APPENDIX C

BORING LOGS/WELL COMPLETION DETAILS

Project No: 0250-012-001

Borehole Number: PZ-1-1

Project: Olean Redevelopment Site

A.K.A.:

Client: Olean Gateway LLC

Logged By: BMG

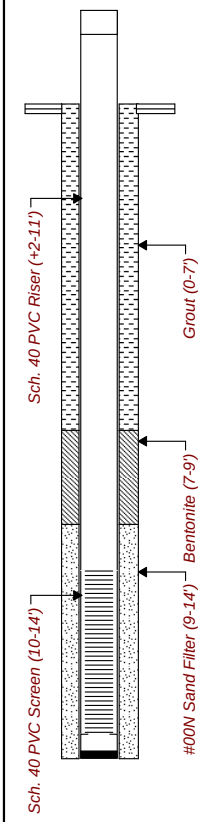
Site Location: Olean Redevelopment Site

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
-5.0									
0.0	0.0 / 0.0	Ground Surface							
		FILL Dark Brown and black, moist, sand with some brick, trace clay chunks, metal, wood, concrete, cinders and ash, dense in place	S1	NA	8'		6.6, 1.4, 0.7, 11.5		
5.0									
			S2	NA	1.4'		312.4		
10.0	-10.0 / 10.0	***Well Graded Sand with Silt and Gravel*** Black, moist to wet (14'), fine to coarse sand with little fine to coarse rounded gravel, little non-plastic fines to non-plastic fines, dense in place, slight odor	S3	NA	1.4'		427.7		
			S4	NA	1.5'		749.2		
15.0			S5	NA	1.7'		919.4		
	-16.0 / 16.0	End of Borehole							
20.0									

PID VOCs scale: 0 – 1000 – 2000 ppm



Drilled By: Parratt Wolff Inc.
Drill Rig Type: Ingersoll Rand 200
Drill Method: Test pit to 8'/continuous SS w/H.S.A.
Comments: Slight odor 8-16'
Drill Date(s): 8-8-12

Hole Size: 8"
Stick-up: 2'
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0250-012-001

Borehole Number: PZ-1-2

Project: Olean Redevelopment Site

A.K.A.:

Client: Olean Gateway LLC

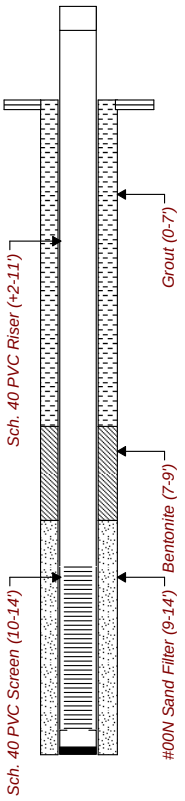
Logged By: BMG

Site Location: Olean Redevelopment Site

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
-5.0									
0.0	0.0 / 0.0	Ground Surface							
		FILL Dark Brown and black, moist, sand with some brick, trace clay chunks, metal, wood, concrete, cinders and ash, dense in place	S1	NA	8'		1.5, 2.6, 19.8, 58.5		
5.0	-6.0 / 6.0	***Well Graded Sand with Silt and Gravel*** Black, moist to wet (14'), fine to coarse sand with little fine to coarse rounded gravel, little non-plastic fines to non-plastic fines, dense in place, slight odor 12-16'	S2	NA	0.2'		18.5		
10.0			S3	NA	0.4'		72.3		
			S4	NA	1.2'		291.1		
15.0	-16.0 / 16.0	End of Borehole	S5	NA	0.9'		508.9		
20.0									



Drilled By: Parratt Wolff Inc.
Drill Rig Type: Ingersoll Rand 200
Drill Method: Test pit to 8'/continuous SS w/H.S.A.
Comments: Slight odor 12-16'
Drill Date(s): 8-8-12

Hole Size: 8"
Stick-up: 2'
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0250-012-001

Borehole Number: PZ-2-1

Project: Olean Redevelopment Site

A.K.A.:

Client: Olean Gateway LLC

Logged By: BMG

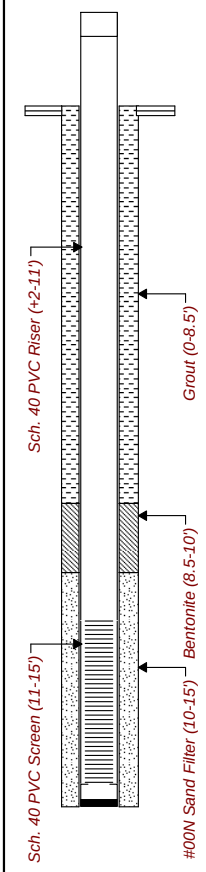
Site Location: Olean Redevelopment Site

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE					
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample
-5.0								
0.0	0.0 / 0.0	Ground Surface						
		FILL Dark Brown and black, moist, sand with some brick, trace clay chunks, metal, wood, concrete, cinders and ash, dense in place, slight odor 6-8'	S1	NA	8'		51.6, 86.5, 123.9, 704.9	
5.0								
			S2	NA	0.4'		8.2	
10.0	-10.0 / 10.0	***Well Graded Sand with Silt and Gravel*** Black, moist to wet (15'), fine to coarse sand with little fine to coarse rounded gravel, little non-plastic fines to non-plastic fines, slight odor, dense in place	S3	NA	0.4'		401.3	
			S4	NA	0.0'			
15.0			S5	NA	1.2'		556.2	
	-16.0 / 16.0	End of Borehole						
20.0								

Scale: 0 – 1000 – 2000 ppm



Drilled By: Parratt Wolff Inc.
Drill Rig Type: Ingersoll Rand 200
Drill Method: Test pit to 8'/continuous SS w/H.S.A.
Comments: Slight odor 6-16'
Drill Date(s): 8-9-12

Hole Size: 8"
Stick-up: 2'
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0250-012-001

Borehole Number: PZ-2-2

Project: Olean Redevelopment Site

A.K.A.:

Client: Olean Gateway LLC

Logged By: BMG

Site Location: Olean Redevelopment Site

Checked By: BCH

TurnKey Environmental Restoration, LLC
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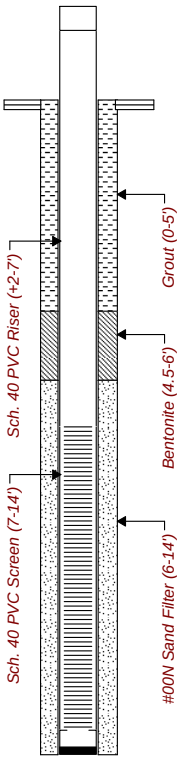
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
-5.0									
0.0	0.0	Ground Surface							
	0.0	***FILL*** Dark Brown and black, moist, sand with some brick, trace clay chunks, metal, wood, concrete, cinders and ash, dense in place	S1	NA	8'		1.3; 1.6; 39.5; 65.7		
5.0									
	-8.0 / 8.0	***Well Graded Sand with Silt and Gravel*** Black, wet, fine to coarse sand with little fine to coarse rounded gravel, little non-plastic fines to non-plastic fines, dense in place, slight odor	S2	NA	1.1'		1172.0		
10.0			S3	NA	1.8'		293.1		
			S4	NA	1.8'		281.6		
	-14.0 / 14.0	End of Borehole							
15.0									
20.0									



Drilled By: Parratt Wolff Inc.
Drill Rig Type: Ingersoll Rand 200
Drill Method: Test pit to 8'/continuous SS w/H.S.A.
Comments: Slight odor 8-14'
Drill Date(s): 8-9-12

Hole Size: 8"
Stick-up: 2'
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0250-012-001

Borehole Number: SVE-1

Project: Olean Redevelopment Site

A.K.A.:

Client: Olean Gateway LLC

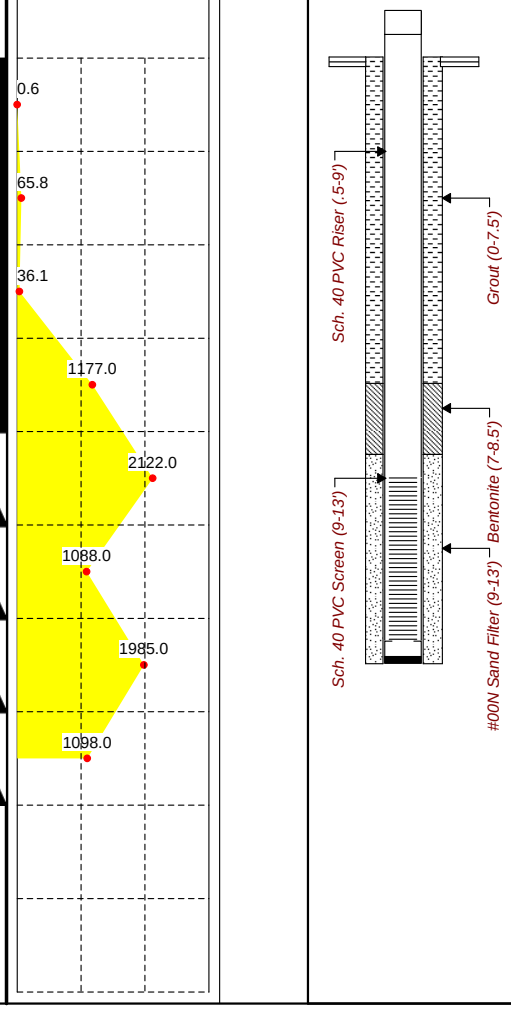
Logged By: BMG

Site Location: Olean Redevelopment Site

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
-5.0									
0.0	0.0	Ground Surface							
	0.0	***FILL*** Dark Brown and black, moist, sand with some brick, trace clay chunks, metal, wood, concrete, cinders and ash, dense in place	S1	NA	8'		0.6; 65.8; 36.1		
5.0	-6.0 / 6.0	***Lean Clay*** Gray, moist, low plasticity fines with trace gravel, medium stiff, moderate odor					1177.0		
	-8.0 / 8.0	***Well Graded Sand with Silt and Gravel*** Black, moist to wet (12'), fine to coarse sand with little fine to coarse rounded gravel, little non-plastic fines to non-plastic fines, dense in place, moderate odor	S2	NA	0.4'		2122.0		
10.0			S3	NA	0.3'		1088.0		
			S4	NA	1.2'		1985.0		
15.0			S5	NA	1.5'		1098.0		
	-16.0 / 16.0	End of Borehole							
20.0									



Drilled By: Parratt Wolff Inc.
Drill Rig Type: Ingersoll Rand 200
Drill Method: Test pit to 8'/continuous SS w/H.S.A.
Comments: Moderate odor 6-16'
Drill Date(s): 8-9-12

Hole Size: 8"
Stick-up: 1'
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0250-012-001

Borehole Number: SVE-2

Project: Olean Redevelopment Site

A.K.A.:

Client: Olean Gateway LLC

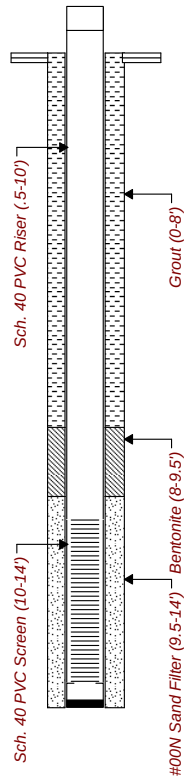
Logged By: BMG

Site Location: Olean Redevelopment Site

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
-5.0									
0.0	0.0 / 0.0	Ground Surface							
		FILL Dark Brown and black, moist, sand with some brick, trace clay chunks, metal, wood, concrete, cinders and ash, dense in place, slight odor	S1	NA	8'		147.6, 89.9, 404.8, 407.9		
5.0									
	-8.5 / 8.5	***Silty Sand with Gravel*** Black, moist, fine to coarse sand with little fine to coarse rounded gravel, few non-plastic fines to non-plastic fines, dense in place, moderate odor	S2	NA	1.0'		1669.0		
10.0			S3	NA	1.0'		1797.0		
			S4	NA	0.3'		377.9		
15.0			S5	NA	1.0'		1842.0		
	-16.0 / 16.0	End of Borehole							
20.0									



Drilled By: Parratt Wolff Inc.
Drill Rig Type: Ingersoll Rand 200
Drill Method: Test pit to 8'/continuous SS w/H.S.A.
Comments: Slight odor 0-8.5' , moderate odor 8.5-16'
Drill Date(s): 8-9-12

Hole Size: 8"
Stick-up: 1'
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0250-012-001

Borehole Number: W-29

Project: Olean Redevelopment Site

A.K.A.:

Client: Olean Gateway LLC

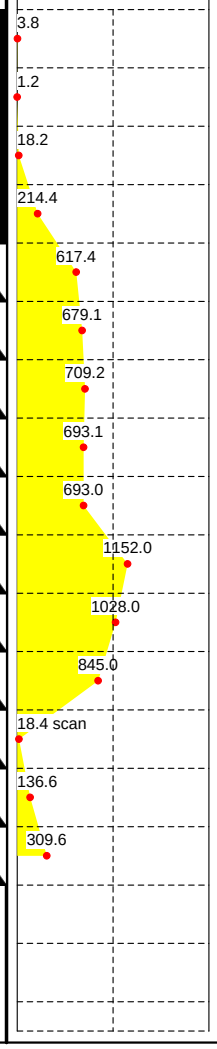
Logged By: BMG

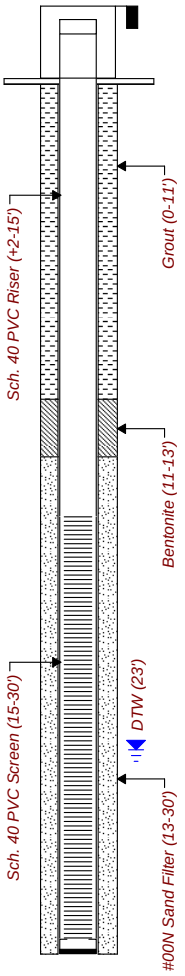
Site Location: Olean Redevelopment Site

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE				PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol			
	0.0	Ground Surface							
	0.0	***FILL*** Brown, moist, sand with some cobble, few brick and trace metal	S1	NA	8'		3.8, 1.2, 18.2, 214.4		
	-6.0 / 6.0	***FILL*** SAA, with trace cobble, some black staining in sand, and slight odor							
	-8.0 / 8.0	***Well Graded Sand with Silt and Gravel*** Gray, moist, fine to coarse sand with some fine to coarse rounded gravel, little non-plastic fines, dense in place, slight odor	S2	23	.8'		617.4		
			S3	32	1.2'		679.1		
			S4	>80	.8'		709.2		
	-14.0 / 14.0	***Well Graded Sand with Silt and Gravel*** Gray, moist, fine to coarse sand with some fine to coarse rounded gravel, little non-plastic fines, and trace shale fragments, very dense, slight odor	S5	42	.9'		693.1		
			S6	55	1.3'		693.0		
			S7	>50	.8'		1152.0		
	-20.0 / 20.0	***Well Graded Gravel with Silt and Sand*** Gray, moist to wet (26'), fine to coarse rounded gravel with little fine to coarse sand, and little non-plastic fines, very dense, slight odor, may be cobbles base on drilling observations	S8	45	1.5		1028.0		
			S9	>80	.8'		845.0		
			S10	67	0.1'		18.4 scan		
			S11	>79	.2'		136.6		
			S12	21	.5'		309.6		
	-30.0 / 30.0	End of Borehole							





Drilled By: Parratt Wolff Inc.
Drill Rig Type: Ingersoll Rand 200
Drill Method: Test pit to 8'/continuous SS w/H.S.A.
Comments: Slight odor 6-30'
Drill Date(s): 8-7-12

Hole Size: 6"
Stick-up: 2'
Datum: Mean Sea Level

Sheet: 1 of 1

Project No: 0250-012-001

Borehole Number: W-30

Project: Olean Redevelopment Site

A.K.A.:

Client: Olean Gateway LLC

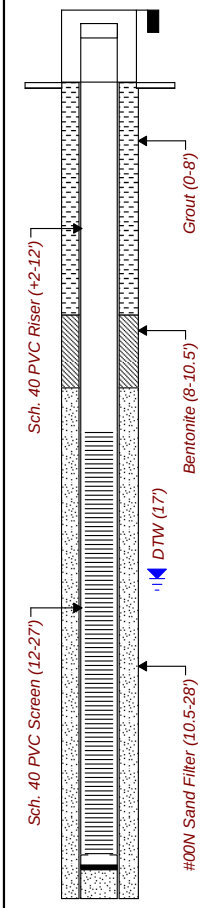
Logged By: BMG

Site Location: Olean Redevelopment Site

Checked By: BCH

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

SUBSURFACE PROFILE			SAMPLE						
Depth (fbgs)	Elev. /Depth	Description (ASTM D2488: Visual-Manual Procedure)	Sample No.	SPT N-Value	Recovery (ft)	Symbol	PID VOCs (ppm)	Lab Sample	Well Completion Details or Remarks
-5.0									
0.0	0.0	Ground Surface							
	0.0	***FILL*** Dark Brown and black, moist, sand with some cinders and ash, slight to moderate odor	S1	NA	8'		183.5, 287.2, 98.6, 399.9		
5.0	-8.0								
	8.0	***Silty Sand with Gravel*** Brown, moist, fine to coarse sand with few rounded fine to coarse gravel and little low plastic to non-plastic fines, dense in place	S2	11	1.0'		34.6		
10.0			S3	21	1.0'		40.7		
			S4	22	1.4'		8.3		
	-14.0								
	14.0	***Well Graded Sand with Gravel*** Brown, moist, fine to coarse sand with some fine rounded gravel, little coarse rounded gravel, and trace non-plastic fines, dense in place	S5	9	1.7'		49.5		
15.0			S6	6	1.4'		2.1		
			S7	10	0.8'		77.2		
20.0			S8	17	1.2'		3.2		
	-23.0								
	23.0	***Well Graded Gravel with Silt and Sand*** Gray, wet, rounded fine to coarse rounded gravel with little fine to coarse sand, and little non-plastic fines, very dense, slight odor, may be cobbles base on drilling observations	S9	8	1.5'		25.4		
25.0			S10	33	1.8'		99.7		
			S11	24	0.4'		60.6		
			S12	15	1.9'		244.8		
30.0	-30.0								
	30.0	End of Borehole							
35.0									



Drilled By: Parratt Wolff Inc.
Drill Rig Type: Ingersoll Rand 200
Drill Method: Test pit to 8'/continuous SS w/H.S.A.
Comments: Slight to moderate odor 0-8'
Drill Date(s): 8-8-12

Hole Size: 8"
Stick-up: 2'
Datum: Mean Sea Level

Sheet: 1 of 1

BORING LOG

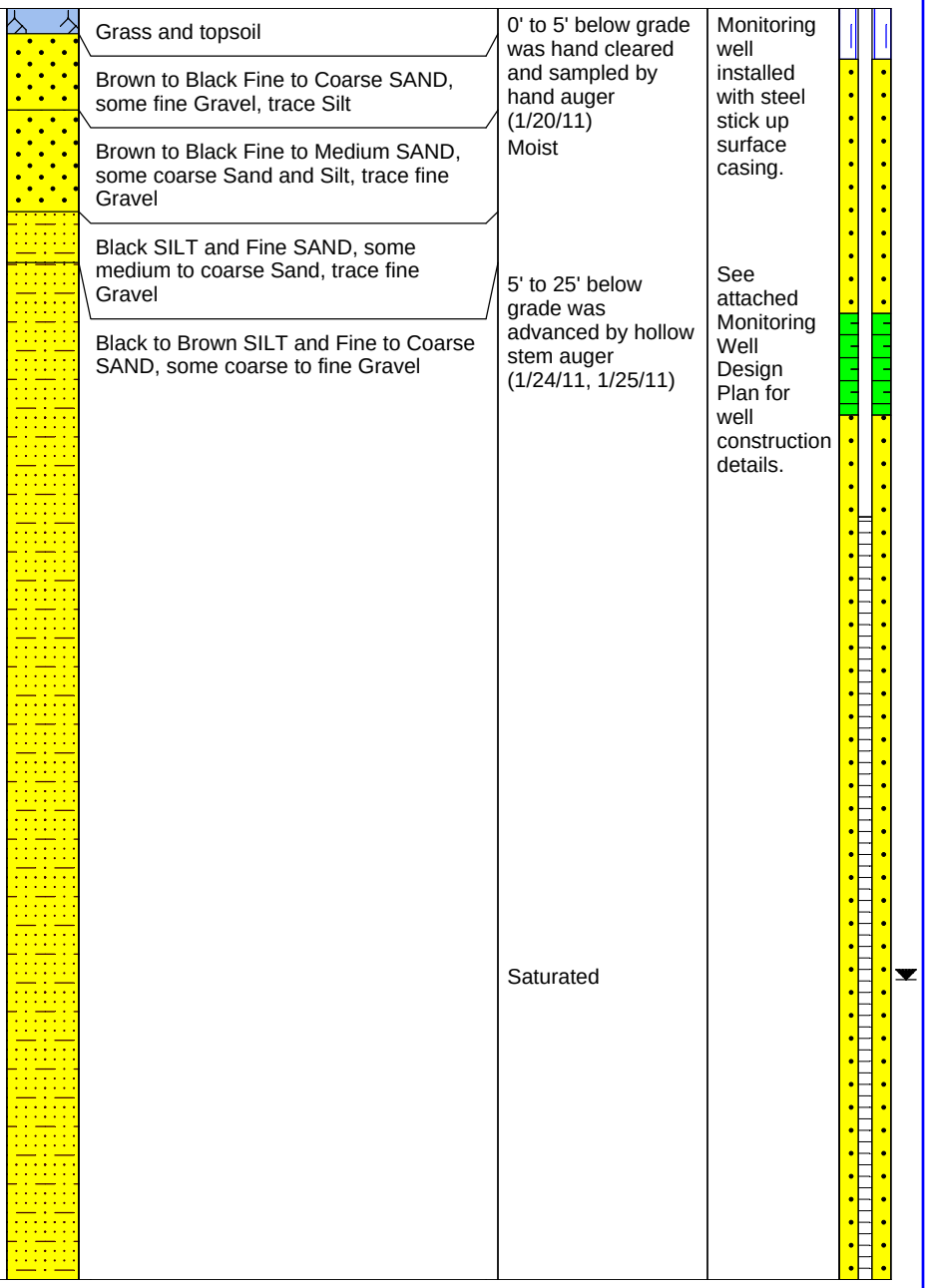
ID NO. **W-26**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**25'**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**19'**	CASING EL.:	**NA**
JOB NO.	**06-02376**	BOREHOLE DIA.:	**10.5"**	WELL DIA.:	**4"**

Logged By:	**L. Tuovila**	Drilling Method:	**Air Knife, Hand Auger/Hollow Stem Auger**
Dates Drilled:	**1/20/11; 1/24/11; 1/25/11**	Sampling Method:	**NA**
Drilling Company:	**Parratt Wolff, Inc.**	Soil Class. System:	**Burmister**
Drill Rig:	**Dietrich D-90**	Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Percent Recovery	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0 - 2	8.0	NA	NC	Grass and topsoil	0' to 5' below grade was hand cleared and sampled by hand auger (1/20/11)	Monitoring well installed with steel stick up surface casing.
2	2 - 4	10.0	NA	NC	Brown to Black Fine to Coarse SAND, some fine Gravel, trace Silt	Moist	
4	4 - 5	40.7	NA	NC	Brown to Black Fine to Medium SAND, some coarse Sand and Silt, trace fine Gravel		
6					Black SILT and Fine SAND, some medium to coarse Sand, trace fine Gravel	5' to 25' below grade was advanced by hollow stem auger (1/24/11, 1/25/11)	See attached Monitoring Well Design Plan for well construction details.
8					Black to Brown SILT and Fine to Coarse SAND, some coarse to fine Gravel		
10							
12							
14		NA	NA	NA			
16							
18						Saturated	
20							
22							
24							



Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Hand Clearing (0-5 ft) completed on 1/20/11. Soil boring completed on 1/25/11. Sampling not required at this location due to previous soil boring information collected at the location (see TPSB-19). Monitoring well installed on 1/25/11.

