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Ms. Jamie Verrigni  
New York State Department of Environmental Conservation  
Division of Environmental Remediation  
Remedial Bureau C, 625 Broadway, 11<sup>th</sup> Floor  
Albany, New York 12233-7014

ENVIRONMENT

Subject:  
Pre-Construction Soil/Concrete Characterization and Piezometer Decommissioning  
Work Plan  
Orange and Rockland Utilities, Inc.  
Port Jervis Former MGP Site  
City of Port Jervis, Orange County, New York  
Site No. 3-36-049

Date:  
May 22, 2012

Contact:  
Andrew Corbin, P.E.

Dear Ms. Verrigni:

Phone:  
315.671.9275

This letter summarizes the planned scope of the soil characterization and piezometer decommissioning activities to be performed by ARCADIS (on behalf of Orange and Rockland Utilities, Inc. [O&R]) to support the upcoming remedial construction activities at the Port Jervis former manufactured gas plant (MGP) site. As further described below, these pre-construction activities will include the: 1) drilling of soil borings; 2) collection of soil and concrete samples for laboratory analysis; and 3) decommissioning of existing piezometer PZ1.

Email:  
[andrew.corbin@arcadis-us.com](mailto:andrew.corbin@arcadis-us.com)

Our ref:  
B0043021

### **Soil and Concrete Characterization**

The remedial construction activities will include the excavation, demolition, and removal of approximately 5,400 *in-situ* cubic yards (cy) of soil and debris (e.g., concrete, brick, etc.) from depths ranging from approximately 2 to 20 feet below ground surface (bgs). The majority of these materials will be transported off-site for 1) treatment/disposal via low temperature thermal desorption (LTTD), or 2) disposal at a non-hazardous landfill. Soils requiring LTTD treatment will be transported to either the Environmental Soil Management Incorporated (ESMI) facility located in Fort Edward, New York (ESMI of New York) or the Bayshore Soil Management, LLC (BSM) facility located in Keasbey, New Jersey. In addition, based on the results of previous site investigations, soils generally located within the upper 6 feet of the 20-foot excavation surrounding the foundation of former Gas Holder A may be suitable for re-use on-site as subsurface backfill (subject to visual and analytical confirmation).

The pre-construction soil characterization activities will involve the drilling of four soil borings (identified as soil borings SC-1 through SC-4 on the attached Figure 1), and the collection and analysis of soil samples to characterize soils for: 1) off-site LTDD treatment/disposal; 2) off-site disposal at a non-hazardous landfill; and 3) potential re-use on-site as subsurface backfill. The concrete characterization activities will involve the drilling of eight cores through the foundations of former Gas Holders C and D (four cores per foundation), and the collection and analysis of two composite concrete core samples (one composite sample per foundation) to characterize those materials for off-site disposal at a non-hazardous landfill. The concrete coring locations are identified on Figure 1 as CC-1A through CC-1D (foundation of former Gas Holder C) and CC-2A through CC-2D (foundation of former Gas Holder D).

Table 1 summarizes the sample intervals, sample types (discrete or composite), and laboratory analyses to be performed on the samples collected at each soil boring location and the composite concrete core samples collected from the foundations of former Gas Holders C and D. As further described below, the overall sampling approach (e.g., frequencies, analyses, etc.) is based on: 1) the combined acceptance criteria of ESMI of New York and BSM; 2) typical acceptance criteria for non-hazardous landfills; and 3) the characterization guidelines for the on-site re-use of excavated soils as subsurface backfill, which were described in Section 2.2.1 of the *Waste Management Plan (WMP; Appendix F of the NYSDEC-approved Final [100%] Remedial Design Report for Source Area Excavation)*.

The combined acceptance criteria of ESMI of New York and BSM requires the collection of three composite samples for the initial 750 tons of material and one additional composite sample for every 750 tons of material thereafter. As indicated in Table 1, a total of 15 composite samples will be collected from soil borings SC-1 through SC-4. These samples will satisfy the combined acceptance criteria for up to 9,750 tons of material. Each composite sample will be submitted for laboratory analysis of the following parameters:

- Volatile organic compounds (VOCs) by EPA SW-846 Method 8260;
- Semi-volatile organic compounds (SVOCs) by EPA SW-846 Method 8270;
- Total petroleum hydrocarbons (TPHs) by EPA SW-846 Method 8015;
- Polychlorinated biphenyls (PCBs) by EPA SW-846 Method 8082;
- Metals by EPA SW-846 Method 6010;
- Total cyanide by EPA SW-846 Method 9010;
- Percent sulfur by ASTM D129; and
- British thermal units (BTUs) by ASTM D240.

