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Subject:
2017 Groundwater Sampling & Soil Cover Inspection Report
Waterville Former MGP Site
Waterville, New York

ENVIRONMENT

Dear Mr. Verrigni:

Date:
September 25, 2017

On behalf of NYSEG, Arcadis is pleased to present this annual report summarizing the results of groundwater sampling and soil cover inspection activities conducted in 2017 at the Waterville manufactured gas plant (MGP) site. Relevant background information is provided below, followed by a discussion of the 2017 results and recommendations for the site.

Contact:
David Cornell

Phone:
315 671 9379

BACKGROUND

Email:
David.Cornell@arcadis.com

As required by the New York State Department of Environmental Conservation's (NYSDEC's) Record of Decision (ROD) issued in March 2002, NYSEG administered a 5-year post-IRM groundwater monitoring program at the Waterville, New York MGP site. An evaluation of the results of this monitoring program was submitted to the NYSDEC on May 8, 2007. Based on the NYSDEC's comments on this evaluation, NYSEG agreed (in a letter dated January 4, 2008) to revise the scope of the monitoring to sampling one well (MW98-7D) annually for an additional 5 years (until 2012). Based on the results of the supplemental 5-year groundwater monitoring program completed in 2012 and discussions with the NYSDEC, NYSEG agreed to continue sampling groundwater from MW98-7D on an annual basis.

Our ref:
B0013053

2017 GROUNDWATER SAMPLING EVENT

Arcadis sampled groundwater from monitoring well MW98-7D on June 15, 2017. The location of the well and other pertinent site features can be found on Figure 1. Consistent with the sampling events completed since 2004, the sampling from MW98-7D was conducted using low-flow purging techniques. The low-flow

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method consists of slowly purging water from the well at a rate of approximately 100 to 200 milliliters per minute until readings of the following field parameters stabilized: pH, dissolved oxygen, oxidation-reduction potential (ORP), turbidity and conductivity. The table below presents the values for these field parameters at the time of sampling:

Well ID	pH (S.U.) ¹	Temperature (°C) ²	Conductivity (mS/cm) ³	Dissolved Oxygen (mg/L) ⁴	ORP (mV) ⁵	Turbidity (NTU) ⁶
MW98-7D	7.24	11.22	0.414	0.14	-48.9	0.90

Notes:

- ¹ S.U. = Standard Units.
- ² °C = degrees Celsius.
- ³ mS/cm = milliSiemens per centimeter.
- ⁴ mg/L = milligrams per liter.
- ⁵ mV = milliVolts.
- ⁶ NTU = Nephelometric Turbidity Units.

No problems arose during the sampling event. The collected sample was analyzed for BTEX (benzene, toluene, ethylbenzene, and xylenes) and PAHs (polycyclic aromatic hydrocarbons) by TestAmerica of Amherst, New York. The groundwater sampling log is included as Attachment 1 and the historical analytical results for MW98-7D are summarized in Table 1 in comparison to NYSDEC Class GA Standards and Guidance Values¹.

Consistent with previous sampling events, groundwater sampled from MW98-7D exceeded the NYSDEC Class GA Standards for all of the BTEX compounds. Also consistent with previous events, several PAHs continue to be detected in the sample collected from well MW98-7D. While trace amounts of individual PAHs continue to be detected, only acenaphthene, phenanthrene and naphthalene were detected at a concentration above the NYSDEC Class GA Guidance Value for these compounds. The levels for both BTEX and PAHs were generally within the range of concentrations detected during the previous sampling rounds.

2017 RECONNAISSANCE OF SOIL COVER AREA

On June 15, 2017, Arcadis also performed the annual reconnaissance of the soil cover portion of the site, as required by the site's ROD. Findings of the reconnaissance were generally consistent with those found during previous years. Please refer to the attached photographic log for pictures of relevant features of the soil cover. As observed in the past, soft wet soil was observed in the southwest corner of the property, near the fence corner and just north of the MW98-7S/7D well pair. Tire ruts from apparent lawn mowing were present in the soft soil area (Photo #1). The ruts appeared to be shallow with no obvious damage to the cover. As reported in the 2014 inspection report, the above-ground pool installed at the 139 Babbott Avenue property and raised-bed vegetable garden at 145 Babbott Avenue are still present (Photo #2). No additional disturbances were observed during the 2017 inspection.

