casing and concrete collar are damaged. No plow protection. |
| MW-17 | Missing | Could not find. |
| MW-19 | Missing | Could not find. |
| **Environmental Monitoring NGP (OU2)** | | |
| MW A | Good | No lock. |
| MW AS | Good | No lock. |
| MW-10 | Good | Cap broken. No lock. |
| **Landfill Structures** | | |
| Gas Monitoring vents | | All vent screens for insects/rodents are missing. All monitoring points are not labeled. |
| GV-1 | Needs Repair | PVC vent structure has been destroyed. |
| MH-13 | Fair | Cast iron collar is cracked but manhole is functional. |
| V-9 | Missing | V-9 as shown on figure does not exist or has been destroyed. |
| V-12 | Good | Not shown on Site Management Plan, Site Plan Figure. ID V-12 assigned and written on vent. |
| V-13 | Good | Not shown on Site Management Plan, Site Plan Figure. ID V-13 assigned and written on vent. |


Prepared by: JRK 11/20/2013
Reviewed by JMF 11/22/2013

**Table 2.3: Long Term Monitoring Sampling and Analysis Plan Requirements**

| Environmental Monitoring Landfill (OU1) | Sampling Frequency | | | | | | |
|---|---|---|---|---|---|---|---|
| | 15 Months | Annual | Semi Annual | PCBs | VOCs | TCL Metals | Total Phenolics |
| MW-1S | x | | | water level only | | | |
| MW-1M | x | | | water level only | | | |
| MW-1D | x | | | water level only | | | |
| MW-4S | x | | | water level only | | | |
| MW-5S | x | | | water level only | | | |
| MW-5D | x | | | x | x | x | x |
| MW-6S | x | | | x | x | x | x |
| MW-6D | x | | | x | x | x | x |
| MW-7S | x | | | x | x | x | x |
| MW-7D | x | | | x | x | x | x |
| MW-8S | x | | | x | x | x | x |
| MW-8D | x | | | x | x | x | x |
| MW-9S | x | | | x | x | x | x |
| MW-9D | x | | | x | x | x | x |
| MW-13S | x | | | x | x | x | x |
| MW-13D | x | | | x | x | x | x |
| MW-14S | x | | | x | x | x | x |
| MW-14D | x | | | x | x | x | x |
| MW-15S | x | | | x | x | x | x |
| MW-15D | x | | | x | x | x | x |
| MW-16S | x | | | x | x | x | x |
| MW-16D | x | | | x | x | x | x |
| PW-26 | x | | | x | x | x | x |
| PW-27 | x | | | x | x | x | x |
| PW-28 | x | | | x | x | x | x |
| Clayville Supply Well | x | | | x | x | x | x |
| Pump Station #1 | x | | | x | x | x | x |
| MH-01* | x | | | x | x | x | x |
| SW-01 | x | | | x | | | |
| **Environmental Monitoring NGP (OU2)** | | | | | | | |
| MW A | x | | | x | | | |
| MW B | x | | | x | | | |
| MW C | x | | | x | | | |
| MW AS | x | | | x | | | |
| MW CS | x | | | x | | | |
| MW-10 | x | | | x | | | |
| MW-11R | x | | | x | | | |
| MW-17 | x | | | x | | | |
| MW-18 | x | | | x | | | |
| MW-19 | x | | | x | | | |
| **Inspections** | **Inspection Frequency** | | | | | | |
| Fencing, Gates and Site Access | | x | | | | | |
| Landfill Seep Inspections | | | x | | | | |
| Landfill Cap Integrity | | x | | | | | |
| Landfill Gas Collection System | | x | | | | | |
| Manholes, Pump Stations and Wells | | x | | | | | |
| LMS Building | | x | | | | | |
| **Measurements** | **Measurement Frequency** | | | | | | |
| Groundwater WLMs | x | | | | | | |
| Methane Monitoring | x | | | | | | |

Notes:
x = Activity Required
WLM = Water Level Measurement
Semiannual - May and October
Annual - October
*- Changed from MH-02 because MH-02 does not have sufficient water to sample.


Prepared by: JMF 9/17/13
Checked by: JPC 9/20/13

**Table 2.4: Water Elevations (October 2013)**

| Well ID | Depth to BOW (ft TOR) | Stickup on casing (ft) | Dist. TOC to TOR (ft) | Elevation[1] TOC/TOR (ft msl) | Elevation[1] Ground (ft msl) | Measurement Date | Depth to Groundwater (ft TOR) | Groundwater Elevation (ft msl) |
|---|---|---|---|---|---|---|---|---|
| MW-1S | 12.20 | 1.72 | 0.01 | 1280.86 | 1279.15 | NM | NM | -- |
| MW-1M | 31.50 | 1.70 | 0.07 | 1281.07 | 1279.44 | NM | NM | -- |
| MW-1D | 94.45 | 1.90 | 0.29 | 1280.07 | 1278.46 | NM | NM | -- |
| MW-3S | | 1.92 | 0.57 | 1295.19 | 1293.84 | NM | NM | -- |
| MW-3D | 22.00 | 1.85 | 0.13 | 1295.26 | 1293.54 | NM | NM | -- |
| MW-4S | 29.00 | | | 1285.56 | 1285.56 | NM | NM | -- |
| MW-5S | 23.15 | 1.90 | 0.15 | 1289.94 | 1288.19 | NM | NM | -- |
| MW-5D | 78.45 | 1.95 | 0.02 | 1289.90 | 1287.97 | 10/8/2013 | 39.95 | 1249.95 |
| MW-6S | 90.15 | 0.15 | 0.00 | 1326.40 | 1326.25 | 10/8/2013 | 61.58 | 1264.82 |
| MW-6D | 106.00 | 1.45 | 0.11 | 1327.00 | 1325.66 | 10/8/2013 | 62.18 | 1264.82 |
| MW-7S | 85.20 | 1.73 | 0.94 | 1297.20 | 1296.41 | 10/8/2013 | 67.56 | 1229.64 |
| MW-7D | 148.00 | 1.80 | 0.92 | 1297.20 | 1296.32 | 10/8/2013 | 57.06 | 1240.14 |
| MW-8S | 56.02 | 1.65 | 0.80 | 1284.20 | 1283.35 | 10/8/2013 | 41.66 | 1242.54 |
| MW-8D | 128.00 | 1.96 | 1.65 | 1283.60 | 1283.29 | 10/8/2013 | 44.46 | 1239.14 |
| MW-9S | 15.60 | 2.72 | 0.74 | 1264.90 | 1262.92 | 10/8/2013 | 4.74 | 1260.16 |
| MW-9D | 38.80 | 2.72 | 0.96 | 1264.70 | 1262.94 | 10/8/2013 | 19.21 | 1245.49 |
| MW-13S | 38.45 | 1.75 | 0.20 | 1284.80 | 1283.25 | 10/8/2013 | 30.54 | 1254.26 |
| MW-13D | 63.80 | 1.65 | 0.22 | 1284.40 | 1282.97 | 10/8/2013 | 30.54 | 1253.86 |
| MW-14S | 63.77 | 1.20 | 0.20 | 1319.40 | 1318.40 | 10/8/2013 | 63.77 | 1255.63 |
| MW-14D | 108.00 | 1.60 | 0.30 | 1320.00 | 1318.70 | 10/8/2013 | 68.43 | 1251.57 |
| MW-15S | 45.70 | 0.40 | 0.30 | 1312.50 | 1312.40 | 10/8/2013 | 45.70 | 1266.80 |
| MW-15D | 109.00 | 1.30 | 0.20 | 1313.10 | 1312.00 | 10/8/2013 | 48.36 | 1264.74 |
| MW-16S | 32.65 | 1.95 | 0.20 | 1298.20 | 1296.45 | 10/8/2013 | 32.65 | 1265.55 |
| MW-16D | 79.50 | 1.90 | 0.20 | 1297.90 | 1296.20 | 10/8/2013 | 34.83 | 1263.07 |
| Pump Station #1 | 12.05 | NA | NA | 1290.03 | NA | NA | 6.71 | -- |
| MW-A | | 2.29 | 0.53 | | -1.76 | 10/8/2013 | 23.00 | -- |
| MW-B | 85.00 | 2.00 | 0.25 | 1285.92 | 1284.17 | 10/8/2013 | 28.50 | 1257.42 |
| MW-C | 108.00 | 1.88 | 0.37 | 1288.35 | 1286.84 | 10/8/2013 | 30.62 | 1257.73 |
| MW-AS | 42.00 | 1.67 | 0.27 | | 55.69 | 10/8/2013 | 22.50 | -- |
| MW-CS | 45.00 | 2.06 | 0.46 | 1288.20 | 60.93 | 10/8/2013 | 30.85 | 1257.35 |
| MW-10 | | 2.00 | 0.18 | 1277.74 | 61.46 | 10/8/2013 | 18.44 | 1259.30 |
| MW-11R | 32.00 | 2.66 | 0.25 | 1283.97 | 54.63 | 10/8/2013 | 28.00 | 1255.97 |
| MW-17 | | | | 1273.94 | 50.66 | NM | NM | -- |
| MW-18 | 19.90 | 3.35 | 0.38 | 1271.96 | 50.54 | 10/8/2013 | 14.22 | 1257.74 |
| MW-19 | | | | 1297.66 | 51.58 | NM | NM | -- |

TOR = Top of Riser
TOC = Top of Casing
BOW = Bottom of Well
Dist. = Distance
ft msl = feet, mean sea level
NM = not monitored

