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Mr. William Ports
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7014

ENVIRONMENT

Subject:
OU-1 Petroleum LNAPL Assessment Report
NYSEG Cortland-Homer Former MGP Site
Homer, New York
NYSDEC Site # 7-12-005

Date:
February 20, 2014

Contact:
John C. Brussel, PE

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315.671.9441

Email:
John.Brussel@arcadis-us.com

Our ref:
B0013123.0006

Dear Mr. Ports:

On behalf of New York State Electric & Gas Corporation (NYSEG), this letter summarizes the findings of a light non-aqueous phase liquid (LNAPL) investigation performed at the Cortland-Homer former manufactured gas plant (MGP) site in Homer, New York (the Site). The LNAPL investigation involved the installation and development of three new groundwater monitoring wells, followed by gauging at each new well and five other existing wells to assess the nature, extent, and recoverability of petroleum-based light non-aqueous phase liquid (LNAPL) in the southern part of Operable Unit 1 (OU-1). ARCADIS implemented the LNAPL investigation between October 28, 2013 and December 27, 2013. The fieldwork was implemented in accordance with the work plan contained in a June 6, 2013 letter from ARCADIS to the New York State Department of Environmental Conservation (NYSDEC), which was approved by the NYSDEC on September 19, 2013.

The findings summarized herein indicate that recoverable LNAPL is limited to the immediate vicinity of one well (MW-11) located at the southeast corner of OU-1. However, the well is not ideally constructed to recover LNAPL. Therefore, NYSEG and ARCADIS propose to install two additional wells near MW-11 that are larger in diameter and screened more appropriately.

This report also summarizes work performed to repair four monitoring wells that were damaged and one monitoring well that was lost during implementation of soil remedial activities at the Site in from July 2012 to February 2013.

Relevant background information is presented below, followed by a discussion of the monitoring well installation and repairs, a summary of the NAPL gauging and removal efforts, and recommendations for further investigation work.

I. BACKGROUND INFORMATION

The LNAPL investigation was conducted in response to the discovery of LNAPL within the southern portion of OU-1 in early 2013 during implementation of the in-situ soil solidification (ISS) remedial action. LNAPL was noted in several test pits south of the OU-1 ISS monolith, and measureable LNAPL was observed in monitoring well MW-11. The overall extent of LNAPL was known to be limited in the hydraulically downgradient (eastern) direction. This is because LNAPL was not observed in the trench excavated along the full eastern extent of OU-1 to replace a water main in February 2013. The boundaries of OU-1, the ISS monolith limits, and the waterline and MW-11 locations are shown on Figure 1. A photo log documenting conditions encountered in the excavation for the waterline is included as Attachment A, and a detail map providing a close-up view of the area around MW-11 and locations where the photos were taken is provided on Figure 2.

II. MONITORING WELL INSTALLATION AND REPAIR SUMMARY

The sections below summarize: (1) the installation of new monitoring wells for the LNAPL investigation; (2) the repair/replacement of monitoring wells damaged during the ISS remedial construction project; (3) monitoring well development activities; (4) community air monitoring performed during well installation activities; and (5) management of investigation-derived wastes (IDW).

Monitoring Well Installation

Three new 4-inch diameter monitoring wells (wells MW-31, MW-32, and MW-33, as shown on Figure 1) were installed in the southeastern corner of OU-1 to further assess the extent and recoverability of LNAPL. The wells were installed by an ARCADIS drilling subcontractor (Parratt-Wolff) between October 28, 2013 and October 30, 2013.

Prior to drilling at each proposed well location, Parratt-Wolff used a vacuum truck to hand-clear each boring/monitoring well location to a depth of 8 feet below ground surface (bgs). The pre-clearing work was performed due to the proximity of the borings/wells to existing subsurface utilities, which extend to nearly 8 feet bgs in this area.

Following the subsurface utility clearance, a soil boring was drilled at each proposed well location to depths ranging from 16 to 18 feet bgs using conventional, 6¼-inch hollow-stem auger (HSA) drilling and sampling techniques. Soil samples were continuously collected from each boring using a 2-foot long, 2-inch outside diameter split-spoon sampler. An ARCADIS geologist visually characterized the soil samples

for color, texture, and moisture content. Samples collected from each location generally consisted of medium to coarse sands with some fine to coarse sub-angular gravel. Once below the water table (generally between 5 and 6 feet bgs), the samples exhibited iridescent sheens and petroleum fuel-like odors. Soil samples recovered from each 2-foot interval were screened for volatile organic vapors using a photoionization detector (PID). Conditions encountered in each boring and the PID screening results are presented on the monitoring well construction logs included in Attachment B.

Each new monitoring well was constructed of 4-inch-diameter Schedule 40 polyvinyl chloride (PVC) pipe with a 10-foot-long, 0.020-inch slotted screen. The top of the screen in each well was positioned approximately 2- to 3-feet above the highest water table as observed between June 2012 (the pre-remediation baseline groundwater monitoring event) and October 2013 (the most recent monitoring event prior to the well installation) to account for water table fluctuations and to allow LNAPL, if present, to enter the well. Each well was completed flush with the land surface with a bolt-down steel cover set inside a concrete pad.

The work plan called for a fourth monitoring well to be installed (as a replacement to monitoring well MW-29S located on the grocery store property south of OU-1) if the PVC bailer silted-in-place inside the well could not be removed and the well could not be restored to a useful condition. Installation of a replacement well was not necessary because ARCADIS and Parratt-Wolff were able to successfully remove the bailer and restore the well on June 7, 2013.

The location and elevation of each new monitoring well was surveyed by a NYSEG land surveyor on November 21, 2013. The survey elevations and well construction details for each new well are presented on the monitoring well construction logs in Attachment B.

Monitoring Well Repairs/Replacement

Five monitoring wells were damaged or lost during the ISS remedial construction project. These wells were repaired or replaced on October 30, 2013, as described below:

- The surface completions (steel covers and flush-mount concrete pads) at monitoring wells MW-6 and MW-13 were replaced with new steel covers and concrete pads. The inner casing construction remained the same for each well.

- The locking tops for the protective casings of monitoring wells MW-17 and MW-18 were replaced with new aluminum locking tops.