¹ The NYSDEC Class GA Guidance Values are published in the NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations; reissued June 1998 and revised in April 2000 and June 2004.

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SUMMARY

The 2017 PAH analytical results for the groundwater sample collected from MW98-7D are higher than the 2016 results but are generally within the range of concentrations historically detected at this well. Only acenaphthene, phenanthrene and naphthalene were found to exceed Class GA Guidance Values for these compounds. BTEX concentrations also increased in 2017 compared to analytical results from 2016, but remained within the range of historical BTEX concentrations observed in groundwater from this well. Analytical data from the 2018 BTEX and PAH results will be evaluated to determine if any concentration trends become apparent.

Aside from the disturbances caused by the installation of the above-ground pool and raised garden in 2014, and the shallow tire ruts near the MW98-7 well pair, the soil cover appeared to be in good condition with no obvious damage.

The next groundwater sampling and soil cover inspection event is scheduled for the summer of 2018. If you have any questions, please feel free to contact John Ruspantini of NYSEG at 607.762.8787 or me at 315.671.9379.

Sincerely,

Arcadis of New York, Inc.



David A. Cornell
Senior Geologist

Copies:

John J. Ruspantini, CHMM, NYSEG
Keith A. White, C.P.G., Arcadis

Enclosures:

Table

- 1 Comparison to NYSDEC Class GA Standards and Guidance Values

Figure

- 1 Site Map

Attachments

- 1 Groundwater Sampling Log
- 2 Chain of Custody Record
- 3 Soil Cover Inspection Photograph Log

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TABLE



Table 1
Historical and Current Groundwater Analytical Results

New York State Electric Gas Company
Waterville MGP Site, Waterville, New York

Location ID: Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	Units	MW98-7D 11/01/98	MW98-7D 02/01/99	MW98-7D 05/01/99	MW98-7D 08/01/99	MW98-7D 12/01/99	MW98-7D 02/01/00	MW98-7D 05/01/00	MW98-7D 06/01/01	MW98-7D 08/30/01	MW98-7D 05/15/02
Detected Volatile Organics												
Benzene	1	ug/L	400 *	540 *	340 *	230 *	140 *	180 *	310 *	110 *	110	150
Ethylbenzene	5	ug/L	40 *	110 *	150 *	44 *	90 *	65 *	22 *	22 *	41	35
m&p-Xylene	--	ug/L	NA	50								
o-Xylene	--	ug/L	40 *	72 *	140 *	ND	45 *	80 *	130 *	78 *	NA	60
Toluene	5	ug/L	100 *	220 *	110 *	150 *	44 *	90 *	65 *	22 *	22	82
Xylenes (total)	5	ug/L	NA	78	NA							
Total BTEX	--	ug/L	580	940	740	420	320	420	530	230	250	380
Detected Semivolatile Organics												
2-Methylnaphthalene	--	ug/L	NA	280	100 U							
Acenaphthene	20	ug/L	NA	200 J	170							
Acenaphthylene	--	ug/L	NA	56 J	38 J							
Anthracene	50	ug/L	NA	20 J	31 J							
Dibenzofuran	--	ug/L	NA	4.0 J	100 U							
Fluoranthene	50	ug/L	NA	13 J	100 U							
Fluorene	50	ug/L	NA	37 J	25 J							
Indeno(1,2,3-cd)pyrene	0.002	ug/L	NA	210 U	100 U							
Naphthalene	10	ug/L	680	2,200	1,100	1,300	1,900	3,200	1,300	1,400	1,400	1,600
Phenanthrene	50	ug/L	NA	80 J	71 J							
Pyrene	50	ug/L	NA	16 J	100 U							
Total PAHs	--	ug/L	680	2,200	1,100	1,300	1,900	3,200	1,300	1,400	2,100 J	1,900 J
Detected Inorganics												
Iron	300	ug/L	39,900	770	20,200	3,720	5,340	288	834	8,660	8,660	415
Manganese	300	ug/L	2,760	1,250	1,580	1,400	1,250	1,430	1,280	1,210	1,210	1,380
Nitrate	--	ug/L	NA	NA	NA	ND	ND	60.0	ND	ND	100 U	20.0 U
Sulfate	250,000	ug/L	NA	NA	NA	ND	ND	ND	ND	1,840	1,840	2,100
Total Organic Carbon	--	ug/L	NA	3,770	3,300							

See Notes on Page 4.