**Table 2.5: Long Term Monitoring - OU 1**
**October 2013**

| | | | Location | MH-1 | PS-1 | MW-05D | MW-06D | MW-06S | MW-07D | MW-07S | MW-08D | MW-08S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample Date | 10/10/2013 | 10/10/2013 | 10/9/2013 | 10/8/2013 | 10/9/2013 | 10/9/2013 | 10/9/2013 | 10/8/2013 | 10/8/2013 |
| | | | Sample ID | MH-1 | PS-1 | MW-5D | MW-6D | MW-6S | MW-7D | MW-7S | MW-8D | MW-8S |
| | | | QC Code | FS | FS | FS | FS | FS | FS | FS | FS | FS |
| **Parameter** | **GA GW [1]** | **Units** | | | | | | | | | | |
| **VOCs - Method 8260B** | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 5 | µg/L | | -- | -- | -- | -- | -- | -- | -- | **1** | -- |
| 1,1-Dichloroethane | 5 | µg/L | | -- | -- | -- | -- | **1.9** | -- | -- | **3.4** | **1.2** |
| Acetone | 50 | µg/L | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chloroethane | 5 | µg/L | | -- | -- | -- | -- | **1.6** | -- | -- | -- | -- |
| Methylene chloride | 5 | µg/L | | -- | **1.3** | -- | -- | -- | -- | -- | -- | -- |
| Toluene | 5 | µg/L | | -- | -- | -- | -- | **19** | -- | -- | -- | -- |
| **SVOCs - Method** | | | | | | | | | | | | |
| 4-Chloro-3-methylphenol | 1* | µg/L | | -- | -- | -- | **2.1** J | -- | -- | -- | -- | -- |
| 4-Methylphenol | 1* | µg/L | | **1.7** J | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs** | | | | | | | | | | | | |
| PCB Target Compounds | 0.09** | µg/L | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Metals - Method 6010C** | | | | | | | | | | | | |
| Aluminum | NA | µg/L | | -- | -- | **556** | **1650** | **178** J | -- | -- | -- | -- |
| Antimony | 3 | µg/L | | -- | -- | -- | **9.7** J | -- | -- | -- | -- | -- |
| Arsenic | 25 | µg/L | | **18.5** J | -- | -- | -- | -- | **8.4** J | -- | -- | -- |
| Barium | 1,000 | µg/L | | **415** | **275** | **138** J | **378** | **279** | **248** | **112** J | **131** J | **109** J |
| Calcium | NA | µg/L | | **130000** | **105000** | **96100** | **206000** | **217000** | **59900** | **102000** | **105000** | **111000** |
| Cobalt | NA | µg/L | | -- | -- | -- | **1.6** J | **1.5** J | -- | -- | -- | -- |
| Copper | 200 | µg/L | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Iron | 300 | µg/L | | **22600** | **6500** | **7650** | **4480** | **5780** | **731** | **577** | **91.5** J | -- |
| Lead | 25 | µg/L | | -- | -- | **5.1** J | **4.6** J | -- | -- | -- | **5.4** J | -- |
| Magnesium | 35,000 | µg/L | | **27800** | **19900** | **18400** | **70300** | **61900** | **18100** | **24300** | **31300** | **25800** |
| Manganese | 300 | µg/L | | **469** | **320** | **208** | **424** | **2710** | **22.8** J | **40.3** J | -- | -- |
| Nickel | 100 | µg/L | | **1.6** J | **1.5** J | **1.6** J | **24.5** J | **10** J | -- | -- | **1.4** J | -- |
| Potassium | NA | µg/L | | **4360** | **6430** | **2300** | **3260** | **2900** | **805** J | **1370** | **1300** | **2160** |
| Silver | 50 | µg/L | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sodium | 20,000 | µg/L | | **6830** | **5570** | **5290** | **156000** | **73500** | **4650** | **7470** | **10900** | **27600** |
| Vanadium | NA | µg/L | | -- | -- | **1.2** J | **2.4** J | -- | -- | -- | -- | -- |
| Zinc | 2000 | µg/L | | **5.2** J | **206** | **24.9** J | **43.8** J | **12.8** J | -- | **6.2** J | **33.1** J | **7** J |
| Mercury | 0.7 | µg/L | | -- | -- | -- | **0.097** J | -- | -- | -- | -- | -- |

**Notes:**
-- = Non Detect
µg/L = microgram per liter
QC Codes: FS = Field Sample; FD = Field Duplicate
Qualifiers:
J = Estimated value
1=NYS Class GA Standards
**Bold text indicates detected concentration**
**Shaded indicates exceedance of Standard or Guidance**
NA = Not Available
PCB- polychlorinated biphenyl
MH (MH-1) = man hole
Blank cell indicates not analyzed for that parameter
*- this standard is for total phenols
**- this standard is for total PCBs

**Table 2.5: Long Term Monitoring - OU 1**
**October 2013**

| | | | Location | MW-09D | MW-09S | MW-13D | MW-13S | MW-14D | MW-15D | MW-16D | SW-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample Date | 10/8/2013 | 10/8/2013 | 10/8/2013 | 10/8/2013 | 10/8/2013 | 10/9/2013 | 10/9/2013 | 10/9/2013 |
| | | | Sample ID | MW-9D | MW-9S | MW-13D | MW-13S | MW-14D | MW-15D | MW-16D | SW-1 |
| | | | QC Code | FS | FS | FS | FS | FS | FS | FS | FS |
| **Parameter** | **GA GW [1]** | **Units** | | | | | | | | | |
| **VOCs - Method 8260B** | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 5 | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| 1,1-Dichloroethane | 5 | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| Acetone | 50 | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| Chloroethane | 5 | µg/L | -- | -- | -- | -- | **2** | -- | -- | |
| Methylene chloride | 5 | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| Toluene | 5 | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| **SVOCs - Method** | | | | | | | | | | | |
| 4-Chloro-3-methylphenol | 1* | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| 4-Methylphenol | 1* | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| **PCBs** | | | | | | | | | | | |
| PCB Target Compounds | 0.09** | µg/L | -- | -- | -- | -- | -- | -- | -- | -- |
| **Metals - Method 6010C** | | | | | | | | | | | |
| Aluminum | NA | µg/L | -- | -- | -- | -- | -- | **100** J | -- | |
| Antimony | 3 | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| Arsenic | 25 | µg/L | -- | -- | -- | -- | -- | **5.4** J | -- | |
| Barium | 1,000 | µg/L | **161** J | **38** J | **162** J | **71.9** J | **541** | **506** | **183** J | |
| Calcium | NA | µg/L | **100000** | **119000** | **122000** | **121000** | **175000** | **171000** | **72400** | |
| Cobalt | NA | µg/L | -- | -- | -- | -- | **1.6** J | -- | -- | |
| Copper | 200 | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| Iron | 300 | µg/L | **85.8** J | **876** | **39.8** J | **54.5** J | **1060** | **6280** | **576** | |
| Lead | 25 | µg/L | -- | -- | **6.2** J | -- | **4.9** J | -- | -- | |
| Magnesium | 35,000 | µg/L | **20300** | **17800** | **24600** | **12900** | **49300** | **46400** | **17300** | |
| Manganese | 300 | µg/L | **18.6** J | **500** | **1740** | -- | **2230** | **286** | **382** | |
| Nickel | 100 | µg/L | -- | **1** J | **2.4** J | -- | **9** J | **13.2** J | **0.88** J | |
| Potassium | NA | µg/L | **1280** | **659** J | **2200** | **3880** | **2150** | **1910** | **6770** | |
| Silver | 50 | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| Sodium | 20,000 | µg/L | **73200** | **13400** | **13400** | **27800** | **126000** | **115000** | **6700** | |
| Vanadium | NA | µg/L | -- | -- | -- | -- | -- | -- | -- | |
| Zinc | 2000 | µg/L | -- | -- | **104** | **15.4** J | **47.5** J | **20.3** J | **8.7** J | |
| Mercury | 0.7 | µg/L | -- | -- | -- | -- | -- | -- | -- | |

**Notes:**
-- = Non Detect
µg/L = microgram per liter
QC Codes: FS = Field Sample; FD = Field Duplicate
Qualifiers:
J = Estimated value
1=NYS Class GA Standards
**Bold text indicates detected concentration**
**Shaded indicates exceedance of Standard or Guidance**
NA = Not Available
PCB- polychlorinated biphenyl
MH (MH-1) = man hole
Blank cell indicates not analyzed for that parameter
*- this standard is for total phenols
**- this standard is for total PCBs

## Table 2.6: Long Term Monitoring- OU 2
## October 2013

| | | Location | MW-10 | MW-11R | MW-18 | MW-A | MW-AS | MW-B | MW-C | MW-CS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Date | 10/9/2013 | 10/9/2013 | 10/9/2013 | 10/9/2013 | 10/8/2013 | 10/8/2013 | 10/8/2013 | 10/8/2013 |
| | | Sample ID | MW-10 | MW-11R | MW-18 | MW-A | MW-AS | MW-B | MW-C | MW-CS |
| | | QC Code | FS | FS | FS | FS | FS | FS | FS | FS |
| **Parameter** | **GA GW [1]** | **Units** | | | | | | | | |
| PCB Target Compounds | 0.09** | µg/L | -- | -- | -- | -- | -- | -- | -- | -- |

**Notes:**
-- = Non Detect
µg/L = microgram per liter
QC Codes: FS = Field Sample; FD = Field Duplicate
1=NYS Class GA Standards
PCB- polychlorinated biphenyl
**- this standard is for total PCBs

## Table 2.7: Long Term Monitoring Drinking Water Supply Wells
## October 2013

| | | | **Location** | Clayville Well | PW-26 | PW-27 | PW-28 |
|---|---|---|---|---|---|---|---|
| | | | **Sample Date** | 10/8/2013 | 10/8/2013 | 10/9/2013 | 10/9/2013 |
| | | | **Sample ID** | CLAYVILLE SUPPLY WELL | PW-26 | PW-27 | PW-28 |
| | | | **QC Code** | FS | FS | FS | FS |
| **Parameter** | **GA GW [1]** | **Units** | | | | | |
| **VOCs - Method 8260B** | | | | | | | |
| Methylene chloride | 5 | µg/L | | -- | -- | -- | **1.2** |
| **Phenols** | | | | | | | |
| Phenols | 1* | µg/L | | -- | -- | -- | -- |
| **PCBs** | | | | | | | |
| PCB Target Compounds | 0.09** | µg/L | | -- | -- | -- | -- |
| **Metals - Method 6010C** | | | | | | | |
| Barium | 1,000 | µg/L | | **86.6** J | **108** J | **121** J | **75.8** J |
| Calcium | NA | µg/L | | **84600** | **54900** | **70100** | **88800** |
| Iron | 300 | µg/L | | **34.4** J | **320** | -- | -- |
| Magnesium | 35,000 | µg/L | | **33400** | **23100** | **20300** | **17400** |
| Manganese | 300 | µg/L | | **17** J | -- | -- | -- |
| Potassium | NA | µg/L | | **1250** | **1120** | **963** J | **1920** |
| Sodium | 20,000 | µg/L | | **3730** | **4860** | **1710** | **7630** |
| Zinc | 2000 | µg/L | | **8.3** J | -- | **13.3** J | **10.9** J |

**Notes:**
-- = Non Detect
µg/L = microgram per liter
QC Codes: FS = Field Sample; FD = Field Duplicate
Qualifiers:
J = Estimated value
1=NYS Class GA Standards
**Bold text indicates detected concentration**
**Shaded indicates exceedance of Standard or Guidance**
NA = Not Available
PCB- polychlorinated biphenyl
*- this standard is for total phenols
**- this standard is for total PCBs

