FINAL
FIELD ACTIVITIES REPORT
GROUNDWATER MONITORING WELL INSTALLATION AND LANDFILL INSPECTION
SOUTH HILL DUMP
SITE NO. 712009

WORK ASSIGNMENT NO. D007619-16

Prepared for:

New York State Department of Environmental Conservation

Division of Environmental Remediation
Remedial Bureau E
Albany, New York

Prepared by:

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

MACTEC: 3612122249

AUGUST 2014

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Submitted by:

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Approved by:

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TABLE OF CONTENTS

LIST OF FIGURES

Figures

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
EC	engineering control
IC	institutional control
MACTEC	MACTEC Engineering and Consulting, P.C.
NTU	nephelometric turbidity unit
NYSDEC	New York State Department of Environmental Conservation
PID	photoionization detector
PVC	polyvinyl chloride
RA	remedial action
Report	Field Activities Report
ROD	Record of Decision
Site	South Hill Dump Site
SM	Site Management
SMP	Site Management Plan
TCE	trichloroethene
µg/L	microgram(s) per liter

1.0 INTRODUCTION AND DESCRIPTION OF THE REMEDIAL ACTION

1.1 INTRODUCTION

MACTEC Engineering and Consulting, P.C. (MACTEC), under contract to the New York State Department of Environmental Conservation (NYSDEC), is submitting this Field Activities Report (Report) for the South Hill Dump Site (Site) in the Town of Cortlandville, Cortland County, New York (Figure 1.1). The Site is currently listed as a Class 4 Inactive hazardous waste site - Site No. 712009 - in the Registry of Hazardous Waste Sites in New York State. This Report is being submitted in accordance with Work Assignment No. D007619-16, and with the Superfund Standby Contract between MACTEC and the NYSDEC. The Site is under site management (SM) in accordance with the Record of Decision (ROD) dated January 2008 (NYSDEC, 2008).

The Site is located in the Town of Cortlandville, Cortland County, approximately two miles south of the Village of McGraw, on the south side of South Hill Road (Figure 1.1). Much of the property is steeply sloped. The area surrounding the Site includes wooded areas, orchards, and active and former farm fields. A mix of forested areas and apple orchards are located east of the Site. The topography in this area slopes to the south, toward an unnamed stream located approximately 1/4 mile south of the Site (MACTEC, 2006).

Two residential parcels abut the Site and are located along the southern and eastern sides of South Hill Road; the closest residence is less than ¼ mile southwest of the Site. The area west and north of the Site consists primarily of active farm land. A former apple orchard is located farther west. A mix of meadow, farm land, apple orchards, and forest area is located northeast of the Site. The Tioughnioga River is located within two miles southwest of the Site. The unnamed stream located south and east of the Site discharges to the Tioughnioga River via Hoxie Gorge Creek.

The Site was operated as a municipal waste disposal facility by the Town of Cortlandville from the early 1960s until 1972, although it is reported that local residents used the Site for trash disposal as early as 1949. During its years of operation, wastes were received from the Village of McGraw and the Towns of Cortlandville and Solon, as well as local industry. Access to the Site was reportedly unrestricted during this time. It has also been reported that waste was often permitted to burn during landfill operation, and that at one time a waste oil pit may have existed. Operations are

reported to have involved pushing waste over the working face of the landfill with some spreading and compaction. Cover material was reportedly spread one or more times per week. Prior to the remedial action (RA) described in this report, waste was observed protruding from the surface of the landfill across much of the Site, and included road construction debris, brush, stumps, tires, white metal, automobile parts, and miscellaneous industrial waste materials. Numerous decomposed drums were present across many areas of the landfill (MACTEC, 2006).

1.2 SUMMARY OF THE REMEDIAL ACTION

A RA was conducted at the Site in 2011 and 2012, in accordance with the ROD, and as documented in the Final Engineering Report (MACTEC, 2013a).

The RA included the following activities:

- Installation of stabilized vehicle entrance
- Installation of perimeter erosion and sedimentation controls
- Clearing of trees and brush above the ground surface
- Grubbing of areas within the limit of grading, and disposal of grubbings on-site (beneath the new landfill cover)
- Excavation of on-site waste outside the new solid waste boundary and consolidation within the new solid waste boundary
- Decommissioning of two existing groundwater monitoring wells (MW-3S and MW-3B)
- Installation of additional erosion and sedimentation controls and measures, including a sedimentation basin, in preparation for landfill grading and soil cover installation
- Grading of the landfill within the new solid waste boundary to achieve subgrade
- Excavation for installation of landfill storm water controls (slope benches and downdrains) within the new solid waste boundary
- Removal of bulky waste items uncovered during the course of waste consolidation and landfill grading, with off-site disposal of removed bulky wastes
- Characterization and offsite disposal of uncovered buried waste drums, drum nests, and drum remnants
- Installation of 24 inch landfill cover system including associated landfill storm water controls
- Installation of landfill gas vents
- Installation of perimeter access road with waterbars
- Installation of perimeter storm water controls including riprap drainage channels and culverts

- Conversion of the sedimentation basin to a storm water detention basin
- Installation of two new groundwater monitoring wells (MW-3SR and MW-3BR)
- Seeding and mulching of all disturbed areas within the limit of work.

RA activities for the Site were completed in December 2012.

1.2.1 Remaining Contamination

Remaining contamination at the Site consists primarily of municipal and industrial wastes beneath the constructed landfill cover.

1.2.2 Engineering and Institutional Controls

Because remaining contamination is present at this Site, engineering controls (ECs) and institutional controls (ICs) have been implemented to protect public health and the environment for the applicable future use. The Controlled Property has the following ECs:

- a cover system placed over the landfilled waste
- site access controls
- surface water drainage conveyance
- landfill gas vents

A series of ICs are required to implement, maintain and monitor these ECs. The Environmental Easement requires compliance with these ICs, to ensure that:

- All ECs must be operated and maintained as specified in the SM Plan (SMP)
- All ECs on the Site must be inspected and certified at a frequency and in a manner defined in the SMP
- Environmental monitoring must be performed as defined in the SMP
- Data and information pertinent to SM for the Controlled Property must be reported at the frequency and in a manner defined in the SMP
- On-site environmental monitoring devices, including but not limited to groundwater monitoring wells, must be protected and replaced as necessary to ensure continued functioning in the manner specified in the SMP.