Table 1
Historical and Current Groundwater Analytical Results

New York State Electric Gas Company
Waterville MGP Site, Waterville, New York

Location ID: Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	Units	MW98-7D 11/22/02	MW98-7D 05/21/03	MW98-7D 11/01/03	MW98-7D 07/01/04	MW98-7D 11/11/04	MW98-7D 05/10/05	MW98-7D 11/10/05	MW98-7D 05/10/06	MW98-7D 11/07/06	MW98-7D 05/01/08
Detected Volatile Organics												
Benzene	1	ug/L	110	160 *	150	170	98	160	90	140	110	140 D
Ethylbenzene	5	ug/L	22	58 *	22	96	74	110	84	97	85	86
m&p-Xylene	--	ug/L	41	38 *	47 *	NA	NA	NA	NA	NA	NA	38
o-Xylene	--	ug/L	56	47 *	66 *	NA	NA	NA	NA	NA	NA	52
Toluene	5	ug/L	76	25 *	92	31	19 J	26	20 J	27	18	26
Xylenes (total)	5	ug/L	NA	NA	ND	100	88	110	81	95	90	NA
Total BTEX	--	ug/L	310	330	260	400	280 J	410	280 J	360	300	340
Detected Semivolatile Organics												
2-Methylnaphthalene	--	ug/L	190	76	130	NA	130	110	140	130	100 J	110
Acenaphthene	20	ug/L	170	69	110 J	190	120	110	140	96 J	140	120
Acenaphthylene	--	ug/L	40 J	17	20 J	40 J	25 J	23 J	24 J	19 J	19 J	22
Anthracene	50	ug/L	18 J	3.0 J	ND	16 J	11 J	7.0 J	11 J	44 J	8.7 J	8.0
Dibenzofuran	--	ug/L	56 U	1.0 J	ND	NA	NA	NA	NA	NA	NA	2.0 J
Fluoranthene	50	ug/L	11 J	0.60 J	ND	6.7 J	100 U	2.6 J	100 U	100 U	3.5 J	3.0 J
Fluorene	50	ug/L	25 J	5.0 U	19 J	28 J	18 J	13 J	100 U	57 J	14 J	16
Indeno(1,2,3-cd)pyrene	0.002	ug/L	56 U	5.0 U	ND	10	10 U	5.3 U	10 U	10 U	11 U	5.0 U
Naphthalene	10	ug/L	1,500	860 E	1,000	1,600	1,400	970	1,200	910	1,300	1,100 D
Phenanthrene	50	ug/L	78	15	48 J	88 J	58 J	44 J	54 J	75 J	51 J	46
Pyrene	50	ug/L	15 J	0.70 J	ND	8.8 J	100 U	2.9 J	100 U	100 U	4.1 J	4.0 J
Total PAHs	--	ug/L	2,000 J	1,000 J	1,300 J	2,000 J	1,800 J	1,300 J	1,600 J	1,300 J	1,600 J	1,400 J
Detected Inorganics												
Iron	300	ug/L	1,190 EN	402	333	459	1,200	859	1,200	1,180	1,130	NA
Manganese	300	ug/L	1,400 N	901	1,150	1,280	1,330	1,130	1,390	1,380	1,220	NA
Nitrate	--	ug/L	30.0	30.0	ND	100 U	100 U	100 U	100 U	110	100 U	NA
Sulfate	250,000	ug/L	1,400	1,200	1,200	5,000 U	NA					
Total Organic Carbon	--	ug/L	4,400	1,800	2,200	1,800	1,800	1,700	1,800	2,100	1,700	NA

See Notes on Page 4.