PID=Photionization detector; SPH=Separate phase hydrocarbons; ppm=Parts per million

NC-Not checked; NA=Not available

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

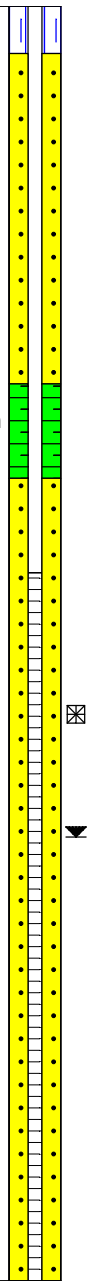
ID NO. **W-27**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**27'**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**17.5'**	CASING EL.:	**NA**
JOB NO.	**06-02376**	BOREHOLE DIA.:	**10.5"**	WELL DIA.:	**4"**

Logged By:	**L. Tuovila**	Drilling Method:	**Air Knife, VacMaster 4000/Hollow Stem Auger**
Dates Drilled:	**1/21/11; 1/25/11**	Sampling Method:	**Hand Auger/Split Spoon**
Drilling Company:	**Parratt Wolff, Inc.**	Soil Class. System:	**Burmister**
Drill Rig:	**Dietrich D-90**	Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Percent Recovery	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0 - 2	0.0	NA	NC	Grass and topsoil	0' to 5' below grade was hand cleared and sampled by hand auger (1/21/11) Moist	Monitoring well installed with steel stick up surface casing.
2	2 - 4	0.0	NA	NC	Brown to Black Fine to Coarse SAND, some Silt, trace coarse to fine Gravel		
4	4 - 5	0.8	NA	NC	Black Fine to Medium SAND, some Silt and fine to coarse Gravel, trace Brick Fragments		
6	5 - 7	1.8	50	NC		5' to 27' below grade was advanced by hollow stem auger (1/25/11)	See attached Monitoring Well Design Plan for well construction details.
8	7 - 9	0.8	60	NC			
10	9 - 11	0.0	50	NC			
12	11 - 13	0.8	60	NC			
14	13 - 15	21.8	75	NC	Brown to Black Medium to Coarse SAND, some fine Gravel, trace Silt and fine Sand		
16	15 - 17	78.9	40	NC	Black Medium to Coarse SAND, some fine Gravel		
18	17 - 19	82.5	10	NC		Saturated	
20	19 - 21	827	75	Neg.	Gray to Black Fine to Coarse SAND, some fine Gravel, trace Silt		
22	21 - 23	187	75	Neg.			
24	23 - 25	NA	NA	NA	Gray to Black Fine to Coarse SAND, Fine GRAVEL and SILT		
26	25 - 27	NA	NA	NA			



Location:
- Northing/Latitude:
- Easting/Longitude:
- Horizontal Datum:
- Vertical Datum:

General Comments:

Hand Clearing (0-5 ft) completed on 1/21/11. Soil boring completed on 1/25/11.
Monitoring well installed on 1/25/11.
PID=Photionization detector; SPH=Separate phase hydrocarbons; ppm=Parts per million
NC=Not checked; Neg.=SPH NOT observed; Pos.=SPH observed
NA=Not available

Symbol Key:
- Apparent Water Level
- Lab Sample Location

BORING LOG

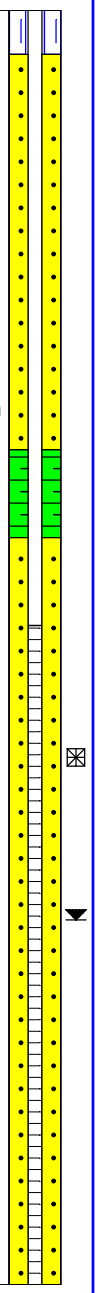
ID NO. **W-28**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**29'**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**20.5**	CASING EL.:	**NA**
JOB NO.	**06-02376**	BOREHOLE DIA.:	**10.5"**	WELL DIA.:	**4"**

Logged By:	**L. Tuovila**	Drilling Method:	**Air Knife, VacMaster 4000/Hollow Stem Auger**
Dates Drilled:	**1/21/11; 1/26/11**	Sampling Method:	**Hand Auger/Split Spoon**
Drilling Company:	**Parratt Wolff, Inc.**	Soil Class. System:	**Burmister**
Drill Rig:	**Dietrich D-90**	Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Percent Recovery	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0 - 2	0.8	NA	NC	Grass and topsoil	0' to 5' below grade was hand cleared and sampled by hand auger (1/21/11)	Monitoring well installed with steel stick up surface casing.
2	2 - 4	0.0	NA	NC	Brown to Black Fine to Coarse SAND, some fine Gravel, trace Silt and coarse Gravel	Moist	
4	4 - 5	0.0	NA	NC	Brown SILT and CLAY, some fine to coarse Sand and fine Gravel, trace coarse Gravel		
6	5 - 7	3.8	10	NC	Brown Fine SAND and SILT, some Clay an dMedium to Coarse Sand, trace fine Gravel	5' to 29' below grade was advanced by hollow stem auger (1/26/11)	See attached Monitoring Well Design Plan for well construction details.
8	7 - 9	0.2	75	NC	Brown Fine SAND and SILT, some coarse Sand and Fine Gravel, trace coarse Gravel		
10	9 - 11	0.0	75	NC	Brown Fine to Coarse SAND, some Silt, trace fine to coarse Gravel		
12	11 - 13	1.3	100	NC	Brown Fine to Coarse SAND, trace Silt and fine to coarse Gravel		
14	13 - 15	0.3	75	NC			
16	15 - 17	92.3	75	NC	Gray Fine to Coarse SAND, some fine Gravel, trace coarse Gravel and Silt		
18	17 - 19	108	75	Neg.			
20	19 - 21	117	75	Neg.		Saturated	
22	21 - 23	207	100	Neg.			
24	23 - 25	98	50	NC			
26	25 - 27	NA	NA	NA	Gray Fine to Coarse SAND, Fine to Coarse GRAVEL and SILT		
28	27 - 29	NA	NA	NA			



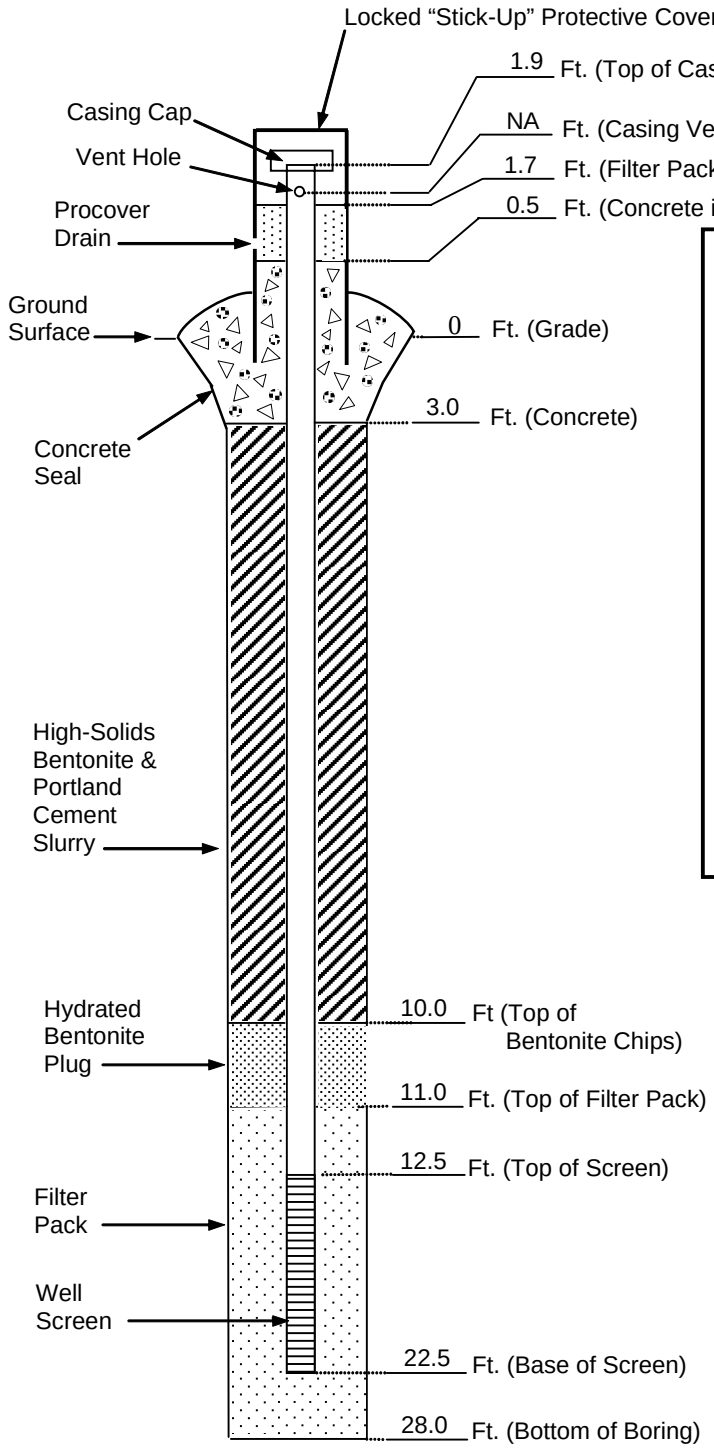
Location:
- Northing/Latitude:
- Easting/Longitude:
- Horizontal Datum:
- Vertical Datum:

General Comments:

Hand Clearing (0-5 ft) completed on 1/21/11. Soil boring completed on 1/26/11.
Monitoring well installed on 1/26/11.
PID=Photionization detector; SPH=Separate phase hydrocarbons; ppm=Parts per million
NC=Not checked; Neg.=SPH NOT observed; Pos.=SPH observed
NA=Not avialable

Symbol Key:
- Apparent Water Level
- Lab Sample Location

W-1



Well No: W-1 (formerly TPSB-15)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms

Date Started: 7/16/08
Date Completed: 7/22/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1424.93 ft N.A.V.D. 1988
Grade Elev.: 1421.9 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 14.50 ft.
SWL from TOC: 16.95 ft. on 8/13/08
SWL Elev.: 1407.98 ft. on 8/13/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 9 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/16/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/22/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/13/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/16/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **TPSB-15/W-1**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1421.9 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18 feet**	CASING EL.:	**1424.93 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/11/08; 6/19 & 20/08; 7/16/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

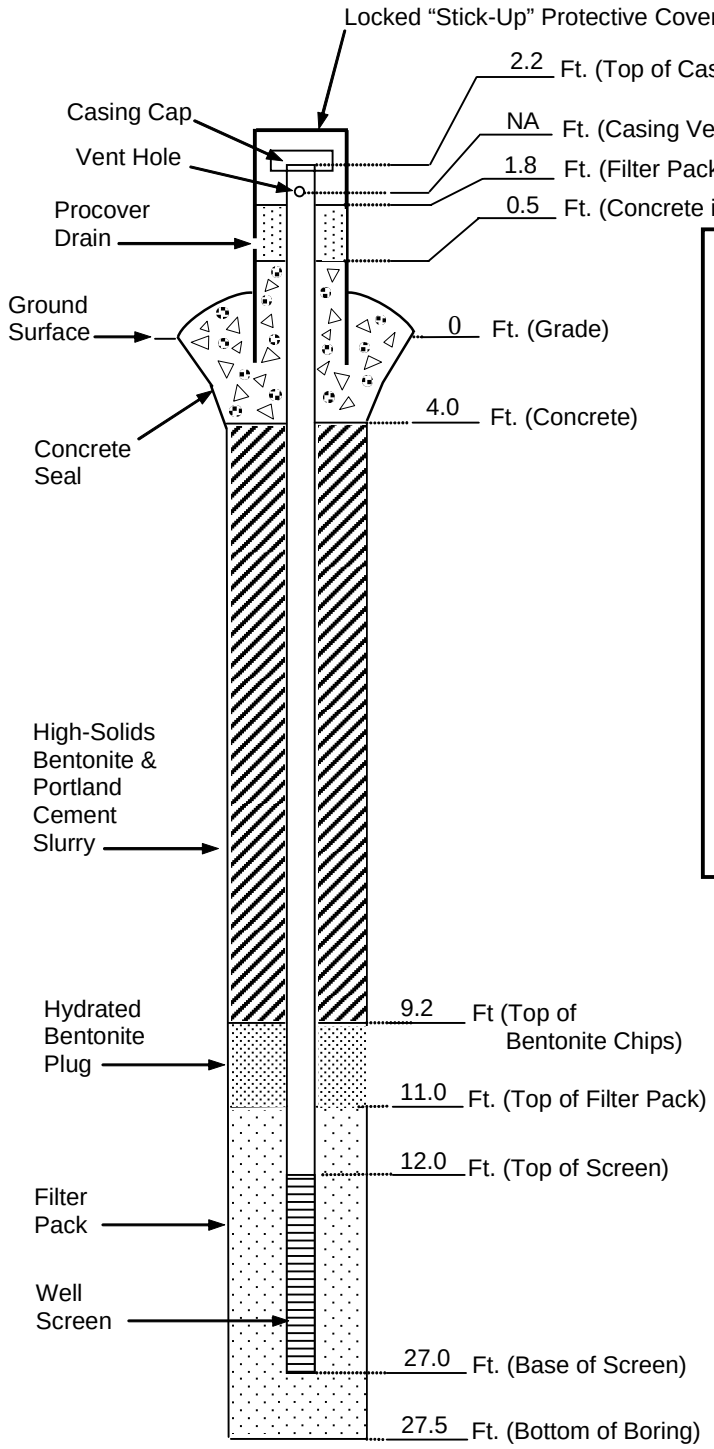
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			FILL; Brown Fine to Medium SAND, some Brick and Concrete	Communications Line encountered at 1 ftbg. Concrete slab on SW side of TP at 2 ftbg.	See attached Monitoring Well Design Plan for well construction details.
	0.5-2	5.4	NA			
2	2-4	4.1	NA	Gray CLAY, trace coarse Gravel		
4	4-6	2.4	1.0 / 1.25	Gray CLAY	Moist	
6	6-8	9.5	1.3 / 1.0	Gray CLAY, some fine to medium Sand, trace Gravel		
8	8-10	10.3	1.25 / 0.5	Gray Fine to Coarse SAND and CLAY, some Gravel		
10	10-12	24.5	1.0 / 0.5			
12	12-14	87.9	NA	Gray Fine to Coarse SAND and GRAVEL, little Silt and Clay		
14	14-16	182	1.8 / <0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt	Wet, ST = Pos	
16	16-18	78.6	1.25 / 1.0		Saturated	
18	18-20	59.1	1.2 / 1.0			
20	20-22	45.7	1.0 / 1.5			
22	22-24	44.3	1.25 / <0.5			
24	24-26	9.6	1.2 / 1.5	Tan grading to Gray CLAY	Wet	
26	26-28	0.0	1.1 / 0.5			
28						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 28 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-2



Well No: W-2

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms

Date Started: 7/23/08
Date Completed: 7/25/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1426.09 ft N.A.V.D. 1988
Grade Elev.: 1423.9 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 16.02 ft. on 8/13/08
SWL from TOC: 18.22 ft. on 8/13/08
SWL Elev.: 1407.87 ft. on 8/13/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 8 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 3 50# bags of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/23/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/25/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/13/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/23/08

BORING LOG

ID NO. **W-2**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1423.9 feet**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**1426.09 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**C. Letts, J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**7/17/08; 7/23/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company, Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

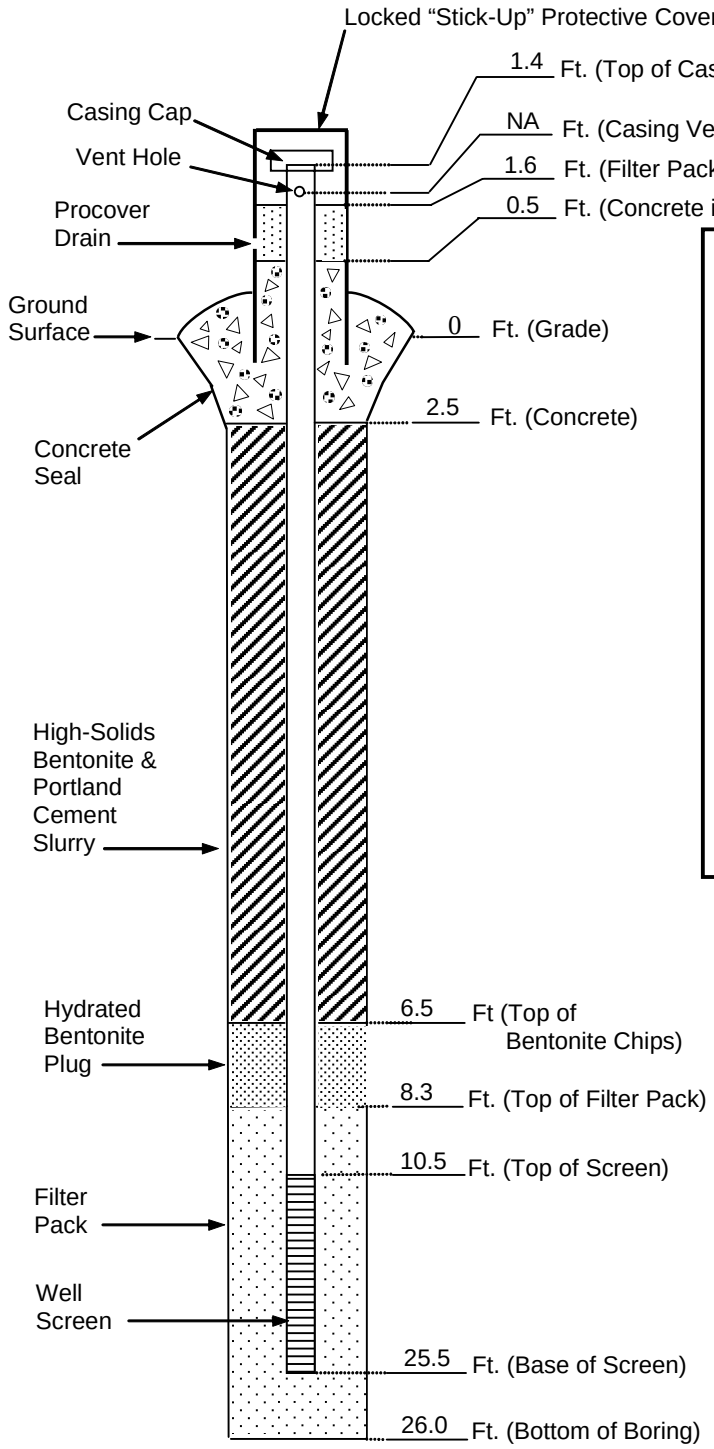
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	66.4	NA	FILL; Black Medium SAND, trace fine Gravel	Dry	See attached Monitoring Well Design Plan for well construction details.
2	2-4	0.0	NA	FILL; Black Medium SAND, some Clinkers		
4	4-6	18.2	0.7 / <0.5	FILL; Dark Gray Fine to Medium Fly Ash, some Gravel, trace Silt	Moist	
6	6-8	NA	NR	No Recovery		
8	8-10	19.7	0.8 / <0.5	FILL; Gray CLAY, trace fine Sand		
10				FILL; Red CLAY		
	10-12	150	1.4 / >5.0	Gray Fine to Coarse SAND and GRAVEL, trace Silt	Sheen, ST = Neg	
12	12-14	22.8	0.3 / <0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay		
14	14-16	83.9	1.1 / 0.75		Wet	
16				Dark Gray Fine to Coarse SAND and GRAVEL, little Silt	Saturated	
	16-18	123	0.9 / <0.5		Sheen, ST = Neg	
18	18-20	92.8	0.6 / <0.5			
20	20-22	162	1.1 / 1.25		Sheen, ST = Neg	
22	22-24	131	1.7 / 0.5		Sheen, ST = Neg	
24	24-26	146	1.3 / 1.5		Sheen, ST = Neg	
26						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26 feet, bedrock not encountered.
ST = Shake Test, N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-3



Well No: W-3 (formerly TPSB-35)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms

Date Started: 7/22/08
Date Completed: 7/25/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1424.64 ft N.A.V.D. 1988
Grade Elev.: 1422.7 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 14.9 ft.
SWL from TOC: 16.88 ft. on 8/13/08
SWL Elev.: 1407.76 ft. on 8/13/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 7 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/22/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/25/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/13/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/22/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **TPSB-35/W-3**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1422.7 feet**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18 feet**	CASING EL.:	**1424.64 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/11/08; 6/18/08; 7/22/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

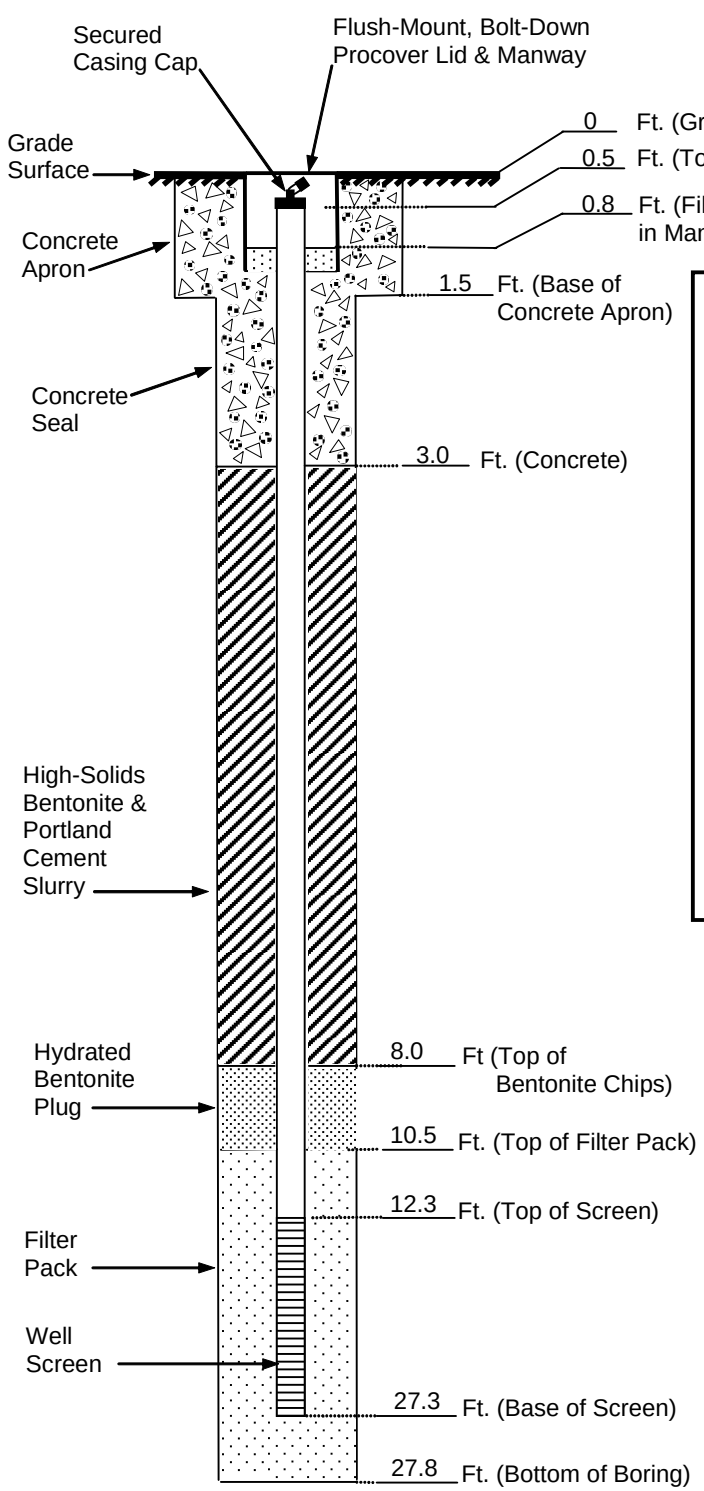
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	11.0	NA	FILL; Brown Medium to Coarse SAND, trace Gravel, Coal and Ash		
2	2-4	9.1	NA	Tan Fine SAND and SILT, trace coarse Gravel		See attached Monitoring Well Design Plan for well construction details.
4	4-6	0.0	1.0 / <0.5	Brown Fine to Medium SAND, some Gravel, trace Silt	Moist	
6	6-8	0.0	1.0 / <0.5			
8	8-10	0.0	1.0 / <0.5	Red Brown Fine to Coarse SAND and GRAVEL, trace Silt		
10	10-12	0.0	1.5 / 0.5	Red Brown Fine to Coarse SAND and GRAVEL, trace Silt and Clay		
12	12-14	48.9	1.0 / 1.75	Gray Black Fine to Coarse SAND, some Gravel, trace Silt		
14	14-16	97.4	1.2 / 0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Wet	
16	16-18	74.5	1.3 / <0.5	Gray Fine to Coarse SAND and GRAVEL, trace Silt	Saturated	
18	18-20	168	1.0 / <0.5	Gray Fine to Coarse SAND and GRAVEL, trace Silt	ST = Neg	
20	20-22	93.9	1.5 / <0.5	Black Fine to Coarse SAND and GRAVEL, trace Silt		
22	22-24	66.1	1.5 / <0.5			
24	24-26	51.9	1.5 / <0.5			
26						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-4



Well No: W-4 (formerly SB-20)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms

Date Started: 7/17/08
Date Completed: 7/24/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1425.06 ft N.A.V.D. 1988
Grade Elev.: 1425.6 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 17.90 ft.
SWL from TOC: 17.59 ft. on 8/13/08
SWL Elev.: 1407.47 ft. on 8/13/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 12 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bags of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/17/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/24/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/13/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN FLUSH-MOUNT CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/17/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **SB-20/W-4**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1425.6 feet**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18 feet**	CASING EL.:	**1425.06 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/11/08; 6/18/08; 7/17/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

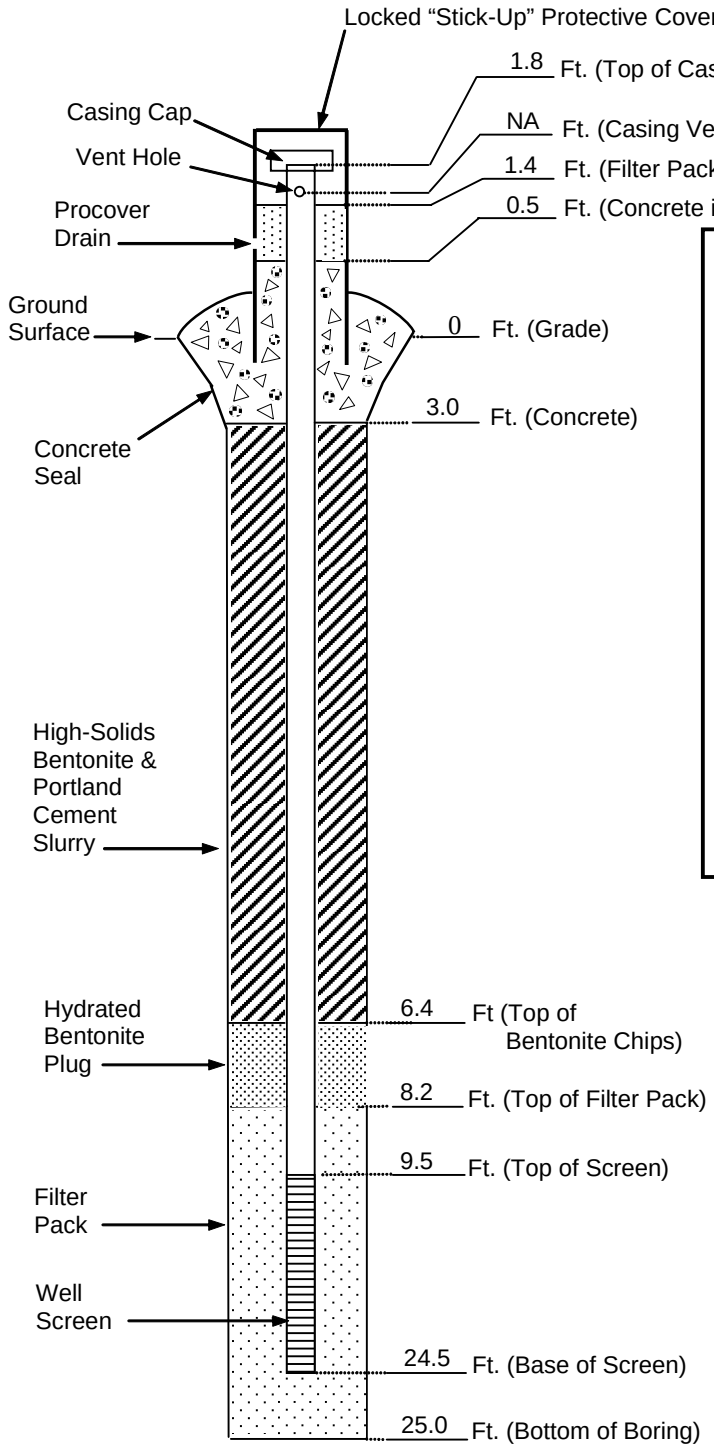
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0						
	0-2	3.6	NA	Asphalt FILL; Brown Gray Coarse SAND, GRAVEL, Coal Ash, Slag		See attached Monitoring Well Design Plan for well construction details.
2						
	2-4	3.0	NA	FILL; Coarse SAND and GRAVEL, some Coal Ash and Slag		
4						
	4-6	3.5	1.0 / >4.0	FILL; Red Brown Fine to Medium SAND and GRAVEL, little Silt, Glass and Brick	Moist	
6						
	6-8	2.6	0.5 / <0.5	Tan SILT and CLAY		
8						
	8-10	2.4	1.4 / 1.0	SILT and CLAY, some fine to coarse Sand, trace Gravel		
10						
	10-12	2.6	1.3 / 1.0	Light Brown Fine to Medium SAND, little Silt, Clay and Gravel		
12						
	12-14	3.2	1.0 / 1.0	Brown Fine to Coarse SAND and GRAVEL, trace Silt and Clay		
14						
	14-16	94.9	1.3 / 0.75	Gray Black Fine SAND, some Silt and Clay		
16						
	16-18	646	1.3 / <0.5	Gray Black Fine to Coarse SAND and GRAVEL, some Silt and Clay	ST = Neg	
18						
	18-20	195	1.0 / <0.5	Gray Black Fine to Coarse SAND and GRAVEL, some Silt	Saturated, ST = Neg	
20						
	20-22	324	1.4 / <0.25		Sheen, ST = Neg	
22						
	22-24	198	1.2 / 3.75	Gray Black Fine to Coarse SAND and GRAVEL, trace Silt	Sheen, ST = Neg	
24						
	24-26	44.9	1.0 / 1.75	Blue Gray CLAY, little fine Sand and Gravel		
26						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-5