This report describes SM field activities conducted in June 2014 in accordance with the SMP (MACTEC 2013b) for the Site. The field activities were completed following the procedures described herein, in accordance with the SMP, in general accordance with the Quality Assurance Program Plan (MACTEC, 2007), and the Site Specific Health and Safety Plan (MACTEC, 2013c). This Report is organized as follows:

- Section 2.0 describes the field activities conducted at the Site in accordance with the SMP
- Section 3.0 presents recommendations for future site activities
- Section 4.0 includes the references discussed in this report.

2.0 FIELD ACTIVITIES

This Report describes the field activities completed at the site from June 23 through June 27, 2014 including landfill inspection, replacement monitoring well installation, and well development.

The June 2014 annual landfill inspection was conducted in accordance with the SMP.

Groundwater monitoring wells MW-3S and MW-3D installed during the Remedial Investigation were decommissioned in 2011 during the RA. Replacement wells MW-3SR and MW-3BR were installed approximately 120 feet southwest of the original MW-3 pair in 2012.

Trichloroethene (TCE) concentrations reported during historic groundwater sampling at MW-3S and MW-3B consistently exceeded the groundwater standard. The concentration of TCE reported in the replacement overburden well MW-3SR (20 micrograms per liter [ug/L]) in 2013 was significantly less that the concentration of TCE in MW-3S in 1997 (80 ug/L) and in 2001 (200 ug/L). TCE was not detected in the replacement bedrock well MW-3BR. The most recent Field Activities Report (MACTEC, 2013a) recommended that an additional downgradient well pair (bedrock and overburden) be installed in an attempt to replicate the groundwater flow path position of MW-3S/3R.

The remainder of Section 2.0 describes the field activities conducted in accordance with the SMP.

2.1 LANDFILL INSPECTION

On June 23, 2014 an environmental professional from MACTEC arrived on site to conduct a landfill inspection. Inspected features include the landfill cover system, surface water drainage conveyance system, landfill gas vents, chain link fence, and groundwater monitoring wells. The completed landfill inspection report is included in Appendix A. The following are the notable findings that require further action:

- Grass needs mowing and overgrown vegetation at some locations.
- Stone check dam in the southeast corner of the site is in disrepair.

- Two erosion gullies were observed cutting across the perimeter road exiting the southeast corner of the downdrain terminus.
- An erosion gully observed in the southwest extension of the perimeter road starting downgradient of the end of the west drainage swale downgradient of culvert C-3.
- The eastern drainage swale has 9 different areas where the geotextile fabric is exposed. Beginning from South Hill road and ending at the outfall at the property boundary in the southeast property corner. Rip rap appears to slide, exposing the geotextile, which bunches up to a depth of approximately two feet. This observation appears to be most prevalent at the water bars.

2.2 GROUNDWATER MONITORING WELL INSTALLATION AND DEVELOPMENT

From June 24 through June 27, two monitoring wells consisting of a shallow overburden (MW-3SR2) and a shallow bedrock (MW-3BR2) well pair were installed and developed in down gradient locations relative to the landfill (Figure 2.1). The wells were positioned to replicate sampling results from MW-3S and MW-3D that showed elevated volatile organic compounds in groundwater. TCE concentrations reported during previous groundwater sampling at MW-3S and MW-3B consistently exceeded the groundwater standard. MW-3S and MW-3D were decommissioned during landfill capping efforts. A MACTEC environmental professional oversaw the installation of the wells. Empire Geo Services, Inc., a standby drilling contractor to the NYSDEC, completed the drilling using a CME 850 drilling rig via hollow stem augers and rock coring methods.

Monitoring well MW-3BR2 was initiated with hollow stem augers. Split-spoon samples were collected for visual evaluation of geology and grain size. The soil encountered consisted of silt with little to trace coarse sand and gravel. The water table was encountered at approximately 7-8 feet below ground surface (bgs) and bedrock was encountered at a depth of 12 feet. A roller bit was used to drill a rock socket and steel casing was seated using grout. Once the grout hardened, the drilling method was changed to NX-size rock coring and the core barrel was advanced to a depth of 26 feet. The bedrock consisted of gray shale. The soil boring and rock coring logs for MW-3BR2 are provided in Appendix B. Following completion of the coring, the borehole was reamed using a roller bit to a diameter of 4-inches.

MW-3BR2 was completed as a 4-inch diameter open-hole bedrock well. The bottom depth of the well is 26 feet bgs. Well construction diagrams are provided in Appendix B. MW-3SR2 was

completed using hollow stem augers and is co-located with MW-3BR2. MW-3SR2 was conventionally built using a 2-inch diameter, 5-foot long, 10-slot polyvinyl chloride (PVC) screen. The screened section is from a depth of 11-feet to 6-feet. Above the screen, PVC riser extends up to the ground surface. Both MW-3BR2 and MW-3SR2 were completed as flush-mount wells and are located within curb boxes.

No elevated photoionization detector (PID) readings were noted of the soil cuttings or groundwater water. Cuttings were disposed of on-site. Both wells were developed using a whale pump. No sheen on the water was observed, nor was there an odor or elevated PID readings and as a result, purge water was discharged to the ground. MW-3SR2 produced very little water. The well was pumped dry four times and turbidity was still greater (i.e., off-scale) than 1000 nephelometric turbidity units (NTU); a total of 2 gallons of water was removed. MW-3BRS had a total of 89 gallons of water removed and turbidity, although still high, was measurable at 208 NTU Well development records are included in Appendix C.

3.0 RECOMMENDATIONS

Recommendations for additional activities are included in this section.

3.1 WELL INSTALLATION – ADDITIONAL ACTIVITIES

The following activities need to be completed to supplement the installation of groundwater monitoring wells MW-3SR2 and MW-3BRS: monitoring well survey (horizontal and vertical), hydraulic conductivity testing, groundwater sampling, and a synoptic round of water level measurements. These activities will occur in October 2014 during the next planned round of sitewide groundwater sampling.

3.2 GROUNDWATER SAMPLING TECHNIQUE

Recognizing the silty material in which MW-3SR2 was screened, and the still relatively high turbidity displayed by MW-3BRS after development, it is recommended that these wells be sampled using passive diffusion bags to avoid prolonged purging and investigation derived waste generation.