Table 1
Historical and Current Groundwater Analytical Results

New York State Electric Gas Company
Waterville MGP Site, Waterville, New York

Location ID: Date Collected:	NYSDEC TOGS 1.1.1 Water Guidance Values	Units	MW98-7D 05/28/09	MW98-7D 06/03/11	MW98-7D 06/14/12	MW98-7D 06/28/13	MW98-7D 06/20/14	MW98-7D 07/09/15	MW98-7D 07/20/16	MW98-7D 06/15/17
Detected Volatile Organics										
Benzene	1	ug/L	110 D08	57	90 J	8.9	17	68	39 J	130 DJ
Ethylbenzene	5	ug/L	90 M7	36	97 J	6.3	11	66	48 J	110 DJ
m&p-Xylene	--	ug/L	39	20	39	3.3	6.9	31	22	48 J
o-Xylene	--	ug/L	52 M7	26	54 J	4.2	10	43	30 J	62 J
Toluene	5	ug/L	22	9.0	18	2.2	3.3	15	9.7	37 J
Xylenes (total)	5	ug/L	92 M7	46	93 J	7.5	17	74	52 J	110 J
Total BTEX	--	ug/L	310	150	300 J	25	48	250	170 J	440 J
Detected Semivolatile Organics										
2-Methylnaphthalene	--	ug/L	110 M7	NA						
Acenaphthene	20	ug/L	120 D08	130	86 J	120 D	61	35 J	100 EJ	150 EJ
Acenaphthylene	--	ug/L	19	21 J	12 J	20	5.6	0.66 J	18	27
Anthracene	50	ug/L	7.8	8.5 J	6.3 J	7.7	4.2	4.9 J	7.8	9.1
Dibenzofuran	--	ug/L	2.3	NA						
Fluoranthene	50	ug/L	2.6	48 U	49 U	2.7 J	1.7 J	1.7 J	2.6 J	3.1 J
Fluorene	50	ug/L	19	20 J	15 J	18	8.5	9.7	14	15
Indeno(1,2,3-cd)pyrene	0.002	ug/L	0.48 UM8	48 U	49 U	4.7 UJ	1.9 U	5.2 UJ	4.8 U	5.0 U
Naphthalene	10	ug/L	850 D08	780	600	990 D	1.9 U	0.86 J	640 D	910 D
Phenanthrene	50	ug/L	44	59	37 J	49	23	24	45	58 J
Pyrene	50	ug/L	3.0	3.3 J	49 U	3.4 J	2.2	2.0 J	2.8 J	4.0 J
Total PAHs	--	ug/L	1,200	1,000 J	760 J	1,200 J	110 J	79 J	830 J	1,200 J
Detected Inorganics										
Iron	300	ug/L	NA							
Manganese	300	ug/L	NA							
Nitrate	--	ug/L	NA							
Sulfate	250,000	ug/L	NA							
Total Organic Carbon	--	ug/L	NA							

See Notes on Page 4.