- A new 2-inch diameter PVC monitoring well was installed to replace monitoring well MW-14, which was lost during the ISS remedial construction project. The new well (MW-14R) was constructed of 2-inch-diameter Schedule 40 PVC pipe with a 10-foot-long, 0.020-inch slotted screen positioned to straddle the water table. The well was installed using the same procedures described above for the new 4-inch diameter wells, except: (1) drilling was performed using 4¼-inch HSAs to a depth of 13 feet bgs; and (2) hand clearing was performed to a depth of 4.5 feet bgs prior to HSA drilling and sampling. Soil samples recovered from the boring were visually characterized for color, texture, and moisture content, and screened using a PID. The samples generally consisted of medium to coarse sand and gravels. No visual or olfactory impacts were observed. Conditions encountered in the boring and well construction details are provided on the monitoring well construction log in Attachment B.

Monitoring Well Development

ARCADIS developed the four new monitoring wells (MW-31, MW-32, MW-33, and MW-14R) and redeveloped three of the four existing wells (MW-6, MW-13, and MW-18) that had been repaired. The well development/redevelopment work was performed on November 1, 2013 and involved alternately surging and pumping to remove sediment and improve the hydraulic connection between the well and the surrounding aquifer.

The three existing wells were redeveloped after ARCADIS discovered that silt/debris was found to cover more than 25% of the well screen, as determined based on ARCADIS depth-to-bottom measurements and construction data reported on the well construction logs. MW-17 did not require redevelopment because sediment did not cover more than 25% of the well screen, as interpreted from a depth-to-bottom measurements and the well construction log.

Community Air Monitoring

Community air monitoring for particulates and volatile organic vapors was performed during drilling at one upwind and one downwind monitoring station. The air monitoring was performed following the same protocols that were used for the ISS remedial construction project. The established particulate action levels of 100 micrograms per cubic meter (µg/m^3) and 150 µg/m^3 above background and the volatile organic vapor action level of 5 ppm above background were not exceeded at any 15-minute interval during drilling/sampling. No work stoppages occurred based on the air monitoring results.

Investigation-Derived Waste Management

Drill cuttings and decontamination/well development water generated by the activities described above were containerized in 55-gallon drums that were staged onsite pending offsite transportation and disposal by NYSEG. ARCADIS collected samples on November 21, 2013 to characterize the IDW for disposal purposes. The waste characterization analytical results indicated that the IDW did not exhibit the characteristics of a hazardous waste.

III. LNAPL MONITORING AND RECOVERY

ARCADIS measured water levels and gauged the LNAPL thickness at the following eight wells over an 8-week period between November 11, 2013 and December 27, 2013:

- Monitoring well MW-11 and the three new monitoring wells (MW-31, MW-32, and MW-33) installed around MW-11, at the southeast corner of OU-1.
- Nearby downgradient monitoring wells (MW-6, MW-13, and MW-14R).
- Rehabilitated monitoring well MW-29S, located south of OU-1.

An oil-water interface probe was used to measure the water levels and gauge NAPL thickness in each well. Monitoring well construction details for each of the above-listed wells, including screen intervals, are provided in Table 1. The water levels and LNAPL thickness recorded during each gauging event are presented in Table 2. As indicated in Table 2, a measureable thickness of LNAPL was identified only in monitoring well MW-11 during the monitoring period. The LNAPL thickness in MW-11 ranged from just under 0.1 feet on December 27, 2013 (final monitoring event) to 1.25 feet on December 12, 2013. The average LNAPL thickness in MW-11 during the monitoring period was 0.4 feet. ARCADIS removed LNAPL from monitoring well MW-11 on three dates using a polyethylene bailer. A total of 0.63 gallons of LNAPL was recovered from MW-11 during the monitoring period and placed into a New York State Department of Transportation-approved container stored within a steel 55-gallon drum overpack.

During all gauging events except the one on November 25, 2013, the measured LNAPL and water elevations in monitoring well MW-11 were higher than the well screen elevation reported on the historical monitoring well construction log. Water/LNAPL levels were generally 5 to 6 feet below the top of the inner casing (TIC), and the well screen is approximately 7 to 12 feet below the TIC. This means that additional LNAPL could potentially be present at the MW-11 location, but that flow

into the well is not possible due to the water level/LNAPL elevations above the screen. The small size of the well (2-inch diameter) may also limit recovery efforts.

A sufficient quantity of LNAPL was present in monitoring well MW-11 on November 21, 2013 to allow sample collection. ARCADIS collected and submitted an LNAPL sample from the well to Accutest Laboratories in Dayton, New Jersey for laboratory analysis for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). The LNAPL analytical results for VOCs and SVOCs are presented in Table 3.

IV. CONCLUSIONS AND RECOMMENDATIONS

Based on the information summarized above, recoverable LNAPL appears to be limited to the immediate vicinity of monitoring well MW-11. Although LNAPL has been recovered from MW-11, the well is not ideally constructed for recovering LNAPL. This is because: (1) the water table is generally above the top of the well screen, which limits LNAPL entry into the well; and (2) the well is only 2-inches in diameter, which limits the types of recovery operations that can be performed. To address these limitations, NYSEG and ARCADIS propose to install two new monitoring wells near MW-11 to facilitate LNAPL recovery.

The new monitoring wells (MW-34 and MW-35) will be installed approximately 10 feet on either side of monitoring well MW-11, as shown on Figure 2. Consistent with the construction of new wells MW-31 through MW-33, both additional wells will be constructed of 4-inch-diameter Schedule 40 polyvinyl chloride (PVC) pipe with a 10-foot-long, 0.020-inch slotted screen. The top of the screen in each well will be positioned approximately 2-feet above the highest fluid level observed at MW-11 between June 2012 and December 2013, which was 4.75 feet on December 6, 2013.

Installation and development of the two additional new wells will be performed in accordance with the protocols presented in the NYSDEC-approved June 6, 2013 work plan letter. Following development of the two new wells, ARCADIS will gauge water levels and LNAPL thickness at these wells and existing wells MW-11, MW-31, MW-32, and MW-33 on a weekly basis for a period of up to six weeks. The monitoring frequency will be changed, as needed, with input from the NYSDEC based on the findings.

The proposed fieldwork described above will be scheduled following receipt of written approval of this letter report by the NYSDEC.

We will contact you during the week of March 10, 2014 to see if the NYSDEC has any comments or questions on the fieldwork proposed in this letter report. Please feel free to contact Tracy Blazicek (NYSEG) at 607.762.8839 or me at 315.671.9441 in the interim if you have any comments/questions or need additional information.

Sincerely,

ARCADIS of New York, Inc.