Composite soil samples will also be analyzed for the following hazardous waste characteristics to evaluate the potential for off-site disposal at a non-hazardous landfill:

- Toxicity via the toxicity characteristic leaching procedure (TCLP) by EPA SW-846 Methods 1311/8260 (VOCs), 1311/8270 (SVOCs), and 1311/6010 (metals)
- Ignitability by EPA SW-846 Method 1010;
- Reactivity by EPA SW-846 Methods 7.3.3/7.3.4; and
- Corrosivity by EPA SW-846 Method 1110.

The characterization guidelines for the on-site soils potentially subject to re-use as subsurface backfill require the collection of seven discrete samples and two composite samples for the initial 1,000 cy of soil, and an additional two discrete samples and one composite sample for every 1,000 cy of soil thereafter. Based on an estimated volume of approximately 1,350 cy, nine discrete samples and three composite samples will be required to characterize the upper 6 feet of soil in the 20-foot excavation surrounding the foundation of former Gas Holder A. These discrete and composite samples will be collected from the top 6 feet of soil borings SC-1, SC-3, and SC-4 (Figure 1).

Discrete soil samples will be collected from the 0- to 2.5-foot, 2.5- to 5-foot, and 5- to 6-foot depth intervals at each location (three discrete samples per location, nine discrete samples total), and will be submitted for laboratory analysis of VOCs by EPA SW-846 Method 8260. The remaining soils from the 0- to 6-foot depth interval at each location will be composited into a single sample (one composite sample per location, three composite samples total). In addition to the parameters required by ESMI of New York and BSM (identified above), these composite samples will be submitted for analysis of pesticides by EPA SW-846 Method 8081 and herbicides by EPA SW-846 Method 8151.

Before initiating drilling activities, soil boring locations will be hand-cleared (using either manual or vacuum methods) to a depth of approximately 5 feet bgs to facilitate the identification of potential near-surface utilities. At soil borings SC-1, SC-3, and SC-4, the materials removed during these hand-clearing activities will be sampled for analysis at the depth intervals specified in Table 1.

Soil borings will be drilled using hollow-stem auger methods and soil samples will be collected continuously in 2-foot intervals using a 3-inch diameter split spoon. Each soil sample will be screened with a photoionization detector (PID) and visually characterized for soil type and the presence of non-aqueous phase liquid. Once drilling is complete, each borehole will be backfilled with soil cuttings and grouted (as required) to existing grade.

Concrete cores will be drilled at a minimum of four locations within each holder foundation using a pulverizing drill bit (1-inch diameter or less). To the extent practicable, each core will be drilled 2 feet into the foundation. Pulverized concrete from the four coring locations within each holder foundation will be composited into a single sample (one composite sample per foundation, two composite samples total) and submitted for laboratory analysis of the following parameters:

- PCBs by EPA SW-846 Method 8082;
- TCLP VOCs by EPA SW-846 Methods 1131/8260;
- TCLP SVOCs by EPA SW-846 Methods 1131/8270;
- TCLP metals by EPA SW-846 Methods 1131/6010;
- Ignitability by EPA SW-846 Method 1010; and
- Reactivity by EPA SW-846 Methods 7.3.3/7.3.4.

Soil boring and concrete coring locations may be repositioned in the field based on accessibility, obstructions encountered, or other factors, and additional borings/cores may be drilled to accommodate the required sample volumes for the analyses identified above. Soil cuttings and other investigation-derived waste will be: 1) transferred into 55-gallon drums; 2) stored on a temporary basis within the limits of the O&R Operations Center; and 3) transported off-site for disposal in accordance with all applicable laws and regulations. Soil cuttings may be consolidated with soil from primary remedial activities and transported off-site for LTTD.