Well No: W-5

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms

Date Started: 7/22/08
Date Completed: 7/25/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1424.93 ft N.A.V.D. 1988
Grade Elev.: 1423.1 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 15.1 ft. on 7/22/08
SWL from TOC: 16.98 ft. on 8/20/08
SWL Elev.: 1407.95 ft. on 8/20/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 8 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/22/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/25/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/20/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/22/08

BORING LOG

ID NO. **W-5**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1423.1 feet**	TOTAL DEPTH:	**24 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**15.9 feet**	CASING EL.:	**1424.93 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**C. Letts, J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**7/17/08; 7/22/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company, Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

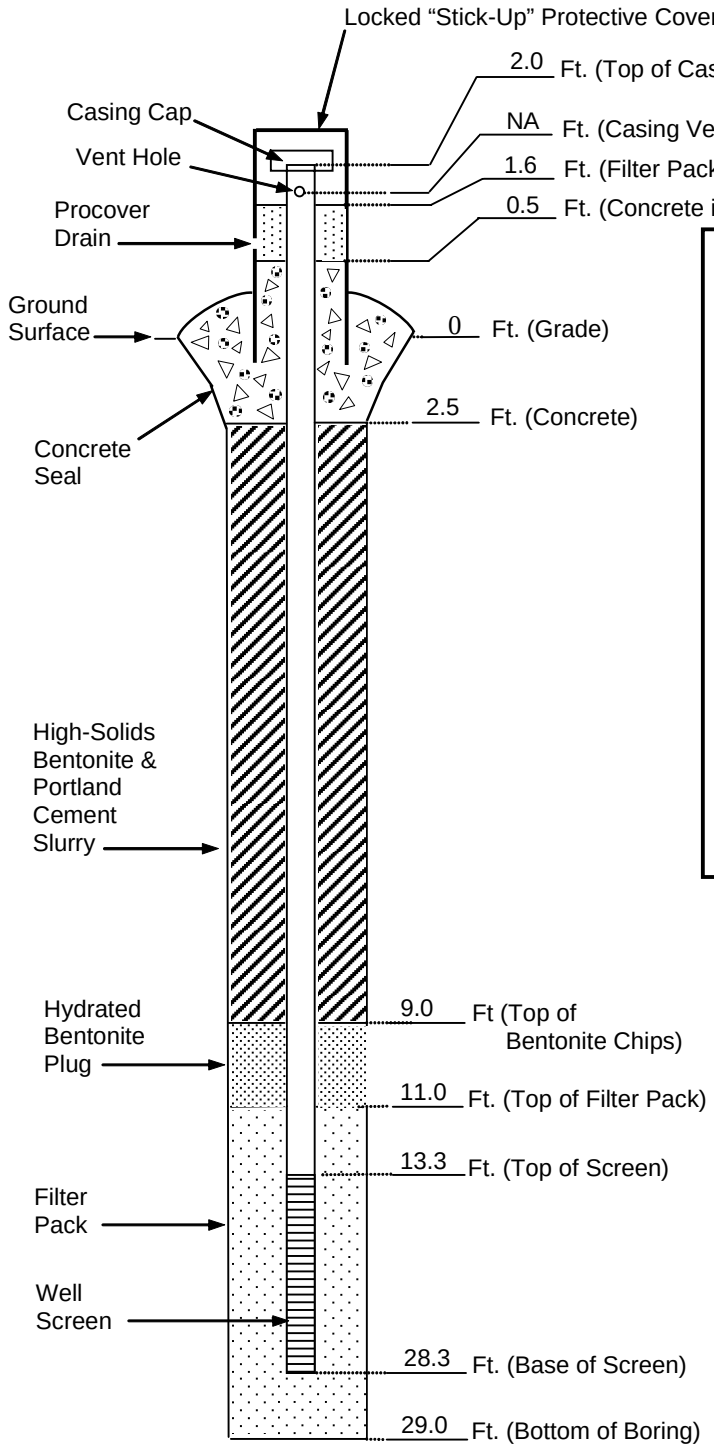
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	2.4	NA	Brown Coarse SAND and Fine to Coarse GRAVEL	Dry	See attached Monitoring Well Design Plan for well construction details.
2	2-4	1.2	NA			
4	4-6	2.3	0.8 / 0.75	Brown Fine to Medium SAND and GRAVEL, some Silt, trace Clay	Moist	
6	6-8	2.9	1.1 / 1.0	Brown CLAY	Wet	
8	8-10	10.0	1.0 / 0.75	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay		
10	10-12	16.9	1.4 / 0.75			
12	12-14	20.5	1.6 / 1.75	Dark Gray Fine to Coarse SAND and GRAVEL, some Silt, trace Clay	Moist	
14	14-16	43.7	1.0 / <0.5	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt	Wet	
16	16-18	34.5	2.0 / <0.5		Saturated	
18	18-20	75.0	1.3 / 0.5	Dark Gray Fine to Medium SAND, some Gravel, little Silt		
20	20-22	53.6	1.6 / <0.5			
22	22-24	62.1	1.3 / <0.5	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt		
24						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 24 feet, bedrock not encountered.
ST = Shake Test, N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-6



Well No: W-6 (formerly TP-21)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Robert Sickler

Date Started: 7/24/08
Date Completed: 7/25/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1426.45 ft N.A.V.D. 1988
Grade Elev.: 1424.4 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 15.71 ft. on 7/29/08
SWL from TOC: 17.71 ft. on 7/29/08
SWL Elev.: 1408.74 ft. on 7/29/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 12 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/24/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/25/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/12/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/24/08

BORING LOG

ID NO. **TP-21/W-6**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1424.4 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**20 feet**	CASING EL.:	**1426.45 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/10/08; 7/24/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	7.0	NA	Brown Fine to Medium SAND, some Gravel		
	0.5-2	360	NA	Dark Gray Black CLAY and SILT, trace coarse Gravel	ST = Neg	See attached Monitoring Well Design Plan for well construction details.
2	2-4	31.1	NA	Dark Gray Coarse SAND and GRAVEL	Saturated (perched)	
4				Gray CLAY, some coarse Gravel		
	4-6	347	1.1 / 1.25	Brown Medium to Coarse SAND and GRAVEL	Moist, Cohesive, Soft, ST = Neg	
6				Gray SILT, some fine to medium Sand, little fine Gravel, trace Clay and coarse Gravel		
	6-8	89.8	0.7 / 1.25			
8						
	8-10	571	1.1 / 1.25		ST = Neg	
10						
	10-12	56.1	0.5 / 2.0			
12						
	12-14	46.1	1.5 / 2.5			
14						
	14-16	89.2	0.9 / 1.75			
16						
	16-18	331	1.7 / 2.5		ST = Neg	
18						
	18-20	248	0.7 / 2.0		ST = Neg	
20				Gray Fine GRAVEL, some Silt, little medium to coarse Sand		
	20-22	1346	2.0 / 1.5		Saturated, Loose, Sheen, ST = Neg	
22						
	22-24	1165	2.0 / 1.5		Sheen, ST = Neg	
24				Gray SILT		
	24-26	212	0.8 / <0.5		Sheen, ST = Neg	
26				Gray SILT and Fine GRAVEL, some fine Sand, little medium to coarse Sand, trace coarse Gravel		
	26-28	3364	1.7 / 1.5		Loose, Sheen, ST = Neg	
28						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 28 feet, bedrock not encountered.

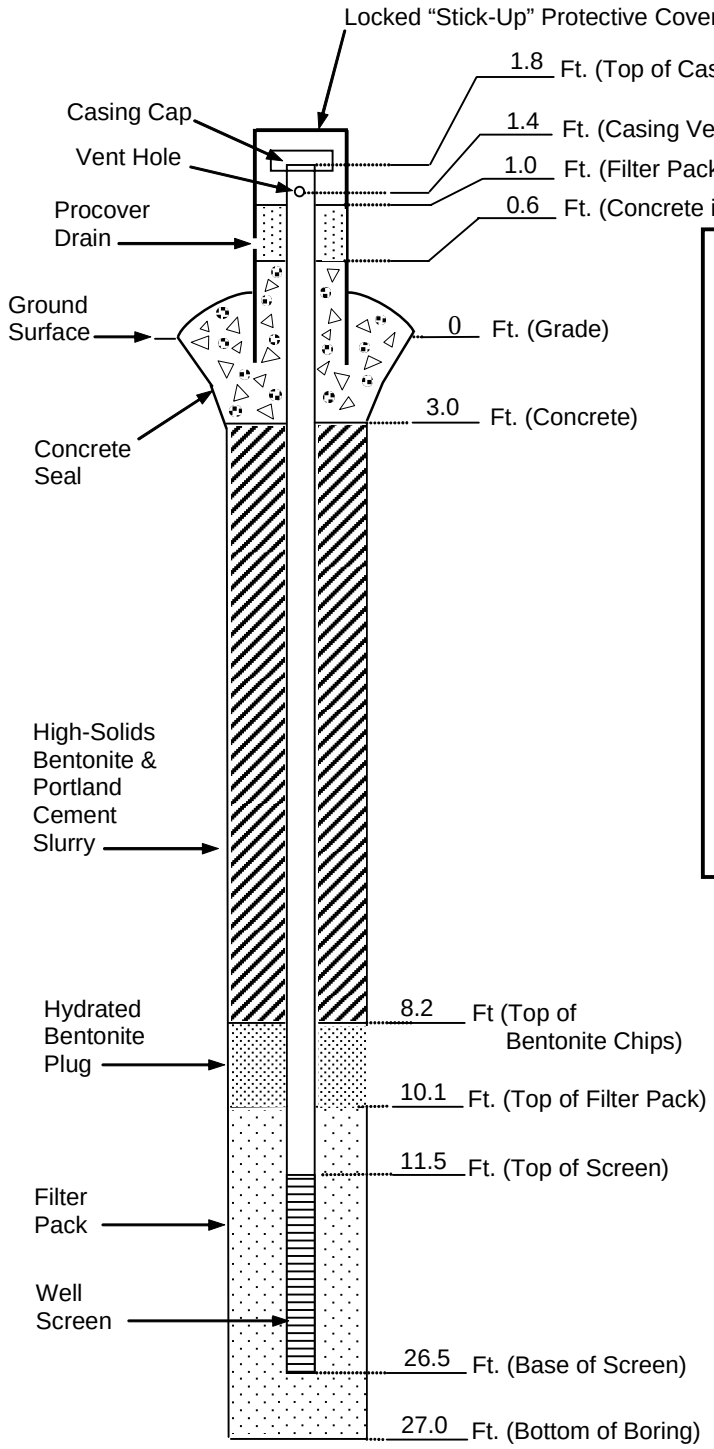
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

W-7



Well No: W-7 (formerly SB-16)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms

Date Started: 7/17/08
Date Completed: 7/24/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1426.99 ft N.A.V.D. 1988
Grade Elev.: 1425.3 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 17.8 ft.
SWL from TOC: 19.69 ft. on 8/20/08
SWL Elev.: 1407.30 ft. on 8/20/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 13 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/17/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/24/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/20/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/17/08

BORING LOG

ID NO. **SB-16/W-7**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1425.3 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**20 feet**	CASING EL.:	**1426.99 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/R. Sickler/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/2/08; 6/3/08; 7/17/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

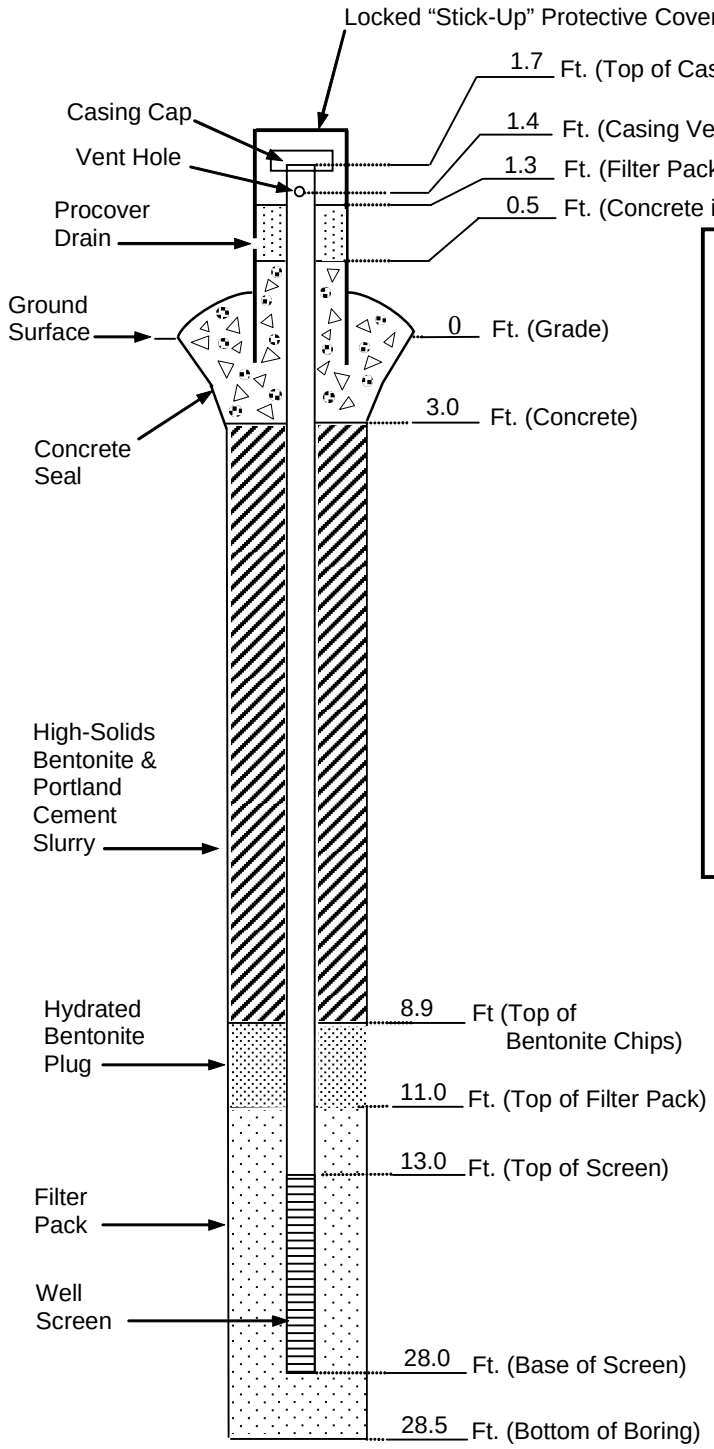
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			FILL; Brown Fine to Medium SAND and GRAVEL		See attached Monitoring Well Design Plan for well construction details.
	0.5-2	2.6	NA	FILL; Cinders		
2	2-4	132 481	NA	FILL; Black Cinders, Clinkers, Coal	Sheen, ST = Neg	
4				Gray CLAY and GRAVEL	Moist, ST = Neg	
	4-6	151	1.2 / 2.25	Brown Medium SAND, little coarse Sand and Fine Gravel, trace Clay and Silt	Slightly Moist, Soft, Cohesive, ST = Neg	
6	6-8	301	1.5 / 0.5		Moist, Very Soft, ST = Neg	
8				Dark Brown Medium SAND, some coarse Sand, little fine to coarse Gravel, Clay and Silt		
	8-10	304	1.3 / 0.75		Trace of suspect Grease noted at 9.5 - 10 ftbg, ST = Neg	
10				Dark Brown Medium SAND, some coarse Sand, little fine to coarse Gravel, Clay and Silt		
	10-12	79.9	1.3 / 1.5	Gray Medium SAND, some coarse Sand, little fine to coarse Gravel, Clay and SIlt	Blebs of suspect Grease observed, Soft	
12	12-14	281	1.5 / 3.75		3 inch Medium Sand lense noted at 13.5 ftbg, ST = Neg	
14	14-16	328	1.5 / 2.5		ST = Neg	
16	16-18	603	1.5 / 1.25		ST = Neg	
18	18-20	484	1.2 / 0.75		ST = Neg	
20			N Value = 0.5	Gray SILT, some coarse Sand, trace fine Gravel	Wet, Cohesive, Medium Loose, ST = Neg	
	20-22	297	N Value = >4.5	Gray Coarse SAND, some fine Gravel and Medium Sand, trace coarse Gravel and Silt		
22	22-24	358	1.5 / 0.75		ST = Neg	
24	24-26	755	1.8 / <0.5		ST = Neg	
26	26-28	910	1.8 / <0.5	Gray Fine SAND, little medium Sand, trace Silt, Clay and coarse Gravel	Cohesive, ST = Neg	
28						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 28 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-8



Well No: W-8 (formerly TPSB-23)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms

Date Started: 7/18/08
Date Completed: 7/25/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1427.21 ft N.A.V.D. 1988
Grade Elev.: 1425.6 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 17.38 ft. on 8/11/08
SWL from TOC: 19.08 ft. on 8/11/08
SWL Elev.: 1408.13 ft. on 8/11/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 6 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/21/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/25/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/11/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/21/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **TPSB-23/W-8**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1425.6 feet**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18 feet**	CASING EL.:	**1427.21 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/R. Sickler/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/9/08; 6/12/08; 7/18/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			FILL; Brown Fine to Medium SAND		
	0.5-2	35.4	NA	FILL; Black Coarse SAND and GRAVEL, some Slag	Moist, Sheen, ST = Neg	See attached Monitoring Well Design Plan for well contruction details.
2	2-4	69.9	NA			
4	4-6	108	1.2 / 3.5	FILL; Brown CLAY, Ash, Brick fragments and Black Tar	Moist, Cohesive, Staining noted, ST = Neg	
6	6-8	87.8	1.5 / <0.5	Organic Material (possible Sludge), trace Clay	Wet, Cohesive	
8	8-10	275	2.0 / 2.5	Light Brown CLAY, little Silt, trace fine to coarse Sand and fine Gravel	Moist, ST = Neg	
10	10-12	574	1.0 / 3.25	Light Brown grading to Gray Medium SAND, some fine Gravel, trace coarse Gravel, Clay and Silt	Dry, Loose, ST = Neg	
12	12-14	673	1.6 / >4.5		ST = Neg	
14	14-16	1117	2.0 / 2.75		ST = Neg	
16	16-18	633	1.2 / 1.75		Moist, Staining, ST = Neg	
18	18-20	616	1.2 / 1.75		Saturated, Staining, ST = Neg	
20	20-22	401	1.5 / 2.5	Gray Medium SAND and Fine GRAVEL, trace Clay, Silt and coarse Gravel	Staining, Black SPH blebs noted on water from 20 - 26 ftbg, ST = Neg	
22	22-24	846	2.0 / >4.5	Gray Medium SAND and Fine GRAVEL, little coarse Gravel, trace Clay and Silt	ST = Neg	
24	24-26	522	1.5 / 1.5		ST = Neg	
26						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 26 feet, bedrock not encountered.

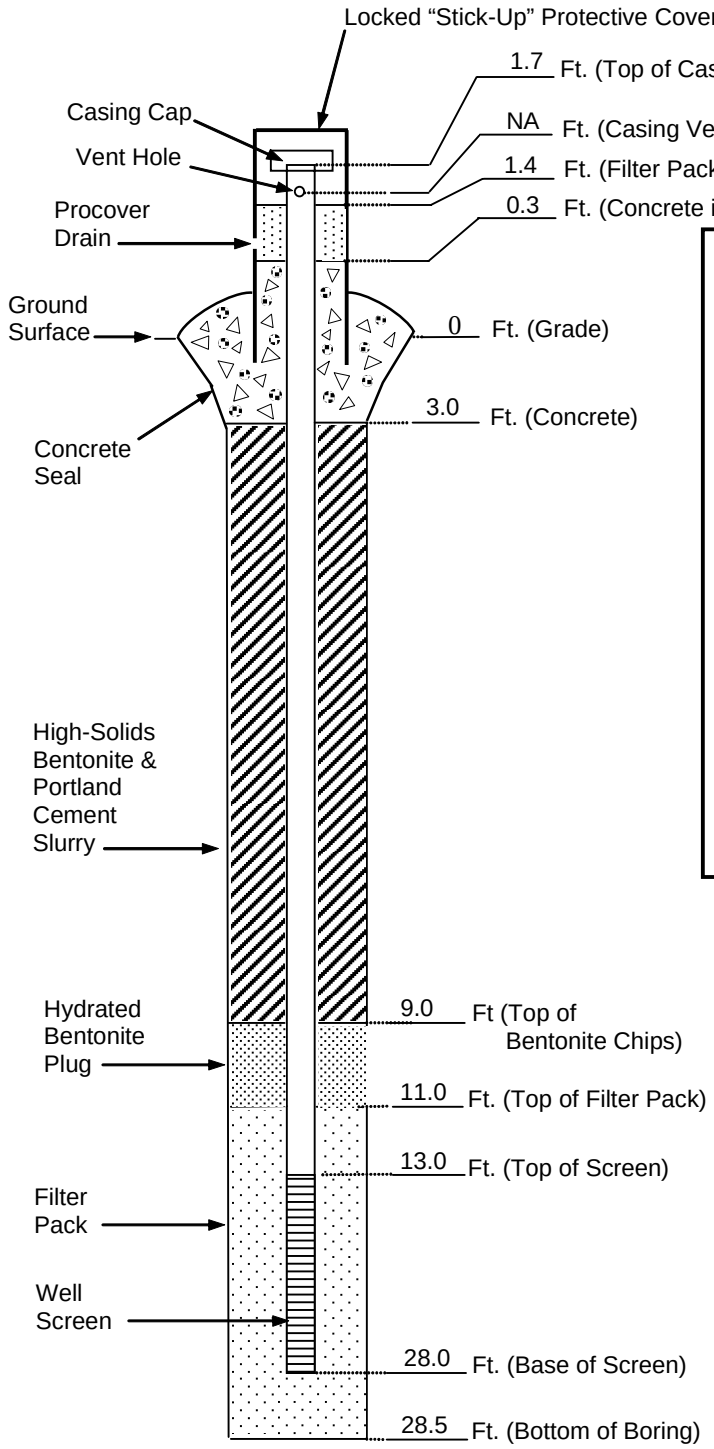
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

W-9



Well No: W-9 (formerly SB-10)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms & Bryan Reles

Date Started: 7/24/08
Date Completed: 7/25/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1428.75 ft N.A.V.D. 1988
Grade Elev.: 1427.0 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 18.7 ft. on 8/11/08
SWL from TOC: 20.4 ft. on 8/11/08
SWL Elev.: 1408.35 ft. on 8/11/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 8 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/24/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/25/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/11/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/24/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **SB-10/W-9**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1427.0 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**20 feet**	CASING EL.:	**1428.75 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 feet**	WELL DIA.:	**4 inches**

Logged By:	**V. Maresco/R. Sickler/J. Simms/B. Reles**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/6/08; 6/12/08; 7/23 & 24/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	5.8	NA	FILL; Black Raw Coal, Coal Fragments and Coal Dust	Dry	See attached Monitoring Well Design Plan for well construction details.
2	2-4	6.4	NA	FILL; Red Yellow Brown Cinders and Ash		
4				Brown SILT and Fine SAND, trace Cinders and Ash		
	4-6	11.7	0.8 / 1.0	Brown Medium SAND, little Clay and Fine Gravel, trace Silt and coarse Gravel	Moist, Loose	
6	6-8	22.2	0.8 / 0.5		Wet	
8	8-10	25.9	1.0 / 1.0		Moist, Staining	
10	10-12	22.6	1.5 / 1.5		Staining	
12	12-14	27.9	1.2 / 1.25			
14	14-16	460	1.8 / 1.5	Gray Medium SAND and Fine GRAVEL, trace coarse Sand, coarse Gravel and Silt	Slightly Moist, Loose, ST = Neg	
16	16-18	2311	1.8 / 2.25		Staining, ST = Neg	
18	18-20	2433	1.5 / 1.75		Staining, ST = Neg	
20	20-22	846	1.5 / 2.25		SPH layer noted on water Saturated, sheen noted, ST = Pos	
22	22-24	2838	1.6 / 2.25		SPH blebs noted on water, ST = Neg	
24				Gray Fine to Coarse SAND, trace Silt		
	24-26	3866	1.5 / 1.75	Gray Medium SAND and Fine GRAVEL, trace coarse Sand, coarse Gravel and Silt	ST = Neg	
26	26-28	993	1.3 / <0.5	Gray Fine to Coarse GRAVEL, little fine to medium Sand, trace Silt	Saturated, ST = Neg	
28						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 26 feet, bedrock not encountered.