John C. Brussel

John C. Brussel, P.E.
Principal Engineer

Attachments:
Table 1 – Monitoring Well Construction Details
Table 2 – LNAPL Gauging and Removal Data
Table 3 – LNAPL Analytical Data
Figure 1 – Existing and Proposed Monitoring Well Locations
Figure 2 – Utility and Photo Log Location Map
Attachment A – Water Main Excavation Photo Log
Attachment B – Monitoring Well Construction Logs

Copies:
Tracy Blazicek, CHMM, NYSEG
Keith White, C.P.G., ARCADIS

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Tables

Table 1
Monitoring Well Construction Details

Operable Unit No. 1 - LNAPL Gauging & Removal Program
New York State Electric & Gas Corporation
Cortland-Homer Former MGP Site
Homer, New York

Location ID	Material Screened/ Location	Date Completed/ Date Repaired	Northing Coordinate (ft.)	Easting Coordinate (ft.)	Top of Inner Casing (TIC) Elevation (ft. NGVD 29)	Ground Surface Elev. (ft. NGVD 29)	Well Diam. (in.)	Casing/Screen Type	Screen Slot Size (in.)	Screen Length (ft.)	Depth to Screened Interval (ft. bgs)		Well Depth (ft. bgs)
											Top	Bottom	
MW-6	sandy gravel w/ silt	11/15/1985	955355.55	927725.19	1113.02	1113.26	2	SS	NA	5.0	26.0	31.0	32.0
MW-11	med. Sandy gravel w/ trace silt	5/18/1987 / 10/30/2013	955272.91	927634.61	1114.86	1115.82	2	SS	NA	5.0	8.0	13.0	14.0
MW-13	med-to-coarse sandy gravel	5/16/1987 / 10/29/2013	955247.18	927721.09	1113.47	1114.15	2	SS	NA	5.0 est.	35.5 est.	40.5	40.5
MW-14R	med-coarse sand & gravel	10/30/2013	955359.47	927730.03	1112.78	1113.28	2	PVC	0.02	10.0	2.8	12.8	13.0
MW-29S	fine-coarse gravel, some silt/clay & fine sand	9/5/2001	955144.15	927606.77	1113.82	1114.12	2	PVC	0.2	10.0	5.0	15.0	15.0
MW-31	fine-med-coarse gravel, some sand, little silt	10/30/2013	955303.41	927635.50	1115.30	1115.94	4	PVC	0.02	10.0	4.3	14.3	14.5
MW-32	fine-med-coarse gravel, some sand, little silt	10/29/2013	955258.40	927621.25	1115.78	1116.16	4	PVC	0.02	10.0	4.8	14.8	15.0
MW-33	fine-med-coarse gravel, some sand, little silt	10/28/2013	955261.34	927596.19	1116.17	1116.63	4	PVC	0.02	10.0	3.9	13.9	14.0

Notes:
1. MW = Monitoring Well; R = Replacement Well; S = Shallow Well.
2. All wells listed above are flush-mounted and are constructed of either polyvinyl chloride (PVC) or stainless steel (SS).
3. TIC = Top of Inner Casing.
4. Elevations are in feet referenced to the National Geodetic Vertical Datum (NAVD) 1929. Horizontal Datum: NAD 83, NYS Plane Central.
5. bgs = below ground surface.
6. NA = not available.
7. est. = estimated (top of screen interval cannot be determined from monitoring well construction log).

Table 2
LNAPL Gauging and Removal Data

Operable Unit No. 1 - LNAPL Gauging & Removal Program
New York State Electric & Gas Corporation
Cortland-Homer Former MGP Site
Homer, New York

Well ID: / Screen Interval: (feet below TIC)	MW-6 (25.8 - 30.8)			MW-11 (7.0 - 12.0)				MW-13 (34.8 est. - 39.8)			MW-14R (2.3 - 12.3)		
	Measured Depth (feet below TIC)		Approximate LNAPL Thickness (feet)	Measured Depth (feet below TIC)		LNAPL Thickness (feet)	Vol of LNAPL Removed (gal)	Measured Depth (feet below TIC)		Approximate LNAPL Thickness (feet)	Measured Depth (feet below TIC)		Approximate LNAPL Thickness (feet)
Date	to Water	to LNAPL	by Interface Probe	to Water	to LNAPL	by Interface Probe	by Bailer	to Water	to LNAPL	by Interface Probe	to Water	to LNAPL	by Interface Probe
11/5/2013	4.20	ND	0.00	6.05	5.75	0.30	0.00	4.55	ND	0.00	4.09	ND	0.00
11/15/2013	4.13	ND	0.00	6.01	5.69	0.32	0.00	4.52	ND	0.00	4.03	ND	0.00
11/21/2013	4.21	ND	0.00	6.01	5.78	0.23	0.13	4.59	ND	0.00	4.11	ND	0.00
11/25/2013	4.29	ND	0.00	7.11	6.87	0.24	0.00	4.77	ND	0.00	4.19	ND	0.00
12/6/2013	3.11	ND	0.00	5.33	4.75	0.58	0.00	3.51	ND	0.00	2.87	ND	0.00
12/12/2013	3.77	ND	0.00	6.55	5.30	1.25	0.50	4.22	ND	0.00	3.47	ND	0.00
12/18/2013	4.02	ND	0.00	6.00	5.55	0.45	0.00	4.44	ND	0.00	3.88	ND	0.00
12/27/2013	3.45	ND	0.00	5.08	4.98	<0.1	0.01	3.90	ND	0.00	3.33	ND	0.00
8 week total							0.64						

See Notes on Page 2.

Well ID: / Screen Interval: (feet below TIC)	MW-29S (4.7 - 14.7)			MW-31 (3.7 - 13.7)				MW-32 (4.4 - 14.4)			MW-33 (3.4 - 13.4)		
	Measured Depth (feet below TIC)		Approximate LNAPL Thickness (feet)	Measured Depth (feet below TIC)		LNAPL Thickness (feet)		Measured Depth (feet below TIC)		Approximate LNAPL Thickness (feet)	Measured Depth (feet below TIC)		Approximate LNAPL Thickness (feet)
Date	to Water	to LNAPL	by Interface Probe	to Water	to LNAPL	by Interface Probe		to Water	to LNAPL	by Interface Probe	to Water	to LNAPL	by Interface Probe
11/5/2013	4.73	ND	0.00	6.42	ND	0.00	No data / not applicable	6.75	ND	0.00	7.10	ND	0.00
11/15/2013	4.85	ND	0.00	6.18	ND	0.00		6.64	ND	0.00	7.04	ND	0.00
11/21/2013	4.87	ND	0.00	6.27	ND	0.00		6.76	ND	0.00	7.10	ND	0.00
11/25/2013	4.94	ND	0.00	6.29	ND	0.00		6.83	ND	0.00	7.19	ND	0.00
12/6/2013	4.00	ND	0.00	5.24	ND	0.00		5.65	5.65	FILM	6.05	ND	0.00
12/12/2013	NM	NM	NM	5.82	ND	0.00		6.32	ND	0.00	6.95	ND	0.00
12/18/2013	4.85	ND	0.00	6.03	ND	0.00		6.51	ND	0.00	6.85	ND	0.00
12/27/2013	4..19	ND	0.00	5.55	ND	0.00		6.00	ND	0.00	6.40	ND	0.00
8 week total													

Notes:
1. LNAPL = light non-aqueous phase liquid.
2. TIC = top of inner casing above mean sea level (AMSL) relative to the National Geodetic Vertical Datum of 1929 (NGVD 29).
3. ND = not detected.
4. gal = gallons.
5. est = estimated (top of screen interval cannot be determined from monitoring well construction log).
6. NM = not measured (well inaccessible).