**Table 2.8 : Historical Long Term Monitoring Results**

| Location | Sample Date | Parameter | 4-Chloro-3-methylphenol | | 4-Methylphenol | | Antimony | | Antimony | | Iron | | Iron | | Magnesium | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Units | T µg/L | | T µg/L | | T µg/L | | D µg/L | | T µg/L | | D µg/L | | T µg/L | |
| | | GA/GW | 1* | | 1* | | 3 | | 3 | | 300 | | 300 | | 35000 | |
| | | | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| MH-1 | 9/9/2008 | | | | | | | | | | | | | | | |
| MH-1 | 8/20/2009 | | | | | | | | | | | | | | | |
| MH-1 | 10/19/2010 | | | | | | | | | | | | | | | |
| MH-1 | 5/31/2011 | | | | | | 25 | U | | | **4160** | | | | 21700 | |
| MH-1 | 12/19/2011 | | | | | | **8** | J | | | **3350** | | | | 22500 | |
| MH-1 | 3/6/2012 | | | | | | 25 | U | | | **792** | | | | 20800 | |
| MH-1 | 10/10/2013 | | 1 | UJ | 1.7 | J | 9.3 | U | | | **22600** | | | | 27800 | |
| MW-05D | 5/17/2006 | | | | | | | | | | | | | | | |
| MW-05D | 11/16/2006 | | | | | | 3.4 | U | | | **9820** | | | | 17300 | |
| MW-05D | 10/23/2007 | | | | | | 3.3 | U | | | **509** | | | | 12500 | |
| MW-05D | 6/10/2008 | | | | | | 0.57 | U | | | **10100** | | | | 17100 | |
| MW-05D | 9/9/2008 | | | | | | 0.57 | U | | | **12800** | | | | 16300 | J |
| MW-05D | 8/20/2009 | | | | | | 1.5 | U | 1.5 | U | **38300** | | **6720** | | **38100** | |
| MW-05D | 10/20/2010 | | | | | | | | 25 | U | | | **4720** | | | |
| MW-05D | 10/20/2010 | | | | | | 25 | U | | | **11800** | | | | 19200 | |
| MW-05D | 3/7/2012 | | | | | | 25 | U | | | **6700** | | | | 16200 | |
| MW-05D | 10/9/2013 | | 1 | UJ | 1 | UJ | 9.3 | U | | | **7650** | | | | 18400 | |
| MW-06D | 5/17/2006 | | | | | | | | | | | | | | | |
| MW-06D | 11/15/2006 | | | | | | 3.4 | U | | | **5410** | | | | **70100** | |
| MW-06D | 10/23/2007 | | | | | | 3.3 | U | | | 276 | | | | **68400** | |
| MW-06D | 6/9/2008 | | | | | | 0.57 | U | | | **613** | | | | **69200** | |
| MW-06D | 9/9/2008 | | | | | | 0.57 | U | | | 258 | | | | **64700** | J |
| MW-06D | 8/18/2009 | | | | | | 1.5 | U | | | 172 | J | | | **69400** | |
| MW-06D | 10/18/2010 | | | | | | 25 | U | | | **8590** | | | | **66600** | |
| MW-06D | 3/7/2012 | | | | | | 25 | U | | | **2050** | | | | **53300** | |
| MW-06D | 10/8/2013 | | 2.1 | J | 1 | UJ | **9.7** | J | | | **4480** | | | | **70300** | |
| MW-06S | 5/17/2006 | | | | | | | | | | | | | | | |
| MW-06S | 11/15/2006 | | | | | | 3.4 | U | | | **1150** | | | | **58300** | |
| MW-06S | 10/23/2007 | | | | | | 3.3 | U | | | **7090** | J | | | **58400** | |
| MW-06S | 10/23/2007 | | | | | | 3.3 | U | | | **613** | J | | | **58400** | |
| MW-06S | 6/9/2008 | | | | | | 0.57 | U | | | **9070** | | | | **61700** | |
| MW-06S | 6/9/2008 | | | | | | 0.57 | U | | | **8950** | | | | **62400** | |
| MW-06S | 9/9/2008 | | | | | | 0.57 | U | | | **5100** | | | | **55900** | J |
| MW-06S | 9/9/2008 | | | | | | 0.57 | U | | | **5070** | | | | **56800** | J |
| MW-06S | 8/18/2009 | | | | | | 1.5 | U | | | **6100** | | | | **60500** | |
| MW-06S | 8/18/2009 | | | | | | 1.5 | U | | | **6000** | | | | **65500** | |
| MW-06S | 10/18/2010 | | | | | | 25 | U | | | **3880** | | | | **58500** | |
| MW-06S | 10/18/2010 | | | | | | 25 | U | | | **4510** | | | | **60800** | |
| MW-06S | 3/7/2012 | | | | | | 25 | U | | | **4510** | | | | **53600** | |
| MW-06S | 10/9/2013 | | 1 | UJ | 1 | UJ | 9.3 | U | | | **5780** | | | | **61900** | |

**Table 2.8 : Historical Long Term Monitoring Results**

| Location | Parameter | 4-Chloro-3-methylphenol | | 4-Methylphenol | | Antimony | | Antimony | | Iron | | Iron | | Magnesium | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | | T | | T | | D | | T | | D | | T | |
| | Units | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| | GA/GW | 1* | | 1* | | 3 | | 3 | | 300 | | 300 | | 35000 | |
| | Sample Date | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| MW-07D | 5/16/2006 | | | | | | | | | | | | | | |
| MW-07D | 5/16/2006 | | | | | | | | | | | | | | |
| MW-07D | 11/16/2006 | | | | | 3.4 | U | | | **2780** | | | | 19200 | |
| MW-07D | 10/22/2007 | | | | | 3.3 | U | 3.3 | U | **6880** | | **589** | | 21700 | |
| MW-07D | 6/10/2008 | | | | | 0.57 | U | | | **17700** | | | | 34000 | |
| MW-07D | 9/8/2008 | | | | | 0.58 | U | | | **1100** | | | | 17300 | J |
| MW-07D | 8/19/2009 | | | | | 2.1 | U | | | **730** | | | | 17900 | |
| MW-07D | 10/20/2010 | | | | | 25 | U | | | **903** | | | | 15600 | |
| MW-07D | 3/7/2012 | | | | | 25 | U | | | **623** | | | | 15300 | |
| MW-07D | 10/9/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | **731** | | | | 18100 | |
| MW-07S | 5/16/2006 | | | | | | | | | | | | | | |
| MW-07S | 11/16/2006 | | | | | 3.4 | U | | | **3140** | | | | 27400 | |
| MW-07S | 10/22/2007 | | | | | 3.3 | U | 3.3 | U | **2630** | | 128 | | 22900 | |
| MW-07S | 10/22/2007 | | | | | 3.3 | U | | | **2440** | | | | 23900 | |
| MW-07S | 6/10/2008 | | | | | 0.57 | U | | | **1770** | | | | 26800 | |
| MW-07S | 6/10/2008 | | | | | 0.57 | U | | | **2770** | | | | 25800 | |
| MW-07S | 9/8/2008 | | | | | 1.5 | U | | | **1030** | | | | 21700 | J |
| MW-07S | 9/8/2008 | | | | | 0.57 | U | | | **981** | | | | 21800 | J |
| MW-07S | 8/19/2009 | | | | | 5.5 | U | | | **1320** | | | | 23700 | |
| MW-07S | 8/19/2009 | | | | | 2.1 | U | | | **1280** | | | | 24200 | |
| MW-07S | 10/20/2010 | | | | | 25 | U | | | **6180** | | | | 25200 | |
| MW-07S | 10/20/2010 | | | | | 25 | U | | | **5810** | | | | 23500 | |
| MW-07S | 3/7/2012 | | | | | 25 | U | | | **4120** | | | | 21600 | |
| MW-07S | 3/7/2012 | | | | | 25 | U | | | **3950** | | | | 21800 | |
| MW-07S | 10/9/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | **577** | | | | 24300 | |
| MW-08S | 5/16/2006 | | | | | | | | | | | | | | |
| MW-08S | 11/15/2006 | | | | | 3.4 | U | | | **1450** | | | | 24200 | |
| MW-08S | 10/24/2007 | | | | | 3.3 | U | | | 32.3 | U | | | 23400 | |
| MW-08S | 6/10/2008 | | | | | 0.57 | U | | | 36.8 | J | | | 24500 | |
| MW-08S | 9/10/2008 | | | | | 0.57 | U | | | 26.9 | B | | | 23100 | J |
| MW-08S | 8/19/2009 | | | | | 1.5 | U | | | 22.7 | U | | | 24500 | |
| MW-08S | 10/19/2010 | | | | | 25 | U | | | 24.7 | U | | | 22900 | |
| MW-08S | 3/7/2012 | | | | | 25 | U | | | 17.3 | J | | | 20500 | |
| MW-08S | 10/8/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | 31 | U | | | 25800 | |
| MW-09D | 5/16/2006 | | | | | | | | | | | | | | |
| MW-09D | 11/16/2006 | | | | | 3.4 | U | | | 259 | | | | 17300 | |
| MW-09D | 10/23/2007 | | | | | 3.3 | U | | | **685** | | | | 15600 | |
| MW-09D | 6/9/2008 | | | | | 0.57 | U | | | **756** | | | | 18500 | |
| MW-09D | 9/8/2008 | | | | | 0.57 | U | | | **509** | | | | 14800 | J |
| MW-09D | 8/19/2009 | | | | | 1.5 | U | | | 55.4 | U | | | 19500 | |
| MW-09D | 10/18/2010 | | | | | 25 | U | | | 106 | U | | | 17600 | |
| MW-09D | 3/6/2012 | | | | | 25 | U | | | **591** | | | | 17800 | |
| MW-09D | 10/8/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | 85.8 | J | | | 20300 | |