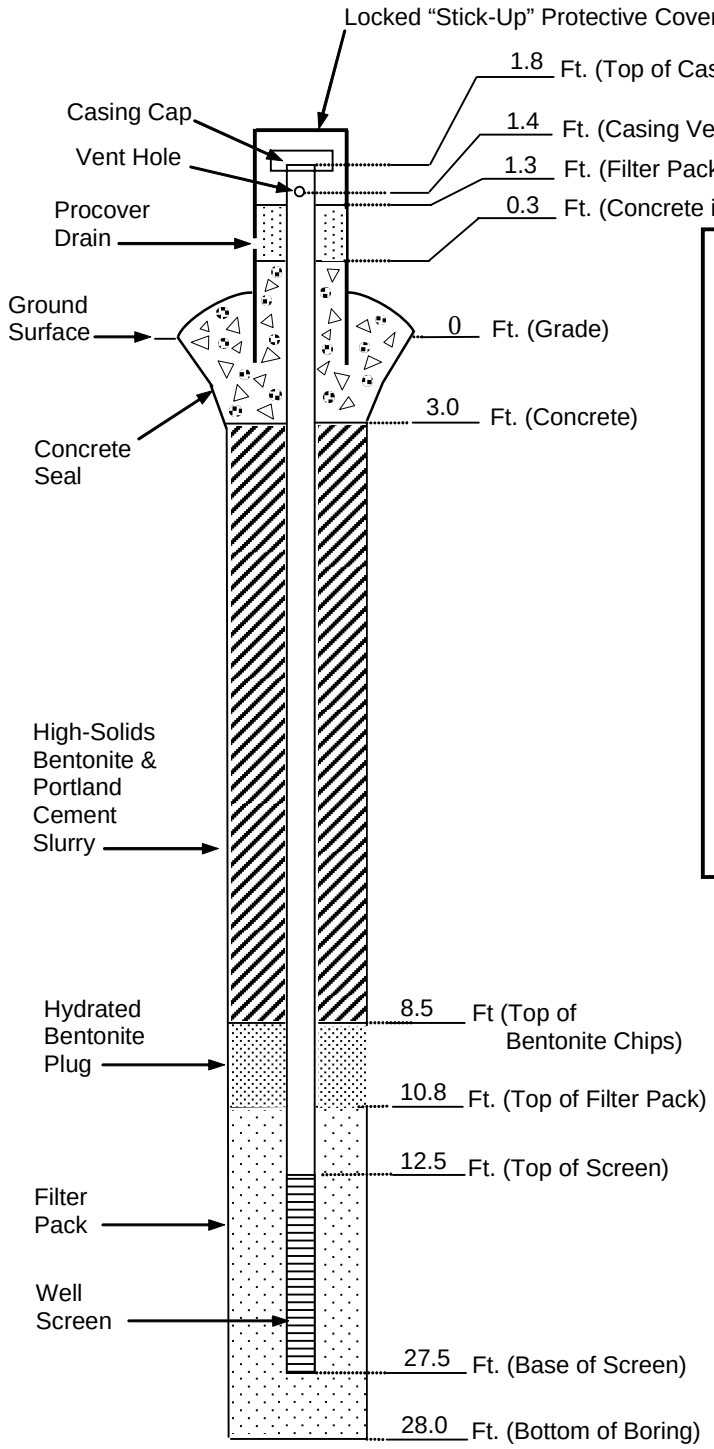
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

W-10



Well No: W-10 (formerly SB-7)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: John Simms

Date Started: 7/21/08
Date Completed: 7/22/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1429.39 ft N.A.V.D. 1988
Grade Elev.: 1427.5 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 19.26 ft. on 8/20/08
SWL from TOC: 21.06 ft. on 8/20/08
SWL Elev.: 1408.33 ft. on 8/20/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 8 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/21/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on 7/22/08.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/20/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/21/08

BORING LOG

ID NO. **SB-7/W-10**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1427.5 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18.7 feet**	CASING EL.:	**1429.39 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**V. Maresco/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/6/08; 6/20/08; 7/21/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

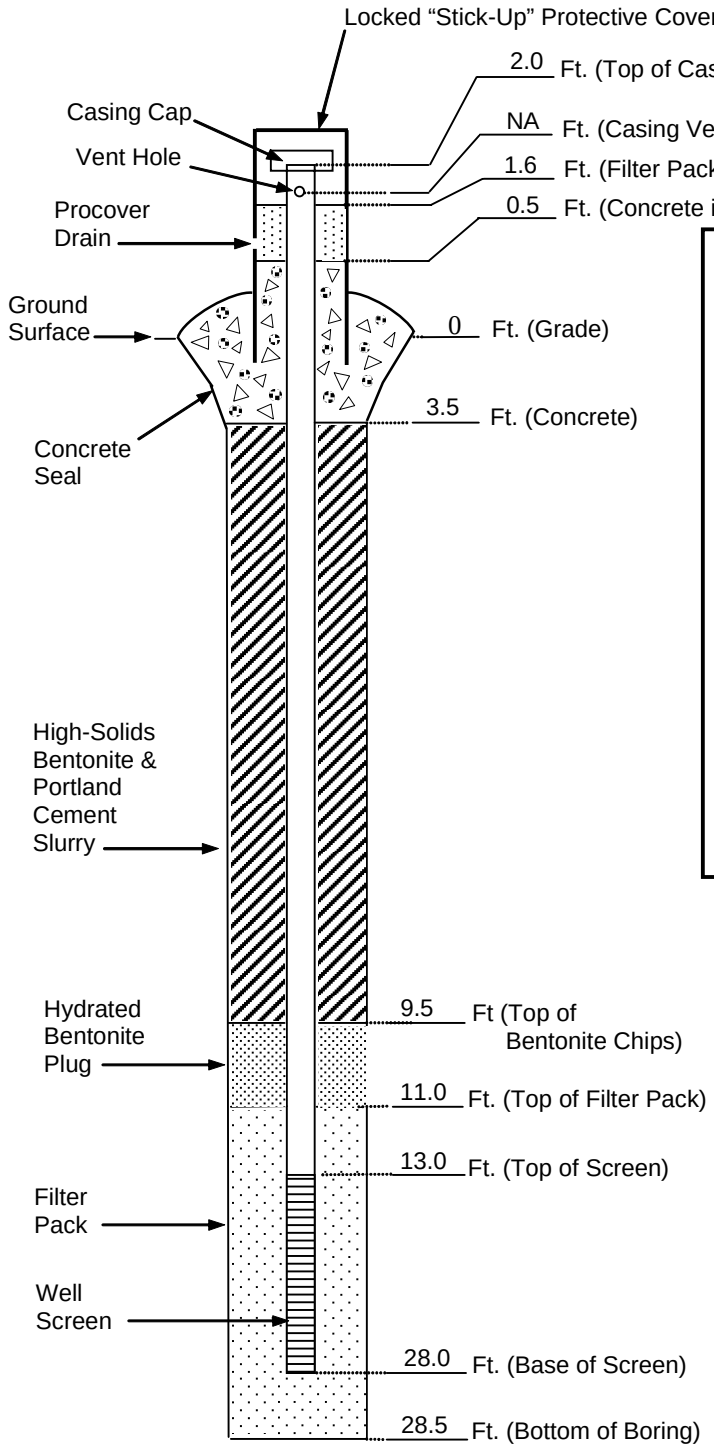
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			FILL; Black Ash, Cinder, possible Raw Coal, Bricks, Metal pieces, trace Sand and Gravel		
	0.5-2	698	NA		ST = Neg	
2	2-4	267	NA	Gray SILT and SAND, some Clay and Gravel	Dry, ST = Neg	See attached Monitoring Well Design Plan for well construction details.
4	4-6	37.7	0.7 / <0.5	Gray CLAY, trace fine to coarse Sand	Moist	
6	6-8	139	0.7 / 0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Sheen, ST = Neg	
8	8-10	333	1.0 / 1.25	Red Brown Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Sheen, ST = Neg	
10	10-12	150	0.6 / 0.5	Gray Brown Fine to Coarse SAND and GRAVEL, trace Silt	Sheen, ST = Neg	
12	12-14	371	1.25 / 0.5	Gray Brown Fine to Coarse SAND and GRAVEL, little Silt and Clay	Sheen, ST = Neg	
14	14-16	919	1.3 / 1.5	Gray Fine to Coarse SAND and GRAVEL, little Silt	Sheen, ST = Neg	
16	16-18	1512	1.3 / 2.25	Gray Fine to Coarse SAND and GRAVEL, little Silt and Clay	Sheen, ST = Neg	
18	18-20	1488	1.2 / 1.0	Gray Fine to Coarse SAND and GRAVEL, little Silt	Wet, ST = Neg	
20	20-22	NA	NR	No Recovery		
22	22-24	778	NA	Gray SAND and GRAVEL	Saturated Sheen, ST = Neg	
24	24-26	562	NA		Sheen, ST = Neg	
26	26-28	425	1.0 / <0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt	Saturated, Sheen, ST = Neg	
28						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 28 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-11



Well No: W-11 (formerly TP-26)

Location: Parcel 1
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Robert Sickler

Date Started: 7/25/08
Date Completed: 7/28/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1426.61 ft N.A.V.D. 1988
Grade Elev.: 1424.5 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 15.21 ft. on 8/12/08
SWL from TOC: 17.21 ft. on 8/12/08
SWL Elev.: 1409.40 ft. on 8/12/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 8 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 2 50# bags of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/28/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/12/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/25/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **TP-26/W-11**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1424.5 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18 feet**	CASING EL.:	**1426.61 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/10/08; 7/25/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parrott Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

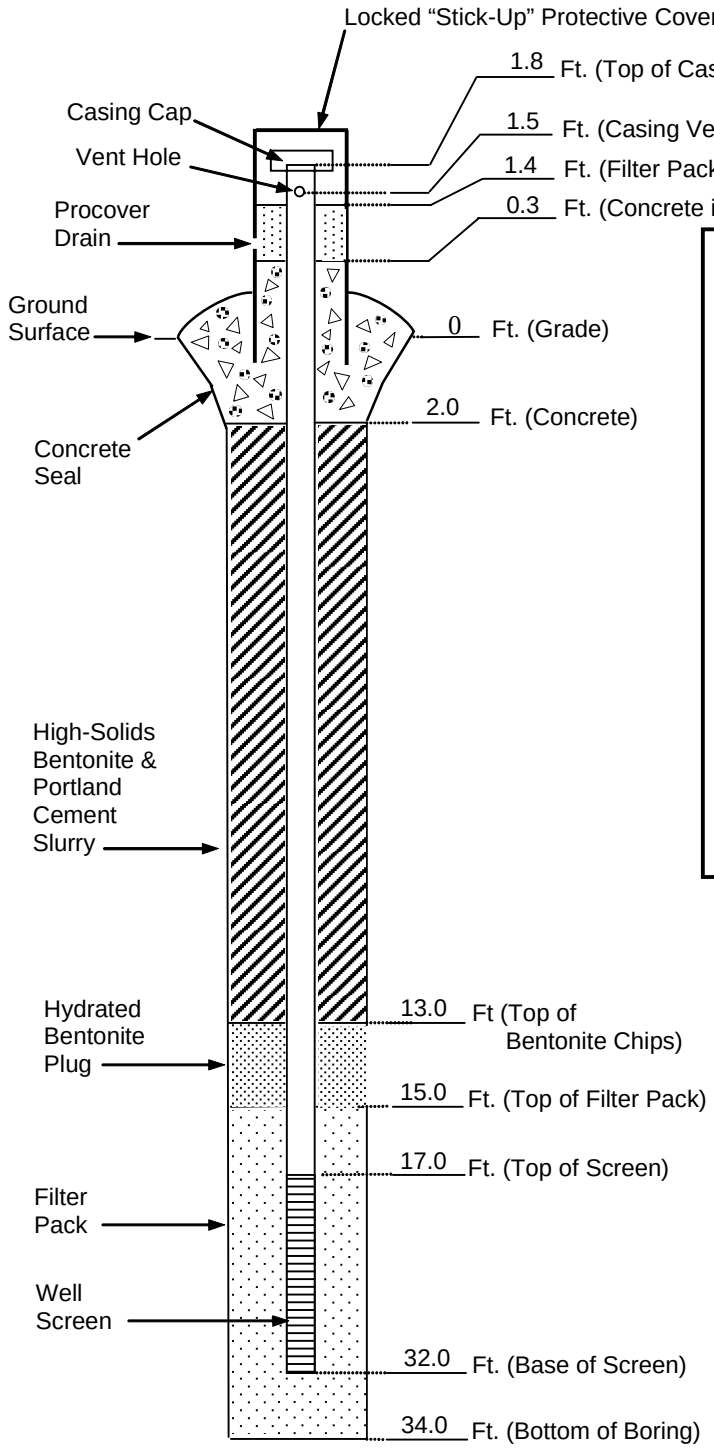
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	4.1	NA	FILL; Brown Fine to Medium SAND and GRAVEL		See attached Monitoring Well Design Plan for well construction details.
	0.5-2	5.8	NA	FILL; Black Medium to Coarse SAND and Coarse GRAVEL, some Ash		
2	2-4	4.9	NA	Tan SILT, some Clay and coarse Gravel		
4	4-6	9.0	0.6 / 0.75	Orange Medium SAND and SILT, some fine Gravel, trace Clay and coarse Gravel	Dry, Loose	
6	6-8	7.4	1.3 / 2.0		Moist	
8	8-10	8.0	1.4 / 1.75	Brown Medium SAND, some fine Gravel, little Silt, trace coarse Gravel	Dry, Loose	
10	10-12	5.5	1.5 / 1.5	Brown Medium SAND and SILT, some fine Gravel, trace coarse Gravel	Loose	
12	12-14	11.6	1.5 / 2.75			
14	14-16	16.3	2.0 / 2.25	Brown SILT and Fine GRAVEL, some fine Sand, trace coarse Gravel	Loose	
16	16-18	547	1.0 / 2.25	Gray SILT and Fine GRAVEL, some fine Sand, trace coarse Gravel	Moist, Wet around coarse grains, ST = Neg	
18	18-20	NA	NR	No Recovery; Rock lodged in Spoon Tip	Wet inside Spoon	
20	20-22	116	1.0 / 1.25	Gray Coarse SAND and Fine GRAVEL, little Silt, trace coarse Gravel	Saturated, Loose, ST = Neg	
22	22-24	401	1.3 / <0.50	Gray SILT, some fine Sand, trace fine to coarse Gravel	Moist, Cohesive, ST = Neg	
24	24-26	215	1.3 / 2.5		ST = Neg	
26	26-28	292	1.0 / <0.50	Gray Coarse SAND and Fine GRAVEL, little Silt, trace fine to medium Sand and coarse Gravel	Saturated, Loose, Sheen noted on coarse grains, ST = Neg	
28						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 28 feet, bedrock not encountered.
ST = Shake Test, N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-12



Well No: W-12 (formerly SB-57)

Location: Parcel 2
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Eric Popken

Date Started: 7/31/08
Date Completed: NA

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1433.72 ft N.A.V.D. 1988
Grade Elev.: 1431.9 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 22.85 ft. on 8/14/08
SWL from TOC: 24.65 ft. on 8/14/08
SWL Elev.: 1409.07 ft. on 8/14/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 10 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/31/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/14/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/31/08

BORING LOG

ID NO. **TP-3/SB-57/W-12**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1431.9 Feet**	TOTAL DEPTH:	**34 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**22 feet**	CASING EL.:	**1433.72 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci/J. Simms/E. Popken**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/18/08; 6/25/08; 7/31/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parrott Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	0.1	NA	Grass, Topsoil, Roots, some coarse Gravel	Moist to Dry	
	0.5-2	0.0	NA	FILL; Bricks, Rebar, Concrete, some brown fine to medium Sand, trace medium Gravel and Ash	Dry	See attached Monitoring Well Design Plan for well construction details.
2	2-4	0.0	NA			
4				FILL: Bricks, Concrete, some brown fine to medium Sand and medium Gravel		
	4-6	1.9	0.8 / 0.5			
6				FILL; Brown Fine to Medium SAND, some Gravel and Silt, trace Clay		
	6-8	NA	NR			
8				No Recovery; Concrete		
	8-10	1.8	1.2 / 0.75	Brown Fine to Coarse SAND and GRAVEL, some Silt, trace Clay		
10						
	10-12	0.0	1.5 / 1.0	Brown Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Moist	
12						
	12-14	0.0	1.2 / 1.25	Brown Fine to Medium SAND and GRAVEL, some Silt		
14						
	14-16	0.0	1.4 / 0.5	Brown Fine to Medium SAND and GRAVEL, trace Silt	Dry	
16						
	16-18	0.0	1.3 / 1.0		Moist	
18						
	18-20	0.0	1.0 / 0.5	Brown Fine to Coarse SAND and GRAVEL, trace Silt		
20						
	20-22	0.0	1.0 / 1.5	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Wet	
22						
	22-24	17.4	1.5 / 0.5	Gray Fine to Medium SAND, some Gravel, trace Silt	Saturated	
24						
	24-26	253	1.0 / 1.25	Gray Fine to Coarse SAND and Fine to Coarse GRAVEL, trace Silt	Sheen, SPH Blebs noted, ST = Neg	
26						
	26-28	113	1.0 / 1.0	Gray Fine to Coarse SAND, little fine to coarse Gravel, trace Silt	Loose, ST = Neg	
28						
	28-30	50.5	1.0 / 3.0	Gray Fine to Coarse SAND, little fine to coarse Gravel, trace Silt and Clay	Wet, Loose	
30						
	30-32	40.8	1.5 / 1.75	Gray Fine to Coarse GRAVEL, some to little fine to coarse Sand, trace Silt	Loose	
32						
	32-34	60.2	1.8 / 2.0	Gray Fine to Coarse SAND, some fine to coarse Gravel, trace Silt and Clay	Saturated, Compact	
34						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 34 feet, bedrock not encountered.

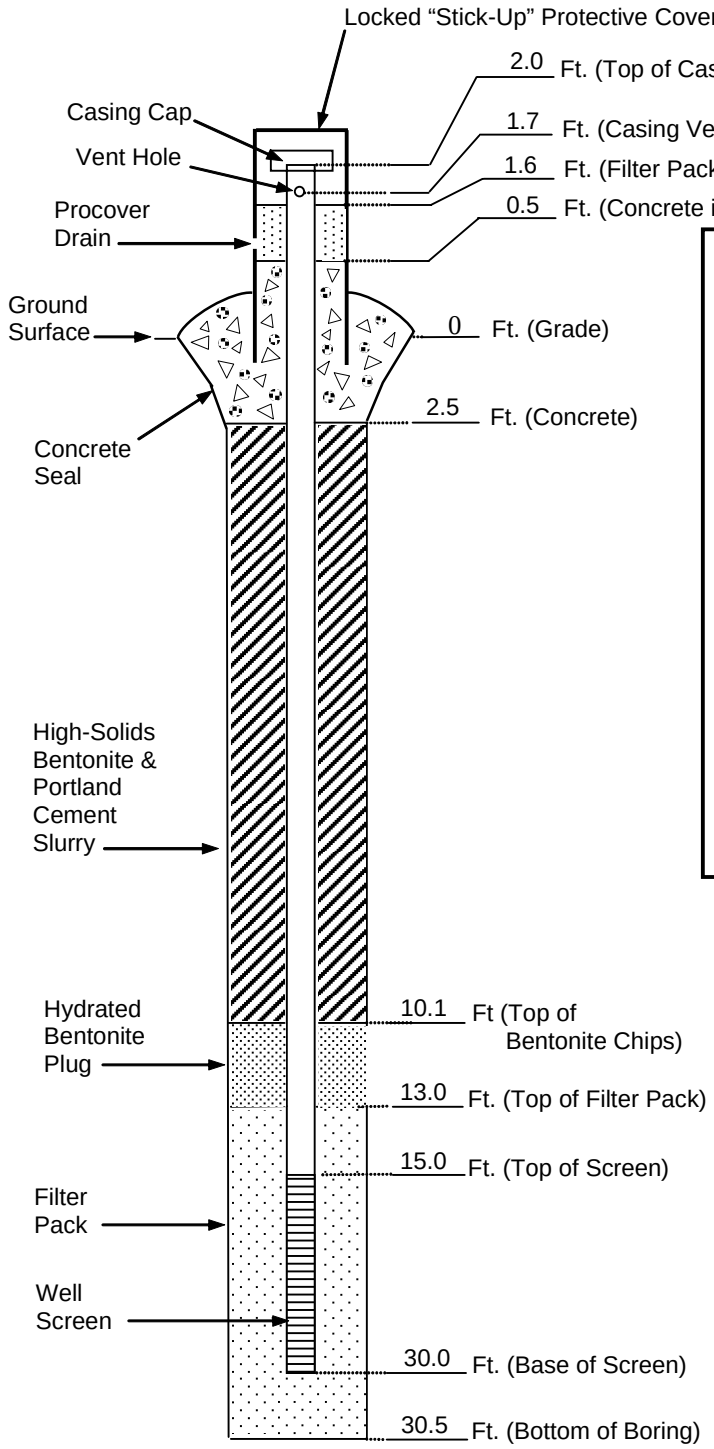
ST = Shake Test, N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

W-13



Well No: W-13 (formerly TPSB-12)

Location: Parcel 2
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Eric Popken

Date Started: 7/31/08
Date Completed: NA

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1431.14 ft N.A.V.D. 1988
Grade Elev.: 1429.2 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 20.50 ft. on 8/14/08
SWL from TOC: 22.50 ft. on 8/14/08
SWL Elev.: 1408.64 ft. on 8/14/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 9 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/31/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/14/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/31/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **TPSB-12/W-13**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1429.2 feet**	TOTAL DEPTH:	**30 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**20 feet**	CASING EL.:	**1431.14 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci / J. Simms/ E. Popken**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/18/08; 6/25/08; 7/31/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	0.0	NA	Topsoil and Grass		
2	0.5-2	0.0	NA	Brown SILT, some Gravel	Moist	
4	2-4	0.0	NA	Brown Fine to Medium SAND and GRAVEL, some Silt		See attached Monitoring Well Design Plan for well construction details.
6	4-6	52.8	1.0 / 1.0	Brown Fine to Coarse SAND and GRAVEL, little Silt		
8	6-8	141	.75 / <0.5	Gray Fine to Medium SAND and GRAVEL, little Silt	ST = Neg	
10	8-10	64.5	.75 / 0.5	Gray Fine to Coarse SAND and GRAVEL. some Silt		
12	10-12	58.6	1.2 / 0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay		
14	12-14	32.5	1.6 / 1.25	Gray Fine to Coarse SAND and GRAVEL, some Silt, little Clay		
				Gray Fine to Medium SAND, trace Silt		
16	14-16	53.2	1.3 / <0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt		
18	16-18	49.5	1.6 / 1.5	Gray Fine to Coarse SAND and GRAVEL, some Silt, trace Clay		
20	18-20	86.8	1.75 / 2.0	Gray Fine to Medium SAND, some Gravel, little Silt		
22	20-22	201	1.6 / 2.5	Gray Fine to Medium SAND and GRAVEL, trace Silt	Saturated, ST = Neg	
24	22-24	471	1.5 / 0.75	Gray Fine to Coarse GRAVEL, some fine to coarse Sand, trace Silt	Wet, Compact, SPH Blebs noted, ST = Neg	
26	24-26	317	1.1 / 0.5	Gray Fine to Coarse SAND, some fine to coarse Gravel, trace Silt	Saturated, Loose, SPH Blebs noted, ST = Neg	
28	26-28	175	0.8 / 0.5		ST = Neg	
				Gray Fine to Coarse SAND, little Silt, trace Clay	Wet, SPH Blebs noted, ST = Neg	
30	28-30	50.7	1.2 / 2.5	Brown SILT, little fine Sand		

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 30 feet, bedrock not encountered.

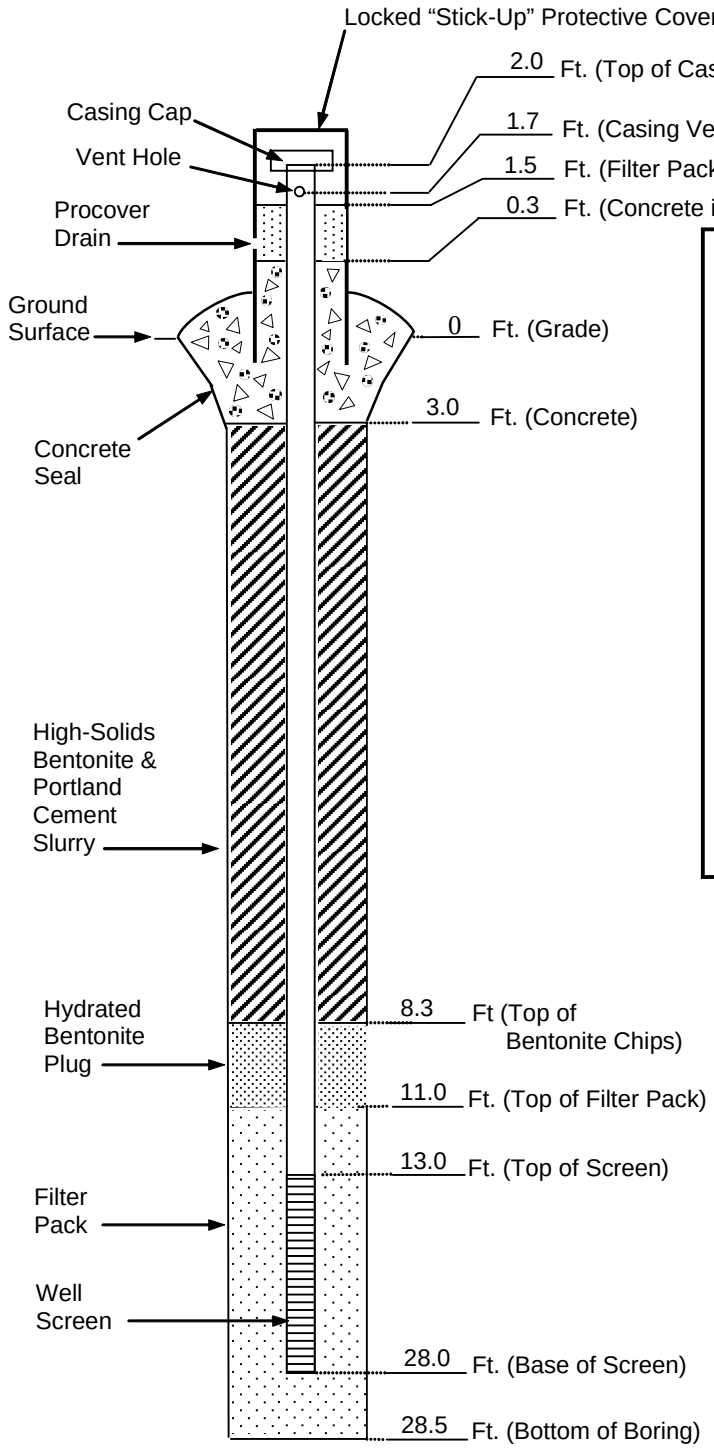
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

W-14



Well No: W-14 (formerly TP-2)

Location: Parcel 2
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Robert Sickler

Date Started: 7/28/08
Date Completed: NA

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1428.67 ft N.A.V.D. 1988
Grade Elev.: 1426.6 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 19.71 ft. on 8/20/08
SWL from TOC: 21.71 ft. on 8/20/08
SWL Elev.: 1406.96 ft. on 8/20/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 8.75 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/28/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/20/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/28/08

BORING LOG

ID NO. **TP-2/W-14**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1426.6 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18 feet**	CASING EL.:	**1428.67 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci/ R. Sickler/ E. Popken**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/17/08; 7/28/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