Table 3
LNAPL Analytical Data (ppb)

Operable Unit No. 1 - LNAPL Gauging & Removal Program
New York State Electric & Gas Corporation
Cortland-Homer Former MGP Site- Homer, New York

Location ID:	MW-11 LNAPL
Sample Depth (ft TIC):	5.78 - 6.01
Date Collected:	11/21/13
Volatile Organic Compounds	
Acetone	<73,000
Benzene	<4,600
2-Butanone (MEK)	<58,000
n-Butylbenzene	<3,200
sec-Butylbenzene	<3,000
tert-Butylbenzene	<6,600
Carbon tetrachloride	<22,000
Chlorobenzene	<5,000
Chloroform	<5,400
1,2-Dichlorobenzene	<3,900
1,3-Dichlorobenzene	<4,200
1,4-Dichlorobenzene	<3,800
1,1-Dichloroethane	<6,200
1,2-Dichloroethane	<10,000
1,1-Dichloroethene	<9,700
cis-1,2-Dichloroethene	<9,500
trans-1,2-Dichloroethene	<8,300
1,4-Dioxane	<390,000
Ethylbenzene	<3,300
Methyl Tert Butyl Ether	<7,400
Methylene chloride	<29,000
n-Propylbenzene	<4,500
Tetrachloroethene	<8,300
Toluene	<4,500
1,1,1-Trichloroethane	<3,400
Trichloroethene	<8,800
1,2,4-Trimethylbenzene	<3,800
1,3,5-Trimethylbenzene	<2,400
Vinyl chloride	<11,000
Xylene (total)	<3,800
Semi-Volatile Organic Compounds	
2-Chlorophenol	<9,200
4-Chloro-3-methyl phenol	<10,000
2,4-Dichlorophenol	<12,000
2,4-Dimethylphenol	<67,000
2,4-Dinitrophenol	<100,000
4,6-Dinitro-o-cresol	<51,000
3&4-Methylphenol	<20,000
2-Nitrophenol	<11,000
4-Nitrophenol	<77,000
Pentachlorophenol	<29,000
Phenol	<12,000
2,4,5-Trichlorophenol	<10,000
2,4,6-Trichlorophenol	<10,000
Acenaphthene	43,800 J
Acenaphthylene	<8,200
Acetophenone	<9,000
Anthracene	<9,800
Atrazine	<410,000
Benzaldehyde	<410,000
Benzo(a)anthracene	39,100 J
Benzo(a)pyrene	16,500 J
Benzo(b)fluoranthene	13,000 J
Benzo(g,h,i)perylene	9,220 J
Benzo(k)fluoranthene	<12,000
1,1'-Biphenyl	<82,000
4-Bromophenyl phenyl ether	<10,000
Butyl benzyl phthalate	<8,300
Caprolactam	<410,000

See Notes on Page 2.

Table 3
LNAPL Analytical Data (ppb)

Operable Unit No. 1 - LNAPL Gauging & Removal Program
New York State Electric & Gas Corporation
Cortland-Homer Former MGP Site- Homer, New York

Location ID:	MW-11 LNAPL
Sample Depth (ft TIC):	5.78 - 6.01
Date Collected:	11/21/13
Semi-Volatile Organic Compounds (Cont.)	
2-Chloronaphthalene	<11,000
4-Chloroaniline	<10,000
Carbazole	<9,600
Chrysene	40,800 J
bis(2-Chloroethoxy)methane	<9,600
bis(2-Chloroethyl)ether	<12,000
4-Chlorophenyl phenyl ether	<13,000
2,4-Dinitrotoluene	<27,000
2,6-Dinitrotoluene	<10,000
3,3'-Dichlorobenzidine	<20,000
Dibenzo(a,h)anthracene	<9,700
Dibenzofuran	27,500 J
Di-n-butyl phthalate	<22,000
Di-n-octyl phthalate	<6,400
Diethyl phthalate	<10,000
Dimethyl phthalate	<12,000
bis(2-Ethylhexyl)phthalate	<7,500
Fluoranthene	26,600 J
Fluorene	44,100 J
Hexachlorobenzene	<13,000
Hexachlorobutadiene	<12,000
Hexachlorocyclopentadiene	<100,000
Hexachloroethane	<9,800
Indeno(1,2,3-cd)pyrene	<9,000
Isophorone	<9,400
2-Methylnaphthalene	<10,000
2-Nitroaniline	<10,000
3-Nitroaniline	<22,000
4-Nitroaniline	<10,000
Naphthalene	<13,000
Nitrobenzene	<11,000
N-Nitroso-di-n-propylamine	<12,000
N-Nitrosodiphenylamine	<12,000
Phenanthrene	<11,000
Pyrene	136,000
1,2,4,5-Tetrachlorobenzene	<11,000

Notes:
1. The light non-aqueous phase liquid (LNAPL) sample was collected by ARCADIS on the date indicated.
2. Laboratory analysis was performed by Accutest Laboratories of Dayton, New Jersey.
3. ft TIC = feet below top of inner casing.
4. J = indicates an estimated value.
5. < = the compound was analyzed for, but not detected. The associated value is the compound quantitation limit.