3.3 LANDFILL COVER REPAIR

MACTEC will prepare a scope of work describing remedial activities needed to address the notable findings identified in the June 2014 landfill inspection and described in Subsection 2.1 of this Report.

4.0 REFERENCES

MACTEC Engineering and Consulting, P.C. (MACTEC), 2006. Feasibility Study Report: South Hill Dump, NYSDEC Site No. 712009. December 2006.

MACTEC Engineering and Consulting, P.C. (MACTEC), 2007. Program Quality Assurance Program Plan. Prepared for the New York State Department of Environmental Conservation, Albany, New York. October 2007.

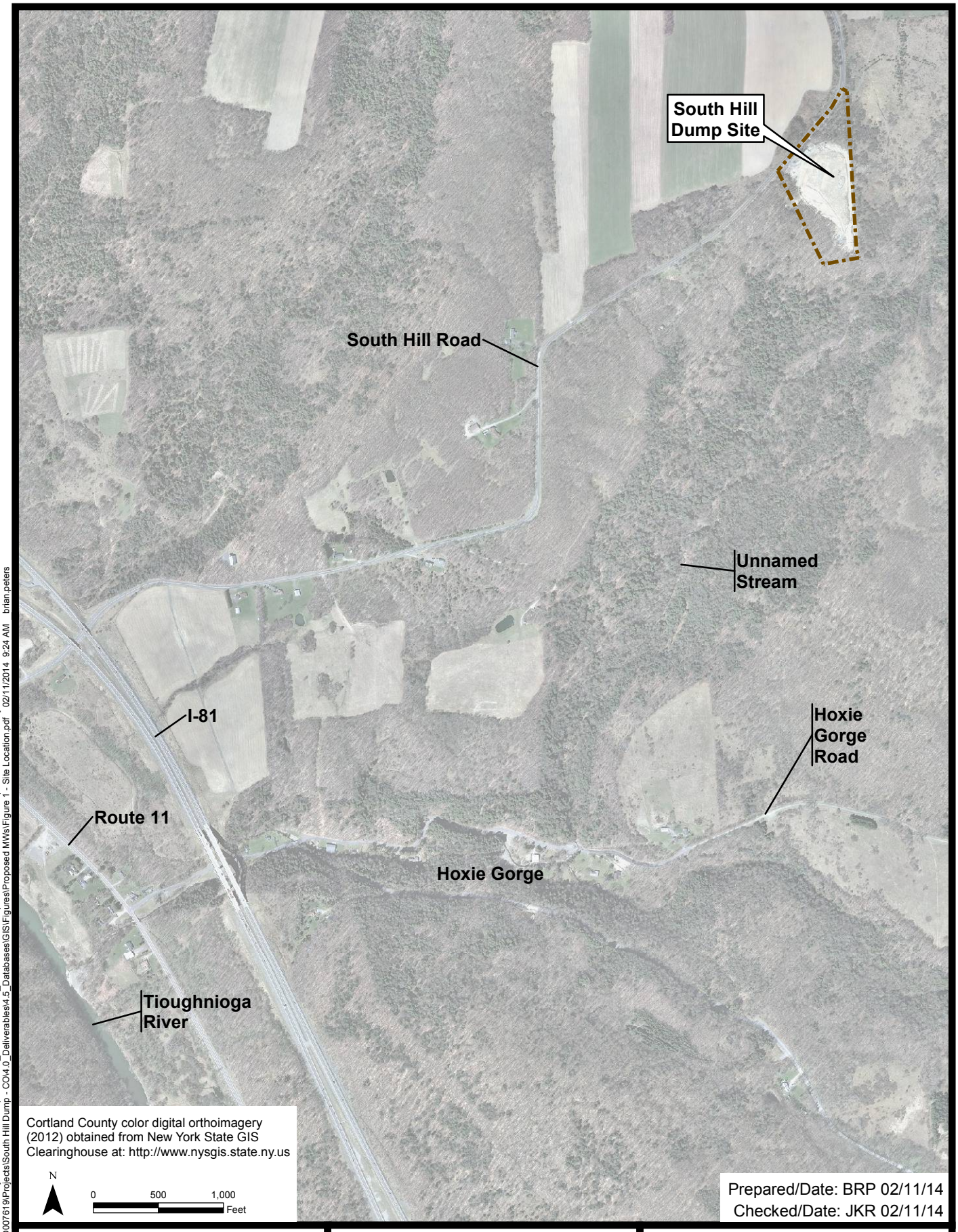
MACTEC, 2013a. Final Engineering Report, South Hill Dump Remedial Action, Site No 712009. October 2013.

MACTEC, 2013b. Site Management Plan, South Hill Dump Site, Site No. 712009. September 2013.

MACTEC, 2013c. Short Form Health and Safety Plan, South Hill Dump Landfill. July 2013.

NYSDEC, 2008. Record of Decision – South Hill Dump Site, Town of Cortlandville, Cortland County, New York: Site Number 712009. January 2008.

FIGURES



Cortland County color digital orthoimagery (2012) obtained from New York State GIS Clearinghouse at: http://www.nysgis.state.ny.us