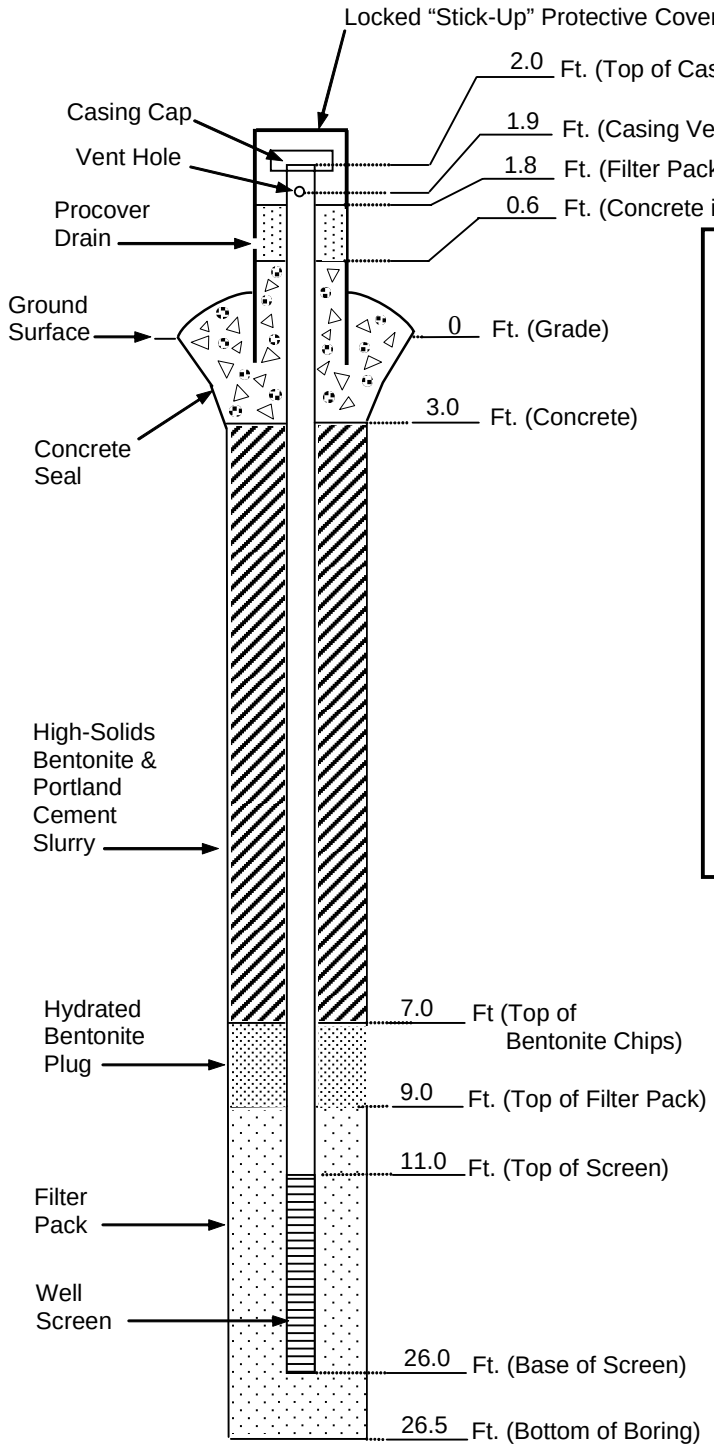
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	0.9	NA	Topsoil, Grass, Roots, trace Cobble	Dry	
	0.5-2	26.0	NA	Gray SILT, some medium Gravel	Moist	See attached Monitoring Well Design Plan for well construction details.
2	2-4	1.8	NA	Gray Coarse GRAVEL		
4	4-6	8.6	1.2 / 1.0	Brown Fine to Coarse SAND, little fine to coarse Gravel, trace Silt	Dry to Moist	
6	6-8	9.6	1.3 / 1.0	Brown Fine to Coarse SAND and fine to coarse GRAVEL, trace Silt		
8	8-10	9.9	1.3 / 0.5		Moist	
10	10-12	6.1	1.5 / 1.5			
12	12-14	6.1	0.8 / 1.5	Brown SILT, some to little fine to coarse Sand, trace fine to coarse Gravel and Clay	Wet	
14	14-16	186	1.2 / 1.25	Gray Fine to Coarse SAND, some to little fine to coarse Gravel, trace Silt	ST = Neg	
16	16-18	NA	NR	No Recovery; Rock lodged in tip of Spoon		
18	18-20	118	1.5 / 0.75	Gray Fine to Coarse GRAVEL, little fine to coarse Sand	Saturated, SPH Blebs noted, ST = Neg	
20	20-22	163	1.8 / 0.5		Moist, SPH Blebs noted, ST = Neg	
22	22-24	246	1.7 / 0.5	Gray Fine to Coarse SAND and Fine to Coarse GRAVEL	Saturated, SPH noted, ST = Pos	
24	24-26	208	1.0 / 0.5	Gray Fine to Coarse SAND and Fine to Coarse GRAVEL, trace Silt	Wet, SPH Blebs noted, ST = Neg	
26	26-28	199	1.2 / 0.5	Gray Fine to Coarse GRAVEL, little fine to coarse Sand	SPH Blebs noted, ST = Neg	
28						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 28 feet, bedrock not encountered.
ST = Shake Test, N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-15



Well No: W-15

Location: Parcel 2
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Robert Sickler and Eric Popken

Date Started: 7/29/08
Date Completed: NA

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1426.59 ft N.A.V.D. 1988
Grade Elev.: 1424.5 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 15.08 ft. on 8/14/08
SWL from TOC: 17.08 ft. on 8/14/08
SWL Elev.: 1409.51 ft. on 8/14/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 8 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/29/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/14/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/29/08

BORING LOG

ID NO. **W-15**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1424.5 feet**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**14 feet**	CASING EL.:	**1426.59 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**C. Letts/ R. Sickler/ E. Popken**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**7/18/08; 7/29/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Clean Harbors/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

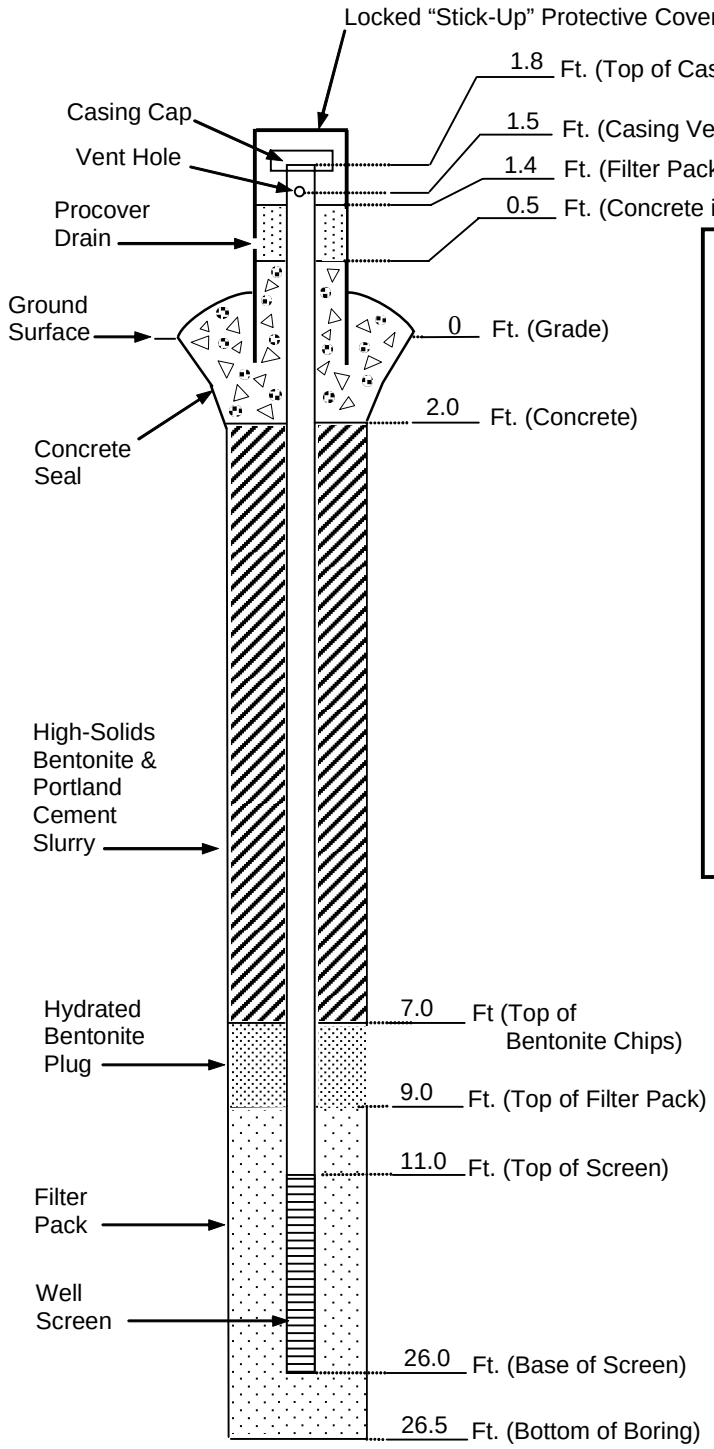
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	2.4	NA	FILL; Brown Fine to Coarse SAND, some fine to coarse Gravel and Bricks		
2	2-4	NA	NA	FILL; Building Debris including Brick, Scrap Metal and Ash/Coal	Wet, Loose	See attached Monitoring Well Design Plan for well construction details.
4	4-6	8.3	0.5 / <0.5	FILL; Black Ash, Coal fragments, Cinders, Clinkers		
6	6-8	25.6	1.0 / 0.5	Gray SILT, some Clay	Soft, Cohesive	
8	8-10	50.4	1.0 / 1.5	Gray Medium SAND and SILT, some fine Gravel, trace coarse Gravel	Soft, Semi-Cohesive	
10	10-12	71.7	1.0 / 0.5		Moist	
12	12-14	45.1	2.0 / 0.5			
14	14-16	148	2.0 / 2.75	Gray Medium SAND and Fine GRAVEL, little Silt, trace coarse Gravel	Saturated, Loose, ST = Neg Wet	
16	16-18	176	1.0 / 2.0		Saturated, SPH Blebs noted, ST = Neg	
18	18-20	183	1.2 / 2.0		Sheen noted, ST = Neg	
20	20-22	100	1.8 / 0.5	Gray Medium SAND and Fine to Coarse GRAVEL, trace Silt	Wet, ST = Neg	
22	22-24	15.1	1.0 / 1.25	Brown SILT and CLAY, trace fine Sand and fine to coarse Gravel	Moist	
24	24-26	9.7	1.0 / 1.25	Brown CLAY and Fine to Coarse GRAVEL, little to trace Silt	Wet	
26						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26 feet, bedrock not encountered.
ST = Shake Test, N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-16



Well No: W-16 (formerly TPSB-1)

Location: Parcel 2
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Eric Popken

Date Started: 8/1/08
Date Completed: NA

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1423.61 ft N.A.V.D. 1988
Grade Elev.: 1421.7 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 13.02 ft. on 8/13/08
SWL from TOC: 14.82 ft. on 8/13/08
SWL Elev.: 1408.79 ft. on 8/13/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 7 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 0.5 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 8/1/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/13/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 8/1/08

BORING LOG

ID NO. **DTP-1/TPSB-1/W-16**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1421.7 feet**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**1423.61 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/ R. Sickler/ E. Popken**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/13/08; 7/2/08; 8/1/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	5.0	NA	FILL; Brown Fine SAND, some Coarse GRAVEL and Brick		See attached Monitoring Well Design Plan for well construction details.
2	2-4	7.2	NA	FILL; Black Coal, Ash, Cinders, Coarse GRAVEL, some coarse Sand		
4	4-6	46.2	NA	FILL; Black Ash, Cinders, Clinkers and Coarse GRAVEL	Saturated (perched)	
6	6-8	183	NA	Gray SILT, some Clay	Wet, Cohesive, Sticky, Soft, Black Staining, ST = Neg	
8	8-10	441	NA		Moist, Black Staining, ST = Neg	
10	10-12	435	NA		Black Staining, ST = Neg	
12	12-14	23.4	0.5 / 0.5	Brown Fine to Coarse GRAVEL, little Silt, little to trace fine to coarse Sand, trace Clay	Wet	
14	14-16	382	1.8 / 0.5	Gray Fine to Coarse SAND, some to little Silt, little fine to coarse Gravel, trace Clay	SPH Blebs noted, ST = Neg	
16	16-18	225	0.5 / 0.5	Black Fine to Coarse SAND and Fine to Coarse GRAVEL, trace Silt	Saturated, Loose, Sheen and SPH Blebs noted, ST = Neg	
18	18-20	806	1.8 / 1.25	Gray Fine to Coarse SAND and Fine to Coarse GRAVEL, little to trace Silt	Wet, SPH Blebs noted, ST = Neg	
20	20-22	552	0.8 / 1.0	Gray Fine to Coarse SAND, little fine to coarse Gravel	SPH Blebs noted, ST = Neg	
22	22-24	240	1.0 / 1.5	Gray Fine to Coarse SAND and GRAVEL, some fine to coarse Sand, trace Silt	ST = Neg	
24	24-26	301	0.8 / 2.5	Gray Fine to Coarse SAND, little fine to coarse Sand, trace Silt	Saturated, ST = Neg	
26						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 26 feet, bedrock not encountered.

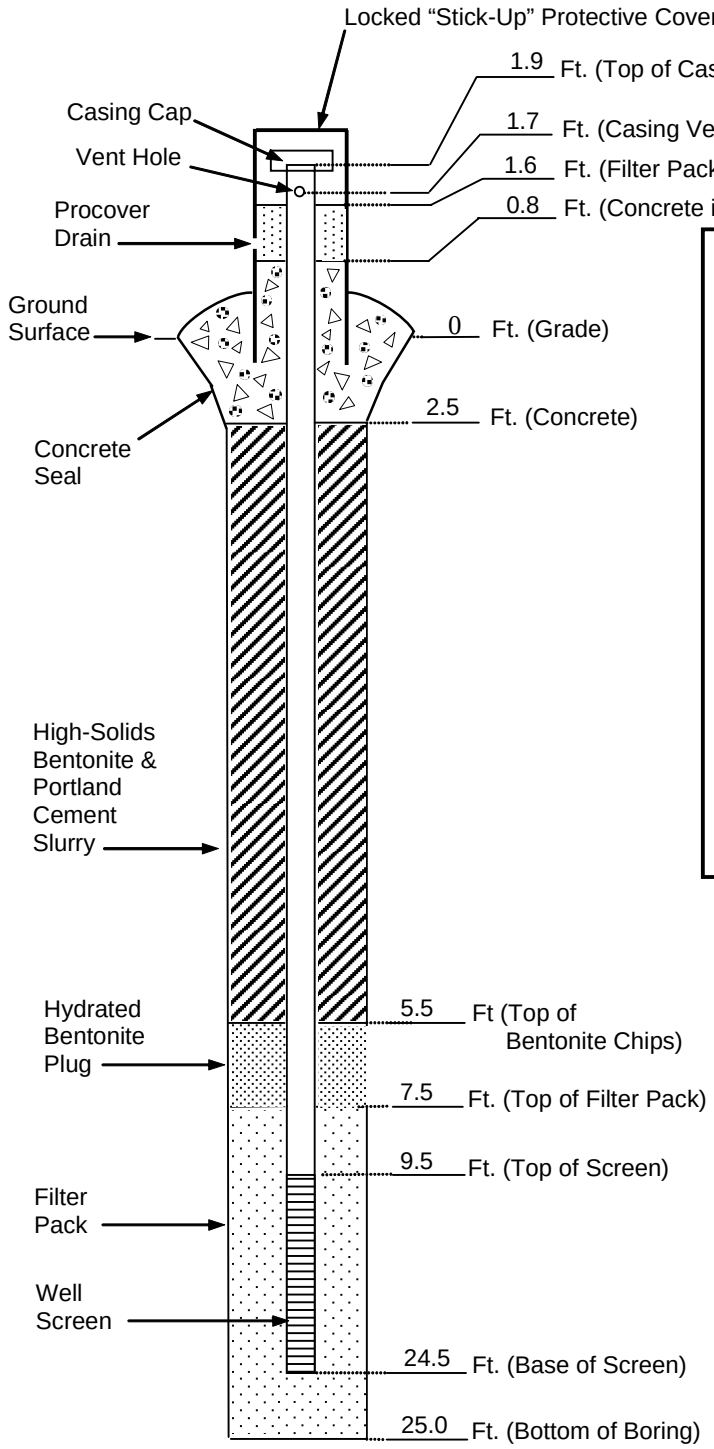
ST = Shake Test, N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

W-17



Well No: W-17 (formerly TPSB-2)

Location: Parcel 2
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Eric Popken

Date Started: 7/29/08
Date Completed: 7/29/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1424.83 ft N.A.V.D. 1988
Grade Elev.: 1423.0 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/26/08

SWL from Grade: 14.46 ft. on 8/13/08
SWL from TOC: 16.36 ft. on 8/13/08
SWL Elev.: 1408.47 ft. on 8/13/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 8 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/29/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/13/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/29/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **TPSB-2/W-17**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1423.0 feet**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**1424.83 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci / J. Simms/ E. Popken**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/24/08; 7/29/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

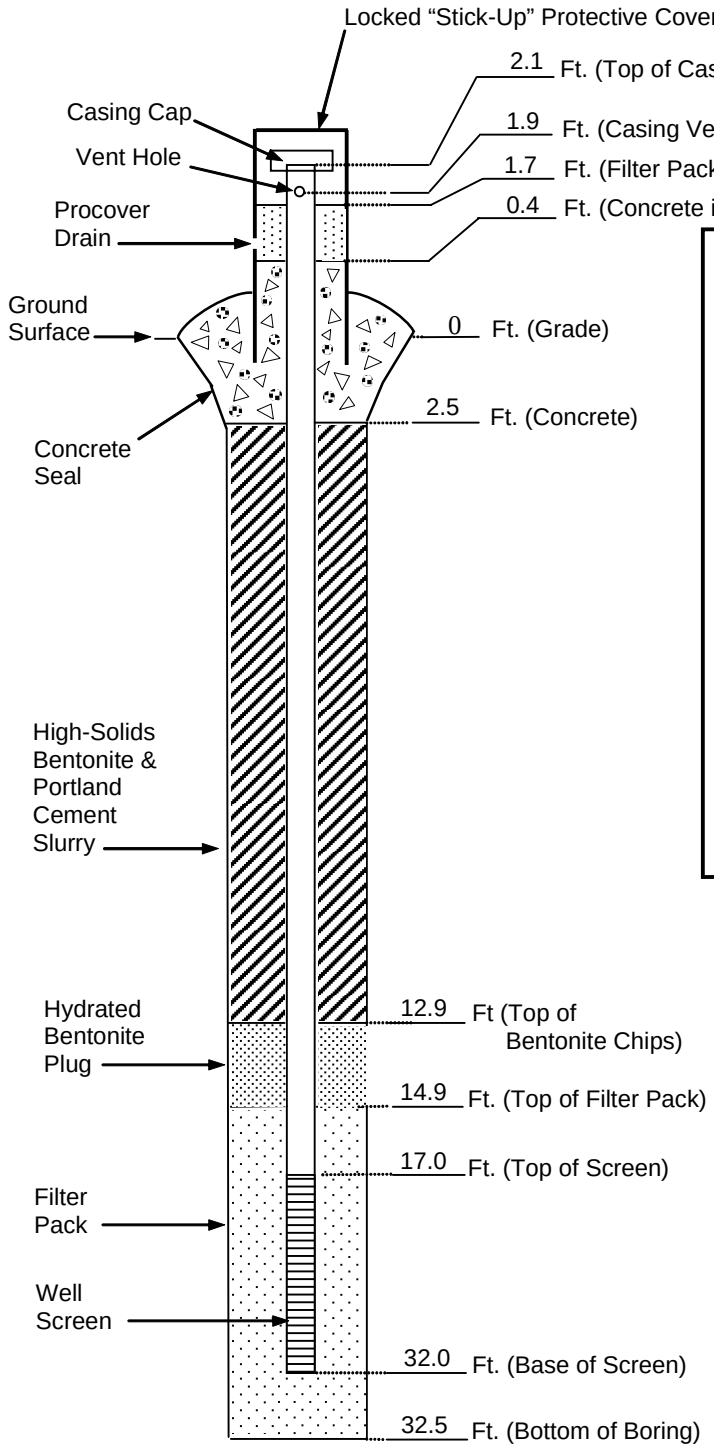
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			Topsoil and Grass		
	0.5-2	6.2	NA	Concrete		
2	2-4	78.5	NA	FILL; Black Fine to Medium SAND, little Gravel and Slag	Dry Moist	See attached Monitoring Well Design Plan for well construction details.
4				Light Gray CLAY	Wet	
	4-6	0.0	0.3 / 1.0	Gray Coarse GRAVEL, some fine to medium Sand	Moist	
6				Brown SILT and CLAY		
	6-8	1350	1.0 / 0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Sheen, ST = Neg	
8	8-10	1295	1.25 / 0.75		Sheen, ST = Neg	
10	10-12	993	1.0 / 0.75		Wet, Sheen, ST = Neg	
12	12-14	1037	1.3 / 0.75	Gray Fine to Coarse SAND and GRAVEL, some Silt, trace Clay	Sheen, ST = Neg	
14	14-16	585	0.7 / 0.5	Gray Fine to Coarse SAND and GRAVEL, some Silt	Sheen, ST = Neg	
16	16-18	1521	1.75 / 0.5	Dark Gray Fine to Coarse SAND and GRAVEL, some Silt	Sheen, ST = Neg	
18	18-20	1667	1.2 / 1.5		Sheen, ST = Neg	
20	20-22	619	1.0 / <0.5	Dark Gray Fine to Coarse SAND and GRAVEL, trace Silt	Sheen, ST = Neg	
22	22-24	513	0.6 / 0.5	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt	Sheen, ST = Neg	
24	24-26	16.2	0.5 / 0.5	Tan Brown CLAY and SILT, trace fine to medium Sand and fine to coarse Gravel		
26						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-18



Well No: W-18 (formerly DTP-54)

Location: Parcel 3
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Carey Letts

Date Started: 8/5/08
Date Completed: 8/5/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1433.08 ft N.A.V.D. 1988
Grade Elev.: 1430.9 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 22.20 ft. on 8/19/08
SWL from TOC: 24.30 ft. on 8/19/08
SWL Elev.: 1408.78 ft. on 8/19/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 7 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 8/5/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/19/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 8/5/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **DTP-54/W-18**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1430.9 feet**	TOTAL DEPTH:	**32 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**22 feet**	CASING EL.:	**1433.08 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci/ C. Letts**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/23/08; 8/5/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	1.9	NA	Grass and Topsoil	Dry	
2	0.5-2	3.0	NA	Topsoil, little Gravel and Roots	Moist	
4	2-4	1.8	NA	Brown Fine SAND, little Gravel		See attached Monitoring Well Design Plan for well construction details.
				Gray SILT and Medium SAND		
6	4-6	73.9	NA	Brown Medium SAND, some coarse Gravel and Cobbles		
8	6-8	79.2	NA	Gray Medium to Coarse SAND, some coarse Gravel and Cobbles	Loose	
10	8-10	376	NA	Gray Medium to Coarse GRAVEL and Cobbles, some medium Sand	Wet, ST = Pos	
12	10-12	582	NA	Gray Coarse SAND, some medium Gravel, little coarse Gravel	Moist, ST = Pos	
14	12-14	196	1.5 / 1.5	Gray Coarse GRAVEL, some Sand	Dry, ST = Neg	
	14-16	401	1.5 / 0.5	Gray SAND and Coarse GRAVEL	Moist, ST = Neg	
16	16-18	295	1.5 / 1.5		ST = Neg	
18	18-20	448	1.5 / 0.75		ST = Neg	
20	20-22	314	1.0 / 1.5		Dry, ST = Neg	
22	22-24	129	1.25 / 0.5		Saturated, Sheen noted, ST = Pos	
24	24-26	230	1.25 / 0.5		ST = Neg	
26	26-28	117	1.5 / 0.5		ST = Neg	
28	28-30	129	1.75 / 0.5		Sheen noted, ST = Neg	
30	30-32	127	2.0 / 0.5	Gray Coarse SAND, trace coarse Gravel	ST = Neg	
32						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 32 feet, bedrock not encountered.

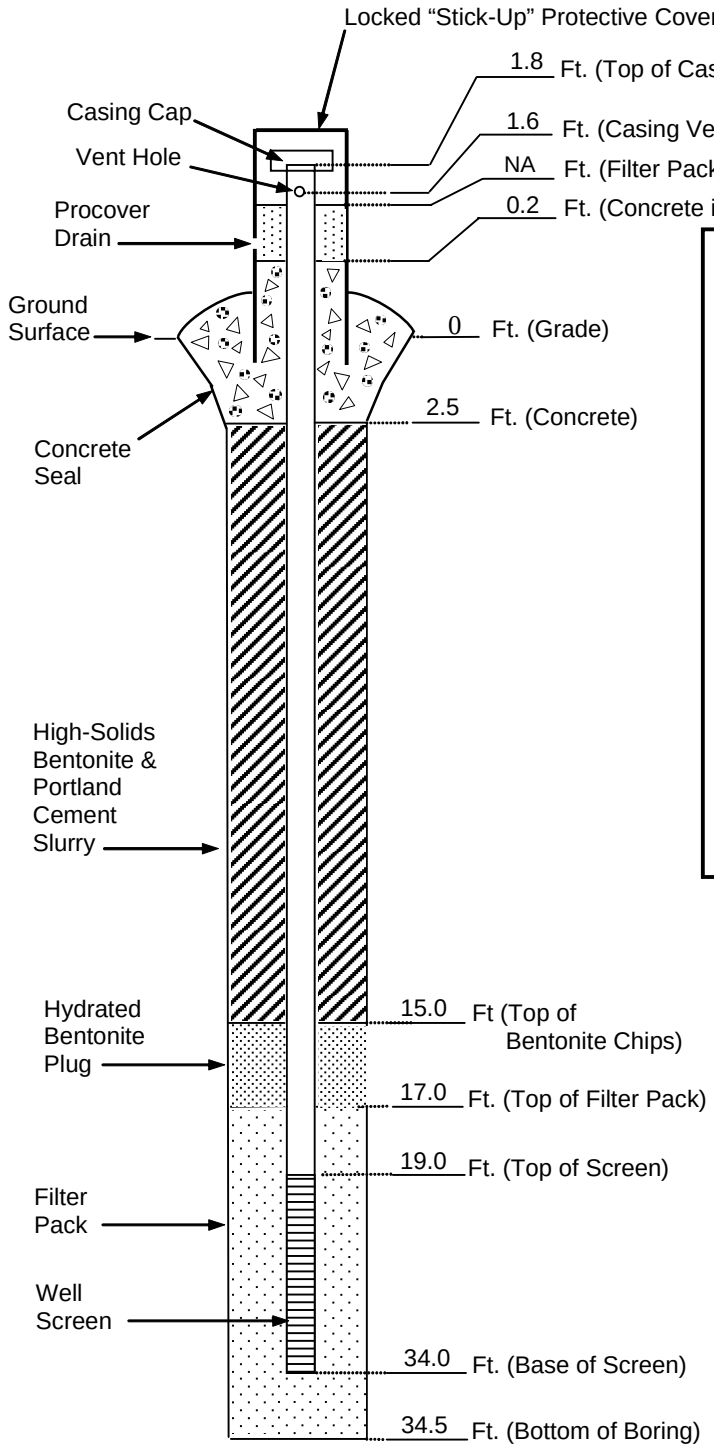
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

W-19



Well No: W-19 (formerly DTP-52)

Location: Parcel 3
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Carey Letts

Date Started: 8/6/08
Date Completed: NA

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1432.33 ft N.A.V.D. 1988
Grade Elev.: 1430.5 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 21.63 ft. on 8/19/08
SWL from TOC: 23.43 ft. on 8/19/08
SWL Elev.: 1408.90 ft. on 8/19/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 9 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 8/6/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/19/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 8/6/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **DTP-52/W-19**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1430.5 feet**	TOTAL DEPTH:	**34 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**24 feet**	CASING EL.:	**1432.33 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci/ C. Letts**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/24/08; 8/6/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parrott Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