### **Piezometer Decommissioning**

ARCADIS will decommission existing piezometer PZ1 in conjunction with the soil characterization activities described above. This piezometer is located within the limits of 20-foot excavation surrounding foundation of former Gas Holder A (Figure 1) and extends to a total depth of approximately 25.5 feet bgs. A copy of the construction log for piezometer PZ1 is provided in Attachment A. Decommissioning activities will be performed in accordance with the NYSDEC *Groundwater Monitoring Well Decommissioning Policy* (CP-43) and will consist of the casing pull methods described in that document.

### **Community Air Monitoring**

Community air monitoring will be performed on a daily basis during the drilling activities to provide real-time measurements of total VOCs and particulate matter less than 10 microns in diameter (PM<sub>10</sub>) at the downwind perimeter of the work area. The community air monitoring procedures and action levels for total VOCs and PM<sub>10</sub> were specified in the NYSDEC-approved *Community Air Monitoring Plan* (CAMP), which was included as

Appendix E of the January 2010 *Remedial Design Work Plan*. Community air monitoring stations (one upwind and one downwind location) will be established at the start of each work day based on the predominant wind direction and general location of work activities at that site. Each monitoring station will include a PID and dust meter with data logging capabilities.

**Schedule**

The activities described herein will be initiated on June 5, 2012 and are anticipated to last approximately four days. In the meantime, please contact Dave Work at 845.577.3664 with any questions or comments regarding the information provided herein.

Sincerely,

ARCADIS of New York, Inc.



Andrew Corbin, P.E.  
Principal Engineer

Enclosures:

Table 1, Sampling and Analysis Schedule for Soil/Concrete Characterization Activities  
Figure 1, Site Plan  
Attachment A, Construction Log for Piezometer PZ1

Copies:

George Heitzman, P.E., NYSDEC\*  
Kristin Kulow, NYSDOH\*  
Maribeth McCormick, O&R  
Dave Work, P.E., O&R  
Margaret Carrillo-Sheridan, P.E., ARCADIS  
Scott Powlin, P.G., ARCADIS  
Michael Benoit, P.E., ARCADIS

*\*electronic copy only*

**Table**

TABLE 1

SAMPLING AND ANALYSIS SCHEDULE FOR SOIL/CONCRETE CHARACTERIZATION ACTIVITIES

ORANGE AND ROCKLAND UTILITIES, INC.  
 PORT JERVIS FORMER MGP SITE  
 PORT JERVIS, NEW YORK

Location ID <sup>1</sup>	Total Depth of Boring or Core (feet bgs)	Sample ID	Sample Interval (feet bgs)	Sample Type <sup>2</sup>	Analysis									
					VOCs (EPA SW-846 Method 8260)	SVOCs (EPA SW-846 Method 8270)	TPHs <sup>3</sup> (EPA SW-846 Method 8015)	PCBs (EPA SW-846 Method 8082)	Metals <sup>4</sup> (EPA SW-846 Method 6010)	Total Cyanide (EPA SW-846 Method 9010)	Percent Sulfur (ASTM D129)	BTUs (ASTM D240)		
SC-1	20	SC-01-0002	0-2.5	Discrete	X	--	--	--	--	--	--	--		
		SC-01-0204	2.5-5	Discrete	X	--	--	--	--	--	--	--		
		SC-01-0406	5-6	Discrete	X	--	--	--	--	--	--	--		
		SC-01-0006	0-6	Composite	X	X	X	X	X	X	X	X		
		SC-01-0610	6-10	Composite	X	X	X	X	X	X	X	X		
		SC-01-1016	10-16	Composite	X	X	X	X	X	X	X	X		
SC-2	14	SC-01-1620	16-20	Composite	X	X	X	X	X	X	X	X		
		SC-02-0004	0-4	Composite	X	X	X	X	X	X	X	X		
		SC-02-0408	4-8	Composite	X	X	X	X	X	X	X	X		
SC-3	20	SC-02-0814	8-14	Composite	X	X	X	X	X	X	X	X		
		SC-03-0002	0-2.5	Discrete	X	--	--	--	--	--	--	--		
		SC-03-0204	2.5-5	Discrete	X	--	--	--	--	--	--	--		
		SC-03-0406	5-6	Discrete	X	--	--	--	--	--	--	--		
		SC-03-0006	0-6	Composite	X	X	X	X	X	X	X	X		
		SC-03-0610	6-10	Composite	X	X	X	X	X	X	X	X		
SC-4	20	SC-03-1016	10-16	Composite	X	X	X	X	X	X	X	X		
		SC-03-1620	16-20	Composite	X	X	X	X	X	X	X	X		
		SC-04-0002	0-2.5	Discrete	X	--	--	--	--	--	--	--		
		SC-04-0204	2.5-5	Discrete	X	--	--	--	--	--	--	--		
		SC-04-0406	5-6	Discrete	X	--	--	--	--	--	--	--		
		SC-04-0006	0-6	Composite	X	X	X	X	X	X	X	X		
CC-1A CC-1B CC-1C CC-1D CC-2A CC-2B CC-2C CC-2D	2	SC-04-0610	6-10	Composite	X	X	X	X	X	X	X	X		
		SC-04-1016	10-16	Composite	X	X	X	X	X	X	X	X		
		SC-04-1620	16-20	Composite	X	X	X	X	X	X	X	X		
		CC-01-0002	0-2	Composite	--	--	--	X	--	--	--	--		
					CC-02-0002	0-2	Composite	--	--	--	X	--	--	--
								--	--	--	--	--	--	
					Totals			24	15	15	17	15	15	15