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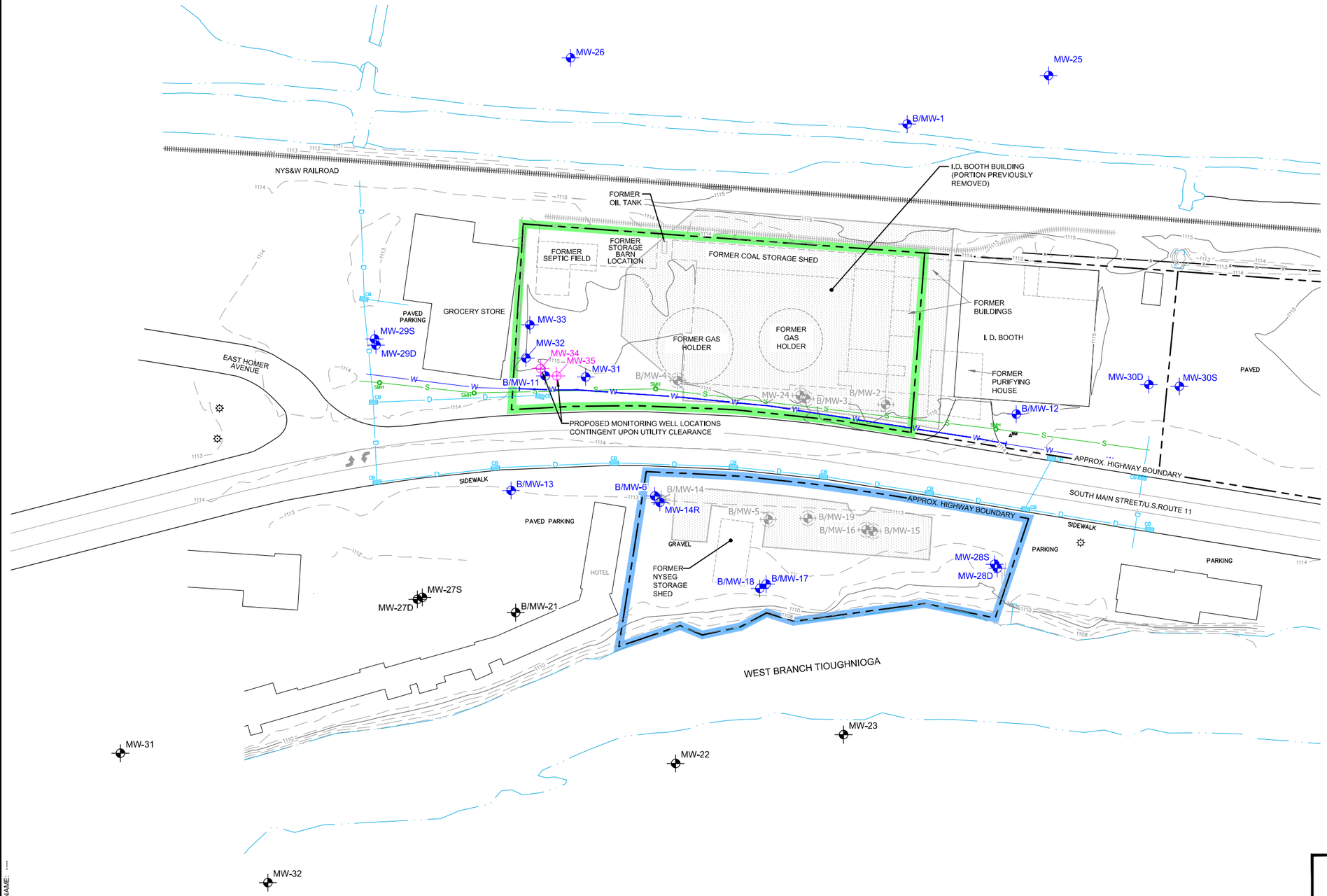
Figures



LEGEND:

- PROPOSED MONITORING WELL
- EXISTING MONITORING WELL IN MONITORING NETWORK
- FORMER MONITORING WELL LOCATION (DECOMMISSIONED IN JULY/AUGUST 2012)
- EXISTING MONITORING WELL NOT IN MONITORING NETWORK
- DESTROYED MONITORING WELL
- EXISTING WATER MAIN
- NEW WATER MAIN (2012)
- EXISTING SANITARY SEWER AND MANHOLE
- EXISTING STORM DRAIN AND CATCH BASIN
- REMOVED/FORMER BUILDINGS
- FORMER MGP STRUCTURE
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE HIGHWAY BOUNDARY
- IN-SITU SOIL SOLIDIFICATION (ISS) MONOLITH
- OPERABLE UNIT 1
- OPERABLE UNIT 2

NOTES:

1. BASEMAP ADAPTED FROM DRAWING 3 ENTITLED "EXISITNG CONDITIONS" AND DRAWING 7 ENTITLED "SITE UTILITY RELOCATION PLAN" BY AECOM OF LATHAM, NEW YORK, AT A SCALE 1"=60' AND 1"=40', RESPECTIVELY, AND DATED 4/16/2012.
2. FORMER SEPTIC SYSTEM AND OIL TANK TAKEN FROM A PLAN ENTITLED "INVESTIGATION OF FORMER COAL GASIFICATION SITES", DATED 1987 BY E.C. JORDAN CO..
3. NEW WATER MAIN ALIGNMENT TAKEN FROM A "DRAFT" "AS-BUILT SURVEY MAP", DATED JUNE 26, 2013 BY KLUMPP LAND SURVEYING, GROTON, NEW YORK.
4. EXISTING UTILITY LOCATIONS ARE APPROXIMATE.
5. THE LOCATION OF MONITORING WELLS MW-6, -11, -13, -14R, -17, -18, -31, -32 AND -33 WERE SURVEYED ON NOVEMBER 21, 2013 BY J. OLMSTEAD & S. HOPE. ALL OTHER MONITORING WELL LOCATIONS ARE APPROXIMATE.

0 80' 160'