N

0 500 1,000 Feet

Prepared/Date: BRP 02/11/14
Checked/Date: JKR 02/11/14

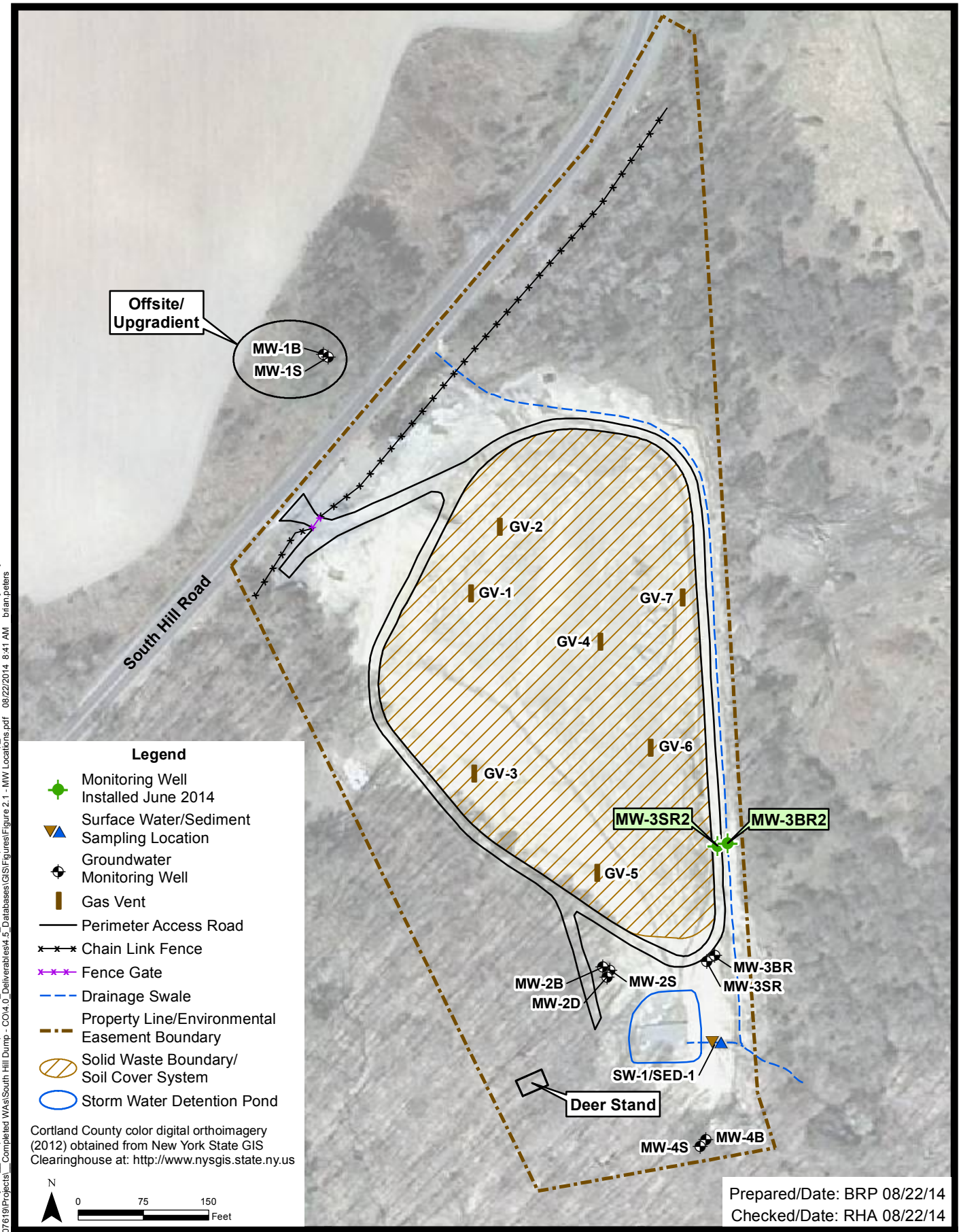
SOUTH HILL DUMP SITE
CORTLANDVILLE, NEW YORK

MACTEC

SITE LOCATION

Project 3617137309 Figure 1.1

Document: P:\Projects
ysdec1\Contract D007619\Projects\South Hill Dump - CO\4.0_Deliverables\4.5_Databases\GIS\MapDocuments\SiteLocationMap.mxd PDF: P:\Projects
ysdec1\Contract D007619\Projects\South Hill Dump - CO\4.0_Deliverables\4.5_Databases\GIS\Figures\Proposed MWs\Figure 1 - Site Location.pdf 02/11/2014 9:24 AM brian.peters



SOUTH HILL DUMP SITE
CORTLANDVILLE, NEW YORK

MACTEC

GROUNDWATER MONITORING WELL LOCATIONS
Project 3617137309 Figure 2.1

APPENDIX A

LANDFILL INSPECTION REPORT

APPENDIX I-1

New York Department of Environmental Conservation
Inactive Hazardous Waste Site
Inspection Form-Landfills

Site Name: South Hill Dump	NYSDEC Site Number: 712009	NYSDEC PM: D. Chiusano
Site Location: South Hill Road, Cortlandville, NY	Site Classification # (circle): 1 2 2a 3 (4)	Primary Site Contact: D. Chiusano

Site Inspection Date: 06/23/14	Purpose of Inspection: Annual Inspection		
Name of Inspector: Rick Walzak	Title: Project Scientist	Agency/Company: AMEC	Address: 1090 Elm St. Rocky Hill, CT
Phone Number: 860-529-7191			

Landfill Cover System

Cover System Onsite?	(Yes)	No (Proceed to next Section)		Cover System Observations: Site dry during inspection. Vegitation > 2 ft.
Vegetative Cover Condition	(Good)	Poor	NA	
Evidence of Vegetative Stress	Yes	(No)	NA	
Mowing Required	(Yes)	No	NA	
Presence of Debris	Yes	(No)	NA	
Evidence of Ponded Water	Yes	(No)	NA	
Exposed Geotextile	Yes	(No)	NA	
Evidence of Erosion Settlement	Yes	(No)	NA	
Engineered Drainage Swale Condition	(Good)	Poor	NA	
Evidence of Leachate Seepage	Yes	(No)	NA	
Evidence of Erosion	Yes	(No)	NA	
Presence of Woody Growth	Yes	(No)	NA	
Animal Burrows	Yes	(No)	NA	

Stormwater Collection and Drainage

Drainage Channel Condition	(Good)	Poor	NA	Collection System Observations: Detension Basin Outlet Structure - Chicken wire screen clogged with grass and zip ties loose. Grass removed / ties secured.
Sedimentation	Yes	(No)	NA	
Debris	Yes	(No)	NA	
Erosion/Slope Loss	Yes	(No)	NA	
Evidence of Leachate Seepage	Yes	(No)	NA	
Rip-Rap Condition	(Good)	Poor	NA	
Condition of Synthetic Liner	Good	Poor	(NA)	
Culvert Condition	(Good)	Poor	NA	
Other Drainage Structures/Pipes	(Good)	Poor	NA	
Condition of Drainage Grates	Good	Poor	(NA)	
Retention Ponds	(Good)	Poor	NA	

Building Structures

Are there any building structures at the site?	Yes	(No) (Proceed to next section)		Building Condition Observations:
Overall Exterior Condition	Good	Poor	NA	
Overall Interior Condition	Good	Poor	NA	
Interior Floor	Good	Poor	NA	
Vaulted Areas	Good	Poor	NA	