See notes on page 2.

TABLE 1

SAMPLING AND ANALYSIS SCHEDULE FOR SOIL/CONCRETE CHARACTERIZATION ACTIVITIES

ORANGE AND ROCKLAND UTILITIES, INC.  
PORT JERVIS FORMER MGP SITE  
PORT JERVIS, NEW YORK

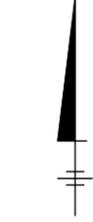
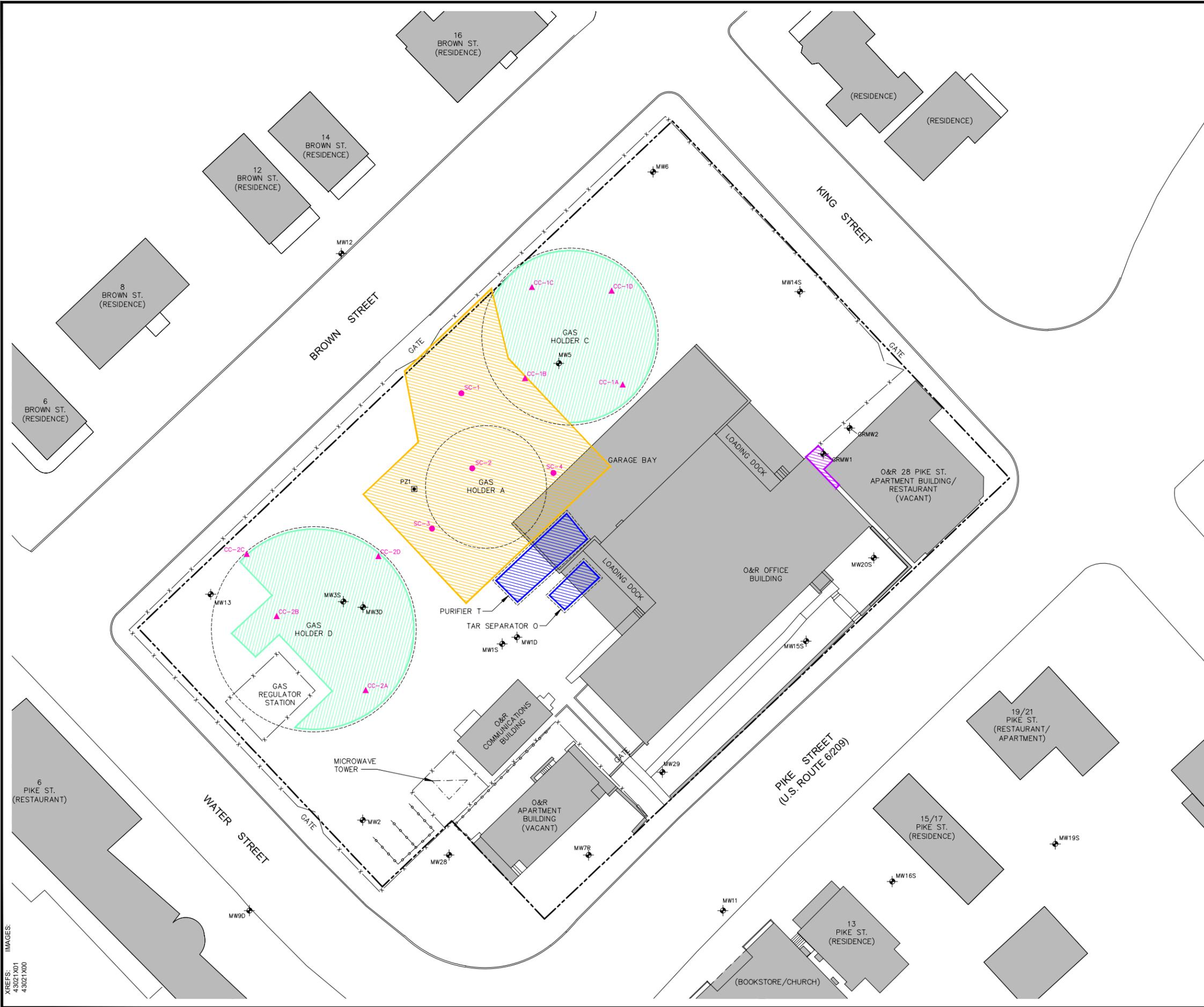
Location ID <sup>1</sup>	Total Depth of Boring or Core (feet bgs)	Sample ID	Sample Interval (feet bgs)	Sample Type <sup>2</sup>	Analysis								
					TCLP VOCs (EPA SW-846 Methods 1131/8260)	TCLP SVOCs (EPA SW-846 Methods 1131/8270)	TCLP Metals <sup>5</sup> (EPA SW-846 Methods 1131/6010)	Ignitability (EPA SW-846 Method 1010)	Reactivity (EPA SW-846 Methods 7.3.3/7.3.4)	Corrosivity (EPA SW-846 Method 1110)	Pesticides (EPA SW-846 Method 8081)	Herbicides (EPA SW-846 Method 8151)	
SC-1	20	SC-01-0002	0-2.5	Discrete	--	--	--	--	--	--	--	--	
		SC-01-0204	2.5-5	Discrete	--	--	--	--	--	--	--	--	
		SC-01-0406	5-6	Discrete	--	--	--	--	--	--	--	--	
		SC-01-0006	0-6	Composite	X	X	X	X	X	X	X	X	
		SC-01-0610	6-10	Composite	X	X	X	X	X	X	X	--	
		SC-01-1016	10-16	Composite	X	X	X	X	X	X	X	--	
SC-2	14	SC-01-1620	16-20	Composite	X	X	X	X	X	X	--	--	