GRAPHIC SCALE

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

EXISTING AND PROPOSED MONITORING WELL LOCATIONS

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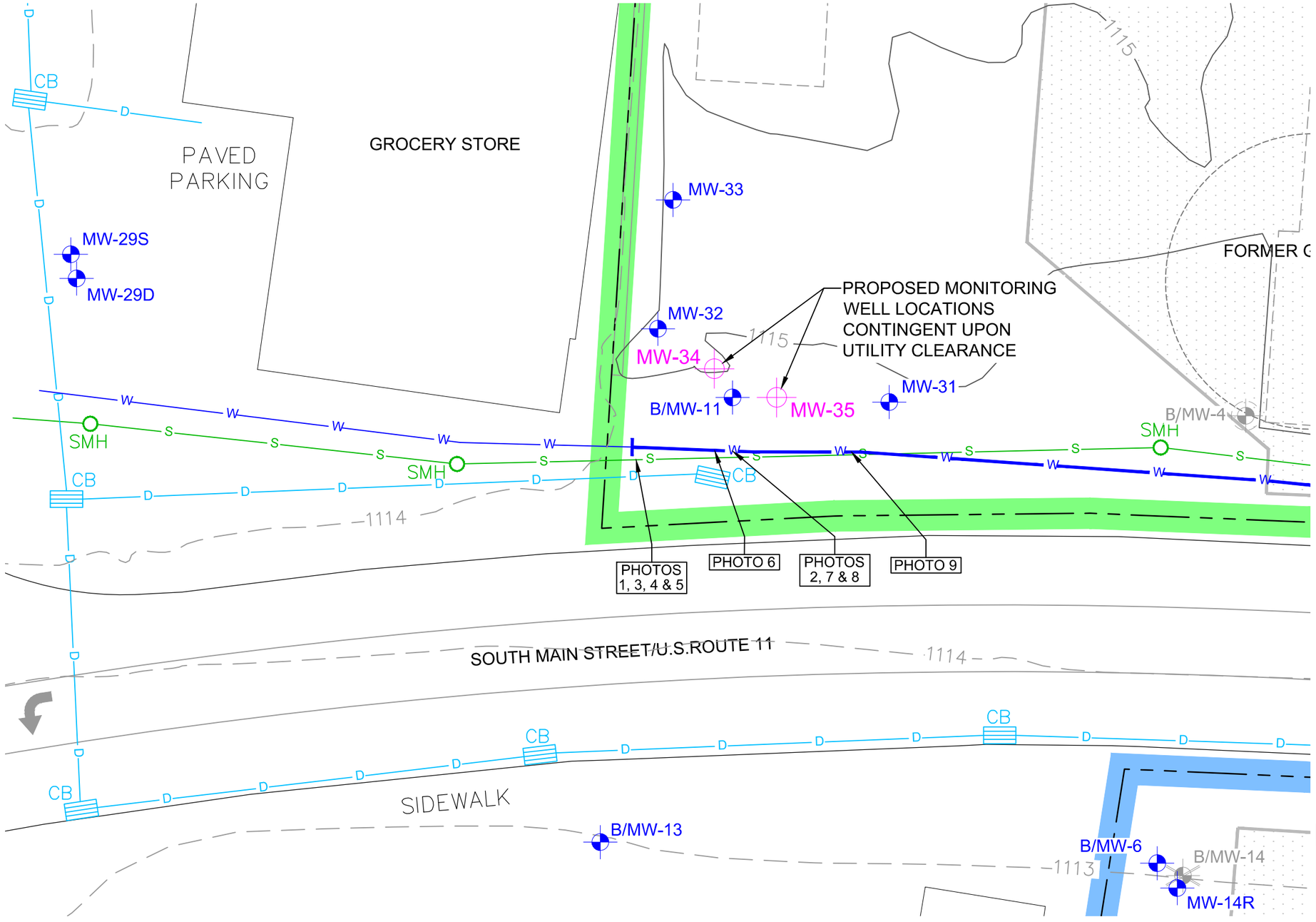
FIGURE 1

CITY:SYRACUSE, NY DV/GROUP:ENV//REM-W/IM-DV DB: A. SCHILLING, R. BASSETT, E. KRAHMER PM: J. BRUSSEL TM: J. BRUSSEL TR: M. HYSELL LYR:ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\60013123\006\0000\01DWG\13123B02.dwg LAYOUT: 1 SAVED: 2/17/2014 1:16 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 2/17/2014 1:22 PM BY: KRAHMER, ERIC
XREFS:
13123X00
13123X03
13123X01
13123X02
IMAGES:
PROJECTNAME: ----



LEGEND:

- PROPOSED MONITORING WELL
- EXISTING MONITORING WELL IN MONITORING NETWORK
- FORMER MONITORING WELL LOCATION (DECOMMISSIONED IN JULY/AUGUST 2012)
- DESTROYED MONITORING WELL
- EXISTING WATER MAIN
- NEW WATER MAIN (2012)
- EXISTING SANITARY SEWER AND MANHOLE
- EXISTING STORM DRAIN AND CATCH BASIN
- REMOVED/FORMER BUILDINGS
- FORMER MGP STRUCTURE
- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE HIGHWAY BOUNDARY
- IN-SITU SOIL SOLIDIFICATION (ISS) MONOLITH
- OPERABLE UNIT 1
- OPERABLE UNIT 2

NOTES:

1. BASEMAP ADAPTED FROM DRAWING 3 ENTITLED "EXISITNG CONDITIONS" AND DRAWING 7 ENTITLED "SITE UTILITY RELOCATION PLAN", BY AECOM OF LATHAM, NEW YORK , AT A SCALE 1"=60' AND 1"=40', RESPECTIVELY, AND DATED 4/16/2012.
2. NEW WATER MAIN ALIGNMENT TAKEN FROM "DRAFT" "AS-BUILT SURVEY MAP", DATED JUNE 26, 2013 BY KLUMPP LAND SURVEYING, GROTON, NEW YORK.
3. EXISTING SANITARY SEWER AND STORM SEWER TAKEN FROM A PLAN ENTITLED "SITE UTILITY RELOCATION PLAN", DATED APRIL 2012 BY AECOM.
4. EXISTING UTILITY LOCATIONS ARE APPROXIMATE.
5. PHOTOS 1 - 9 WITH DESCRIPTIONS ARE PROVIDED AS THE PHOTO LOG ATTACHED TO THIS LETTER REPORT. THE PHOTO LOCATIONS PROVIDED ON THE FIGURE ARE APPROXIMATE.

0 30' 60'

GRAPHIC SCALE

NYSEG
CORTLAND-HOMER FORMER MGP SITE
HOMER, NEW YORK

UTILITY AND PHOTO LOG LOCATION MAP

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FIGURE
2

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Attachment A

Water Main Excavation Photo Log

Photo #1: Installing water main shutoff valve and tee for the grout batch plant water supply line (Approximately 10 feet southeast of monitoring well MW-11)

Photo #2: View of water main installation trench East of monitoring well MW-11 (cone with flag is on MW-11 cap)

Client: NYSEG	
Project: In-Situ Soil Solidification Project	
Site: Cortland-Homer Former MGP Site	ARCADIS
Site Location: Homer, New York	

Photo #3: View of water around shutoff valve in water main installation trench southeast of monitoring well MW-11 (No Sheen Present)

Photo #4: Waterline installation trench southeast of monitoring well MW-11

Client: NYSEG	
Project: In-Situ Soil Solidification Project	
Site: Cortland-Homer Former MGP Site	ARCADIS
Site Location: Homer, New York	

Photo #5: View of southern most end of water main installation trench

Photo #6: Water in water main installation trench (no sheen present)

Client:	NYSEG
Project:	In-Situ Soil Solidification Project
Site:	Cortland-Homer Former MGP Site
Site Location:	Homer, New York

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Photo #7: Water main installation trench (additional view)

Photo #8: Backfilling of water main installation trench

Client:	NYSEG
Project:	In-Situ Soil Solidification Project
Site:	Cortland-Homer Former MGP Site
Site Location:	Homer, New York

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Photo #9: Water main installation trench northeast of MW-11.