**Table 2.8 : Historical Long Term Monitoring Results**

| Location | Parameter | 4-Chloro-3-methylphenol | | 4-Methylphenol | | Antimony | | Antimony | | Iron | | Iron | | Magnesium | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | | T | | T | | D | | T | | D | | T | |
| | Units | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| | GA/GW | 1* | | 1* | | 3 | | 3 | | 300 | | 300 | | 35000 | |
| | Sample Date | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| MW-09S | 5/16/2006 | | | | | | | | | | | | | | |
| MW-09S | 11/16/2006 | | | | | 3.4 | U | | | **368** | | | | 12200 | |
| MW-09S | 10/23/2007 | | | | | 3.3 | U | | | 258 | | | | 17600 | |
| MW-09S | 6/9/2008 | | | | | 1.3 | U | | | 30 | J | | | 11200 | |
| MW-09S | 9/8/2008 | | | | | 1 | U | | | 27.7 | B | | | 15200 | J |
| MW-09S | 8/19/2009 | | | | | 1.5 | U | | | 14.8 | U | | | 14000 | |
| MW-09S | 3/6/2012 | | | | | 25 | U | | | 79.5 | | | | 13400 | |
| MW-09S | 10/8/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | **876** | | | | 17800 | |
| MW-13D | 5/18/2006 | | | | | | | | | | | | | | |
| MW-13D | 5/18/2006 | | | | | | | | | | | | | | |
| MW-13D | 11/15/2006 | | | | | 3.4 | U | | | 55.3 | U | | | 24000 | |
| MW-13D | 10/23/2007 | | | | | 3.3 | U | | | 192 | | | | 22800 | |
| MW-13D | 6/10/2008 | | | | | 0.57 | U | | | 72.5 | J | | | 27200 | |
| MW-13D | 9/9/2008 | | | | | 0.57 | U | | | 60.6 | B | | | 24000 | J |
| MW-13D | 8/19/2009 | | | | | 1.7 | U | | | 12.6 | U | | | 26100 | |
| MW-13D | 10/18/2010 | | | | | 25 | U | | | 80 | U | | | 21000 | |
| MW-13D | 3/6/2012 | | | | | 25 | U | | | 75.4 | | | | 21300 | |
| MW-13D | 10/8/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | 39.8 | J | | | 24600 | |
| MW-13S | 5/18/2006 | | | | | | | | | | | | | | |
| MW-13S | 11/15/2006 | | | | | 3.4 | U | | | 55.3 | U | | | 18900 | |
| MW-13S | 10/24/2007 | | | | | 3.3 | U | | | **1030** | | | | 13500 | |
| MW-13S | 6/10/2008 | | | | | 0.57 | U | | | 85 | J | | | 16000 | |
| MW-13S | 9/9/2008 | | | | | 0.57 | U | | | 74.7 | B | | | 13800 | J |
| MW-13S | 8/19/2009 | | | | | 3.3 | U | | | 11.5 | U | | | 15100 | |
| MW-13S | 10/18/2010 | | | | | 25 | U | | | 235 | | | | 11000 | |
| MW-13S | 3/6/2012 | | | | | 25 | U | | | 82.9 | | | | 8610 | |
| MW-13S | 10/8/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | 54.5 | J | | | 12900 | |
| MW-14D | 5/18/2006 | | | | | | | | | | | | | | |
| MW-14D | 5/18/2006 | | | | | | | | | | | | | | |
| MW-14D | 11/15/2006 | | | | | 3.4 | U | | | **1480** | | | | **53800** | |
| MW-14D | 11/15/2006 | | | | | 3.4 | U | | | **1300** | | | | **53400** | |
| MW-14D | 10/23/2007 | | | | | 3.3 | U | | | **2560** | | | | **52200** | |
| MW-14D | 6/10/2008 | | | | | 0.57 | U | | | **2550** | | | | **53500** | |
| MW-14D | 9/9/2008 | | | | | 0.57 | U | | | **3030** | | | | **48500** | J |
| MW-14D | 8/19/2009 | | | | | 2.3 | U | | | **2140** | | | | **51500** | |
| MW-14D | 10/20/2010 | | | | | 25 | U | | | **2650** | | | | **47400** | |
| MW-14D | 3/6/2012 | | | | | 25 | U | | | **1180** | | | | **43100** | |
| MW-14D | 10/8/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | **1060** | | | | **49300** | |
| MW-15D | 5/17/2006 | | | | | | | | | | | | | | |
| MW-15D | 11/14/2006 | | | | | 3.4 | U | | | **9440** | | | | **62000** | |
| MW-15D | 10/23/2007 | | | | | 3.3 | U | | | **6120** | | | | **46000** | |
| MW-15D | 6/9/2008 | | | | | 0.57 | U | | | **6270** | | | | **50000** | |
| MW-15D | 9/9/2008 | | | | | 0.57 | U | | | **7400** | | | | **53200** | J |
| MW-15D | 8/19/2009 | | | | | 2.2 | U | | | **6460** | | | | **52100** | |
| MW-15D | 10/19/2010 | | | | | | | 25 | U | | | **6610** | | | |
| MW-15D | 10/19/2010 | | | | | 25 | U | | | **18100** | | | | **53400** | |
| MW-15D | 3/6/2012 | | | | | 25 | U | | | **6920** | | | | **47400** | |
| MW-15D | 10/9/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | **6280** | | | | **46400** | |

**Table 2.8 : Historical Long Term Monitoring Results**

| | Parameter | 4-Chloro-3-methylphenol | | 4-Methylphenol | | Antimony | | Antimony | | Iron | | Iron | | Magnesium | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | T | | T | | T | | D | | T | | D | | T | |
| | Units | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | | µg/L | |
| | GA/GW | 1* | | 1* | | 3 | | 3 | | 300 | | 300 | | 35000 | |
| **Location** | **Sample Date** | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| MW-16D | 5/17/2006 | | | | | | | | | | | | | | |
| MW-16D | 5/17/2006 | | | | | | | | | | | | | | |
| MW-16D | 11/16/2006 | | | | | 3.4 | U | | | **1880** | | | | 16500 | |
| MW-16D | 10/23/2007 | | | | | 3.3 | U | | | **1180** | | | | 15200 | |
| MW-16D | 6/10/2008 | | | | | 0.57 | U | | | **745** | | | | 16500 | |
| MW-16D | 9/10/2008 | | | | | 0.57 | U | | | **540** | | | | 15300 | J |
| MW-16D | 8/20/2009 | | | | | 1.5 | U | | | **733** | | | | 17000 | |
| MW-16D | 10/18/2010 | | | | | 25 | U | | | **648** | | | | 14800 | |
| MW-16D | 3/6/2012 | | | | | 25 | U | | | **532** | | | | 14800 | |
| MW-16D | 10/9/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | **576** | | | | 17300 | |
| PS-1 | 9/9/2008 | | | | | | | | | | | | | | |
| PS-1 | 8/20/2009 | | | | | | | | | | | | | | |
| PS-1 | 10/19/2010 | | | | | | | | | | | | | | |
| PS-1 | 5/31/2011 | | | | | 25 | U | | | **1280** | | | | 17400 | |
| PS-1 | 12/19/2011 | | | | | **7.57** | J | | | **6490** | | | | 24100 | |
| PS-1 | 3/6/2012 | | | | | 25 | U | | | **6660** | | | | 23700 | |
| PS-1 | 10/10/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | **6500** | | | | 19900 | |
| PW-26 | 5/17/2006 | | | | | | | | | | | | | | |
| PW-26 | 11/15/2006 | | | | | 3.4 | U | | | 178 | | | | 21400 | |
| PW-26 | 10/22/2007 | | | | | 3.3 | U | | | **515** | | | | 20100 | |
| PW-26 | 6/10/2008 | | | | | 0.57 | U | | | 296 | J | | | 22900 | |
| PW-26 | 9/8/2008 | | | | | 0.57 | U | | | 183 | | | | 19300 | J |
| PW-26 | 8/19/2009 | | | | | 4.9 | U | | | 286 | | | | 23200 | |
| PW-26 | 10/20/2010 | | | | | 25 | U | | | 190 | U | | | 20700 | |
| PW-26 | 3/7/2012 | | | | | 25 | U | | | 283 | | | | 19700 | |
| PW-26 | 10/8/2013 | 1 | UJ | 1 | UJ | 9.3 | U | | | **320** | | | | 23100 | |

**Notes:**
µg/L = microgram per liter
Qualifiers:
J = Estimated value
U- not detected
GA/GW=NYS Class GA Standards
**Shaded indicates exceedance of Standard or Guidance**
MH (MH-1) = man hole
Blank cell indicates not analyzed for that parameter
*- this standard is for total phenols
T- total
D- dissolved

**Table 2.8 : Historical Long Term Monitoring Results**

| Location | Sample Date | Parameter | Magnesium | | Manganese | | Manganese | | Sodium | | Sodium | | Toluene | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Units | D<br>µg/L | | T<br>µg/L | | D<br>µg/L | | T<br>µg/L | | D<br>µg/L | | T<br>µg/L | |
| | | GA/GW | 35000 | | 300 | | 300 | | 20000 | | 20000 | | 5 | |
| | | | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| MH-1 | 9/9/2008 | | | | | | | | | | | | 1 | U |
| MH-1 | 8/20/2009 | | | | | | | | | | | | 1 | U |
| MH-1 | 10/19/2010 | | | | | | | | | | | | 1 | U |
| MH-1 | 5/31/2011 | | | | **356** | | | | 4560 | | | | 1 | U |
| MH-1 | 12/19/2011 | | | | **499** | | | | 4920 | | | | 1 | UJ |
| MH-1 | 3/6/2012 | | | | 94.4 | | | | 5470 | | | | 1 | U |
| MH-1 | 10/10/2013 | | | | **469** | | | | 6830 | | | | 1 | U |
| MW-05D | 5/17/2006 | | | | | | | | | | | | 0.5 | U |
| MW-05D | 11/16/2006 | | | | 230 | | | | 4820 | B | | | 1 | U |
| MW-05D | 10/23/2007 | | | | 246 | | | | 6710 | | | | 1 | U |
| MW-05D | 6/10/2008 | | | | 209 | J | | | 5150 | | | | 1 | U |
| MW-05D | 9/9/2008 | | | | 233 | | | | 5280 | | | | 0.3 | J |
| MW-05D | 8/20/2009 | | 15200 | | **716** | | 163 | | 5560 | | 4930 | J | 1 | U |
| MW-05D | 10/20/2010 | | 13500 | | | | 172 | | | | 5880 | J | | |
| MW-05D | 10/20/2010 | | | | 276 | | | | 5140 | J | | | 1 | U |
| MW-05D | 3/7/2012 | | | | 166 | | | | 4480 | | | | 1 | U |
| MW-05D | 10/9/2013 | | | | 208 | | | | 5290 | | | | 1 | U |
| MW-06D | 5/17/2006 | | | | | | | | | | | | 0.5 | U |
| MW-06D | 11/15/2006 | | | | **491** | | | | **158000** | | | | 1 | U |
| MW-06D | 10/23/2007 | | | | **416** | | | | **177000** | | | | 1 | U |
| MW-06D | 6/9/2008 | | | | **451** | J | | | **160000** | | | | 0.3 | J |
| MW-06D | 9/9/2008 | | | | **426** | | | | **159000** | | | | 0.1 | J |
| MW-06D | 8/18/2009 | | | | **466** | | | | **160000** | | | | 1 | U |
| MW-06D | 10/18/2010 | | | | **539** | | | | **156000** | | | | 1 | U |
| MW-06D | 3/7/2012 | | | | **376** | | | | **117000** | | | | 1 | U |
| MW-06D | 10/8/2013 | | | | **424** | | | | **156000** | | | | 1 | U |
| MW-06S | 5/17/2006 | | | | | | | | | | | | 0.5 | U |
| MW-06S | 11/15/2006 | | | | **1800** | | | | **94200** | | | | 1 | U |
| MW-06S | 10/23/2007 | | | | **2650** | | | | **64000** | | | | 0.6 | J |
| MW-06S | 10/23/2007 | | | | **2530** | | | | **62400** | | | | 0.5 | J |
| MW-06S | 6/9/2008 | | | | **2810** | J | | | **61000** | | | | 1 | U |
| MW-06S | 6/9/2008 | | | | **2810** | J | | | **62000** | | | | 1 | U |
| MW-06S | 9/9/2008 | | | | **2690** | | | | **65400** | | | | 1 | U |
| MW-06S | 9/9/2008 | | | | **2730** | | | | **67400** | | | | 1 | U |
| MW-06S | 8/18/2009 | | | | **2840** | | | | **64300** | | | | 1 | U |
| MW-06S | 8/18/2009 | | | | **2810** | | | | **69900** | | | | 1 | U |
| MW-06S | 10/18/2010 | | | | **2350** | | | | **95100** | | | | 1 | U |
| MW-06S | 10/18/2010 | | | | **2480** | | | | **98700** | | | | 1 | U |
| MW-06S | 3/7/2012 | | | | **1900** | | | | **75500** | | | | 1 | U |
| MW-06S | 10/9/2013 | | | | **2710** | | | | **73500** | | | | **19** | |