		SC-02-0004	0-4	Composite	X	X	X	X	X	X	--	--	
		SC-02-0408	4-8	Composite	X	X	X	X	X	X	--	--	
SC-3	20	SC-02-0814	8-14	Composite	X	X	X	X	X	X	--	--	
		SC-03-0002	0-2.5	Discrete	--	--	--	--	--	--	--	--	
		SC-03-0204	2.5-5	Discrete	--	--	--	--	--	--	--	--	
		SC-03-0406	5-6	Discrete	--	--	--	--	--	--	--	--	
		SC-03-0006	0-6	Composite	X	X	X	X	X	X	X	X	
		SC-03-0610	6-10	Composite	X	X	X	X	X	X	X	--	
SC-4	20	SC-03-1016	10-16	Composite	X	X	X	X	X	X	--	--	
		SC-03-1620	16-20	Composite	X	X	X	X	X	X	--	--	
		SC-04-0002	0-2.5	Discrete	--	--	--	--	--	--	--	--	
		SC-04-0204	2.5-5	Discrete	--	--	--	--	--	--	--	--	
		SC-04-0406	5-6	Discrete	--	--	--	--	--	--	--	--	
		SC-04-0006	0-6	Composite	X	X	X	X	X	X	X	X	
CC-1A	2	SC-04-0610	6-10	Composite	X	X	X	X	X	X	--	--	
		SC-04-1016	10-16	Composite	X	X	X	X	X	X	--	--	
		SC-04-1620	16-20	Composite	X	X	X	X	X	X	--	--	
		CC-1B		CC-01-0002	0-2	Composite	X	X	X	X	X	--	--
		CC-1C											
		CC-1D											
CC-2A													
CC-2B		CC-02-0002	0-2	Composite	X	X	X	X	X	--	--		
CC-2C													
CC-2D													
<b>Totals</b>					<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>17</b>	<b>15</b>	<b>3</b>	<b>3</b>	