Table 1
Historical and Current Groundwater Analytical Results

New York State Electric Gas Company
Waterville MGP Site, Waterville, New York

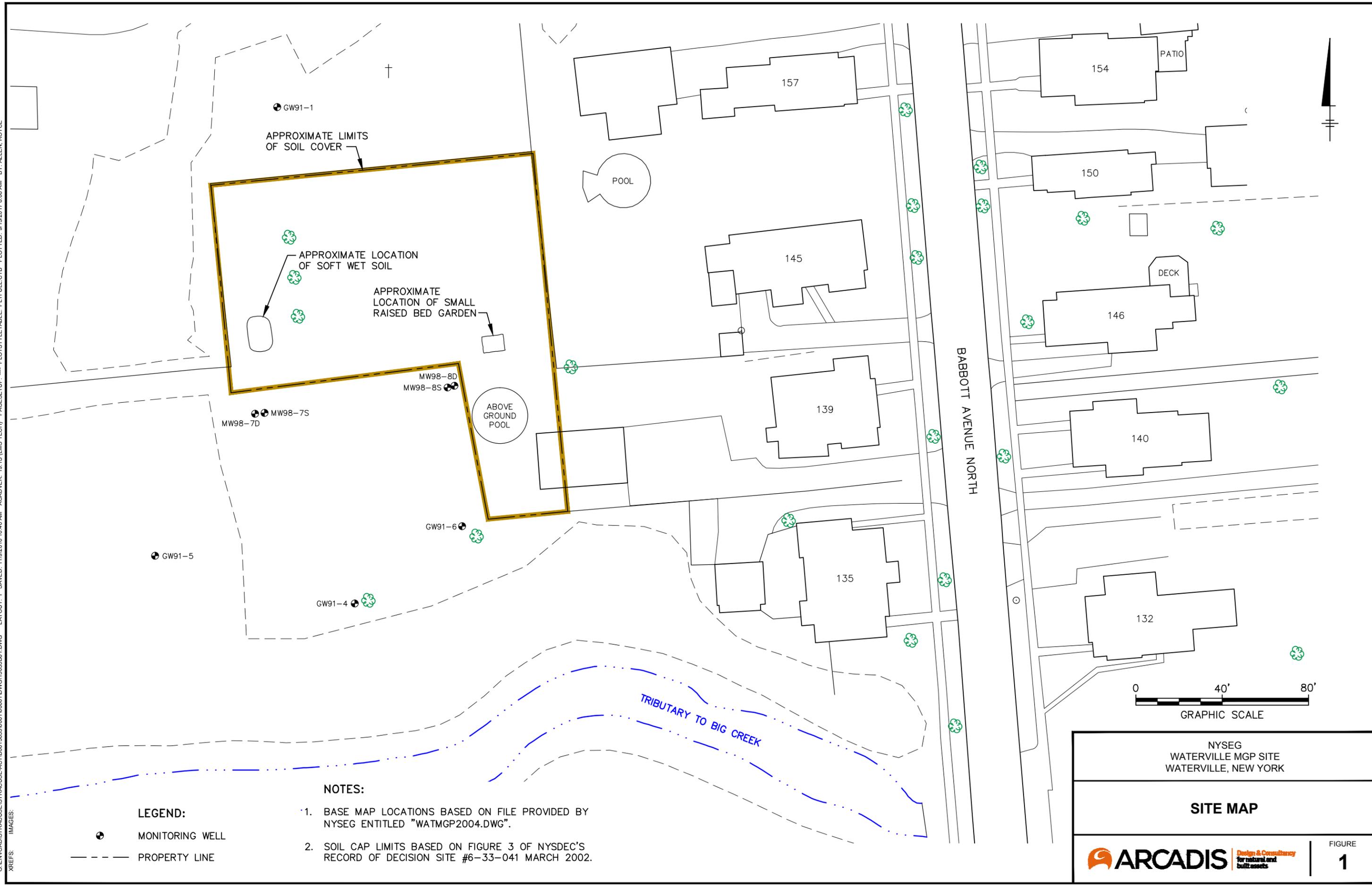
Notes:

- D = Compound quantitated using a secondary dilution.
- E = Analyte exceeded calibration range.
- J = Indicates an estimated value.
- ND = None detected.
- U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

FIGURE



CITY: SYRACUSE, NY DIV: GROUP: ENV/MDV DB: P. LISTER, R. ALLEN PM/TM/TR: D. CORNELL LVR: ON=OFF=REF (FRZ)
 G:\ENVCAD\SYRACUSE\SYRACUSE\ACT\B0013063\0001\DWG\13063B01.DWG LAYOUT: 1 SAVED: 11/9/2016 10:40 AM ACADVER: 19.1S (LMS TECH) PAGES: 10 PLOT: 10
 PLOTSTYLETABLE: PLTFULLCTB PLOTTED: 9/13/2017 8:08 AM BY: ALLEN, ROYCE



NOTES:

1. BASE MAP LOCATIONS BASED ON FILE PROVIDED BY NYSEG ENTITLED "WATMGP2004.DWG".
2. SOIL CAP LIMITS BASED ON FIGURE 3 OF NYSDEC'S RECORD OF DECISION SITE #6-33-041 MARCH 2002.