**Table 2.8 : Historical Long Term Monitoring Results**

| Location | Sample Date | Parameter | Magnesium | Manganese | Manganese | Sodium | Sodium | Toluene |
|---|---|---|---|---|---|---|---|---|
| | | Units | D<br>µg/L | T<br>µg/L | D<br>µg/L | T<br>µg/L | D<br>µg/L | T<br>µg/L |
| | | GA/GW | 35000 | 300 | 300 | 20000 | 20000 | 5 |
| | | | Result Qualifier | Result Qualifier | Result Qualifier | Result Qualifier | Result Qualifier | Result Qualifier |
| MW-07D | 5/16/2006 | | | | | | | 0.5 U |
| MW-07D | 5/16/2006 | | | | | | | 0.5 U |
| MW-07D | 11/16/2006 | | | 70.6 | | 4070 B | | 1 U |
| MW-07D | 10/22/2007 | | 16600 | 136 | 22.4 | 4580 B | 4380 B | 1 U |
| MW-07D | 6/10/2008 | | | **382** J | | 4590 | | 1 U |
| MW-07D | 9/8/2008 | | | 28.8 | | 4000 B | | 1 U |
| MW-07D | 8/19/2009 | | | 25.9 | | 3910 J | | 1 U |
| MW-07D | 10/20/2010 | | | 34.3 | | 4840 | | 1 U |
| MW-07D | 3/7/2012 | | | 20.6 | | 4600 | | 1 U |
| MW-07D | 10/9/2013 | | | 22.8 J | | 4650 | | 1 U |
| MW-07S | 5/16/2006 | | | | | | | 0.5 U |
| MW-07S | 11/16/2006 | | | 46.7 | | 7100 | | 1 U |
| MW-07S | 10/22/2007 | | 23800 | 144 | 50.4 | 7940 | 8440 | 1 U |
| MW-07S | 10/22/2007 | | | 132 | | 8110 | | 1 U |
| MW-07S | 6/10/2008 | | | 36.4 J | | 8310 | | 1 U |
| MW-07S | 6/10/2008 | | | 54.9 J | | 8460 | | 1 U |
| MW-07S | 9/8/2008 | | | 46.5 | | 5780 | | 1 U |
| MW-07S | 9/8/2008 | | | 54.5 | | 5890 | | 1 U |
| MW-07S | 8/19/2009 | | | 23.1 | | 5830 | | 1 U |
| MW-07S | 8/19/2009 | | | 22.3 | | 6000 | | 1 U |
| MW-07S | 10/20/2010 | | | 18.2 | | 9200 | | 1 U |
| MW-07S | 10/20/2010 | | | 24.5 | | 8410 | | 1 U |
| MW-07S | 3/7/2012 | | | 40.1 | | 7150 | | 1 U |
| MW-07S | 3/7/2012 | | | 37.1 | | 6230 | | 1 U |
| MW-07S | 10/9/2013 | | | 40.3 J | | 7470 | | 1 U |
| MW-08S | 5/16/2006 | | | | | | | 0.5 U |
| MW-08S | 11/15/2006 | | | 46.3 | | 18200 | | 1 U |
| MW-08S | 10/24/2007 | | | 0.43 U | | 19400 | | 1 U |
| MW-08S | 6/10/2008 | | | 0.07 UJ | | **26700** | | 1 U |
| MW-08S | 9/10/2008 | | | 0.07 U | | **20100** | | 1 U |
| MW-08S | 8/19/2009 | | | 0.12 U | | **26500** | | 1 U |
| MW-08S | 10/19/2010 | | | 10 U | | **31300** | | 1 U |
| MW-08S | 3/7/2012 | | | 10 U | | **22200** | | 1 U |
| MW-08S | 10/8/2013 | | | 10 U | | **27600** | | 1 U |
| MW-09D | 5/16/2006 | | | | | | | 0.5 U |
| MW-09D | 11/16/2006 | | | 78.2 | | **30500** | | 1 U |
| MW-09D | 10/23/2007 | | | 231 | | **28700** | | 1 U |
| MW-09D | 6/9/2008 | | | 103 J | | **36900** | | 1 U |
| MW-09D | 9/8/2008 | | | 55.2 | | **31000** | | 1 U |
| MW-09D | 8/19/2009 | | | 20.4 | | **40800** | | 1 U |
| MW-09D | 10/18/2010 | | | 46.3 | | **37900** | | 1 U |
| MW-09D | 3/6/2012 | | | 83 | | **36800** | | 1 U |
| MW-09D | 10/8/2013 | | | 18.6 J | | **73200** | | 1 U |

**Table 2.8 : Historical Long Term Monitoring Results**

| Location | Sample Date | Parameter: Magnesium, D; Units: µg/L; GA/GW: 35000 | | Manganese, T; µg/L; 300 | | Manganese, D; µg/L; 300 | | Sodium, T; µg/L; 20000 | | Sodium, D; µg/L; 20000 | | Toluene, T; µg/L; 5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier | Result | Qualifier |
| MW-09S | 5/16/2006 | | | | | | | | | | | 0.5 | U |
| MW-09S | 11/16/2006 | | | 23.7 | | | | 2930 | B | | | 1 | U |
| MW-09S | 10/23/2007 | | | 36.9 | | | | 18700 | | | | 1 | U |
| MW-09S | 6/9/2008 | | | 0.72 | J | | | 14700 | | | | 1 | U |
| MW-09S | 9/8/2008 | | | 3 | B | | | **20400** | | | | 1 | U |
| MW-09S | 8/19/2009 | | | 2.8 | J | | | 10100 | | | | 1 | U |
| MW-09S | 3/6/2012 | | | 48.3 | | | | 8410 | | | | 1 | U |
| MW-09S | 10/8/2013 | | | **500** | | | | 13400 | | | | 1 | U |
| MW-13D | 5/18/2006 | | | | | | | | | | | 0.31 | J |
| MW-13D | 5/18/2006 | | | | | | | | | | | 0.5 | U |
| MW-13D | 11/15/2006 | | | **1530** | | | | 6170 | | | | 1 | U |
| MW-13D | 10/23/2007 | | | **2460** | | | | 5720 | | | | 1 | U |
| MW-13D | 6/10/2008 | | | **2050** | J | | | 6470 | | | | 1 | U |
| MW-13D | 9/9/2008 | | | **1710** | | | | 7890 | | | | 1 | U |
| MW-13D | 8/19/2009 | | | **1610** | | | | 10000 | | | | 1 | U |
| MW-13D | 10/18/2010 | | | **1480** | | | | 9850 | | | | 1 | U |
| MW-13D | 3/6/2012 | | | **1850** | | | | 6630 | | | | 1 | U |
| MW-13D | 10/8/2013 | | | **1740** | | | | 13400 | | | | 1 | U |
| MW-13S | 5/18/2006 | | | | | | | | | | | 0.5 | U |
| MW-13S | 11/15/2006 | | | 0.31 | U | | | 6530 | | | | 1 | U |
| MW-13S | 10/24/2007 | | | 22.5 | | | | **189000** | | | | 1 | U |
| MW-13S | 6/10/2008 | | | 2 | J | | | 9410 | | | | 1 | U |
| MW-13S | 9/9/2008 | | | 1.6 | B | | | **26500** | | | | 1 | U |
| MW-13S | 8/19/2009 | | | 3.4 | U | | | 7260 | | | | 1 | U |
| MW-13S | 10/18/2010 | | | 8.75 | U | | | 16300 | | | | 1 | U |
| MW-13S | 3/6/2012 | | | 4.93 | J | | | **35900** | | | | 1 | U |
| MW-13S | 10/8/2013 | | | 10 | U | | | **27800** | | | | 1 | U |
| MW-14D | 5/18/2006 | | | | | | | | | | | 0.5 | U |
| MW-14D | 5/18/2006 | | | | | | | | | | | 0.5 | U |
| MW-14D | 11/15/2006 | | | **2020** | | | | **150000** | | | | 1 | U |
| MW-14D | 11/15/2006 | | | **2010** | | | | **148000** | | | | 1 | U |
| MW-14D | 10/23/2007 | | | **1780** | | | | **159000** | | | | 1 | U |
| MW-14D | 6/10/2008 | | | **1970** | J | | | **140000** | | | | 1 | U |
| MW-14D | 9/9/2008 | | | **1690** | | | | **135000** | | | | 1 | U |
| MW-14D | 8/19/2009 | | | **1850** | | | | **133000** | | | | 1 | U |
| MW-14D | 10/20/2010 | | | **1830** | | | | **132000** | | | | 1 | U |
| MW-14D | 3/6/2012 | | | **1710** | | | | **123000** | | | | 1 | U |
| MW-14D | 10/8/2013 | | | **2230** | | | | **126000** | | | | 1 | U |
| MW-15D | 5/17/2006 | | | | | | | | | | | 0.5 | U |
| MW-15D | 11/14/2006 | | | **357** | | | | **141000** | | | | 1 | U |
| MW-15D | 10/23/2007 | | | 255 | | | | **90300** | | | | 1 | U |
| MW-15D | 6/9/2008 | | | 296 | J | | | **76800** | | | | 1 | U |
| MW-15D | 9/9/2008 | | | **337** | | | | **66000** | | | | 1 | U |
| MW-15D | 8/19/2009 | | | 285 | | | | **98400** | | | | 1 | U |
| MW-15D | 10/19/2010 | **47300** | | | | 273 | | | | **86100** | | | |
| MW-15D | 10/19/2010 | | | **459** | | | | **89300** | | | | 1 | U |
| MW-15D | 3/6/2012 | | | 294 | | | | **84600** | | | | 1 | U |
| MW-15D | 10/9/2013 | | | 286 | | | | **115000** | | | | 1 | U |