Leachate Collection System

Is there a leachate collection system at the site?	Yes	(No) (Proceed to next section)		Collection System Observations:
Collection Trench Condition	Good	Poor	NA	
Transfer Flow Pipes	Good	Poor	NA	
Condition of Valves	Good	Poor	NA	
Leachate Pump Condition	Good	Poor	NA	
Holding Tank(s) Condition	Good	Poor	NA	
Leachate Transfer/Loading Area	Good	Poor	NA	
List other applicable components and their overall condition				

Environmental Monitoring Locations

Is there a monitoring network at the site?	(Yes)	No (Proceed to next section)		Monitoring Network Observations: MW's condition good. MW-1 + MW-4 series overgrown with vegitation MW-2 + MW-3 series needs mowing.
Monitoring Wells/Piezometers	(Good)	Poor	NA	
Soil Gas Monitoring Probes	Good	Poor	(NA)	
Landfill Gas Vents	(Good)	Poor	NA	
List other applicable location types and their overall condition	NA			

APPENDIX I-1

New York Department of Environmental Conservation
Inactive Hazardous Waste Site
Inspection Form-Landfills

Interviews/Additional Contacts			
Name/Title	Phone:	Company/Entity	Contact Information
None			

Additional Observation Notes:

See report.

Photograph Log: Attached to report

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

Photograph 10

Performance Monitoring

Were check samples collected during this visit? Yes (No)

Sample type collected *(circle or write in other)*: Groundwater Sediment Soil Leachate Air Surface Water

List Parameters/Methods Collected Per Media:

Analytical Laboratory/Location:

Sample Observations:

JULY 2014 LANDFILL INSPECTION
SOUTH HILL DUMP SITE, SITE NO 712009
SOUTH HILL ROAD, CORTLANDVILLE, NY

ATTACHMENT: PHOTOGRAPHS

JULY 2014 LANDFILL INSPECTION
SOUTH HILL DUMP SITE, SITE NO 712009
SOUTH HILL ROAD, CORTLANDVILLE, NY

Photo 205 Description: Two erosion gullies across perimeter road from the southeast corner of the downdrain terminus near culvert C-1. Orientation: Looking west. Source: MACTEC, July 2014 Site Inspection	
Photo 206 Description: Close up of the gully crossing the road from the downdrain terminus. Orientation: Looking west. Source: MACTEC, July 2014 Site Inspection	

JULY 2014 LANDFILL INSPECTION
SOUTH HILL DUMP SITE, SITE NO 712009
SOUTH HILL ROAD, CORTLANDVILLE, NY

Photo 207 Description: West side of landfill looking east from entrance gate. Source: MACTEC, July 2014 Site Inspection	
Photo 208 Description: Erosion gully cutting into the southwest branch of the perimeter road beginning downgradient of the end of the west drainage swale downgradient of culvert C-3. Source: MACTEC, July 2014 Site Inspection	

JULY 2014 LANDFILL INSPECTION
SOUTH HILL DUMP SITE, SITE NO 712009
SOUTH HILL ROAD, CORTLANDVILLE, NY

Photo 209 Description: Original seep area sample location condition on June 23, 2014. Area dry. No seep observed. Orientation: Looking west. Source: MACTEC, July 2014 Site Inspection	
Photo 210 Description: West perimeter road and west landfill slope. Grass and weeds growing in road. Orientation: Looking south. Source: MACTEC, July 2014 Site Inspection	

JULY 2014 LANDFILL INSPECTION
SOUTH HILL DUMP SITE, SITE NO 712009
SOUTH HILL ROAD, CORTLANDVILLE, NY

Photo 211 Description: East perimeter road with grass and weeds growing in road. Eastern landfill slope. East drainage swale. Orientation: Looking north. Source: MACTEC, July 2014 Site Inspection	
Photo 212 Description: Downdrain terminus. Orientation: Looking northwest from the downdrain terminus. Source: MACTEC, July 2014 Site Inspection	

Photo 213 Description: Detention basin in-flow pipe. Culvert C-1. Orientation: Looking south into the detention basin. Source: MACTEC, July 2014 Site Inspection	
Photo 214 Description: Culvert C-2. Detention basin out-flow pipe into the east drainage swale. Orientation: Looking north toward the landfill. Source: MACTEC, July 2014 Site Inspection	

Photo 215 Description: Exposed geotextile as the east drainage swale exits the site property. Orientation: Looking southeast. Source: MACTEC, July 2014 Site Inspection	
Photo 216 Description: Detention basin outlet structure after repairing chicken wire zip ties and removing grass clogging screen. Source: MACTEC, July 2014 Site Inspection	

Photo 217 Description: West drainage swale looking from top down, facing south. Source: MACTEC, July 2014 Site Inspection	
Photo 218 Description: Site entrance gate and fence. Grasses and weed growing in access road. Orientation: Looking north. Source: MACTEC, July 2014 Site Inspection	

Photo 219 Description: Looking down site access road to the temporary drum storage area. Orientation: Looking northeast. Source: MACTEC, July 2014 Site Inspection	
Photo 220 Description: Two exposed geotextile areas at the head of the east drainage swale. Orientation: Looking north. Source: MACTEC, July 2014 Site Inspection	

Photo 221 Description: Close up of the exposed geotextile area at the head of the east drainage swale showing rip rap bunching up below the exposed area. Orientation: Looking south. Source: MACTEC, July 2014 Site Inspection	
Photo 222 Description: Rip rap sliding down steep slope exposing geotextile fabric at South Hill Road and the head of the east drainage swale. Orientation: Looking north. Source: MACTEC, July 2014 Site Inspection	

Photo 223 Description: Slope Bench 4 (SB-4) viewed north to south. Source: MACTEC, July 2014 Site Inspection	
Photo 224 Description: Landfill cover eastern slope looking north to south. Source: MACTEC, July 2014 Site Inspection	