LEGEND:

- MONITORING WELL
- PROPERTY LINE

NYSEG WATERVILLE MGP SITE WATERVILLE, NEW YORK	
SITE MAP	
Design & Consultancy for natural and built assets	FIGURE 1

ATTACHMENT 1

Groundwater Sampling Log



Site

Event

GROUNDWATER SAMPLING LOG

Sampling Personnel: Levia G Terrell/Nicholle R Griffith Well ID: MW98-7D
 Client / Job Number: NYSEG Waterville Date: 6-15-17
 Weather: SUNNY, 72°F Time In: 4:35 Time Out: 1:22

Well Information

Depth to Water:	(feet)	5.78	(from MP)
Total Depth:	(feet)	18.44	(from MP)
Length of Water Column:	(feet)	12.66	
Volume of Water in Well:	(gal)	~2.0	

Well Type:	Flushmount	Stick-Up
Well Material:	Stainless Steel	PVC
Well Locked:	Yes	No
Measuring Point Marked:	Yes	No
Well Diameter:	1"	2" Other:

Purging Information

Purging Method:	Bailer	Peristaltic	Grundfos	Other:
Tubing/Bailer Material:	St. Steel	Polyethylene	Teflon	Other:
Sampling Method:	Bailer	Peristaltic	Grundfos	Other:
Duration of Pumping:	(min)	60		
Average Pumping Rate:	(ml/min)	150	Water-Quality Meter Type:	YSI / Lamotte 2020
Total Volume Removed:	(gal)	~3.0	Did well go dry:	Yes No

Conversion Factors

gal / ft. of water	1" ID	2" ID	4" ID	6" ID
	0.041	0.163	0.653	1.469

1 gal = 3.785 L = 3785 ml = 0.1337 cubic feet

Unit Stability

pH	DO	Cond.	ORP
± 0.1	± 10%	± 3.0%	± 10 mV

Parameter:	1	2	3	4	5	6	7	8	9	10	11	12	13
Volume Purged (gal)	945	950	955	10.00	1005	1010	1015	1020	1025	1030	1035	1040	
Rate (mL/min)	200	150	150	150	150	150	150	150	150	150	150	S	
Depth to Water (ft.)	5.92	6.04	6.17	6.30	6.48	6.62	6.76	6.92	7.10	7.24	7.42	A	
pH	7.28	7.28	7.23	7.22	7.20	7.21	7.22	7.21	7.23	7.23	7.24	M	
Temp. (C)	11.52	11.42	11.43	11.42	11.92	11.69	11.48	11.42	11.31	11.32	11.22	P	
Conductivity (mS/cm)	0.308	0.328	0.374	0.375	0.385	0.402	0.407	0.409	0.410	0.411	0.414	L	
Dissolved Oxygen (mg/L)	2.29	1.71	0.74	0.71	0.60	0.53	0.37	0.19	0.15	0.14	0.14	F	
ORP (mV)	2.3	8.50	-9.2	-12.4	-21.6	-41.7	-52.8	-55.7	-56.9	-50.9	-48.9		
Turbidity (NTU)	4.53	3.14	3.06	2.55	2.14	1.73	1.54	1.48	0.95	0.91	0.90		
Notes:		Lower flow rate to minimize draw down											

Sampling Information

Analyses	#	Laboratory
BTEX	③	TestAmerica Buffalo
PAHs	②	TestAmerica Buffalo
Sample ID:	MW98-7D	Sample Time: 1040
MS/MSD:	Yes	No
Duplicate:	Yes	No
Duplicate ID		Dup. Time:
Chain of Custody Signed By:		

Problems / Observations

940 CLEAR, COLORLESS, ODOORLESS

1040 CLEAR, COLORLESS MINOR CTL ODOOR
PID 0.0

ATTACHMENT 2

Chain of Custody Record



ATTACHMENT 3

Soil Cover Inspection Photograph Log



SOIL COVER INSPECTION PHOTOGRAPH LOG

CLIENT: NYSEG	SITE NAME: Waterville Former MGP Site
PROJECT#: B0013053.0005	SITE LOCATION: Waterville, New York
PHOTOGRAPH #: 1	
PHOTOGRAPHER: LGT	
DATE: 06/15/17	
DIRECTION: E-SE	
COMMENT: Location where soft wet soil and tire ruts were observed.	

CLIENT: NYSEG	SITE NAME: Waterville Former MGP Site
PROJECT#: B0013053.0001	SITE LOCATION: Waterville, New York
PHOTOGRAPH #: 2	
PHOTOGRAPHER: LGT	
DATE: 06/15/17	
DIRECTION: E	
COMMENT: Raised bed garden and above ground swimming pool behind 139 and 145 Babbott Avenue.	