**Table 2.8 : Historical Long Term Monitoring Results**

| | Parameter | Magnesium | Manganese | Manganese | Sodium | Sodium | Toluene |
|---|---|---|---|---|---|---|---|
| | | D | T | D | T | D | T |
| | Units | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| | GA/GW | 35000 | 300 | 300 | 20000 | 20000 | 5 |
| Location | Sample Date | Result Qualifier | Result Qualifier | Result Qualifier | Result Qualifier | Result Qualifier | Result Qualifier |
| MW-16D | 5/17/2006 | | | | | | 0.29 J |
| MW-16D | 5/17/2006 | | | | | | 0.28 J |
| MW-16D | 11/16/2006 | | **416** | | 5620 | | 1 U |
| MW-16D | 10/23/2007 | | **380** | | 7100 | | 1 U |
| MW-16D | 6/10/2008 | | **349** J | | 6080 | | 1 U |
| MW-16D | 9/10/2008 | | **377** | | 5910 | | 1 U |
| MW-16D | 8/20/2009 | | 289 | | 5700 | | 1 U |
| MW-16D | 10/18/2010 | | 217 | | 5960 | | 1 U |
| MW-16D | 3/6/2012 | | **336** | | 5800 | | 1 U |
| MW-16D | 10/9/2013 | | **382** | | 6700 | | 1 U |
| PS-1 | 9/9/2008 | | | | | | 1 U |
| PS-1 | 8/20/2009 | | | | | | 0.58 J |
| PS-1 | 10/19/2010 | | | | | | 1 U |
| PS-1 | 5/31/2011 | | **394** | | 5010 | | 1 U |
| PS-1 | 12/19/2011 | | **476** | | 6350 | | 1 UJ |
| PS-1 | 3/6/2012 | | **499** | | 5490 | | 1 U |
| PS-1 | 10/10/2013 | | **320** | | 5570 | | 1 U |
| PW-26 | 5/17/2006 | | | | | | 0.5 U |
| PW-26 | 11/15/2006 | | 1.8 B | | 4170 B | | 1 U |
| PW-26 | 10/22/2007 | | 2.2 B | | 4340 B | | 1 U |
| PW-26 | 6/10/2008 | | 2.1 J | | 4360 | | 1 U |
| PW-26 | 9/8/2008 | | 1.8 B | | 3720 B | | 1 U |
| PW-26 | 8/19/2009 | | 2.8 J | | 3980 J | | 1 U |
| PW-26 | 10/20/2010 | | 5.23 U | | 4450 | | 1 U |
| PW-26 | 3/7/2012 | | 2.35 J | | 4240 | | 1 U |
| PW-26 | 10/8/2013 | | 10 U | | 4860 | | 1 U |

**Notes:**
µg/L = microgram per liter
Qualifiers:
J = Estimated value
U- not detected
GA/GW=NYS Class GA Stan
**Shaded indicates exceedance of Standard or Guidance**
MH (MH-1) = man hole
Blank cell indicates not analyzed for that parameter
*- this standard is for total phenols
T- total
D- dissolved

# APPENDIX A

# WELL DEVELOPMENT FIELD DATA RECORDS

# WELL/PIEZOMETER CONSTRUCTION DIAGRAM STICKUP

**LOCATION ID:** MW-101

Project Name: LUDLOW LANDFILL
Project Location: PERU, NY
Project Number: 36121322730 Task Number 04
Subcontractor: GEOLOGIC Drilling Method: HSA 4¼"
Development Method: BAILERS Development Date: 11/15/13
Bucking Posts/Ballards: NONE
Notes:

Date Started: 11/14/13 Date Completed: 11/14/13
Logged By: Clymond
Checked By: JR Checked Date: 11/20/13

**Measuring Point Information**

**Measuring Point (MP) Type** Top Of Riser
**MP Elevation (ft):**

| Item | Depth BMP (ft) | Elevation (ft) | Description |
|---|---|---|---|
| Stickup | 3.2' | | Lock Identification: ~~3343~~ 0344 |
| Riser Pipe (Top) | 3.0' | | Stickup Casing Type: 4"ø x 5' steel w/ Flap Cap |
| Ground Surface Elevation | MP | | Stickup Casing Diameter: 4" |
| | | | Surface Seal Type: Concrete |
| GW = 42.3' BGS 11/14/13 0750 | | | Backfill/Grout Type: -Sand, Gravel, Bentonite |
| | | | Riser Pipe Type: 2" PVC |
| | | | Riser Pipe ID: — |
| | | | Borehole Diameter: ± 8" |
| Top of Well Seal | 41.2' BGS | | Type of Seal: Bentonite (Pel-Plug ¼-TR30) |
| Top of Sand Pack | ~~45~~ 44.0' BGS | | |
| Top of Screen | 47.0' BGS | | Screen Type: 2" PVC |
| | | | Screen ID: — |
| | | | Screen Slot Size: 0.01" |
| | | | Screen Length: 10' |
| | | | Filter/Sand Pack Type: #0 SAND |
| Base of Screen | 57' BGS | | |
| End Cap | 57.2' BGS | | Sump: |
| Drilled Depth | 57.5' BGS | | Fallback/Backfill: NA |
| Bottom of Exploration | — | | |
| Bedrock Surface | NA | | |

No Refusal

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**FIGURE 4.7**
**WELL/PIEZOMETER CONSTRUCTION DIAGRAM - STICKUP**
**NYSDEC QUALITY ASSURANCE PROJECT PLAN**

# WELL/PIEZOMETER CONSTRUCTION DIAGRAM STICKUP

**LOCATION ID:** MW-102

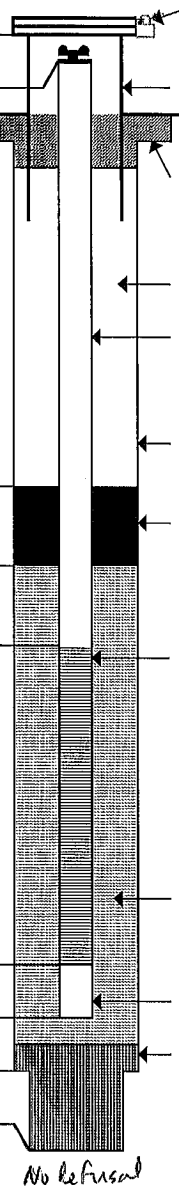
Project Name: LUDLOW LANDFILL
Project Location: ROME, NY
Project Number: 36121322 73. Task Number 04
Subcontractor: GEOLOGIC Drilling Method: HSA 4 1/4"
Development Method: BAILER Development Date: 11/13/13
Bucking Posts/Ballards: NONE
Notes:

Date Started: 11/12/13 Date Completed: 11/12/13
Logged By: C Lyman
Checked By: JR Checked Date: 11/20/13

**Measuring Point Information**

**Measuring Point (MP) Type** Top Of Riser
**MP Elevation (ft):**

| Item | Depth BMP (ft) | Elevation (ft) | Description |
|---|---|---|---|
| Stickup | 3.05 | | Lock Identification: ~~#3343-0344~~ |
| Riser Pipe (Top) | 3.04 | | Stickup Casing Type: 4"Øx5' Steel w/ PVC CAP |
| Ground Surface Elevation | MP | | Stickup Casing Diameter: 4" |
| | | | Surface Seal Type: CONCRETE |
| GW = 25.6' BGS 11/19/13 0815 | | | |
| | | | Backfill/Grout Type: Native/Bentonite |
| | | | Riser Pipe Type: 2" PVC |
| | | | Riser Pipe ID: — |
| | | | Borehole Diameter: 25' 4 1/4" / 8" (00) |
| Top of Well Seal | 24.6' BGS | | Type of Seal: BENTONITE (Pel-Plug 1/4-TI230) |
| Top of Sand Pack | 28.0' BGS | | |
| Top of Screen | 30.0' BGS | | Screen Type: 0.01 2" PVC |
| | | | Screen ID: NA |
| | | | Screen Slot Size: 0.01" |
| | | | Screen Length: 10' |
| | | | Filter/Sand Pack Type: #0 SAND |
| Base of Screen | 40.0' BGS | | |
| End Cap | 40.2' BGS | | Sump: |
| Drilled Depth | 40'+(4") | | Fallback/Backfill: NA |
| Bottom of Exploration | — | | |
| Bedrock Surface | NA | | |

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511 Congress Street, Portland Maine 04101

**FIGURE 4.7**
**WELL/PIEZOMETER CONSTRUCTION DIAGRAM - STICKUP**
**NYSDEC QUALITY ASSURANCE PROJECT PLAN**

# WELL/PIEZOMETER CONSTRUCTION DIAGRAM STICKUP

**LOCATION ID:** MW-103

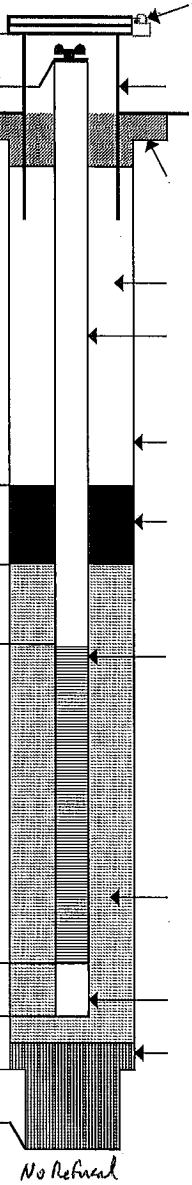
Project Name: LUDLOW LANDFILL
Project Location: PERU, NY
Project Number: 3612322273 Task Number 04
Subcontractor: GEOLOGIC Drilling Method: HSA 4¼" ID
Development Method: BAILERS Development Date: 11/15/13
Bucking Posts/Ballards: NONE
Notes:

Date Started: 11/15/13 Date Completed: 11/15/13
Logged By: CLynam
Checked By: JR Checked Date: 11/20/13

**Measuring Point Information**

**Measuring Point (MP) Type** Top Of Riser
**MP Elevation (ft):**

| Item | Depth BMP (ft) | Elevation (ft) | Description |
|---|---|---|---|
| Stickup | 3.2' | | Lock Identification: # 0344 (Not Installed) |
| Riser Pipe (Top) | 3.0' | | Stickup Casing Type: 4"ø x 5' Steel w/ Flsh Cap. |
| Ground Surface Elevation | MP | | Stickup Casing Diameter: 4" |
| | | | Surface Seal Type: Concrete |
| GW = 14.3' BGS 11/14/13 1500 | | | |
| | | | Backfill/Grout Type: Native/ Bentonite |
| | | | Riser Pipe Type: 2" PVC |
| | | | Riser Pipe ID: NA |
| | | | Borehole Diameter: 5" 4¼ x 8" (OD) |
| Top of Well Seal | 13.5' BGS | | Type of Seal: Bentonite. (Pel-Plug ¼-TR30) |
| Top of Sand Pack | 18.0' BGS | | |
| Top of Screen | 20.0' BGS | | Screen Type: 2" PVC |
| | | | Screen ID: — |
| | | | Screen Slot Size: 0.01" |
| | | | Screen Length: 10' |
| | | | Filter/Sand Pack Type: #0 SAND |
| Base of Screen | 30.0' BGS | | |
| End Cap | 30.2' BGS | | Sump: |
| Drilled Depth | 30'+(31') | | Fallback/Backfill: NA |
| Bottom of Exploration | — 31' BGS | | |
| Bedrock Surface | NA | | |