APPENDIX B

SOIL BORING AND ROCK CORING LOGS

WELL/PIEZOMETER CONSTRUCTION DIAGRAM
FLUSHMOUNT

LOCATION ID: MW-35R2

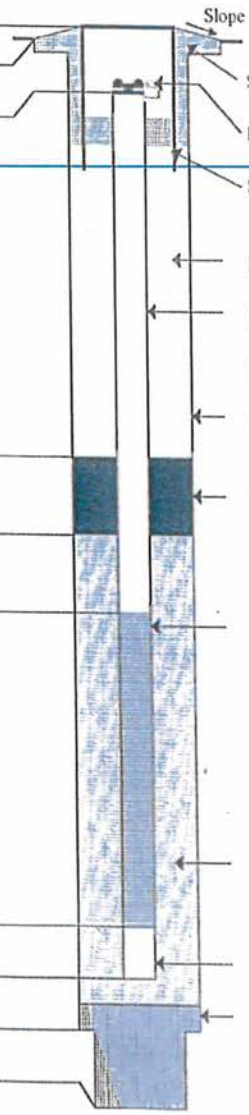
Project Name: NYSDEC - South Hill Dump
Project Location: Cortlandville, NY
Project Number: 3617137309 Task Number 03
Subcontractor: Empire Geoservices Drilling Method: HSA
Development Method: Whale Pump Development Date: 6/27/14
Bucking Posts/Ballards: NA
Notes: 4.25 augers

Date Started: 6/26/14 Date Completed: 6/27/14
Logged By: Rick Wahak
Checked By: RAC Checked Date: 8/21/14

Measuring Point Information

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

Item	Depth BMP (ft)	Elevation (ft)
Surface Casing Elevation	0 Flush	
Ground Surface Elevation	0	
Riser Pipe (Top)	0.23	
Top of Well Seal	1.5	
Top of Sand Pack	4	
Top of Screen	6	
Base of Screen	11.0	
End Cap	11.2	
Drilled Depth	11.5	
Bottom of Exploration	11.5	
Bedrock Surface	11 to 11.5	



Description	
Surface Seal Type:	Concrete
Lock Identification	No lock
Stickup Casing Diameter:	8 inch road box
Backfill/Grout Type:	Native cuttings
Riser Pipe Type:	Sch 40 PVC
Riser Pipe ID:	2 inch
Borehole Diameter:	10 inch
Type of Seal:	Bentonite Chip
Screen Type:	Sch 40 PVC
Screen ID:	2 inch
Screen Slot Size:	10 slot
Screen Length:	5 ft
Filter/Sand Pack Type:	#0
Sump:	2.5 inches
Fallback/Backfill:	Native

NOT TO SCALE

MACTEC
511 Congress Street, Portland Maine 04101

FIGURE 4.8
WELL/PIEZOMETER CONSTRUCTION DIAGRAM - FLUSHMOUNT
NYSDEC QUALITY ASSURANCE PROJECT PLAN

WELL/PIEZOMETER CONSTRUCTION DIAGRAM
FLUSHMOUNT

LOCATION ID: MW-3BR2

Project Name: NYSDEC - South Hill Dump
Project Location: Cortlandville, NY
Project Number: 3617137309 Task Number 03
Subcontractor: Empire Geoservices Drilling Method: (A)
Development Method: Whale Pump/Surge Development Date: 6/27/14
Bucking Posts/Ballards: None. Flushmount, 8 inch roadbox
Notes: (A) Hollow stem auger to rock; 6.25 augers. Overburden borehole diameter = 10 inch 4 inch roller bit through rock.

Date Started: 6/24/14 Date Completed: 6/27
Logged By: Rick Wabzak
Checked By: RHC Checked Date: 8/21/14

Measuring Point Information

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

Item	Depth BMP (ft)	Elevation (ft)	Description
Surface Casing Elevation	0 Flush		
Ground Surface Elevation	0		
Riser Pipe (Top)	-0.40		
Top of Well Seal	5		
~~Top of Sand Pack~~	NA open hole		
~~Top of Screen~~	NA bedrock well		
~~Base of Screen~~	NA open hole		
~~End Cap~~	NA bedrock well		
Drilled Depth	26		
Bottom of Exploration	26		
~~Bedrock Surface~~			

8 inch flushmount roadbox
Slope Away
Grout
2ft socket steel pipe seated into bedrock
Bore hole diameter rock 4in →
Bedrock surface 12ft.
Riser 14ft

Surface Seal Type: Concrete
Lock Identification: No lock
Stickup Casing Diameter: NA
Backfill/Grout Type: Grout = Portland little bentonite
Riser Pipe Type: Steel pipe
Riser Pipe ID: 4 inch
Borehole Diameter: Overburden 10 in
Type of Seal: Grout= Portland little bentonite powder.
Screen Type: NA
Screen ID: NA
Screen Slot Size: NA
Screen Length: NA
Filter/Sand Pack Type: NA
Sump: NA
Fallback/Backfill: None

NOT TO SCALE

MACTEC
511 Congress Street, Portland Maine 04101

FIGURE 4.8
WELL/PIEZOMETER CONSTRUCTION DIAGRAM - FLUSHMOUNT
NYSDEC QUALITY ASSURANCE PROJECT PLAN

SOIL BORING LOG

MACTEC
511 Congress Street, Portland Maine 04101

Project Name: NYSDEC - South Hill Dump			Boring ID: MW-3BR2
Project Location: Cortlandville, NY			Page No. 1 of 1
Project No.: 3617137309	Client: NYSDEC		of: 1
Boring Location: MW-3BR2	Refusal Depth: 12.0 ft	Total Depth: 14 ft	Bore Hole ID/OD: 4.25/8"
Weather: Overcast. Rain. 70°F	Soil Drilled: 12.0 ft.	Method: HSA	Casing Size: —
Subcontractor: Empire Geoservices	P.I.D (eV): 0.0	Protection Level: D	Sampler: 2' split spoon
Driller: Guy	Date Started: 6/24/14	Date Completed: 6/24/14	Sampler ID/OD: 2 inch
Rig Type/Model: CME 850	Logged By: RHW	Checked By: RHC	Hammer Wt/Fall: 140 lbs / 30"
Reference Elevation: Grade / Roadsurface.	Water Level: 7-8 ft	Time: 10:10	Hammer Type: Automatic

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											
1	①	2' / 1.6	7 14 11 14	Stiff	0.0	NT	NT	NT	Auger 0-1 Split Spoon 1-3' 0-0.9 Road base		
3									0.9-1.6 - Brown/Olive Grey/ Orange Silt, Little Fine Gravel, Trace C sand. ~~Med.~~ Stiff. Damp. Till or Fill.	ML	
5	②	2' / 1.0'	6 6 8 9	Soft	0.0	NT	NT	NT	Auger to 5' Split spoon 5-7'		
									0-3in Stuff from above	ML	
									3"-7" Brown Silt. uniform. Soft. Da Moist.	ML	
7									7"-12" Brown Silt, Little Fine gravel, Trace C sand. Wet. Till. Fractured shale in tip.	ML	
10	③	.2 / .2	50 / .2	No recovery	0.0	NT	NT	NT	Auger to 10' Sample 10-10.2 50 blows over 2 tenths. Refusal. Coarse gravel. Same till as above.	ML	
10.2											
12									Auger 10.2-12ft. Refusal. No sample.		