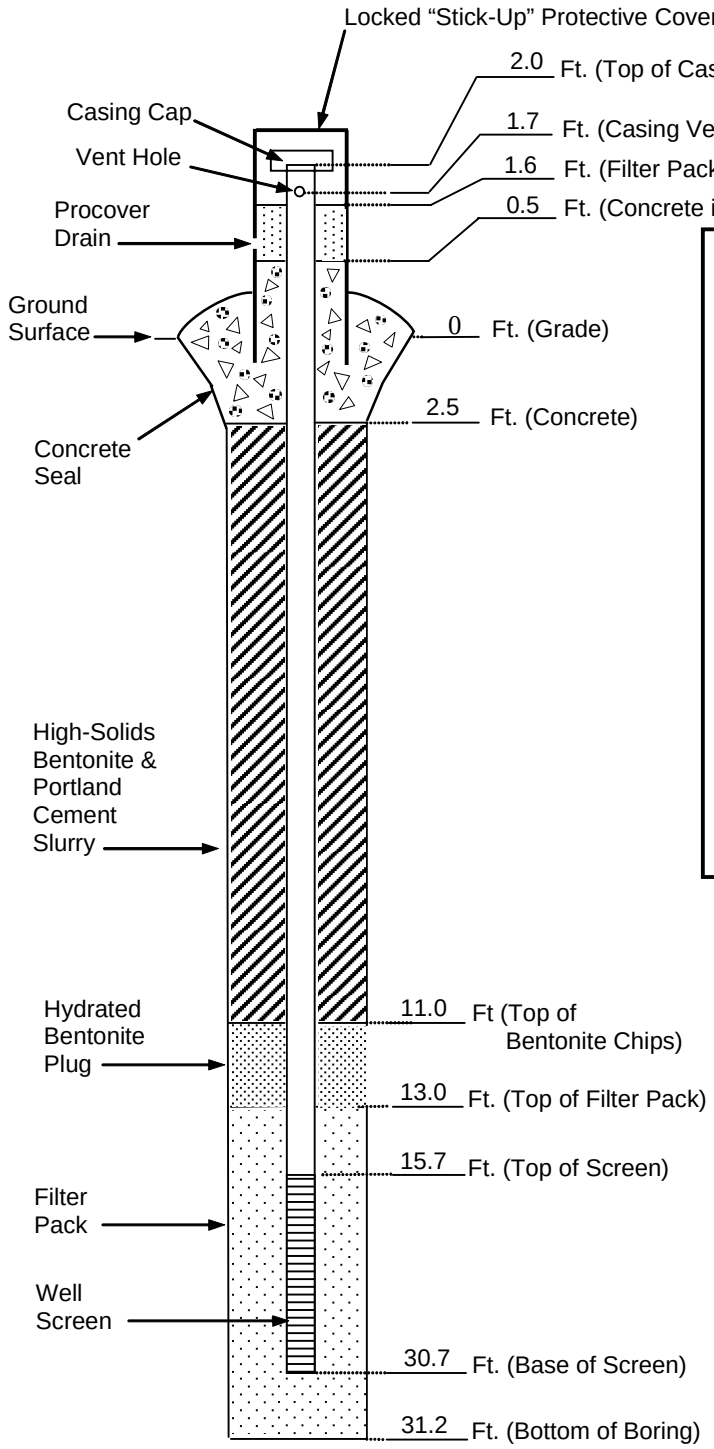
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0						
	0-2	0.2	NA	Grass, Topsoil		
2				Concrete Slab		
	2-4	41.0	NA	FILL; Dark Brown Very Fine to Fine SAND, some Topsoil and fine Gravel	Dry Moist, Pipes encountered	See attached Monitoring Well Design Plan for well completion details.
4						
	4-6	0.0	NA	Orange Red Yellow CLAY		
6						
				Gray CLAY, some Sand, trace Gravel		
	6-8	0.0	NA		Wet	
8				Brown Coarse GRAVEL, some medium Gravel, little Clay, trace fine Sand		
	8-10	233	NA		ST = Pos	
10				Brown Red Fine to Coarse GRAVEL, little Clay		
	10-12	194	NA	Gray Fine to Coarse GRAVEL	Saturated, ST = Pos	
12				Gray Coarse SAND and Fine to Coarse GRAVEL		
	12-14	2439	0.75 / 1.5		Wet, ST = Neg	
14				Gray Coarse SAND and Fine to Coarse GRAVEL, trace Silt		
	14-16	1719	1.0 / 2.5		Moist, ST = Neg	
16						
	16-18	1395	1.0 / 3.75		ST = Neg	
18				Green Coarse SAND and Fine to Coarse GRAVEL		
	18-20	2131	0.5 / 1.25		ST = Neg	
20				Gray Fine to Medium SAND, some fine to coarse Gravel		
	20-22	2250	1.0 / 2.25		ST = Neg	
22				Gray Coarse SAND and Coarse GRAVEL		
	22-24	2516	1.0 / 1.75		Wet, ST = Neg	
24				Gray Fine to Coarse GRAVEL, some coarse Sand		
	24-26	839	1.5 / 0.5		Saturated, ST = Neg	
26				Gray Fine to Coarse GRAVEL and Coarse SAND, trace Silt		
	26-28	2343	1.5 / 1.25		ST = Neg	
28						
	28-30	1031	1.5 / 0.75		ST = Neg	
30						
	30-32	1068	1.25 / 0.75		ST = Neg	
32				Gray Coarse SAND and Fine GRAVEL, trace coarse Gravel		
	32-34	1421	1.0 / 0.5		ST = Neg	
34						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 34 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-20



Well No: W-20 (formerly SB-32)

Location: Parcel 3
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Carey Letts

Date Started: 8/5/08
Date Completed: 8/5/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1431.49 ft N.A.V.D. 1988
Grade Elev.: 1429.5 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 20.83 ft. on 8/19/08
SWL from TOC: 22.83 ft. on 8/19/08
SWL Elev.: 1408.66 ft. on 8/19/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 11 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 8/5/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/19/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 8/5/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **SB-32/W-20**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1429.5 feet**	TOTAL DEPTH:	**32 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**21 feet**	CASING EL.:	**1431.49 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci/ J. Simms/ C. Letts**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/25/08; 7/2/08; 8/5/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	0.8	NA	Dark BrownTopsoil, Organic Material, Roots and Clay	Wet	See attached Monitoring Well Design Plan for well construction details.
	0.5-2	6.4			Tightly Compacted, Dry	
2				Gray SILT, some coarse Gravel		
	2-4	78.4	NA			
4				Gray Fine to Medium SAND, some coarse Gravel, Cobble and Silt		
	4-6	871	0.8 / 0.75	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Moist, Sheen, ST = Neg	
6						
	6-8	376	0.8 / 0.5	Gray Fine to Medium SAND, some Gravel, little Silt	Sheen, ST = Neg	
8				Gray Fine to Coarse SAND and GRAVEL, little Silt		
	8-10	673	1.2 / 0.5		Sheen, ST = Neg	
10						
	10-12	624	1.5 / 0.5		Sheen, ST = Neg	
12						
	12-14	356	1.5 / 0.5		Dry, Sheen, ST = Neg	
14						
	14-16	789	1.5 / 0.75		Moist, Sheen, ST = Neg	
16						
	16-18	1149	1.4 / 1.5		Sheen, ST = Neg	
18						
	18-20	2662	1.4 / 0.5		Wet, Sheen, ST = Neg	
20						
	20-22	1313	2.0 / 2.5		Sheen, ST = Neg	
22						
	22-24	846	1.2 / 0.5		Saturated, Sheen, ST = Neg	
24						
			1.5 / 4.25	Gray SAND, some Silt and fine to coarse Gravel	Dry	
	24-26	980			Saturated, ST = Neg	
26			1.5 / 1.5	Gray SAND and Fine GRAVEL		
	26-28	935	1.5 / 1.25	Gray SAND and Fine to Coarse GRAVEL, trace Silt	ST = Neg	
28						
				Gray SAND, some fine to coarse Gravel		
	28-30	896	1.8 / 0.5		ST = Neg	
30						
	30-32	1005	2.0 / 0.5		ST = Neg	
32						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 32, feet, bedrock not encountered.

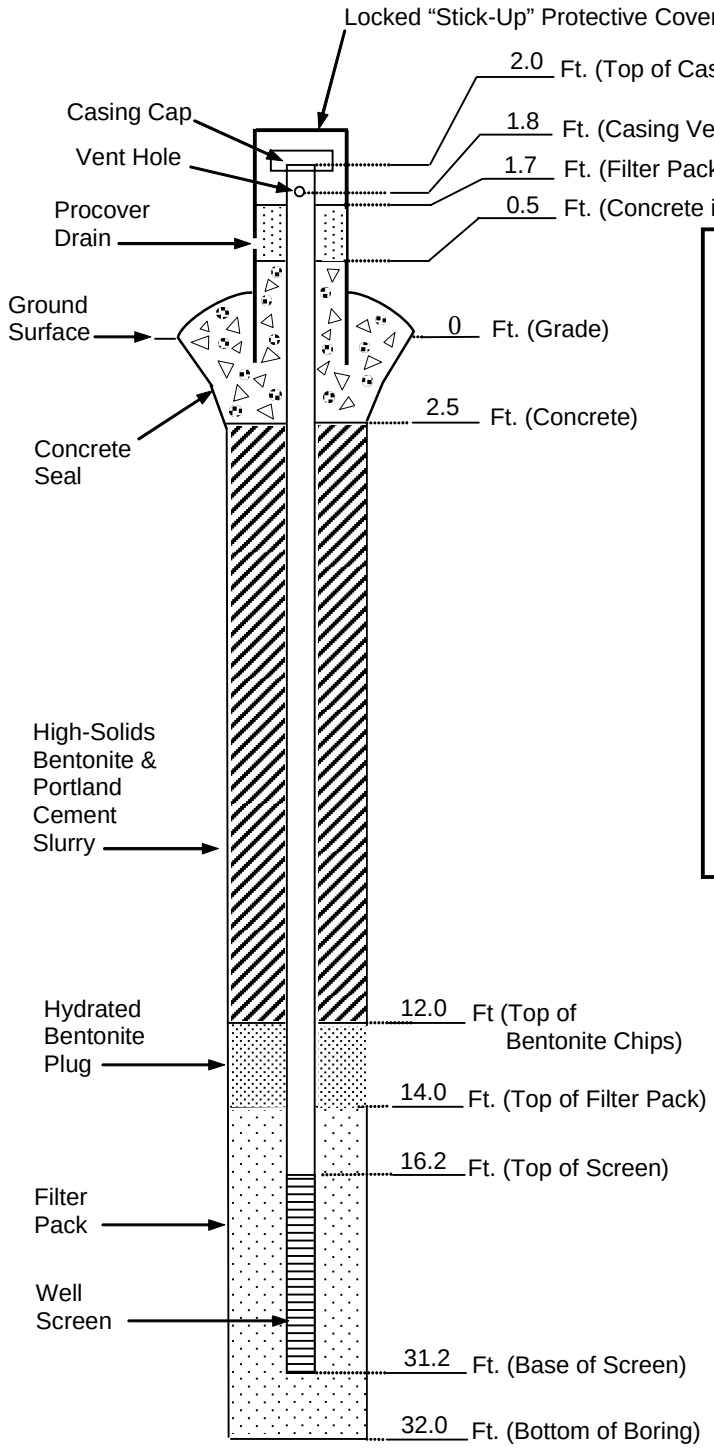
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

W-21



Well No: W-21 (formerly SB-24)

Location: Parcel 3
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Carey Letts

Date Started: 8/6/08
Date Completed: 8/6/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1432.00 ft N.A.V.D. 1988
Grade Elev.: 1430.0 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 21.43 ft. on 8/14/08
SWL from TOC: 23.43 ft. on 8/14/08
SWL Elev.: 1408.57 ft. on 8/14/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 9 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 8/6/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/14/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 8/6/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **SB-24/W-21**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1430.0 feet**	TOTAL DEPTH:	**32 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**22 feet**	CASING EL.:	**1432.00 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci/ J. Simms/ C. Letts**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/26/08; 7/2/08; 8/6/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

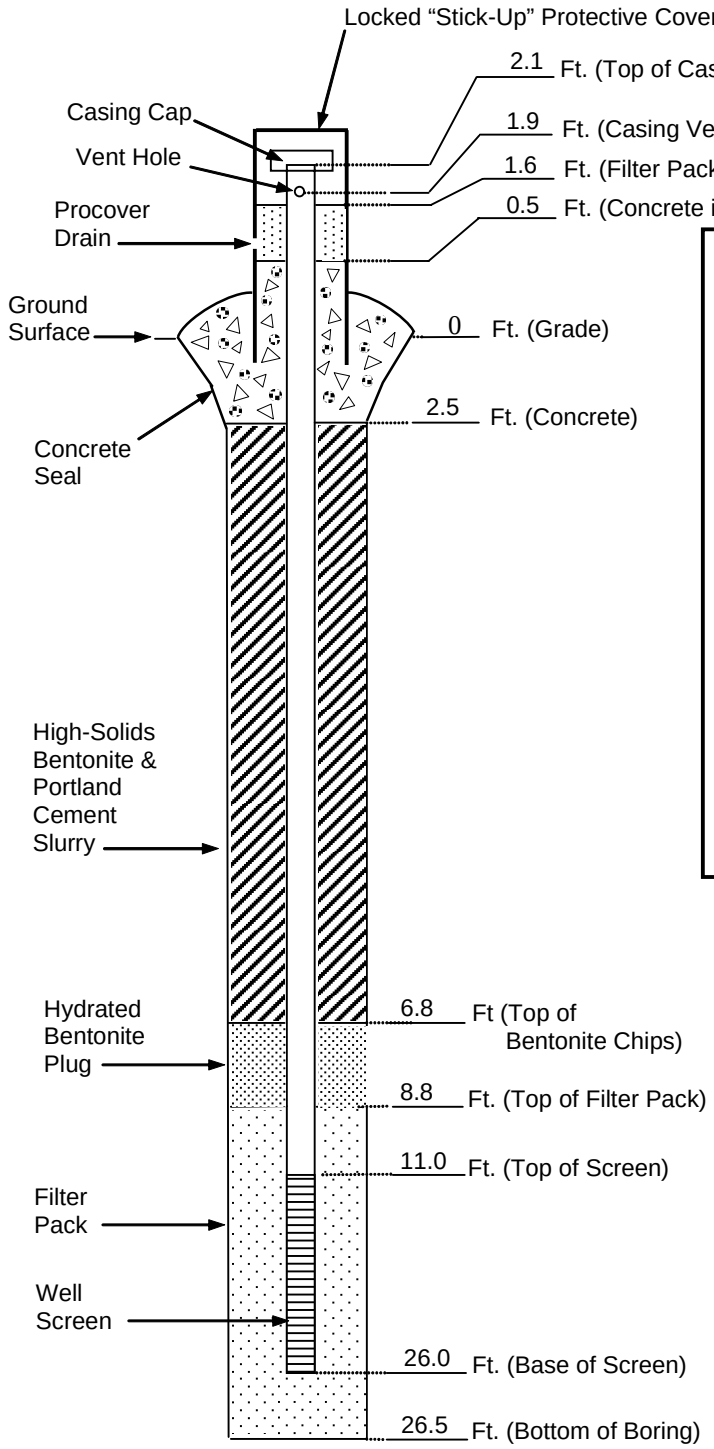
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	1320	NA	Gray Fine to Medium SAND, some Silt	Moist, ST = Neg	See attached Monitoring Well Design Plan for well construction details.
2	2-4	165	NA	Gray Fine to medium SAND, some fine Gravel, trace Silt	ST = Neg	
4	4-6	383	0.2 / 0.5	Brown Fine to medium SAND and GRAVEL, some Silt, trace Clay	Sheen, ST = Neg	
6	6-8	505	0.9 / <0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Sheen, ST = Neg	
8	8-10	775	1.3 / 1.25		Sheen, ST = Neg	
10	10-12	1494	1.6 / 1.5		Sheen, ST = Neg	
12	12-14	786	1.6 / 0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt	Sheen, ST = Neg	
14	14-16	2364	1.8 / 0.5		Sheen, ST = Neg	
16	16-18	1972	1.2 / <0.5		Sheen, ST = Neg	
18	18-20	1521	1.4 / 1.25		Sheen, ST = Neg	
20	20-22	1669	2.0 / 2.0	Brown CLAY	Sheen, ST = Neg	
22	22-24	1299	1.5 / <0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt	Saturated, Sheen, ST = Neg	
24	24-26	918	0.5 / 0.5	Gray Fine to Coarse GRAVEL, some coarse Sand	SPH Blebs noted, ST = Neg	
26	26-28	1870	1.0 / 0.5		ST = Neg	
28	28-30	444	0.75 / 0.5		ST = Neg	
30	30-32	1128	1.25 / 0.5	Gray Fine to Coarse GRAVEL and Coarse SAND	ST = Neg	
32						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 32, feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-22



Well No: W-22

Location: Parcel 3
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Eric Popken

Date Started: 7/30/08
Date Completed: NA

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1431.64 ft N.A.V.D. 1988
Grade Elev.: 1429.5 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 19.70 ft. on 8/14/08
SWL from TOC: 21.80 ft. on 8/14/08
SWL Elev.: 1409.84 ft. on 8/14/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 14 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/31/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/14/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/30/08

BORING LOG

ID NO. **W-22**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1429.5 feet**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**22 feet**	CASING EL.:	**1431.64 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**C. Letts/ E. Popken**	Drilling Method:	**Excavato/Hollow Stem Auger**
Dates Drilled:	**7/17/08; 7/30/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd CompanyParratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

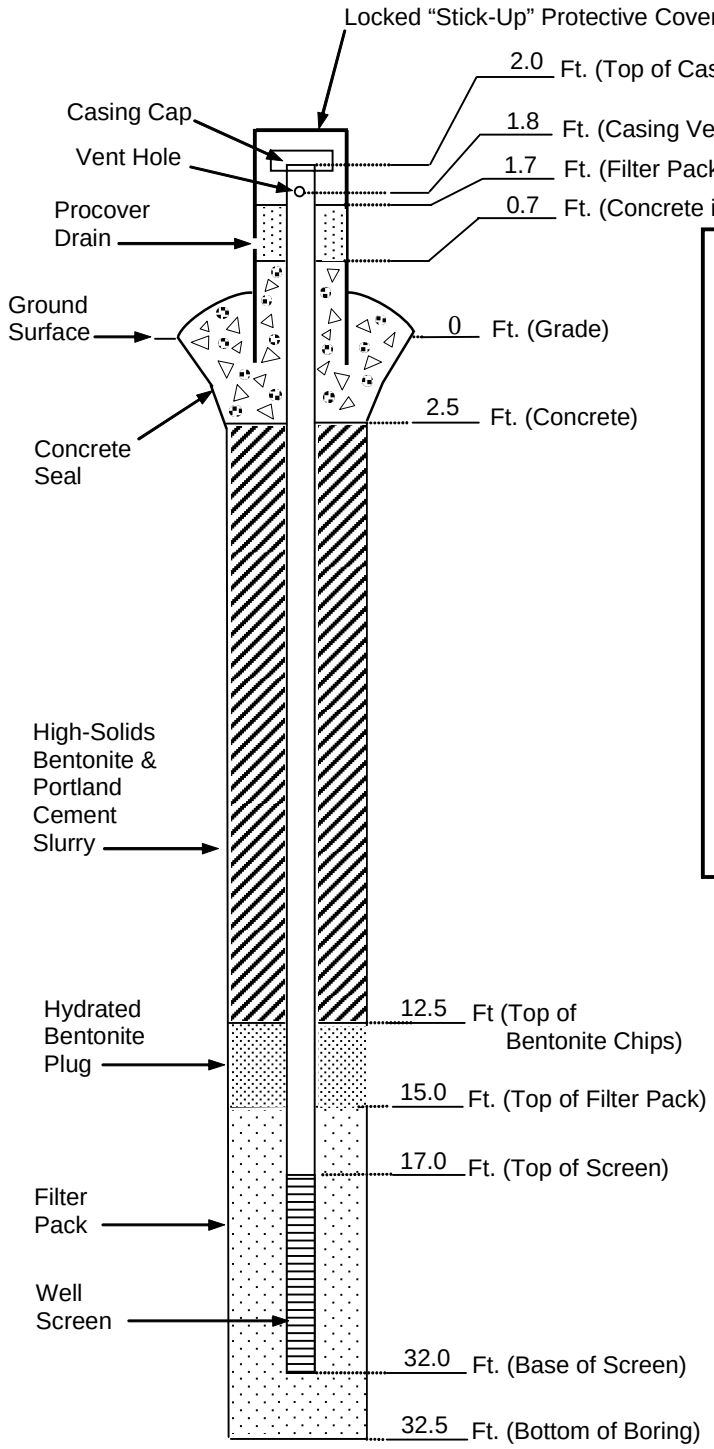
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	140	NA	FILL; Black Medium SAND, trace red Brick and Clinkers	Dry, ST = Neg	See attached Monitoring Well Design Plan for well construction details.
2	2-4	3595	NA	Brown Medium SAND, some fine Gravel, trace Silt	Moist, ST = Neg	
4	4-6	10.7	1.0 / 1.75	Brown CLAY and SILT, trace fine Sand and fine Gravel	Moist, Cohesive	
6	6-8	39.4	1.5 / 0.5	Brown Fine to Coarse GRAVEL, some fine to coarse Sand, trace Silt	Loose	
8	8-10	51.5	1.0 / 0.75			
10	10-12	81.2	0.5 / 0.5			
12	12-14	3599	1.0 / 0.5	Gray Fine to Coarse GRAVEL, some fine to coarse Sand, trace Silt	Wet, Sheen noted, ST = Neg	
14	14-16	3608	1.5 / 2.0	Gray Fine to Coarse SAND, little fine to coarse Gravel, little to trace Silt	Compact, Sheen noted, ST = Neg	
16	16-18	627	1.2 / 2.5	Brown CLAY and SILT, little fine to coarse Gravel, trace fine to coarse Sand	Cohesive, Sheen noted, ST = Neg	
18	18-20	1502	1.5 / 2.5	Gray Fine to Coarse GRAVEL, little fine to coarse Sand, little to trace Silt and Clay	Compact, ST = Neg	
20	20-22	912	1.1 / 1.5	Gray Fine to Coarse GRAVEL, little fine to coarse Sand	Compact, ST = Neg	
22	22-24	970	1.2 / 1.5		Saturated, Loose, Sheen noted, ST = Neg	
24	24-26	567	1.2 / 4.5	Gray Fine to Coarse GRAVEL, little fine to coarse Sand, little to trace Silt and Clay	Wet, Compact, ST = Neg	
26						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-23



Well No: W-23

Location: Parcel 3
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Robert Sickler

Date Started: 7/30/08
Date Completed: NA

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1431.62 ft N.A.V.D. 1988
Grade Elev.: 1429.5 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 20.95 ft. on 8/14/08
SWL from TOC: 22.95 ft. on 8/14/08
SWL Elev.: 1408.67 ft. on 8/14/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 7 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 0.75 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 7/30/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/14/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 7/30/08

BORING LOG

ID NO. **W-23**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1429.5 feet**	TOTAL DEPTH:	**32 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**22 feet**	CASING EL.:	**1431.62 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**C. Letts/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**7/17/08; 7/30/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

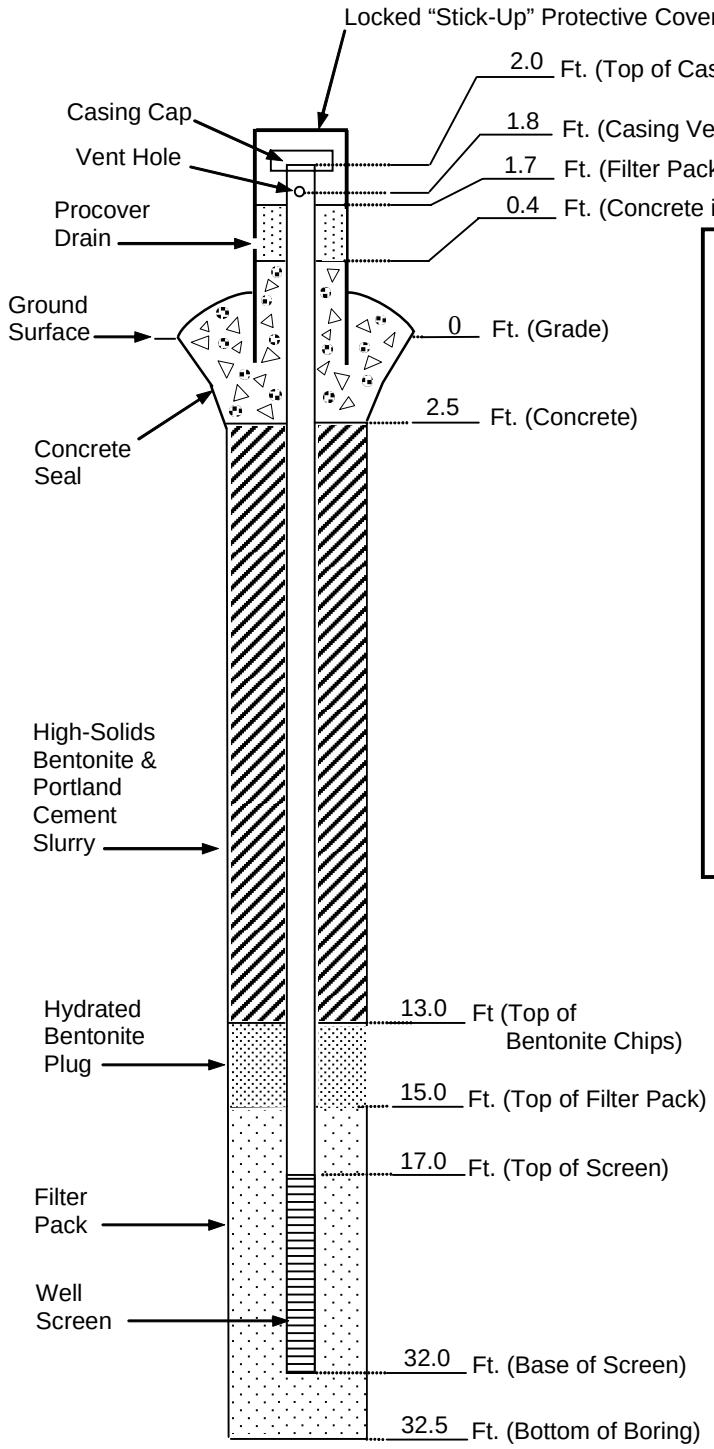
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	0.0	NA	Brown Fine to Medium SAND, some coarse Gravel	Moist	See attached Monitoring Well Design Plan for well construction details.
2	2-4	0.0	NA			
4	4-6	11.6	0.5 / <0.5	Brown Medium SAND and SILT, little fine Gravel, trace Clay and coarse Gravel	Wet, Loose	
6	6-8	3131	1.3 / 2.5	Gray Medium SAND and Fine GRAVEL, some Silt, trace coarse Gravel	Moist, Loose, Sheen noted, ST = Neg	
8	8-10	2428	0.7 / 1.75		Sheen noted, ST = Neg	
10	10-12	4144	1.3 / >4.5	Gray Medium SAND and SILT, little fine Gravel, trace Clay and coarse Gravel	Slightly Moist, Sheen noted, ST = Neg	
12	12-14	3838	1.2 / 1.0	Gray Medium SAND, some fine Gravel, little Silt, trace coarse Gravel	Dry, Loose, Sheen noted, ST = Neg	
14	14-16	3804	1.0 / 1.75		Sheen noted, ST = Neg	
16	16-18	4451	1.5 / 1.75		Sheen noted, ST = Neg	
18	18-20	5630	1.7 / 1.75		Sheen noted, ST = Neg	
20	20-22	2879	1.5 / 3.0		Moist, Sheen noted, ST = Neg	
22	22-24	2679	1.3 / 1.5	Gray Medium SAND and Fine GRAVEL, some Silt, little coarse Gravel	Saturated, Loose, Sheen noted, ST = Neg	
24	24-26	6279	1.2 / 2.0	Gray Coarse SAND and Fine GRAVEL, some fine to medium Sand, trace coarse Gravel and Silt	Loose, Sheen noted, ST = Neg	
26	26-28	2573	1.3 / 2.0		Sheen noted, ST = Neg	
28	28-30	2875	2.0 / 2.25	Gray Medium SAND and Fine GRAVEL, some Silt, little coarse Gravel	Sheen noted	
30	30-32	1951	1.5 / 1.5	Gray Medium SAND, some fine Gravel, little Silt, trace coarse Gravel	Wet, Sheen noted, ST = Neg Saturated, Sheen noted, ST = Neg	
32						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 32 feet, bedrock not encountered.