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Attachment B

Monitoring Well Construction Logs

Date Start/Finish: 10/30/13
Drilling Company: Parratt-Wolff, Inc.
Driller's Name: Jim Robertson
Drilling Method: Hollow Stem Auger
Auger Size: 4.25"
Rig Type: CME 55
Sampling Method: 2' x 2" Split Spoon

Northing: 955359.47
Easting: 927730.03
Casing Elevation: 1112.78' AMSL

Borehole Depth: 14' bgs
Surface Elevation: 1113.28' AMSL

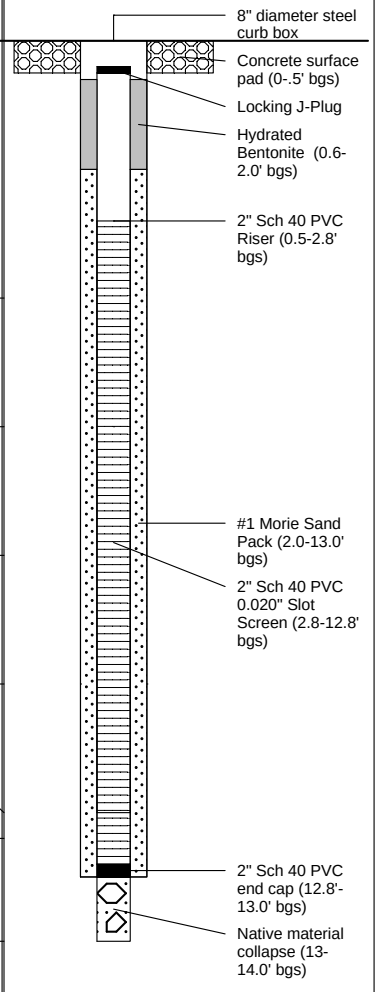
Descriptions By: Will Stephens

Well/Boring ID: **MW-14R**

Client: New York State Electric and Gas

Location: Cortland-Homer Former Manufactured Gas Plant Homer, New York

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
1115								
0	NA	NA	NA	NA	NA	NA		Due to utilities, hand cleared to 4.5' bgs with vac truck.
1110	1	4-6	NR	1 1 1 1	2	NA		No Recovery, saturated.
5	2	6-8	0.6	1 2 37 14	39	0.0		Brown medium to coarse SAND and medium to coarse subangular GRAVEL, little Silt, saturated, loose.
1105	3	8-10	1.4	12 12 15 18	27	0.0		Brown to gray brown medium to coarse SAND, little fine Gravel, saturated, loose.
10	4	10-12	NR	3 5 7 7	12	NA		No Recovery, saturated.
1100	5	12-14	1.7	13 21 14 14	35	0.0		Gray medium to coarse SAND, little fine subangular Gravel, saturated, loose. Grey medium to coarse SAND and medium to coarse GRAVEL, little Silt, saturated, loose.
15								BB at 14' bgs



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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; BB= bottom of boring/well; NR= no recovery.

Date Start/Finish: 10/30/13
Drilling Company: Parratt-Wolff, Inc.
Driller's Name: Jim Robertson
Drilling Method: Hollow Stem Auger
Auger Size: 6.25"
Rig Type: CME 55
Sampling Method: 2' x 2" Split Spoon

Northing: 955303.41
Easting: 927635.50
Casing Elevation: 1116.17' AMSL

Borehole Depth: 16' bgs
Surface Elevation: 1115.94' AMSL

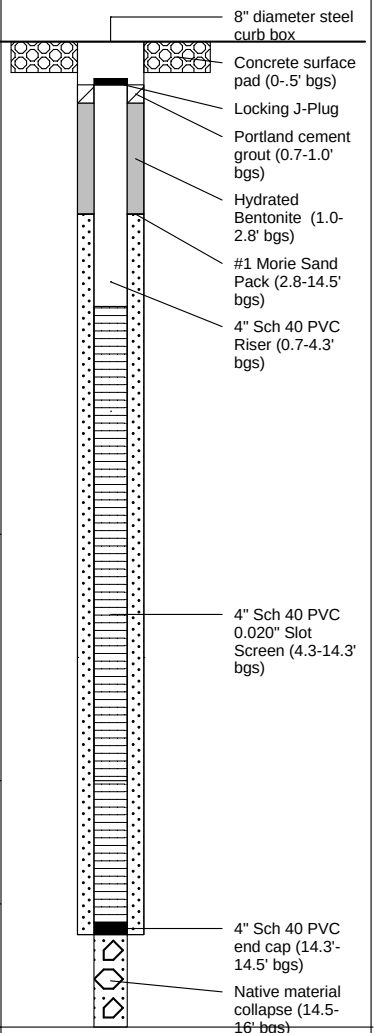
Descriptions By: Will Stephens

Well/Boring ID: **MW-31**

Client: New York State Electric and Gas

Location: Cortland-Homer Former Manufactured Gas Plant Homer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	1115	NA	NA	NA	NA	NA	NA		Due to utilities, hand cleared to 8' bgs with vac truck.
5	1110	1	8-10	.6	2 3 11 15	14	73.4		Gray to gray brown fine to coarse subangular GRAVEL, some fine Sand, little Silt, saturated, loose,trace sheen, petroleum-like odor.
10	1105	2	10-12	.9	11 11 21 30	32	91.9		Sheens increasing with depth
		3	12-14	1.6	15 15 21 31	36	28.6		Gray to gray brown fine to coarse subangular GRAVEL, some fine Sand, little Silt, saturated, loose,trace sheen, faint petroleum-like odor.
15	1100	4	14-16	NR	11 7 27 33	34	NA		No Recovery BB at 16' bgs



Well/Boring Construction

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; BB= bottom of boring/well; NR= no recovery.