NOTES: NT- Not Taken. No lab samples.
Core 12-14 to confirm bedrock & not a boulder. See Rock core.
Grey shale bedrock 12-14' bgs.

FIGURE 4.4
SOIL BORING LOG
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

ROCK CORING LOG

MACTEC
511 Congress Street, Portland Maine 04101

Project Name: NYSDEC - South Hill Dump			Boring ID: MW-3BR2
Project Location: Cortlandville, NY			Page No. 1
Project No.: 3617137309	Client: NYSDEC		of: 1
Boring Location: MW-3BR2	Refusal Depth: 12.0 ft	Total Depth: 26	Bore Hole ID/OD: 4+ inch
Weather: Rain, 70°F, calm, overcast	Soil Drilled: 12.0 ft	Method: Core barrel/Roller Bit	Casing Size: 4 inch steel
Subcontractor: Empire Geoservices	P.I.D (eV): 0.0	Protection Level: D	Bit Type: Diamond
Driller: Guy	Date Started: 6/26/14	Date Completed: 6/26/14	Bit Size: NX (2.16 in)
Rig Type/Model: CME 850	Logged By: RHW	Checked By: RHS	Bit Use: —
Reference Elevation: Grade/Road surface	Water Level: (A)	Time: 12:20	Core Interval: 14 -

Depth (feet bgs)	Sample Number	Penetration/ Recovery (feet)	Natural Core Breaks: Type/Dip	Natural Core Breaks: Surface Condition	Weathered Condition	Rock Quality: Total 4" Core	Rock Quality: RQD (%)	Rock Quality: Rock Quality Description	Drill Rate (min/ft)	Color	Rock Description and Comments on Drilling	Graphic Log	Additional Remarks
14	(1)	5'/2'/1.9 (MW)	fracture	very slight oxidation	very slight	1	50%	Poor to Fair	1 min/.6ft 2/1.5 3/1.8 4/20	Grey	Grey, Fine grained, sedimentary, laminated, Hardness - Medium Weathering - very slight Several (7) plains of weakness 1 Dipping fracture 14'9"		1/2 .5 More weathering at 14 than at 16.
16			40°								Shale		
16	(2)	5'/4.8	fracture 0°	fresh	fresh	2/3	60%	Fair	1 min/.5ft 2/.8 4/1.3	Grey	Grey, Fine Grained, sedimentary, laminated, Shale, Hardness - Medium Weathering - fresh Horizontal fractures/Plains of weakness		3/5 = 0.6
21													
21	(3)	5'/5'	fracture 0	fresh	fresh	2	40%	Poor	1.6 min/1ft 1.52/1ft 1.53 min/1ft	Grey	Grey Shale. Same as above		
26				End Boring									

NOTES: (A) Water level at ground surface in open hole due to heavy rain overnight.

FIGURE 4.5
ROCK CORING LOG
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

APPENDIX C

WELL DEVELOPMENT RECORDS

WELL DEVELOPMENT RECORD

MACTEC
511 Congress Street, Portland Maine 04101

PROJECT NAME	NYSDEC - South Hill Dump
PROJECT NUMBER	3617137309.03. +++
WELL INSTALLATION DATE	6/26/14
WELL DEVELOPMENT DATE	6/27/14
LOCATION ID	MW-35R2
START TIME	11:00
END TIME	13:08
PAGE	1 OF 1
START DATE	6/27/14
END DATE	6/27/14

WELL DIAMETER (INCHES): ☐ 1-IN. ☒ 2-IN. ☐ 4-IN. ☐ 6-IN. ☐ 8-IN. ☐ OTHER

~~CASING DIAMETER (INCHES)~~: ☐ 4-IN. ☐ 6-IN. ☒ 8-IN. ☐ 10-IN. ☐ 12-IN. ☐ OTHER Road box

MEASUREMENT POINT (MP): ☒ TOP OF RISER (TOR) ☐ TOP OF CASING (TOC) ☐ OTHER

INITIAL WELL DEPTH (BMP)	10.79 FT	FINAL WELL DEPTH (BMP)	10.79 FT	SCREEN LENGTH	5 FT	PROT. CASING STICKUP (AGS)	NA FT
INITIAL DTW (BMP)	9.05 FT	SEDIMENT REMOVED (final well depth - initial well depth)	well bottom FT	SCREENED INTERVAL (BMP)	6 TO 11	TOC/TOR DIFFERENCE	NA FT
WATER COLUMN (initial well depth - initial depth to water)	1.74 FT	DTW AFTER DEVELOP. (BMP)	— FT	PUMPING DEPTH (BMP)	Bottom FT	PID AMBIENT AIR	NA PPM
CALCULATED GAL/VOL. (column X well diameter squared X 0.041)	0.29 GAL	FINAL RECOVERY DEPTH (BMP)	— FT	APPROXIMATE RECHARGE RATE	— FT-MIN	PID WELL MOUTH	NA PPM
TOTAL VOL. PURGED ~~(gal. per minute X total minutes X 0.00026 gal=L)~~	2.25 GAL	FINAL RECOVERY TIME (elapsed)	— MIN	FLUIDS LOST DURING DRILLING	0 GAL	END OF WELL DEVELOPMENT SAMPLE TAKEN?	Y ☐ N ☒

FIELD PARAMETERS

TIME	DTW (ft BMP)	PURGE RATE (mL/min)	TEMP. (°C)	SP. CONDUCTANCE (mS/cm)	pH (units)	DISS. O_2 (mg L)	TURBIDITY (ntu)	REDOX (mv)	VOLUME PURGED (gal)	TOTAL GALLONS	COMMENTS
Pumped dry with whale pump in seconds. Water very turbid. Allow recharge. Pump 2nd time. Very turbid Recharge. 8.05 ft bgs											
Pump third time. Recharge. 13:05 DTW 9.81										2 gals.	
Pump 4 time. End development. Well very turbid still.											
well far too silty for Turbidity meter.											