Notes:

1. Refer to Figure 1 for soil boring and concrete coring locations.
2. Composite samples will comprise three to five discrete samples collected from random locations within the sample interval.
3. TPH analysis includes both gasoline-range organics (GRO) and diesel-range organics (DRO).
4. Metals analysis includes antimony, arsenic, barium, beryllium, cadmium, total chromium, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc.
5. TCLP metals analysis includes arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver.

**Figure**

CITY: SYRACUSE DIV/GRP: ENV141 DB: L. FORAKER, K. WOOD, K. DAVIS LD: PIC: M. CARRILLO-SHERIDAN, PM: A. CORBIN, TM: M. BENOIT, LYN: ON, OFF=REF, X01 CONTROL, HISTORICAL, G:\ENVCAD\SYRACUSE\ACT\B0043021\000\100008\DWG\WORK\PLAN\43021\G01.dwg LAYOUT: 1, SAVED: 5/22/2012 1:34 PM, ACADVER: 18.15 (LMS TECH), PAGES: 1, PLOT: 1, PLOTSCALE: 1.00, PLOTDATE: 5/22/2012 1:35 PM, BY: GETTS, BRIAN



- LEGEND:**
- LIMIT OF O&R-OWNED PROPERTY
  - - - - - APPROXIMATE LOCATION OF HISTORICAL SITE FEATURE
  - x-x-x-x-x EXISTING CHAIN-LINK FENCE
  - o-o-o-o- EXISTING WOOD FENCE
  - █ EXISTING STRUCTURE/BUILDING
  - ▨ 2-FOOT EXCAVATION
  - ▨ 3- TO 5-FOOT EXCAVATION
  - ▨ 6-FOOT EXCAVATION
  - ▨ 20-FOOT EXCAVATION
  - MW14S Monitoring Well Location
  - PZ1 Piezometer Location (TO BE DECOMMISSIONED)
  - SC-1 Anticipated Pre-Construction Soil Boring Location
  - ▲ CC-1A Anticipated Pre-Construction Concrete Coring Location