Symbol Key:
Apparent Water Level
Lab Sample Location

W-24



Well No: W-24 (formerly TPSB-36)

Location: Parcel 3
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Carey Letts

Date Started: 8/4/08
Date Completed: 8/4/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1433.09 ft N.A.V.D. 1988
Grade Elev.: 1431.1 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 19.14 ft. on 8/20/08
SWL from TOC: 21.14 ft. on 8/20/08
SWL Elev.: 1411.95 ft. on 8/20/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 10 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 8/4/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover:
Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/20/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 8/4/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **TPSB-36/W-24**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1431.1 feet**	TOTAL DEPTH:	**32 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**24.26 feet**	CASING EL.:	**1433.09 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci / J. Simms / C. Letts**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/19/08; 6/25/08; 8/4/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

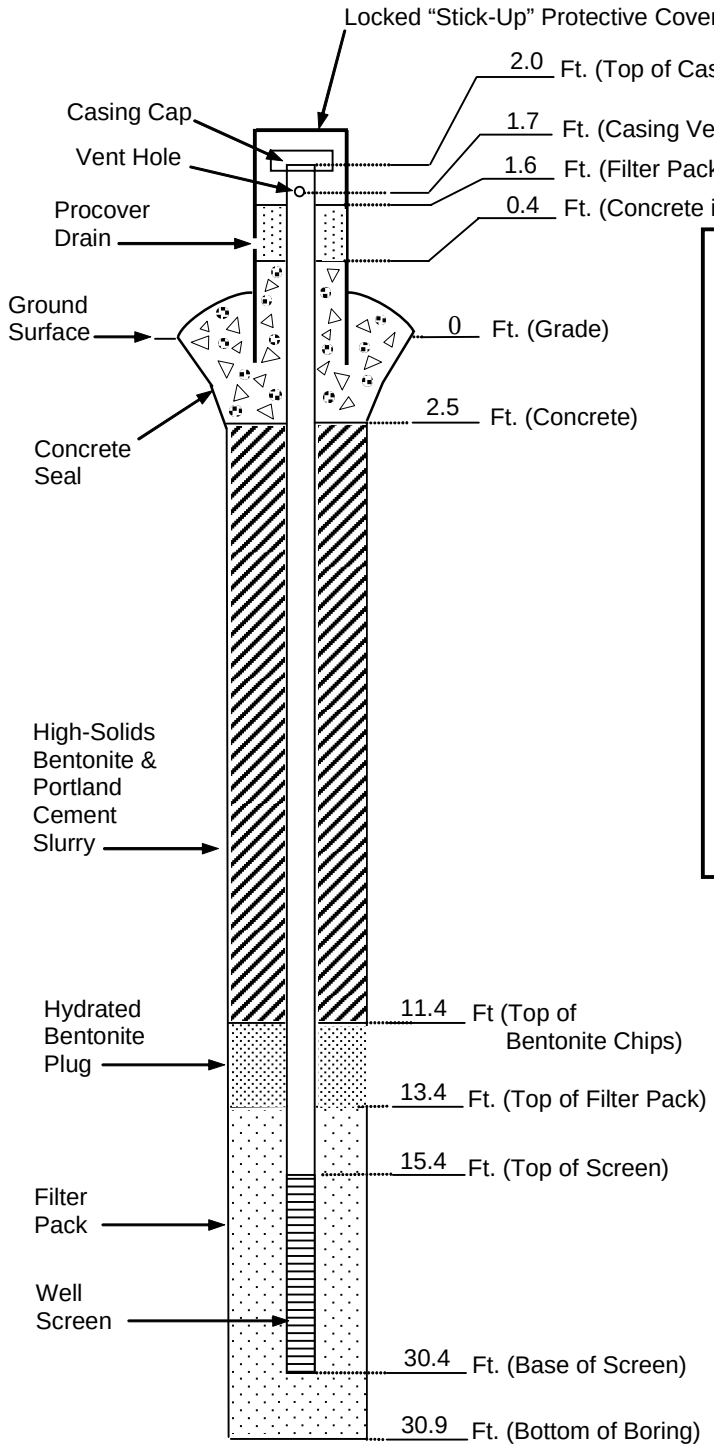
Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	0.0	NA	FILL; Brown Topsoil, Organic Material, trace medium to coarse Gravel	Dry	
	0.5-2	1.6	NA		Pipe encountered at 1 ftbgs, moved to South	
2	2-4	0.3	NA	FILL; Wood, Concrete, Brown Fine SAND, some medium Gravel and Ash/Coal	Wet to Saturated, Pipe encountered at 2.5 ftbgs, moved between pipes	See attached Monitoring Well Design Plan for well construction details.
4				Brown CLAY, some Cobble, trace fine Sand	Wet	
	4-6	0.0	0.3 / 0.5	Brown Fine to Coarse SAND and GRAVEL, some Silt, trace Clay		
6	6-8	0.0	0.9 / 0.5	Gray Fine to Medium SAND and GRAVEL, some Silt, trace Clay	Moist	
8	8-10	29.7	0.8 / 0.5	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Wet	
10	10-12	13.5	0.9 / <0.5	Gray Fine to Medium SAND, little Gravel, trace Silt		
12	12-14	21.7	1.25 / 0.5			
14	14-16	17.4	1.25 / 3.0	Brown Fine to Coarse SAND and GRAVEL, some Silt, trace Clay	Moist	
16	16-18	4.2	1.1 / 1.0	Gray Fine to Coarse SAND and GRAVEL, little Silt		
18	18-20	25.6	1.5 / 0.75			
20	20-22	94.9	1.8 / 2.0	Tan CLAY	Wet	
22	22-24	333	1.5 / 1.5	Gray Fine to Coarse SAND and GRAVEL, trace Silt	Sheen, ST = Neg	
24	24-26	297	1.5 / 1.5	Gray Fine to Coarse SAND and GRAVEL, little Silt and Clay	Saturated, Sheen, ST = Neg	
26	26-28	180	2.0 / 1.5	Gray SILT, some Gravel	ST = Neg	
28			2.0 / >4.5	Brown SILT, CLAY and GRAVEL	Dry, Very Stiff	
	28-30	527	2.0 / 1.5	Gray SAND and GRAVEL, some Silt	ST = Neg	
30	30-32	121	0.2 / 1.25		ST = Neg	
32						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 32 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

W-25



Well No: W-25 (formerly SB-50)

Location: Parcel 3
Former Vacuum Oil Refinery Facility
1406 Buffalo Street, Olean, NY 14760

Driller: Parratt Wolff, Inc., East Syracuse, NY
Chief Driller: Mark Eaves
GES Geologist: Carey Letts

Date Started: 8/7/08
Date Completed: 8/7/08

Casing Material: 4-inch Dia., Sched. 40 PVC.
Screen Material: 4-inch Dia., Sched. 40 PVC.
Screen Size: No. 20 Slot.

TOC Elev.: 1431.38 ft N.A.V.D. 1988
Grade Elev.: 1429.4 ft N.A.V.D. 1988

TOC & Grade Survey: CT Male on 8/25/08

SWL from Grade: 20.65 ft. on 8/19/08
SWL from TOC: 22.65 ft. on 8/19/08
SWL Elev.: 1408.73 ft. on 8/19/08

COMMENTS

AS BUILT DATA SHOWN IN DIAGRAM AT LEFT

Filter Pack: Placed approx. 12 50# bags of #1 Industrial Quartz Sand bagged by U.S. Silica, Mauricetown, NJ.

Bentonite Plug: Placed approx. 1 50# bag of Enviroplug Granular Bentonite Chips bagged by Wyo-Ben, Inc., Billings, MT.

High-Solids Bentonite/Portland Cement Grout Slurry: Placed over filter pack sand to just below grade with tremie pipe on 8/7/08. Grout type was Enviroplug granular Bentonite and Quikrete Portland Cement (Type 1), Atlanta, GA. Mixed 5# of granular Bentonite to 100# of Portland cement. Water source: City of Olean Public Water via hydrant on Buffalo Street near Building #10.

Concrete Surface Seal and Protective Cover: Installed on NA.

Developed by the pump-and-surge method using a Water Spout 2 submersible pump. About 55 gallons removed during development. Well developed on 8/19/08.

GES	**CLIENT NAME:** ExxonMobil Environmental Services Co.	**MONITORING WELL DESIGN PLAN STANDARD CAP**	
	PROJECT NAME: Former Olean Vacuum Oil Refinery Facility	**PROJECT NO.:** 06-02025-02-201	**DATE:** 8/7/08

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **SB-50/W-25**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1429.4 feet**	TOTAL DEPTH:	**30 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**20 feet**	CASING EL.:	**1431.38 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**J. Vinci/ J. Simms/ C. Letts**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/19/08; 6/25/08; 8/7/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0						
	0-2	0.8	NA	GRAVEL, Grass	Dry, Soft	See attached Monitoring Well Design Plan for well construction details.
2				Gray Black CLAY	Saturated	
	2-4	186	NA	Medium GRAVEL, some Clay	Moist, ST = Neg	
4				Gray Fine to Medium SAND and GRAVEL, some Silt, little Clay		
	4-6	441	0.9 / <0.5		Wet, Sheen, ST = Neg	
6						
	6-8	705	1.1 / <0.5		Sheen, ST = Neg	
8						
	8-10	478	0.7 / 0.75		Sheen, ST = Neg	
10				Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay		
	10-12	141	1.0 / 0.5		Moist, Sheen, ST = Neg	
12						
	12-14	858	1.3 / 1.75		Sheen, ST = Neg	
14				Dark Gray Fine to Coarse SAND and GRAVEL, trace Silt		
	14-16	1170	1.4 / 0.75		Wet, Sheen, ST = Neg	
16						
	16-18	964	1.0 / 1.0		Sheen, ST = Neg	
18						
	18-20	1737	0.9 / 0.25		Sheen, ST = Neg	
20				Dark Gray Fine to Coarse SAND and GRAVEL, little Silt		
	20-22	1638	1.4 / 0.75		Saturated, Sheen, ST = Neg	
22				Gray Fine to Coarse GRAVEL, some coarse Sand		
	22-24	1672	1.0 / 0.5		Sheen, ST = Neg	
24				Gray Medium to Coarse SAND, some fine to coarse Gravel		
	24-26	1748	1.25 / <0.5		Sheen, ST = Neg	
26				Gray Fine SAND, trace fine Gravel		
	26-28	1379	1.25 / <0.5		ST = Neg	
28				Gray Fine to Medium SAND and Fine to Coarse GRAVEL		
	28-30	2461	1.50 / 0.75		Sheen, ST = Neg	
30						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 30, feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-1**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**22 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**15 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**J. Vinci/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/16/08; 6/23/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass, Topsoil, Root fragments		
	0-2	1.2	NA	FILL; Topsoil, Root fragments, some larger Cobbles	Dry	
2				FILL; Dark Brown Fill Material, some Slag and coarse Gravel		Backfilled with excavated material and drill cuttings
	2-4	1.0	NA	FILL; Medium to Coarse GRAVEL and Fill Material	Saturated (perched)	
4				Gray Fine to Coarse SAND, little Silt		
	4-6	123	0.3 / <0.5		Wet, ST = Neg	
6				Dark Gray Fine to Coarse SAND, some Silt, trace Gravel		
	6-8	251	2.0 / 0.5		Moist, ST = Neg	
8				Dark Gray CLAY, trace Sand		
	8-10	NA	NR	No Recovery		
10				Dark Gray Fine to Medium SAND and SILT, trace Clay and Gravel		
	10-12	254	1.1 / 1.5		ST = Neg	
12				Dark Grey Fine to Coarse SAND and GRAVEL, little Silt.		
	12-14	598	1.2 / 1.25		ST = Neg	
14						
	14-16	244	1.0 / 0.5		Wet, ST = Neg	
16				Gray Fine to Coarse SAND and GRAVEL, some Silt		
	16-18	98.6	0.8 / 2.0		Saturated	
18						
	18-20	305	2.0 / 2.0		ST = Neg	
20				Gray CLAY, trace fine to medium Sand		
	20-22	270	0.5 / 0.5		Moist, ST = Neg	
22						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 22 feet, bedrock not encountered.

Test Pit (0-4 ft) completed 6/16/08; Boring (4-26 ft) completed 6/23/08.

ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

ID NO. **SB-2**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**17 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**J. Vinci/ J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/16/08; 6/23/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0–2	0-2	0.0	NA	FILL; Grass and Topsoil and Bricks, some concrete and steel		Backfilled with excavated material and drill cuttings
2–4	2-4	0.0	NA	FILL; Brown Black SAND, some Ash, Coal and Coarse Gravel		
4–6	4-6	35.3	0.8 / 1.25	FILL; Tan Wood Fill	Slight plasticity, Cohesive, Steel Pipe at 3 and 4 ftbg on NW and SE corners extending to the SE	
6–8	6-8	226	0.6 / 0.5	FILL; Brown Tan SILT, some Clay and medium to coarse Gravel	Wet, Sheen, ST = Neg	
8–10	8-10	NA	NR	Brown Fine to Medium SAND and SILT, trace Gravel		
10–12	10-12	281	0.8 / 0.5	Black Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Moist, Sheen, ST = Neg	
12–14	12-14	849	1.0 / 0.5	No Recovery		
14–16	14-16	960	0.5 / 0.5	Black Light Brown Fine to Coarse SAND and GRAVEL, some Silt, trace Clay	Sheen, ST = Neg	
16–18	16-18	NA	NR	Green Gray Fine to Coarse SAND and GRAVEL, some Silt, trace Clay	Sheen, ST = Neg	
18–20	18-20	581	1.3 / 1.0	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt	Sheen, ST = Neg	
20–22	20-22	356	0.5 / 0.5	No Recovery		
22–24	22-24	330	0.5 / 1.5	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt	Saturated, Sheen, ST = Neg	
24–26	24-26	111	0.7 / 1.5	Gray Fine to Coarse SAND and GRAVEL, trace Silt	ST = Neg	
				Gray CLAY, little fine Sand	ST = Neg	
					Moist, ST = Neg	

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26, feet, bedrock not encountered.
Test Pit (0-4 ft) completed 6/16/08; Boring (4-26 ft) completed 6/23/08.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-3**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**22 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**15.3 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**J. Vinci/ J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/17/08; 6/24/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	0.6	NA	Grass, Topsoil FILL: Black Ash and Slag, trace medium to fine Gravel	Dry	Backfilled with excavated material and drill cuttings
2	2-4	0.6	NA	FILL: Black Ash and Slag		
4	4-6	NR	NR	No Recovery		
6	6-8	11.8	0.5 / <0.5	Dark Gray Fine to Coarse SAND and GRAVEL, some Silt	Saturated	
8	8-10	NR	NR	No Recovery		
10	10-12	62.7	1.25 / 2.5	Gray CLAY, trace fine to medium Sand	Moist	
12	12-14	NR	NR	No Recovery		
14	14-16	NR	NR		Wet	
16	16-18	4.2	1.1 / 1.0	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt		
18	18-20	1.7	0.75 / 0.5		Saturated	
20	20-22	123	1.5 / 0.5		Sheen, ST = Neg	
22						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 22, feet, bedrock not encountered.
Test Pit (0-4 ft) completed 6/17/08; Boring (4-22 ft) completed 6/24/08.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **SB-4 / DTP4-X**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**24 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**19.5 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**J. Vinci/ J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/17/08; 6/24/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0						
	0-2	0.5	NA	Grass; FILL; Bricks, Corregated Steel	Dry	Backfilled with excavated material and drill cuttings
2				Black Slag and SILT, trace medium Gravel		
	2-4	0.3	NA	Light Brown SILT, some medium Gravel		
4				No Recovery		
	4-6	NR	NR			
6				Dark Brown CLAY		
	6-8	75.4	0.25 / 0.5		Wet	
8				Dark Gray CLAY		
	8-10	34.2	0.6 / <0.5		Moist	
10				Dark Gray Fine to Coarse SAND and GRAVEL, some Silt		
	10-12	121	0.75 / <0.5		Sheen, ST = Neg	
12				Dark Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay		
	12-14	433	1.1 / <0.5		Sheen, ST = Neg	
14				Gray Fine to Coarse SAND and GRAVEL, trace Silt		
	14-16	152	1.0 / 0.75		Dry, Sheen, ST = Neg	
16				Gray Fine to Coarse SAND and GRAVEL, little Silt		
	16-18	881	1.3 / 1.75		Moist, Sheen, ST = Neg	
18				Gray SILT		
	18-20	357	1.2 / <0.5		Wet, ST = Pos	
20				Gray Fine to Coarse SAND and GRAVEL, some Silt		
	20-22	366	1.25 / 3.25		Saturated, Sheen, ST = Neg	
22				Gray Fine to Coarse SAND and GRAVEL, some Silt, trace Clay		
	22-24	395	2.0 / 2.75		Sheen, ST = Neg	
24						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 24, feet, bedrock not encountered.
Test Pit (0-4 ft) completed 6/17/08; Boring (4-24 ft) completed 6/24/08.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-5**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**22 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**15 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**J. Vinci/ J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/17/08; 6/23/08 and 6/24/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	0.3	NA	FILL; Black Coal Slag	Dry	Backfilled with excavated material and drill cuttings
2	2-4	0.0	NA	Brown Coarse GRAVEL, some Cobbles, and Silt	Moist	
4	4-6	291	1.2 / 0.5	Dark Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Sheen, ST = Neg	
6	6-8	210	0.5 / 0.5	Dark Gray CLAY	Sheen, ST = Neg	
8	8-10	NR	NR	No Recovery		
10	10-12	59.9	0.75 / 0.5	Dark Gray Fine to Coarse SAND and GRAVEL, some Silt		
12	12-14	194	0.8 / <0.5		Wet, Sheen, ST = Neg	
14	14-16	232	1.2 / 0.5	Gray Fine to Coarse SAND and GRAVEL, some Silt	Sheen, ST = Neg	
16	16-18	144	1.0 / 0.5		Saturated, Sheen, ST = Neg	
18	18-20	193	1.0 / 1.0		Sheen, ST = Neg	
20	20-22	187	1.0 / 2.0	Gray Fine to Medium SAND and CLAY	Wet, Sheen, ST = Neg	
22						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 22, feet, bedrock not encountered.

Test Pit (0-4 ft) completed 6/17/08; Boring (4-22 ft) completed 6/24/08.

ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

ID NO. **SB-6**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**22 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**14 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/11/08; 6/19/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	6.1	NA	FILL; Brown Coarse SAND and GRAVEL, some Brick		
2	2-4	8.5	NA	Tan Fine SAND and SILT, come coarse Gravel		Backfilled with excavated material and drill cuttings
4	4-6	0.0	1.0 / <0.25	Brown Fine to Medium SAND and CLAY, little Gravel and Silt	Moist	
6	6-8	0.0	1.25 / 0.25	Brown Fine to Coarse SAND and GRAVEL, trace Silt and Clay		
8	8-10	0.0	1.25 / 0.25	Red Brown Fine to Coarse SAND and GRAVEL, trace Silt and Clay		
10	10-12	0.0	1.08 / 0.25	Olive Brown Fine to Coarse SAND and GRAVEL, trace Silt and Clay		
12	12-14	0.0	1.25 / 2.5			
14	14-16	0.0	1.0 / <0.25	Gray Fine to Medium SAND and GRAVEL, little Silt	Saturated	
16	16-18	0.0	1.17 / 0.25			
18	18-20	0.0	0.92 / <0.25			
20	20-22	0.0	0.92 / <0.25			
22						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 22 feet, bedrock not encountered.
Test Pit (0-4 ft) completed 6/11/08; Boring (4-26 ft) completed 6/19/08.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

TEST PIT LOG

ID NO. **SB-6A**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/7/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Reading in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0						
	0-0.5	NA	NA	Asphalt		
	0.5-1	0.2	NA	FILL; Brown Fine to Medium SAND and SILT, little Clay and fine to coarse Gravel, trace Cobbles	Moist, Loose	
	1-2	0.3	NA	FILL; Black, Gray and Brown Fine to Coarse Ash, Cinders and Clinkers		Backfilled with excavated materials
2	2-3	0.4	NA	FILL; Light Brown SILT and CLAY, trace Coal Pieces	Wet, Very Soft, Sticky, Cohesive	
	3-4	0.5	NA			
4						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 4 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-6B**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Asphalt		
	0-0.5	NA	NA	FILL; Brown Fine to Medium SAND and SILT, little Clay and fine to coarse Gravel, trace Cobbles	Moist, Loose	Backfilled with excavated materials
	0.5-1	0.5	NA			
	1-2	0	NA	FILL; Brown, Black and Gray Fine to Coarse Ash, Cinders and Clinkers	Dry, Loose	
2	2-3	0	NA	Brown Fine to Medium SAND, some Silt, little fine to coarse Gravel and Clay, trace Cobbles	Moist, Loose	
	3-4	0	NA	Brown Fine SAND and SILT, little medium to coarse Sand and fine to coarse Gravel, trace Clay	Moist, Soft, Semi-cohesive	
4						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 4 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-6C**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/7/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Black and Gray Fine to Coarse Ash and Cinders, trace Brick Fragments, Clinkers and fine to coarse Gravel	Dry, Loose	
	0.5-1	1.7	NA			
	1-2	1.4	NA	FILL; Dark Brown SILT and Fine to Medium SAND, some Clay, trace fine to coarse Gravel and Brick Fragments	Moist, Soft, Semi-cohesive	Backfilled with excavated materials
2	2-3	1.8	NA			
	3-4	2.0	NA	Light Brown Fine SAND and SILT, some Clay	Slightly Moist, Cohesive	
4						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 4 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-6D**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Dark Brown and Black Fine to Coarse SAND, some fine to coarse Ash and Cinders, trace Raw Coal, fine to coarse Gravel, Silt and Organic Material	Slightly Moist, Loose	
	0.5-1	0.4	NA			Backfilled with excavated materials
	1-2	0.3	NA			
2				FILL; Light to Dark Brown Fine SAND and SILT, some Clay, little fine to coarse Ash and coarse Gravel	Moist, Cohesive	
	2-3	0.5	NA			
				Light to Dark Brown Fine SAN and SILT, some Clay, little coarse Gravel		
	3-4	0.6	NA			
4						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 4 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-6E**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	Dark Brown Fine to Medium SAND, some coarse Sand and fine to coarse Gravel, little Silt, trace Cobbles and Organic Material	Moist, Loose	
	0.5-1	2.7	NA			
	1-2	0.3	NA	Light Brown Fine SAND and SILT, some Clay, trace fine to coarse Gravel	Moist, Soft, Cohesive	Backfilled with excavated materials
2	2-3	0.4	NA	Black Fine to Coarse SAND, little fine Gravel, trace Silt	Dry, Loose	
	3-4	0.8	NA	Black and Gray SILT, some fine Sand, trace fine Gravel	Dry to Slightly Moist, Medium, Cohesive	
4						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 4 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

ID NO. **SB-7/W-10**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1427.5 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18.7 feet**	CASING EL.:	**1429.39 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**V. Maresco/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/6/08; 6/20/08; 7/21/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			FILL; Black Ash, Cinder, possible Raw Coal, Bricks, Metal pieces, trace Sand and Gravel		
	0.5-2	698	NA		ST = Neg	
2	2-4	267	NA	Gray SILT and SAND, some Clay and Gravel	Dry, ST = Neg	See attached Monitoring Well Design Plan for well construction details.
4	4-6	37.7	0.7 / <0.5	Gray CLAY, trace fine to coarse Sand	Moist	
6	6-8	139	0.7 / 0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Sheen, ST = Neg	
8	8-10	333	1.0 / 1.25	Red Brown Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Sheen, ST = Neg	
10	10-12	150	0.6 / 0.5	Gray Brown Fine to Coarse SAND and GRAVEL, trace Silt	Sheen, ST = Neg	
12	12-14	371	1.25 / 0.5	Gray Brown Fine to Coarse SAND and GRAVEL, little Silt and Clay	Sheen, ST = Neg	
14	14-16	919	1.3 / 1.5	Gray Fine to Coarse SAND and GRAVEL, little Silt	Sheen, ST = Neg	
16	16-18	1512	1.3 / 2.25	Gray Fine to Coarse SAND and GRAVEL, little Silt and Clay	Sheen, ST = Neg	
18	18-20	1488	1.2 / 1.0	Gray Fine to Coarse SAND and GRAVEL, little Silt	Wet, ST = Neg	
20	20-22	NA	NR	No Recovery		
22	22-24	778	NA	Gray SAND and GRAVEL	Saturated Sheen, ST = Neg	
24	24-26	562	NA		Sheen, ST = Neg	
26	26-28	425	1.0 / <0.5	Gray Fine to Coarse SAND and GRAVEL, little Silt	Saturated, Sheen, ST = Neg	
28						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 28 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