NOT TO SCALE

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**FIGURE 4.7**
**WELL/PIEZOMETER CONSTRUCTION DIAGRAM - STICKUP**
**NYSDEC QUALITY ASSURANCE PROJECT PLAN**

# SOIL BORING LOG

MACTEC
511 Congress Street, Portland Maine 04101

| | | | |
|---|---|---|---|
| Project Name: LUDLOW LANDFILL | | | Boring ID: MW-101 |
| Project Location: PERU, NY | | | Page No. 1 |
| Project No.: 3612132273.04 | Client: NYSDEC | | of: 2 |
| Boring Location: MW-101 | Refusal Depth: NA | Total Depth: ~~55~~ 57.5 | Bore Hole ID/~~OD~~: ~~4 1/4"~~ 8" |
| Weather: COLD | Soil Drilled: YES | Method: HSA 4¼" | Casing Size: NA |
| Subcontractor: GEOLOGIC | P.I.D (eV): ~~0.0~~ 10.6 | Protection Level: D | Sampler: 2'x2"ø |
| Driller: DAVE LYONS | Date Started: 11/12/13 | Date Completed: 11/13/13 | Sampler ID/OD: 1⅜"/2" |
| Rig Type/Model: TRUCK MOUNTED | Logged By: CLynn | Checked By: BR 11/20/13 | Hammer Wt/Fall: 140 lbs/30" |
| Reference Elevation: — | Water Level: 42.3 BGS | Time: 0750 | Hammer Type: SLIDE |

| Sample Information | | | | | Monitoring | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (feet bgs) | Sample Number | Penetration/ Recovery (feet) | SPT Blows/6" | N Value | PID Field Scan | PID Headspace | Lab Tests Performed | Lab Sample ID | Sample Description and Classification | USCS Group Symbol | Remarks |
| 0.0 | NA | 2'/1' | 2 3 8 12 | 11 | 0.0 | 0.0 | NA | NA | 0-2' LOAM 0-0.75 0.75-1.0' SAND Well graded, moist, trace silt (10-15%) grayish Brown. | SM-ML | |
| 5 | | 2'/1.5' | 2 2 2 4 | 4 | | | | | 5'-7' SAND Well graded, firm, moist. Gravel 20% ⅜"-½". | SW | |
| 10 | | 2'/1.5' | 10 7 5 5 | 12 | | | | | 10'-12' SAND Well graded (fine-Med.) Moist. Silt 25%, Gravel 15% ⅛"-⅜" grayish brown (wet in shoe). | SM-ML | |
| 15 | | 2'/1.5' | 3 8 10 11 | 18 | | | | | 15'-17' Silt. (trace sand) firm, moist (upper 6" wet) SAND, Poorly graded (very fine) grayish Brown, 30-40% gravel 5% ¼"-½". | ML | |
| 20 | | 2'/1' | 24 16 11 11 | 27 | | | | | 20'-22' Gravel (trace sand) ⅛"-¾" 80%, SAND well graded; moist; fine-Med. firm 10-15% grayish brown | GM | |
| 25 | | 2'/1' | 4 4 7 7 | 11 | | | | | 25'-27' SAND Well graded (fine to Med) moist, gravel ⅛"-1" 20-30%, silt 5-10% grayish brown | ~~SM~~ SW-SM | |
| 30 | | 2'/1' | 17 13 12 12 | 25 | | | | | 30-32" 0-1' SAND (wet) 15% silt, 5% gravel Well graded, Loose 1'-2' Gravel (trace sand) ⅛-2", moist well graded, poorly sorted 10-20% | SW-SM GM | #3 "split spoon Tried 2" SS # pt No Recovery. |
| 35 | | 2'/0" | 18 18 19 15 | 37 | | | | | 35-37' No Recovery Rock in Drive Shoe of Sampler 2'/2"ø. | | |
| 40 | | | | | | | | | | | |

NOTES:

FIGURE 4.4
SOIL BORING LOG
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

# SOIL BORING LOG

MACTEC
511 Congress Street, Portland Maine 04101

| | | | |
|---|---|---|---|
| Project Name: LUDLOW LANDFILL | | | Boring ID: MW-101 |
| Project Location: Penn, NY | | | Page No. 1 |
| Project No.: 3612132273.04 | Client: NYSDEC | | of: 2 |
| Boring Location: | Refusal Depth: | Total Depth: | Bore Hole ID/OD: |
| Weather: | Soil Drilled: | Method: | Casing Size: |
| Subcontractor: | P.I.D (eV): | Protection Level: | Sampler: |
| Driller: | Date Started: | Date Completed: | Sampler ID/OD: |
| Rig Type/Model: | Logged By: | Checked By: AR 11/20/13 | Hammer Wt/Fall: |
| Reference Elevation: | Water Level: | Time: | Hammer Type: |

Set Page 1 of 2

| Sample Information | | | | | Monitoring | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (feet bgs) | Sample Number | Penetration/ Recovery (feet) | SPT Blows/6" | N Value | PID Field Scan | PID Headspace | Lab Tests Performed | Lab Sample ID | Sample Description and Classification | USCS Group Symbol | Remarks |
| 0.0 | | | | | | | | | | | |
| 40 | | 2'/1.3' | 16 22 27 21 | 49 | 0.0 | 0.0 | NA | NA | 40-42' SAND Poorly graded. (Med. Sand) Trace silt 5-10%, firm, moist – wet. | SW-SM | 3" split Spoon sampler Note! Blow counts are for 2" SS split spoon. |
| | | | | | | | | | 42-45 (8,11,9,9) SAND (As above) | | |
| 45 | | 2'/0" | 16 15 17 15 | 32 | | | | | 45-47' No Recovery (Rock in Split Spoon shoe). | — | |
| 47 | | 2'/2' | 10 9 9 14 | 18 | | | | | 47-49 SAND Wet, firm, Poorly graded Poorly sorted, gravel 1/8 - 1/2" 10%, trace silt, grayish brown | SW-SM | |
| 49 | | 2'/2' | 6 8 9 10 | 17 | | | | | 49'-51' SAND Well graded, fine, wet, silt 5%, gravel 5% 1/8" - 1/2", firm grayish brown | SW-SM | |
| 51 | | 2'/2' | 5 6 8 11 | 14 | | | | | 51-53' SAND Well graded, fine, Wet Silt <5%, <5% gravel, grayish brown | SW | |
| 53 | | | | | | | | | 53-55' No Sample Collected | | |
| 55 | | 2"SS / 2'/0.2' | 3 4 | 10 | | | | | 55-57 2" split spoon = SAND < 3"SS * SAND Poorly graded, well sorted fine-med) wet, Trace silt <5%; Trace gravel 1/8 - 3/8"; grayish brown | SW | * 3" split spoon Blow counts for 2" split spoon. |
| 57 | | 2'/1.1'* 3"SS | 6 7 | | | | | | | | |
| | | | | | | | | | Bottom of boring = 57.5' BGS No Refusal | | |

NOTES:

FIGURE 4.4
SOIL BORING LOG
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

# SOIL BORING LOG

MACTEC
511 Congress Street, Portland Maine 04101

| | | | |
|---|---|---|---|
| Project Name: LUDLOW LANDFILL | | | Boring ID: MW-102 |
| Project Location: PERU, NY | | | Page No. 1 |
| Project No.: 3612132273.04 | Client: NYSDEC | | of: 2 |
| Boring Location: MW-102 | Refusal Depth: NA | Total Depth: 40' + 41' | Bore Hole ID/OD: ~~8.25~~ 4 1/4 x 8" |
| Weather: Cold, | Soil Drilled: YES | Method: HSA 4 1/4" | Casing Size: — |
| Subcontractor: GEOLOGIC | P.I.D (eV): ~~0.0~~ - 10.6 | Protection Level: D | Sampler: 2" x 2' |
| Driller: DAVE | Date Started: 11/11/13 | Date Completed: 11/12/13 | Sampler ID/OD: 1 1/2" / 2" |
| Rig Type/Model: TRUCK Mounted | Logged By: CLynam | Checked By: JR 11/20/13 | Hammer Wt/Fall: 140 lbs/30" |
| Reference Elevation: NA | Water Level: 25.6' BGS | Time: 0815 | Hammer Type: Slide |

| Depth (feet bgs) 0.0 | Sample Number | Penetration/ Recovery (feet) | SPT Blows/6" | N Value | PID Field Scan | PID Headspace | Lab Tests Performed | Lab Sample ID | Sample Description and Classification | USCS Group Symbol | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NA | 2'/1' | 6 15 26 60 | 41 | 0.0 | 0.0 | NONE | NA | 0-2' SAND - Well graded, ~~Moist~~ Wet, firm, ~~Grayish~~ Brown Rockfrags, & silt | SW-SM | |
| 5 | | 2'/1.3' | 5 3 3 6 | 6 | | | | | 5-7' SAND Well graded, Moist, firm, Grayish Brown; gravel 5% 1/2-3/4, Silt 10%; | SW-SM | |
| 10 | | 2'/1' | 8 8 7 7 | 15 | | | | | 10-12' Silt Nonplastic, Moist, firm, gravel 40% & Rockchips 1/2-3/4" Grayish brown | ML | |
| 15 | | 2'/0.2' | 11 14 10 12 | 24 | | | | | 15-17' SAND Well graded, Med-Coarse, Moist Silt 10%, Grayish brown ~~1/4-3/4~~ | SW-SM | |
| 20 | | 2'/1' | 6 11 12 20 | 23 | | | | | 20-22' GRAVEL (TRACE SAND) 1/4 - 1 3/8 gravel TRACE sand, well graded, Moist, Grayish Brown. | GW | |
| 25 | | 2'/0.6' | 34 16 9 11 | 25 | | | | | 25-27' SAND Poorly graded, well sorted, Dry, trace silt | SW | Poor Recovery Rock in End of Split spoon! |
| 30 | | 2'/1.7' | 11 11 11 12 | 22 | | | | | 30-32' Silty SAND Well graded, gravel 45-55% 1/4-3/4", Mod. Loose, Wet, Grayish Brown | SM | |
| 35 | | 2'/2' | | | | | | | 35-37' SAND Well graded, Wet, Grayish brown gravel 3/8"-2 1/2 40-50% | SW | Used 3" SS spoon |
| 39 | | | | | | | | | | | |

NOTES:

FIGURE 4.4
SOIL BORING LOG
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

# SOIL BORING LOG

MACTEC
511 Congress Street, Portland Maine 04101

| | | | |
|---|---|---|---|
| Project Name: Ludlow Landfill | | | Boring ID: MW-102 |
| Project Location: Peru, NY | | | Page No. 2 |
| Project No.: 3612132273.04 | Client: NYSDEC | | of: 2 |
| Boring Location: | Refusal Depth: | Total Depth: | Bore Hole ID/OD: |
| Weather: | Soil Drilled: | Method: | Casing Size: |
| Subcontractor: | P.I.D (eV): SEE | Protection Level: | Sampler: |
| Driller: | Date Started: Page 1 of 2 | Date Completed: | Sampler ID/OD: |
| Rig Type/Model: | Logged By: | Checked By: JR 11/20/13 | Hammer Wt/Fall: |
| Reference Elevation: | Water Level: | Time: | Hammer Type: |

| Sample Information | | | | | Monitoring | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (feet bgs) | Sample Number | Penetration/ Recovery (feet) | SPT Blows/6" | N Value | PID Field Scan | PID Headspace | Lab Tests Performed | Lab Sample ID | Sample Description and Classification | USCS Group Symbol | Remarks |
| 0.0 | | | | | | | | | | | |
| 37 | NA | 2'/1.8' | 12 10 11 11 | 21 | 0.0 | 0.0 | ND | NA | 37-39' SAND (gravelly) Well graded/Poorly Sorted, Wet, grayish Brown | SW | |
| 39 | | 2'/0.2' | 8 12 16 16 | 28 | | | | | 39'-41' No Recovery – Rock plugged end of SS spoon. (gravelly SAND) | SW | |
| 41 | | | | | | | | | Limit of Exploration. Bottom of boring = 41' BGS No Refusal. | | |

NOTES:

**FIGURE 4.4**
**SOIL BORING LOG**
**NYSDEC QUALITY ASSURANCE PROGRAM PLAN**

# SOIL BORING LOG

MACTEC
511 Congress Street, Portland Maine 04101

| | | | |
|---|---|---|---|
| Project Name: LUDLOW LANDFILL | | | Boring ID: MW-103 |
| Project Location: PERU, NY | | | Page No. 1 |
| Project No.: 3612132273.04 | Client: NYSDEC | | of: 1 |
| Boring Location: MW-103 | Refusal Depth: NA | Total Depth: 31' | Bore Hole ID/OD: ~~4 5~~ 4 1/4/8" |
| Weather: WARM | Soil Drilled: YES | Method: HSA 4 1/4" | Casing Size: NA |
| Subcontractor: GEOLOGIC | P.I.D (eV): ~~0.0 AM~~ 10.6 | Protection Level: D | Sampler: 2" x 2' |
| Driller: DAVE LYONS | Date Started: 11/14/13 | Date Completed: 11/14/13 | Sampler ID/OD: 1 3/4 / 2" |
| Rig Type/Model: TRUCK MOUNTED | Logged By: CLymon | Checked By: BR 11/20/13 | Hammer Wt/Fall: 140 lbs |
| Reference Elevation: UNK | Water Level: 14.3' BGS | Time: 1500 | Hammer Type: SLIDE |

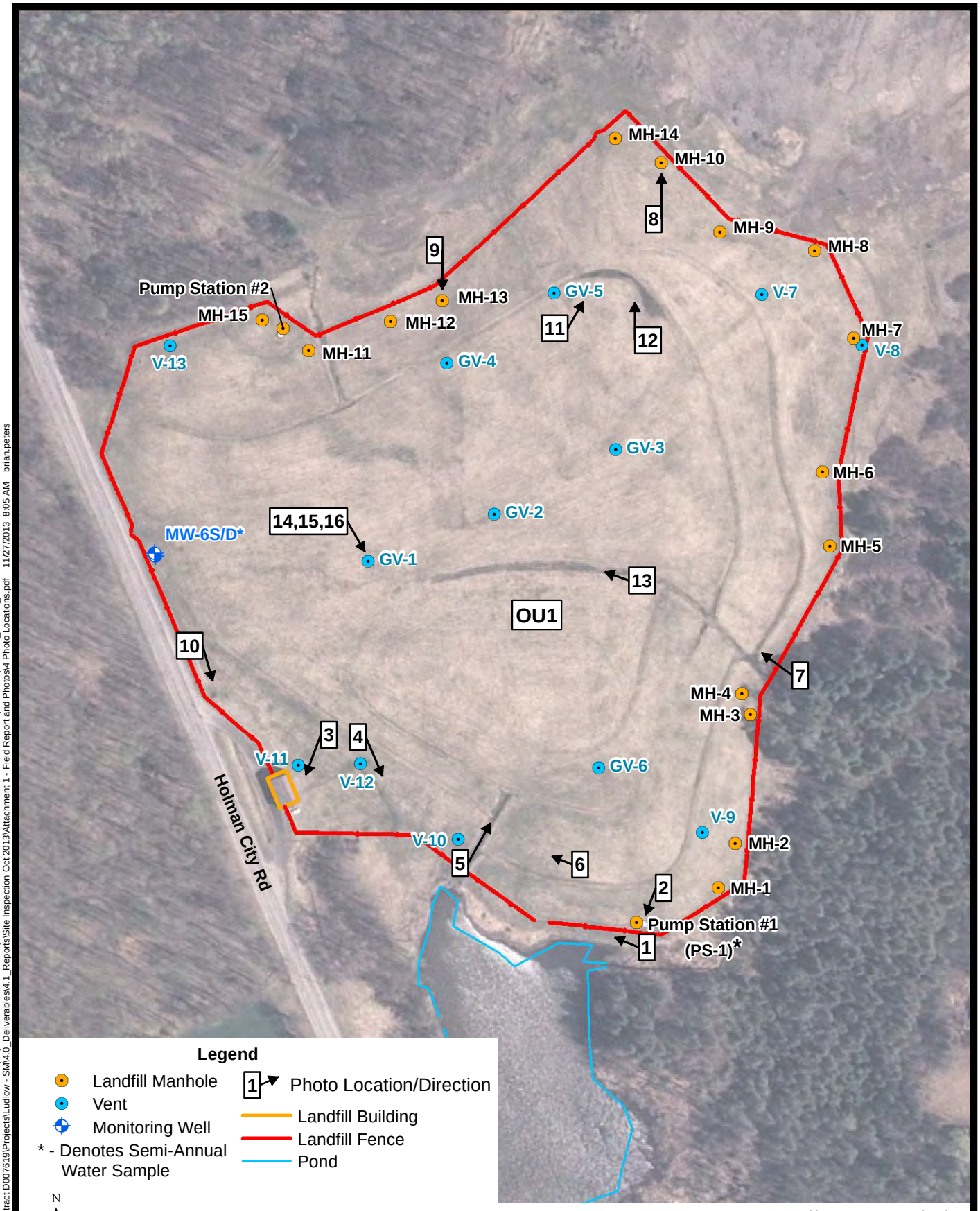
| Depth (feet bgs) | Sample Number | Penetration/ Recovery (feet) | SPT Blows/6" | N Value | PID Field Scan | PID Headspace | Lab Tests Performed | Lab Sample ID | Sample Description and Classification | USCS Group Symbol | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | NA | 2'/1' | 3 5 6 6 | 11 | 0.0 | 0.0 | NA | NA | ~~LOA~~ 0-2' Loam<br>Gravel 3/8-3/4" trace SAND | GW | |
| 5 | | 2'/2' | 5 5 6 5 | 11 | | | | | 5-7' SAND well graded, poorly sorted, moist<br>Gravel 1/8-3/8" (Round) 15-30% ; trace silt <5%<br>grayish brown | SW | |
| 10 | | 2'/0'/1.3' | 6 7 6 8 | 13 | | | | | 10-12 No Recovery Rock in SS basket. 2"SS<br>* SAND moist, firm, med-fine well graded<br>Poorly sorted, trace silt <5%, Trace gravel<br>5% 1/8"-3/8" grayish brown | SW | 2" split spoon<br>3" split spoon * |
| 15 | | 2'/1.8' | 8 10 15 26 | 25 | | | | | 15-17' No Recovery 2"SS<br>* SILT med Plastic; Wet;<br>* SAND fine, poorly graded, well sorted, silt 20-30% loose grayish brown | MH<br>SW | 2" split spoon<br>3" split spoon * |
| 20 | | 2'/1' | 32 25 21 31 | 46 | | | | | 20-22' SAND well graded, Moist, firm, grayish Brown<br>silt trace 5%<br>Gravel Rounds 1/4-1 1/2 40-50%<br>* Wet @ tip, FIRM. | SW | 2" split spoon |
| 25 | | 2'/0.5' | 27 46 50 24/.03 | 96 | | | | | 25-27' GRAVEL 1/8-3/8, wet<br>SAND 10-15% well graded Brownish gray. | GW-GM | * Refusal (cobble) @ 26.5' |
| ~~27~~ | | 2'/1' | 64 50 - | - | | | | | 27-29 Gravel 1/8-1/2" Wet, trace SAND & silt. 20% & 5% ; coarse SAND grayish brown. | GM-ML | * Refusal @ 27.8' |
| 29 | | 2'/ | 24 20 42 42 | 62 | | | | | 29-31 Dense TILL - fine grain SAND, GRAVEL & silt<br>SAND - well graded, firm, Wet grayish Brown<br>Gravel - 1/8 - 1 1/2 40-45%<br>Silt - 5% | SW/GM | * Very firm, Cemented TILL like |
| 31 | | | | | | | | | | | |

NOTES:
Bottom of boring = 31' BGS
No Refusal.

FIGURE 4.4
SOIL BORING LOG
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

# APPENDIX B

# INSPECTION PHOTOS 2013




Oneida County color digital orthoimagery (2008) obtained from New York State GIS Clearinghouse at: http://www.nysgis.state.ny.us

Prepared/Date: BRP 11/27/13
Checked/Date: JMF 11/27/13

LUDLOW SAND & GRAVEL SITE
PARIS, NEW YORK

MACTEC

OCTOBER 2013 INSPECTION FINDINGS
Project 3612132273

Document: P:\Projects\nysdec1\Contracts D004434 and D004444\projects\Ludlow O&M\4.0 project deliverables\4.5 Databases\GIS\Map Documents\inspection report\LF_IR2013_8.5x11.mxd
PDF: P:\Projects\nysdec1\Contract D007619\Projects\Ludlow - SM\4.0_Deliverables\4.1_Reports\Site Inspection Oct 2013\Attachment 1 - Field Report and Photos\4 Photo Locations.pdf 11/27/2013 8:05 AM brian.peters

1. Looking northwest

2. Looking south

3. Looking south west

4. Looking south

5. Small, woody vegetation in swale

6. Looking west

7. Wet and rutted area


8. Insect nest in MH-10 vent

9. Cracked iron collar at MH-13

10. Small, woody vegetation in swale/culvert entrance

11. Area of ponding

12. Area of ponding

13. Area of ponding

14. Dead rodents, near GV-1

15. Parts of destroyed GV-1

16. Parts of destroyed GV-1