EQUIPMENT DOCUMENTATION

☐ DEDICATED SUBMERSIBLE
☐ SURGE BLOCK
☐ BAILER ☐ 2" ☐ ____
☐ GRUNDFOS ☐ 2" ☐ 4"
☒ OTHER whale pump

☐ WATER LEVEL METER
☐ PID ____
☐ WQ METER
☐ TURB. METER 2100 Q #20124
☐ OTHER ____
☐ OTHER ____
☐ OTHER ____

WELL DEVELOPMENT CRITERIA

	Y	N
Well water clear to the unaided eye?		
Sediment thickness remaining in well <1.0" of screen length?		
Total water removed = a minimum of 5x calculated well volumes plus 5x drilling fluids lost?		
Turbidity < 5NTUs?		
10% change in field parameters?		

WAS DEVELOPMENT CRITERIA MET? Y ☐ N ☐

ADDITIONAL OBSERVATIONS

PURGE WATER CONTAINERIZED: Y ☐ N ☒

NUMBER OF GALLONS GENERATED: NA

SKETCH

NOTES

Well Developer Signature: Rick Wolzak
Checked By: RHC
Print Name: Rick Wolzak
Date: 8/21/14

FIGURE 4.9
WELL DEVELOPMENT RECORD
NYSDEC QUALITY ASSURANCE PROGRAM PLAN

WELL DEVELOPMENT RECORD

MACTEC
511 Congress Street, Portland Maine 04101

PROJECT NAME	NYSDEC - South Hill Dump
PROJECT NUMBER	3617137309.03. +++
WELL INSTALLATION DATE	6/25/14
WELL DEVELOPMENT DATE	6/27/14
LOCATION ID	MW-3BRS
START TIME	9:30
END TIME	12:50
PAGE	1 OF 1
START DATE	6/27/14
END DATE	6/27/14

WELL DIAMETER (INCHES): ☐ 1-IN. ☐ 2-IN. ☒ 4-IN. ☐ 6-IN. ☐ 8-IN. ☐ OTHER

CASING DIAMETER (INCHES): ☒ 4-IN. ☐ 6-IN. ☐ 8-IN. ☐ 10-IN. ☐ 12-IN. ☐ OTHER — 4 in steel pipe riser sticking up during develop will be cut down later.

MEASUREMENT POINT (MP): ☒ TOP OF RISER (TOR) ☐ TOP OF CASING (TOC) ☐ OTHER

INITIAL WELL DEPTH (BMP)	(B) (A) 26.79 FT	FINAL WELL DEPTH (BMP)	26.80 FT	SCREEN LENGTH	open hole FT	PROT. CASING STICKUP (AGS)	NA FT
INITIAL DTW (BMP)	(A) FT	SEDIMENT REMOVED (final well depth - initial well depth)	All FT	SCREENED INTERVAL (BMP)	14 TO 26	TOC/TOR DIFFERENCE	NA FT
WATER COLUMN (initial well depth - initial depth to water)	26 FT	DTW AFTER DEVELOP. (BMP)	— FT	PUMPING DEPTH (BMP)	Bottom FT	PID AMBIENT AIR	Not Available PPM
CALCULATED GAL/VOL (column X well diameter squared X 0.041)	17.06 GAL	FINAL RECOVERY DEPTH (BMP)	— FT	APPROXIMATE RECHARGE RATE	.35 to .60 FT/MIN	PID WELL MOUTH	— PPM
TOTAL VOL. PURGED ~~(mL/per minute X total minutes X 0.00026 gal/mL)~~	89 GAL	FINAL RECOVERY TIME (elapsed)	— MIN	FLUIDS LOST DURING DRILLING	— GAL	END OF WELL DEVELOPMENT SAMPLE TAKEN?	Y ☐ N ☒

FIELD PARAMETERS

TIME	DTW (ft BMP)	PURGE RATE (mL/min)	TEMP. (°C)	SP. CONDUCTANCE (mS/cm)	pH (units)	DISS. O_2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	VOLUME PURGED (gal)	TOTAL GALLONS	COMMENTS
9:45	Start pumping.				Surge with pump.						
9:53	Dry	4 gals/min					>scale		25		Very turbid.
	0.6 ft/min recharge		0.5 ft/min recharge								
10:15	15.42	-15.07	0.35 ft/min. recharge								
10:21	13.50	0.27 ft/min recharge.									
10:25	12.55						367				
	Well tapped on well bottom										
10:31	Dry	4 gals/min					>scale		15	40	
11:00	14.90	4/ gals/min.	Dry				182		15	~~50~~	55 gal's.
12:05	8.75	4.					478		19	74	gallons
12:45	13.5						208		15	89	

EQUIPMENT DOCUMENTATION

☐ DEDICATED SUBMERSIBLE
☐ SURGE BLOCK
☐ BAILER ☐ 2" ☐ ____
☐ GRUNDFOS ☐ 2" ☐ 4"
☒ OTHER Whale pump

☑ WATER LEVEL METER
☐ PID
☐ WQ METER
☑ TURB. METER 2100Q #20124
☐ OTHER
☐ OTHER
☐ OTHER

WELL DEVELOPMENT CRITERIA

	Y	N
Well water clear to the unaided eye?		
Sediment thickness remaining in well <1.0' of screen length?		
Total water removed = a minimum of 5x calculated well volumes plus 5x drilling fluids lost?		
Turbidity < 5NTUs?		
10% change in field parameters?		
WAS DEVELOPMENT CRITERIA MET?	☐	☐

ADDITIONAL OBSERVATIONS

PURGE WATER CONTAINERIZED: Y ☐ N ☒

NUMBER OF GALLONS GENERATED: NA

NOTES

SKETCH

(A) Water at grade. Drilling water introduced yesterday? Appears to recharge to similar depth as overburden well.

Well Developer Signature: Rick Walzak
Checked By: RHC
Print Name: Rick Walzak
Date: 6/21/14

FIGURE 4.9
WELL DEVELOPMENT RECORD
NYSDEC QUALITY ASSURANCE PROGRAM PLAN