**NOTE:**

1. ALL LOCATIONS, PROPERTY BOUNDARIES, SITE FEATURES, AND EXCAVATION LIMITS ARE APPROXIMATE.



PORT JERVIS FORMER MGP SITE  
ORANGE AND ROCKLAND UTILITIES, INC.  
PORT JERVIS, NEW YORK

**SITE PLAN**

**ARCADIS**

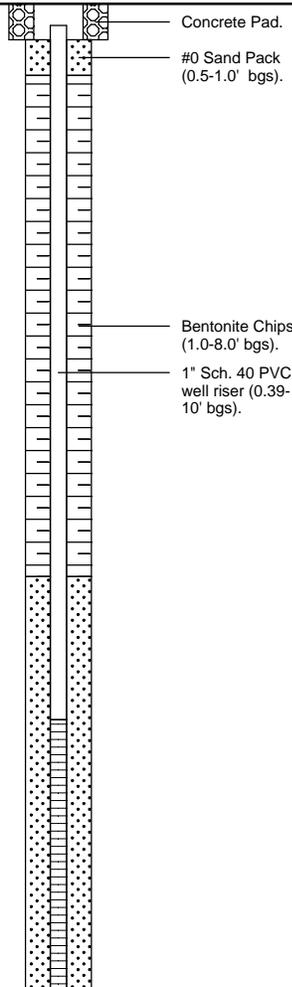
FIGURE  
**1**



**Attachment A**

Construction Log for Piezometer  
PZ1

<b>Date Start/Finish:</b> 11/23/10 <b>Drilling Company:</b> NYEG Drilling, Inc. <b>Driller's Name:</b> Dick Waris <b>Drilling Method:</b> Hollow Stem Auger <b>Auger Size:</b> 3.25" <b>Rig Type:</b> B-59 <b>Sampling Method:</b> 2' x 3" Split Spoon	<b>Northing:</b> 925271.6 <b>Easting:</b> 438242.2 <b>Casing Elevation:</b> 436.5' <b>Borehole Depth:</b> 29' bgs <b>Surface Elevation:</b> 436.9'  <b>Descriptions By:</b> Marcus Eriksson	<b>Well/Boring ID:</b> PDI-SUPP-3/PZ1  <b>Client:</b> Orange and Rockland Utilities, Inc.  <b>Location:</b> Port Jervis Former MGP Site Port Jervis, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
0										
435		NA	0-15	NA	NA	NA	NA		Blind drill to 15' bgs.	 <p>Concrete Pad.            #0 Sand Pack (0.5-1.0' bgs).             Bentonite Chips (1.0-8.0' bgs).            1" Sch. 40 PVC well riser (0.39-10' bgs).</p>
5										
430										
10										
425										

 <p><b>ARCADIS</b>  <i>Infrastructure, environment, buildings</i></p>	<b>Remarks:</b> bgs = below ground surface; NA = Not Available/Applicable; P = Plastic; NP = Non-Plastic; M = Moist; S = Saturated Cat head and rope used for blow counts.  Horizontal datum is the North American Datum of 1983 (NAD 83); New York State Plane East coordinate system, in U.S. Survey feet. Vertical datum is the North American Vertical Datum of 1988 (NAVD 88).
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<b>Date Start/Finish:</b> 11/23/10 <b>Drilling Company:</b> NYEG Drilling, Inc. <b>Driller's Name:</b> Dick Waris <b>Drilling Method:</b> Hollow Stem Auger <b>Auger Size:</b> 3.25" <b>Rig Type:</b> B-59 <b>Sampling Method:</b> 2' x 3" Split Spoon	<b>Northing:</b> 925271.6 <b>Easting:</b> 438242.2 <b>Casing Elevation:</b> 436.5' <b>Borehole Depth:</b> 29' bgs <b>Surface Elevation:</b> 436.9'  <b>Descriptions By:</b> Marcus Eriksson	<b>Well/Boring ID:</b> PDI-SUPP-3/PZ1  <b>Client:</b> Orange and Rockland Utilities, Inc.  <b>Location:</b> Port Jervis Former MGP Site Port Jervis, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description	Well/Boring Construction
15		1	15-17	2.0	4	8	454		Grey to brown fine SAND (M,NP).  1-2mm dark laminations throughout.  Moderate coal tar-like odor.	
		1	15-17	2.0	4	8	454			
420					10					
		2	17-19	1.5	20	45	564		Grey to brown fine to coarse SAND and fine to coarse GRAVEL, very stiff (M,NP).  Heavy coating of oil-like material throughout (17-23' bgs).	
					25					
20					20					
		3	19-21	2.0	14	40	206			
					16					
415					24					
		4	21-23	2.0	26	87	186			
					42					
					49					
		5	23-25	1.0	22	60	192		Moderate coating of oil-like material, trace to little yellow/brown oil-like material.	
					26					
25					34					
		6	25-27	2.0	34	79	267		Moderate to heavy coating of oil-like material.	
					37					
410					42					
		7	27-29	2.0	27	74	180			
					33					
					41					
					47					
30									Boring terminated at 29' bgs.	

	<b>Remarks:</b> bgs = below ground surface; NA = Not Available/Applicable; P = Plastic; NP = Non-Plastic; M = Moist; S = Saturated Cat head and rope used for blow counts.  Horizontal datum is the North American Datum of 1983 (NAD 83); New York State Plane East coordinate system, in U.S. Survey feet. Vertical datum is the North American Vertical Datum of 1988 (NAVD 88).
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