Date Start/Finish: 10/29/13
Drilling Company: Parratt-Wolff, Inc.
Driller's Name: Jim Robertson
Drilling Method: Hollow Stem Auger
Auger Size: 6.25"
Rig Type: CME 55
Sampling Method: 2' x 2" Split Spoon

Northing: 955258.4
Easting: 927621.25
Casing Elevation: 1115.78' AMSL

Borehole Depth: 18' bgs
Surface Elevation: 1116.16' AMSL

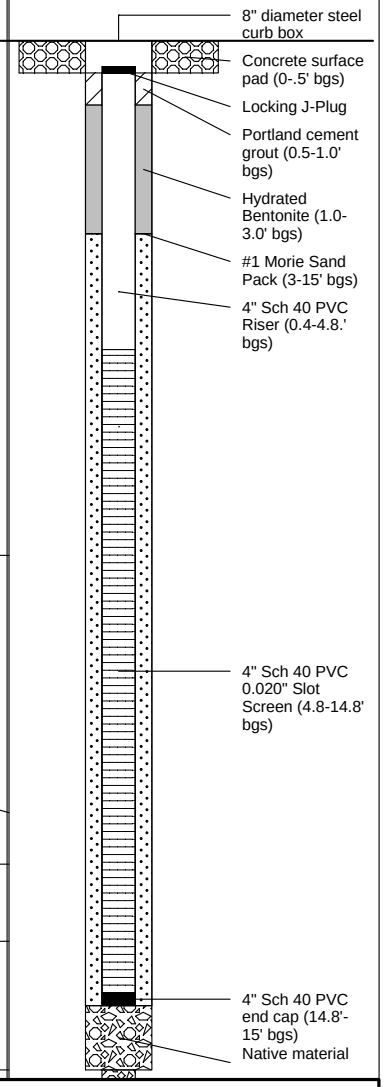
Descriptions By: Will Stephens

Well/Boring ID: **MW-32**

Client: New York State Electric and Gas

Location: Cortland-Homer Former Manufactured Gas Plant Homer, New York

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	1115	NA	NA	NA	NA	NA	NA		Due to utilities, hand cleared to 8' bgs with vac truck.
5	1110								
		1	8-10	1.5	6 6 6 10	12	42.1		Gray to brown fine to coarse GRAVEL, little fine to medium Sand, trace Silt, saturated, loose, petroleum fuel-like odor, sheen.
10	1105	2	10-12	1.0	3 4 11 16	15	50.2		
		3	12-14	1.0	3 4 7 6	11	65.3		Grayish brown fine to medium subangular GRAVEL, some fine to medium Sand, little Silt, saturated, petroleum fuel-like odor, trace sheen, loose. Gray coarse subangular GRAVEL (shale fragements), saturated, sheens, loose.
15		4	14-16	NR	13 21 14 14	35	NA		No Recovery



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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; BB= bottom of boring/well; NR= no recovery.

Client: New York State Electric and Gas

Well/Boring ID: MW-32

Borehole Depth: 18' bgs

Site Location:
Cortland-Homer Former Manufactured Gas Plant Homer, New York

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
	5	16-18	1.0	2 2 2 2	4	30.1		Gray fine subangular GRAVEL, little medium to coarse Gravel, little medium to coarse Sand, trace Silt, saturated, faint petroleum fuel-like odor, loose.	collapse (15-18" bgs) Native material collapse (15-18" bgs)
								BB at 18' bgs	
20 1095									
25 1090									
30 1085									
35									

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; BB= bottom of boring/well; NR= no recovery.

Date Start/Finish: 10/28/13
Drilling Company: Parratt-Wolff, Inc.
Driller's Name: Jim Robertson
Drilling Method: Hollow Stem Auger
Auger Size: 6.25"
Rig Type: CME 55
Sampling Method: 2' x 2" Split Spoon

Northing: 955261.34
Easting: 927596.19
Casing Elevation: 1116.17' AMSL

Borehole Depth: 16' bgs
Surface Elevation: 1116.63' AMSL

Descriptions By: Will Stephens

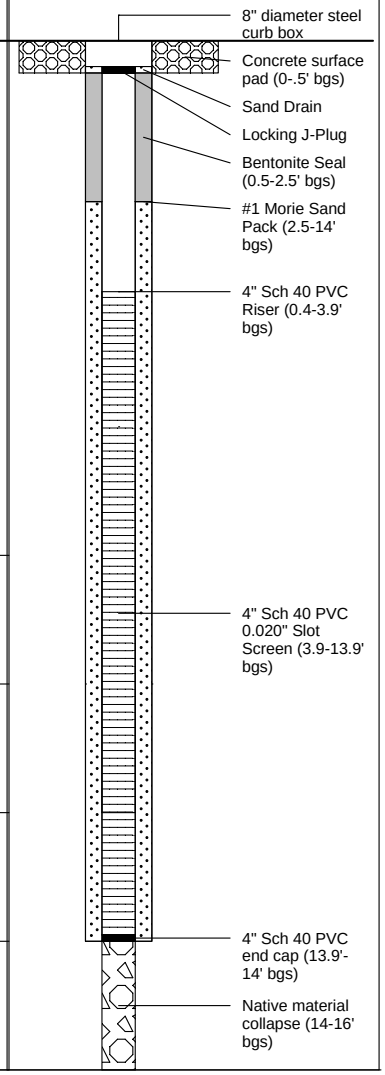
Well/Boring ID: **MW-33**

Client: New York State Electric and Gas

Location: Cortland-Homer Former Manufactured Gas Plant Homer, New York

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0 / 1115	NA	NA	NA	NA	NA	NA		Due to utilities, hand cleared to 8' bgs with vac truck.
5 / 1110	1	8-10	0.5	WOH WOH 7 16	7	23.6		Dark brown fine SAND and fine subangular GRAVEL, little Silt, petroleum fuel-like odor, saturated, nonplastic.
10 / 1105	2	10-12	1.0	9 10 16 14	26	17.1		Gray medium to coarse subangular GRAVEL, some fine Sand, trace fine Gravel, trace Silt, saturated, petroleum fuel-like odor, nonplastic.
	3	12-14	1.0	17 19 21 28	40	18.0		Gray fine to coarse subangular GRAVEL, some fine to medium Sand, little silt, petroleum fuel-like odor, trace sheen, saturated, loose
15	4	14-16	2.0	7 22 26 14	48	7.8		Gray to gray brown fine to coarse GRAVEL (shale fragments), little fine to medium Sand, trace Silt, faint petroleum fuel-like odor, loose, saturated. BB at 16' bgs

Well/Boring Construction



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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level; SS = Split Spoon; BB= bottom of boring/well; NR= no recovery.