TEST PIT LOG

ID NO. **SB-7A**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Black Fine to Medium SAND, some Silt, little Ash, Cinders, Brick and Mortar	Slightly Moist, Loose	
	0.5-1	2.0	NA			
	1-2	107	NA	Gray SILT and Fine to Medium SAND, trace fine to coarse Gravel and Cobbles	Moist, Loose, Sheen Observed in ST bottle	Backfilled with excavated materials
2						
	2-3	163	NA			
	3-4	181	NA			
4						
	4-5	202	NA		Moist, Loose, Sheen and Brown SPH Blebs Observed in ST Bottle	
	5-6	314	NA	Gray Fine to Medium SAND, some fine to coarse Gravel, little Silt and Cobbles	Wet, Loose, Sheen and Brown SPH Blebs Observed in ST Bottle	
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-7B**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Black Fine to Medium SAND, Ash and Cinders, trace fine to coarse Gravel and Brick Fragments	Dry, Loose	Backfilled with excavated materials
	0.5-1	21.8	NA			
	1-2	73	NA			
2				Dark Gray SILT and Fine SAND, trace Clay and fine Gravel	Moist, Soft, Black Staining and Sheen Observed in ST Bottle	
	2-3	213	NA			
				Gray Fine to Coarse SAND and Fine to Coarse GRAVEL, some Silt, trace Clay and Cobbles	Moist, Loose	
	3-4	39	NA			
4						
	4-5	16.2	NA			
	5-6	66.6	NA			
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-7C**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Dark Brown Fine to Medium SAND, some Silt and Black/White Ash and Cinders, trace Clinkers, fine to coarse Gravel and Cobbles	Dry, Loose	
	0.5-1	0.6	NA			
	1-2	34.9	NA	FILL; Black Fine to Medium SAND, little Silt, trace Brick Fragments, Ash, Cinders and Cobbles		Backfilled with excavated materials
2						
	2-3	53.9	NA			
	3-4	31.5	NA	Brown Fine to Medium SAND, trace fine Gravel and Silt	Wet, Loose	
4						
	4-5	39.3	NA			
	5-6	36.4	NA	Brown Fine to Coarse GRAVEL, some fine to coarse Sand, little Silt		
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-7C**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-7D**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Brown and Black Fine to Medium SAND, some Silt, fine to coarse Ash and Cinders, trace fine to coarse Gravel and Clinkers	Dry, Loose	
	0.5-1	1.1	NA			
	1-2	1.3	NA	FILL; Black, Brown, Gray and White Fine to Coarse Ash, Cinders and Coal, trace Brick Fragments		Backfilled with excavated materials
2	2-3	0.9	NA	Brown and Orange SILT and Fine SAND, little Clay, trace fine to coarse Gravel	Slightly Moist, Semi-cohesive	
	3-4	1.5	NA	Brown and Orange Fine to Medium SAND and Fine to Coarse GRAVEL, some Silt, trace Clay	Slightly Moist, Loose	
4	4-5	1.1	NA			
	5-6	1.3	NA		Moist, Loose	
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-7E**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Dark Brown Fine to Medium SAND, some fine to coarse Gravel, trace Silt, Concrete, Brick fragments, Ash and Cinders	Dry, Loose	
	0.5-1	NA	NA			
	1-2	NA	NA	FILL; Black Fine to Medium SAND, some fine to coarse Gravel, trace Silt, Concrete, Brick fragments, Ash and Cinders		Backfilled with excavated materials
2						
	2-3	NA	NA			
	3-4	NA	NA	Gray SILT and Fine to Medium SAND, some Clay, trace fine to coarse Gravel	Moist to Wet, Soft, Cohesive	
4						
	4-5	NA		Light Brown SILT and Fine to Medium SAND, some Clay, trace fine to coarse Gravel		
	5-6	NA		Gray Fine to Coarse SAND and Fine to Medium GRAVEL, little Silt	Moist, Loose	
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-7F**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Black and Gray Fine to Coarse Ash and Cinders, trace fine to coarse Sand, Gravel and Silt	Dry, Loose	
	0.5-1	5.1	NA			Backfilled with excavated materials
	1-2	6.3	NA			
2				Gray SILT and Fine to Medium SAND, some fine to coarse Gravel, little Clay	Moist, Soft, Cohesive	
	2-3	2.2	NA			
					Wet, Soft, Cohesive	
	3-4	1.6	NA			
4				Gray and Black SILT and Fine to Medium SAND, some fine to coarse Gravel, little Clay		
	4-5	13.3	NA			
	5-6	2.2	NA			
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-7G**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Black Fine to Medium SAND, some Silt, little Ash, Cinders, Brick and Concrete Fragments	Slightly Moist, Loose	
	0.5-1	2.5	NA			
	1-2	46.8	NA	Gray SILT and Fine SAND, trace fine to coarse Gravel and Cobbles	Moist, Soft, Cohesive, Black Staining	Backfilled with excavated materials
2						
	2-3	77.3	NA			
	3-4	51.9	NA		Wet, Cohesive, Black Staining	
4				Gray Fine to Medium SAND, some fine to coarse Gravel, little Silt and Cobbles	Moist, Loose	
	4-5	70.7	NA			
	5-6	112	N		Wet, Loose, Sheen Observed in ST bottle	
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-7H**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**6 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/8/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Brown, Black and Gray Fine to Coarse Ash and Cinders	Moist, Loose	
	0.5-1	1.8	NA			
	1-2	105	N	Gray Fine to Medium SAND and SILT, some fine to coarse Gravel, trace Clay and Cobbles	Moist, Loose, Black Staining	Backfilled with excavated materials
2	2-3	263	N	Gray Fine to Coarse SAND and Fine to Coarse GRAVEL, little Silt, trace Cobbles		
	3-4	306	N		Wet, Loose, Black Staining and Sheen Observed in ST Bottle	
4	4-5	671	N		Wet, Loose, Black Staining, Sheen and Brown SPH Blebs Observed (4' - 6') in ST Bottle	
	5-6	587	N			
6						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 6 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-8**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**1.8 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**P. Domago**	Drilling Method:	**Excavator**
Dates Drilled:	**6/4/08**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Todd Company**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				FILL; Fine to Medium SAND and GRAVEL		Backfilled with excavated material
	0-2	NA	NA	FILL; Gray CLAY and GRAVEL, Pipe and Concrete encountered		
2						

Location:
- Northing/Latitude:
- Easting/Longitude:
- Horizontal Datum:
- Vertical Datum:

General Comments:

2 inch Steel Pipe running North/South and Concrete Foundation encountered at 1.8 ftbg. Excavation abandoned.

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

ID NO. **SB-8A**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/4/08; 6/10/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			FILL; Brown Fine to Medium SAND and GRAVEL		Backfilled with excavated material and drill cuttings
	0.5-2	24.2	NA	FILL: Gray CLAY		
2	2-4	13.9	NA	FILL; Brick, Roofing Material, Concrete with re-bar		
4	4-6	45.2	0.5 / <0.5	FILL; Brown CLAY, some medium Sand, trace fine to coarse Gravel, Silt and Wood fragments	Moist, Very Soft, Cohesive	
6	6-8	NA	NR	No Recovery		
8	8-10	NA	NR			
10	10-12	274	1.0 / 0.5	Gray Medium SAND, trace fine Gravel and Silt	Dry, Loose, ST = Neg	
12	12-14	129	1.3 / <0.5		Moist, ST = Neg	
14	14-16	163	1.5 / 2.25		ST = Neg	
16	16-18	189	1.0 / 1.25		Saturated, ST = Neg	
18	18-20	137	1.3 / 1.5		ST = Neg	
20	20-22	164	1.3 / 1.5		ST = Neg	
22	22-24	133	0.5 / 0.75	Gray Medium SAND and Fine GRAVEL, trace coarse Sand, coarse Gravel and Silt	ST = Neg	
24	24-26	156	1.5 / 1.75		ST = Neg	
26						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26 feet, bedrock not encountered.
Test Pit (0-4 ft) completed 6/4/08; Boring (4-26 ft) completed 6/10/08.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-9**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/3/08; 6/10/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			Brown Fine to Medium SAND and GRAVEL		Backfilled with excavated material and drill cuttings
	0.5-2	3.7	NA	Black Brown Fine to Medium SAND		
2				Gray CLAY		
	2-4	2.4	NA	Gray CLAY and Coarse GRAVEL		
4				Brown Medium SAND, trace fine Gravel and Silt		
	4-6	0.4	1.0 / 0.75		Dry to Slightly Moist, Loose	
6				Brown Medium SAND, some Silt, trace fine to coarse Gravel		
	6-8	5.7	1.3 / 0.75		Moist, Semi-cohesive	
8						
	8-10	1.1	1.2 / 1.0			
10						
	10-12	3.3	1.2 / 1.25			
12				Gray Medium SAND, some Silt, little Clay, trace fine to coarse Gravel		
	12-14	42.8	1.3 / 1.5		Wet in Spoon tip	
14						
	14-16	322	1.5 / 1.5		ST = Neg	
16						
	16-18	302	1.3 / 2.0		Saturated, ST = Neg	
18						
	18-20	186	1.0 / 2.25		ST = Neg	
20				Gray Coarse SAND and Fine GRAVEL, little fine to coarse Sand, trace Silt		
	20-22	125	1.5 / 2.0		Loose, ST = Neg	
22						
	22-24	183	1.3 / 2.0		ST = Neg	
24						
	24-26	154	1.8 / 1.75		ST = Neg	
26						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 26 feet, bedrock not encountered.

Test Pit (0-4 ft) completed 6/3/08; Boring (4-26 ft) completed 6/10/08.

ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

Groundwater and Environmental Services, Inc.

ID NO. **SB-10/W-9**

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1427.0 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**20 feet**	CASING EL.:	**1428.75 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 feet**	WELL DIA.:	**4 inches**

Logged By:	**V. Maresco/R. Sickler/J. Simms/B. Reles**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/6/08; 6/12/08; 7/23 & 24/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	5.8	NA	FILL; Black Raw Coal, Coal Fragments and Coal Dust	Dry	See attached Monitoring Well Design Plan for well construction details.
2	2-4	6.4	NA	FILL; Red Yellow Brown Cinders and Ash		
4				Brown SILT and Fine SAND, trace Cinders and Ash		
	4-6	11.7	0.8 / 1.0	Brown Medium SAND, little Clay and Fine Gravel, trace Silt and coarse Gravel	Moist, Loose	
6	6-8	22.2	0.8 / 0.5		Wet	
8	8-10	25.9	1.0 / 1.0		Moist, Staining	
10	10-12	22.6	1.5 / 1.5		Staining	
12	12-14	27.9	1.2 / 1.25			
14	14-16	460	1.8 / 1.5	Gray Medium SAND and Fine GRAVEL, trace coarse Sand, coarse Gravel and Silt	Slightly Moist, Loose, ST = Neg	
16	16-18	2311	1.8 / 2.25		Staining, ST = Neg	
18	18-20	2433	1.5 / 1.75		Staining, ST = Neg	
20	20-22	846	1.5 / 2.25		SPH layer noted on water Saturated, sheen noted, ST = Pos	
22	22-24	2838	1.6 / 2.25		SPH blebs noted on water, ST = Neg	
24				Gray Fine to Coarse SAND, trace Silt		
	24-26	3866	1.5 / 1.75	Gray Medium SAND and Fine GRAVEL, trace coarse Sand, coarse Gravel and Silt	ST = Neg	
26	26-28	993	1.3 / <0.5	Gray Fine to Coarse GRAVEL, little fine to medium Sand, trace Silt	Saturated, ST = Neg	
28						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 26 feet, bedrock not encountered.

ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

ID NO. **SB-11**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/9/08; 6/11-12/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	1.4	NA	FILL; Brown Black Slag and GRAVEL		Backfilled with excavated material and drill cuttings
2	2-4	0.0	NA	Gray CLAY and Coarse GRAVEL	Moist	
4	4-6	11.9	2.0 / 2.25	Light Brown CLAY, some medium Sand, trace Silt and fine to coarse Gravel	Slightly Moist, Cohesive	
6	6-8	22.1	1.3 / 1.5			
8	8-10	27.2	1.5 / 1.25	Brown grading to Gray Fine to Medium SAND, some fine Gravel, trace Clay, Silt and coarse Gravel	Loose	
10	10-12	32.0	1.5 / 2.25			
12	12-14	29.8	1.7 / 1.75		Wet	
14		79.6			Moist	
	14-16	605	1.5 / 3.0	Gray Medium SAND and Fine GRAVEL, trace Clay, Silt and coarse Gravel	ST = Neg	
16	16-18	315	1.5 / 3.25		ST = Neg	
18	18-20	179	1.7 / 3.5	Gray Medium SAND and Fine GRAVEL, some coarse Gravel, trace Clay and Silt	Saturated, ST = Neg	
20	20-22	220	1.5 / 2.5		ST = Neg	
22	22-24	721	2.0 / 2.0		ST = Neg	
24	24-26	829	2.0 / 1.0		Staining noted on coarse Gravel, ST = Neg	
26						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 26 feet, bedrock not encountered.

Test Pit (0-4 ft) completed 6/9/08; Boring (4-26 ft) completed 6/11-12/08

ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

ID NO. **SB-12**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**22 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/3/08; 6/9/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	10.4	NA	FILL; Brown Fine to Medium SAND, Cobbles and Brick		Backfilled with excavated material and drill cuttings
2	2-4	34.0	NA	FILL; Gray grading to Black CLAY and SILT, some Gravel, Concrete Foundation on South side of Test Pit excavation.		
4	4-6	1.7	0.5 / 0.75	Brown CLAY, some medium Sand, little fine Gravel, trace Silt and coarse Gravel	Moist, Very Soft	
6	6-8	13.1	0.8 / 1.0			
8	8-10	NA	NR	No Recovery	Red Brick fragment lodged in Spoon tip	
10	10-12	1.0	0.5 / 0.5	Brown CLAY, some medium Sand, little fine Gravel, trace Silt and coarse Gravel	Soft	
12	12-14	31.2	0.8 / 1.0	Gray Medium SAND and Fine GRAVEL, little Silt, trace coarse Gravel and Clay	Wet, Loose	
14	14-16	298	1.2 / 1.5		Moist, ST = Neg	
16	16-18	297	1.3 / 1.25		Wet, ST = Neg	
18	18-20	364	1.3 / 1.5		ST = Neg	
20	20-22	96.6	1.1 / 1.5			
22						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 22 feet, bedrock not encountered.
Test Pit (0-4 ft) completed 6/3/08; Boring (4-26 ft) completed 6/9/08.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

TEST PIT LOG

ID NO. **SB-13**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**P. Domago**	Drilling Method:	**Excavator**
Dates Drilled:	**6/2/08**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Todd Company**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass		
				FILL; Brown Medium to Coarse SAND	Dry	
	0-2	0.0	NA			Backfilled with excavated material
2				FILL; Brown Medium to Coarse SAND and Coarse GRAVEL, Brick and Concrete at 3 ftbg	Moist	
	2-4	2.4	NA			
4						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:

Bottom of excavation at 4 feet, bedrock not encountered.
See Boring SB-13A for completion to 18 ftbgs.

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-13A**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**18 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/2/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	NA	NA	See Test Pit Log SB-13 for lithology descriptions from 0 - 4 ftbg. Boring SB-13A was completed near SB-13 due to overhead wires overlying the SB-13 location		Backfilled with excavated material and drill cuttings
2	2-4	NA	NA			
4	4-6	0.8	1.5 / 0.75	Light Brown Medium SAND, some coarse Sand, trace fine to coarse Gravel and Silt	Dry to Slightly Moist	
6	6-8	7.3	2.0 / 2.0	Gray Medium SAND, some coarse Sand, trace Fine to Coarse Gravel, Silt and Shale fragments		
8	8-10	45.5	1.5 / 1.5	Gray Medium SAND, little fine Sand, some coarse Sand (quartz), trace Gravel (quartz & shale fragments)	Moist, Loose	
10	10-12	110	1.2 / 1.0		SPH blebs noted, ST = Neg	
12	12-14	203	1.5 / 4.25		SPH blebs noted, ST = Neg	
14	14-16	NA	NR	No Recovery	Quartz rock lodged in tip of Spoon	
16	16-18	39.5	0.8 / 0.75	Gray Fine GRAVEL, trace coarse Gravel, medium Sand and Silt	Wet, Loose	
18						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 18 feet, bedrock not encountered.
Test Pit-13(0-4 ft) completed 6/2/08; Boring SB-13A(4-18 ft) completed 6/2/08.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-14**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**20 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/2/08; 6/3/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	1.9	NA	FILL; Brown Coarse SAND and GRAVEL with Brick		Backfilled with excavated material and drill cuttings
2	2-4	3.0	NA	Brown Orange SILT, Fine SAND and GRAVEL		
4	4-6	3.0	2.0 / 0.75	Brown Fine to Medium SAND, some coarse Sand, little fine Gravel, trace Silt, Clay and coarse Gravel	Moist, Soft, Semi-cohesive	
6	6-8	5.2	1.5 / 1.25	Brown Fine to Medium SAND, some coarse Sand, little fine Gravel and Clay, trace Silt and coarse Gravel	Moist to Wet	
8	8-10	1.7	1.3 / 1.5			
10	10-12	30.5	0.5 / <0.5	Gray Fine to Medium SAND, some coarse Sand, little fine Gravel and Clay, trace Silt and coarse Gravel		
12	12-14	157	1.0 / <0.5		Wet, some Black staining noted, slight Sheen noted on water, ST = Neg	
14	14-16	506	1.5 / 0.5		Moist, Black staining noted, SPH Blebs noted on water, ST = Neg	
16	16-18	307	1.5 / 1.5		Wet to Saturated, Black Staining noted, Sheen noted on all media, SPH Blebs noted on water, ST = Neg	
18	18-20	528	1.5 / <0.5		Saturated, Black Staining noted, Sheen noted on all media, SPH Blebs noted on water, ST = Neg	
20						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 20 feet, bedrock not encountered.

Test Pit (0-4 ft) completed 6/2/08; Boring (4-20 ft) completed 6/3/08.

ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-15**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**0.5 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**J. Vinci**	Drilling Method:	**Excavator**
Dates Drilled:	**6/25/08**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Todd Company**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5	0.0	NA	Brown Topsoil, some Organic Material and Medium to Coarse Gravel	Dry	Backfilled with trowel cuttings.

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Test Pit Depth 0.5 feet, Surficial sample collected only.

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-16/W-7**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**1425.3 feet**	TOTAL DEPTH:	**28 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**20 feet**	CASING EL.:	**1426.99 feet**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**10.5 inches**	WELL DIA.:	**4 inches**

Logged By:	**P. Domago/R. Sickler/J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/2/08; 6/3/08; 7/17/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-0.5			FILL; Brown Fine to Medium SAND and GRAVEL		See attached Monitoring Well Design Plan for well construction details.
	0.5-2	2.6	NA	FILL; Cinders		
2	2-4	132 481	NA	FILL; Black Cinders, Clinkers, Coal	Sheen, ST = Neg	
4				Gray CLAY and GRAVEL	Moist, ST = Neg	
	4-6	151	1.2 / 2.25	Brown Medium SAND, little coarse Sand and Fine Gravel, trace Clay and Silt	Slightly Moist, Soft, Cohesive, ST = Neg	
6	6-8	301	1.5 / 0.5		Moist, Very Soft, ST = Neg	
8				Dark Brown Medium SAND, some coarse Sand, little fine to coarse Gravel, Clay and Silt		
	8-10	304	1.3 / 0.75		Trace of suspect Grease noted at 9.5 - 10 ftbg, ST = Neg	
10				Dark Brown Medium SAND, some coarse Sand, little fine to coarse Gravel, Clay and Silt		
	10-12	79.9	1.3 / 1.5	Gray Medium SAND, some coarse Sand, little fine to coarse Gravel, Clay and SIlt	Blebs of suspect Grease observed, Soft	
12	12-14	281	1.5 / 3.75		3 inch Medium Sand lense noted at 13.5 ftbg, ST = Neg	
14	14-16	328	1.5 / 2.5		ST = Neg	
16	16-18	603	1.5 / 1.25		ST = Neg	
18	18-20	484	1.2 / 0.75		ST = Neg	
20			N Value = 0.5	Gray SILT, some coarse Sand, trace fine Gravel	Wet, Cohesive, Medium Loose, ST = Neg	
	20-22	297	N Value = >4.5	Gray Coarse SAND, some fine Gravel and Medium Sand, trace coarse Gravel and Silt		
22	22-24	358	1.5 / 0.75		ST = Neg	
24	24-26	755	1.8 / <0.5		ST = Neg	
26	26-28	910	1.8 / <0.5	Gray Fine SAND, little medium Sand, trace Silt, Clay and coarse Gravel	Cohesive, ST = Neg	
28						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 28 feet, bedrock not encountered.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-17**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**3.6 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago**	Drilling Method:	**Excavator**
Dates Drilled:	**6/4/08**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Todd Company**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				FILL; Brown Fine to Medium SAND, some coarse Gravel		
	0-2	3.1	NA	FILL; Brown Coarse SAND and Ash, some Coal		Backfilled with excavated material
2				FILL; Bricks, Brown Black SAND and GRAVEL	4 inch Cast Iron Pipe encountered at 2 ftbgs on South side of test pit, elbows down	
	2-4	5.1	NA		Saturated (perched)	
4						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of excavation at 4 feet, bedrock not encountered.

Symbol Key:
Apparent Water Level
Lab Sample Location

BORING LOG

ID NO. **SB-17A**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**18 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**J. Vinci/ J. Simms**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/18/08; 6/19/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0						
	0-2	0.0	NA	Grass and Topsoil FILL; Tan Brown SILT and Fine GRAVEL, some fine to medium Sand, Concrete	Dry, 4 inch pipe encountered extending to the West	Backfilled with excavated material and drill cuttings
2						
	2-4	13.8	NA	Olive Green Gray SILT	Moderately Cohesive, Staining	
4						
	4-6	23.9	NA			
6						
	6-8	6.4	1.0 / 0.5	Brown Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Moist	
8						
	8-10	5.0	1.0 / 0.75	Olive Brown Fine to Medium SAND and GRAVEL, trace Silt and Clay		
10						
	10-12	20.0	1.1 / 2.5			
12						
	12-14	536	1.0 / 0.5	Gray Fine to Coarse SAND and GRAVEL, trace Silt and Clay	Wet, ST = Neg	
14						
	14-16	490	1.3 / 1.5	Olive Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	ST = Neg	
16						
	16-18	1020	1.25 / 1.0		ST = Neg	
18						
	18-20	286	0.7 / 1.25		Saturated, ST = Neg	
20						
	20-22	685	1.0 / 2.0		ST = Neg	
22						
	22-24	NA	NR	No Recovery		
24						
	24-26	222	1.1 / <0.5	Olive Gray Fine to Coarse SAND and GRAVEL, little Silt, trace Clay	Saturated, ST = Neg	
26						

Location:
Northing/Latitude:
Easting/Longitude:
Horizontal Datum:
Vertical Datum:

General Comments:
Bottom of boring at 26, feet, bedrock not encountered.
Test Pit (0-6 ft) completed 6/18/08; Boring (6-26 ft) completed 6/19/08.
ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:
Apparent Water Level
Lab Sample Location

TEST PIT LOG

ID NO. **SB-17B**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**J. Siniscalchi**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/6/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Fine to Coarse SAND and GRAVEL, some Silt and Organic Material	Moist	
	0.5-1	3	NA			Backfilled with excavated materials
	1-2	3	NA			
2				FILL; Coal and Ash		
	2-3	28	NA	Light Gray Fine SAND and SILT		
	3-4	21	NA	Orange and Brown Fine to Medium SAND and SILT, some Gravel		
4						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 4 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-17C**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**R. Sickler**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/7/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0				Grass and Topsoil		
	0-0.5	NA	NA	FILL; Brown Fine to Coarse SAND, some fine to coarse Gravel and Silt, trace Clay and Ash	Moist, Loose	
	0.5-1	0.3	NA			
	1-2	1.2	NA	FILL; Dark Brown and Black Fine to Coarse SAND, some fine to coarse Gravel and Silt, trace Clay and Ash		Backfilled with excavated materials and drill cuttings
2	2-3	49.5	NA	Dark Brown to Black CLAY and SILT, some Ash, little fine to coarse Sand and fine to coarse Gravel	Slightly Moist, Semi-cohesive, Black Staining	
	3-4	3.6	NA	Light Brown Fine SAND and SILT, trace fine to coarse Gravel and Clay	Slightly Moist, Semi-cohesive	
4						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 4 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

TEST PIT LOG

ID NO. **SB-17D**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**4 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**NA**	CASING EL.:	**NA**
JOB NO.	**06-02166**	BOREHOLE DIA.:	**NA**	WELL DIA.:	**NA**

Logged By:	**J. Siniscalchi**	Drilling Method:	**Bobcat 331 Track-Mounted Excavator**
Dates Drilled:	**10/6/09**	Sampling Method:	**Excavator Bucket**
Drilling Company:	**Cortland Pump & Equipment, Inc.**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Shake Test	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0						
	0-0.5	NA	NA	Grass and Topsoil		
				FILL; Slag and Coal		
	0.5-1	2.6	NA	FILL; Black Coal and Ash, some Slag		
	1-2	3	NA	FILL; Brown and Orange Brick, Wood and SILT, some fine Sand and Gravel	Moist	Backfilled with excavated materials
2	2-3	4	NA	Orange and Brown SILT and Fine SAND, some Gravel		
	3-4	10	NA	Orange and Brown SILT and Fine to Coarse SAND, some Gravel		
4						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of Test Pit at 4 feet. Bedrock was not encountered.

ppm = parts per million; bgs = below ground surface; T8= Trench #8

SHAKE TEST (ST) RESULT KEY

NA = Not Applicable

N = Negative

P = Positive

Symbol Key:

Apparent Water Level

Lab Sample Location

BORING LOG

ID NO. **SB-18**

Groundwater and Environmental Services, Inc.

PROJECT:	**Former Vacuum Oil Refinery**	SURFACE ELEV.:	**NA**	TOTAL DEPTH:	**26 feet**
ADDRESS:	**1406 Buffalo St., Olean, NY**	WATER DEPTH	**16 feet**	CASING EL.:	**NA**
STATION NO.	**06-02025**	BOREHOLE DIA.:	**7.25 inches**	WELL DIA.:	**NA**

Logged By:	**P. Domago/R. Sickler**	Drilling Method:	**Excavator/Hollow Stem Auger**
Dates Drilled:	**6/4/08; 6/5/08**	Sampling Method:	**Excavator Bucket/Split Spoon**
Drilling Company:	**Todd Company/Parratt Wolff**	Soil Class. System:	**Burmister**
		Field Screening:	**PID (Readings in ppm)**

Depth (feet)	Sample Interval	Field Screen	Recovery (Feet)	SAMPLE LITHOLOGY	Comments	COMPLETION DETAILS
0	0-2	29.7	NA	FILL; Brown Black Fine to Medium SAND, some medium to coarse Gravel		Backfilled with excavated material and drill cuttings
2	2-4	9.3	NA	FILL; Brick and Concrete pieces		
4	4-6	31.2	0.8 / >4.5	FILL; Red CLAY Brick	Wet, Loose pieces broken by auger	
6	6-8	69.3	1.8 / <0.5	Light Brown CLAY, some Silt, trace very fine Sand	Very Soft, Black Staining noted	
8	8-10	139	1.5 / <0.5	Light Brown CLAY, some Silt, little fine Gravel, trace coarse Gravel	Moist, Soft, Cohesive, Black Staining noted, ST = Neg	
10	10-12	9.6	0.3 / <0.5	Brown Medium SAND and Fine GRAVEL, little coarse Sand and Clay, trace SIlt	Moist to Slightly Wet	
12	12-14	381	1.0 / 2.0	Brown CLAY, some Silt, little fine Gravel, trace coarse Gravel	Moist, Soft, Cohesive, ST = Neg	
14	14-16	750	1.5 / 1.0	Brown Medium SAND and Fine GRAVEL, little coarse Sand, trace Clay and Silt	Wet, Soft, Loose, ST = Neg	
16	16-18	1148	1.1 / 1.0		ST = Neg	
18	18-20	702	1.0 / 0.75		ST = Neg	
20	20-22	232	0.8 / <0.5		3 inch layer of Medium SAND with trace Silt, ST = Neg	
22	22-24	224	0.8 / <0.5	Gray Medium SAND, little coarse Sand, trace coarse Gravel and Silt	ST = Neg	
24	24-26	390	1.3 / <0.5	Gray Medium SAND and Fine GRAVEL, some coarse Sand, trace coarse Gravel and Silt	ST = Neg	
26						

Location:

Northing/Latitude:

Easting/Longitude:

Horizontal Datum:

Vertical Datum:

General Comments:

Bottom of boring at 26, feet, bedrock not encountered.

Test Pit (0-4 ft) completed 6/4/08; Boring (4-26 ft) completed 6/5/08.

ST = Shake Test; N Value = Soil Strength in Tons/Square Foot

Symbol Key:

Apparent Water Level

Lab Sample Location