HALEY ALDRICH

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REPORT ON

JANUARY 2020 GROUNDWATER MONITORING REPORT
OWEGO FORMER MGP SITE
OWEGO, NEW YORK

by
Haley & Aldrich of New York
Rochester, New York

for
New York State Department of Environmental Conservation
Albany, New York

File No. 134371-003
March 2020

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27 March 2020
File No. 134371-003

New York State Department of Environmental Conservation
Division of Environmental Remediation, 11th Floor
625 Broadway
Albany, New York 12223

Attention: Mr. Scott Deyette

Subject: January 2020 Groundwater Monitoring Report
Owego Former MGP Site
Owego, New York

Dear Mr. Deyette:

On behalf of our client, New York State Electric & Gas Corporation (NYSEG), Haley & Aldrich of New York (Haley & Aldrich) has prepared this Groundwater Monitoring Report to document the field activities associated with groundwater quality sampling and monitoring at NYSEG's Owego Former Manufactured Gas Plant (MGP) Site (Site) located in Owego, New York (Figure 1). The work was performed in accordance the monitoring plan described in the "Work Plan for Groundwater Monitoring at the Owego Former MGP Site" prepared by Ish, Inc. and dated February 2003 and "Emerging Contaminants Sampling Plan" prepared by Haley & Aldrich and dated October 2019. The analytes of interest for this groundwater monitoring program included MGP-related constituents benzene and total cyanide, and emerging contaminants 1,4-dioxane and polyfluoroalkyl substances (PFAS).

The Site monitoring program sampling requirements were modified in a letter from NYSDEC dated 10 July 2019, reducing the groundwater sampling and analysis requirement to total cyanide at two locations (MW-4 and PZ-2) once every two years and benzene at one location (PZ-8) once every four years.

Field Activities

On 13 January 2020, Haley & Aldrich staff completed static water level measurements and monitoring for the presence of non-aqueous phase liquid (NAPL) at two monitoring wells (MW-1 and MW-4) and three piezometers (PZ-2, PZ-6, and PZ-8) as shown on Figure 2, and collected groundwater quality samples from the two monitoring wells (MW-1 and MW-4) and three piezometers (PZ-2, PZ-6, and PZ-8). The methods used for groundwater level measurements, NAPL gauging, and groundwater sample collection for this monitoring event were consistent with the methods described in the 2003 and 2019 work plans.

During the January 2020 gauging event, light NAPL (LNAPL) and dense NAPL (DNAPL) were not observed in any of the groundwater monitoring wells or piezometers. The measured depths to water in monitoring wells and resulting groundwater elevations are provided in Table I. The groundwater elevations are also shown on Figure 2. The groundwater elevations varied between 797.34 feet at PZ-8 located on the former MGP site to 795.64 feet at PZ-6 located on John Street, indicating an approximately north to south hydraulic gradient which is consistent with previous observations.

After the completion of water level gauging, groundwater samples were collected for the following analyses using low-flow methodology:

- MW-4 and PZ-2 for total cyanide analysis;
- PZ-8 for benzene analysis; and,
- MW-1, MW-4 and PZ-6 for 1,4-dioxane and PFAS analysis.

Field sampling sheets are included as Appendix A. All purge-water was collected and properly staged at an on-site location pending future disposal by NYSEG.

In addition to the collection of monitoring well and piezometer groundwater samples, a duplicate sample was collected for field quality control purposes. One blind field duplicate sample was collected from monitoring well MW-4. One equipment rinse blank sample was collected at the time of field work. A trip blank accompanied the samples to the laboratory during the January 2020 sampling event.

Groundwater Sampling Results

The groundwater sampling results for benzene and total cyanide are presented in Table II while results for PFAS and 1,4-dioxane are presented in Table III. The groundwater analytical data for benzene and total cyanide are presented with a comparison to NYSDEC Class GA groundwater quality standards. Groundwater sampling locations and analytical results are also shown on Figure 3.

Benzene and total cyanide were detected at concentrations exceeding NYSDEC Class GA groundwater quality standards:

- The concentration of benzene exceeded the Class GA groundwater quality standard (1 microgram per liter, µg/l) in the groundwater sample collected from piezometer PZ-8 (150 µg/l);

- The concentration of total cyanide exceeded the Class GA groundwater quality standard (200 µg/l) in the groundwater samples collected from the on-site monitoring well MW-4 (2,000 µg/l) and on-site piezometer PZ-2 (1,900 µg/l).

The 1,4-dioxane and PFAS analytical results indicate the following:

- 1,4-dioxane was not detected during January 2020 monitoring;

- Several PFAS compounds were detected during January 2020 monitoring, including fluorotelomer sulfonic acid (6:2 FTSA), ferfluorobutanesulfonic acid (PFBS), perfluorobutanoic acid (PFBA), perfluorodecanoic acid (PFDA), perfluoroheptane sulfonic acid (PFHpS), perfluoroheptanoic acid (PFHpA), perfluorohexanoic acid (PFHxA), perfluorononanoic acid (PFNA), perfluorooctane sulfonamide (FOSA), perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluoropentanoic acid (PFPeA), and perfluoroundecanoic acid (PFUnA);

- Concentrations of PFAS were generally greatest in groundwater collected from off-site monitoring well MW-1, located in an area that is typically upgradient from the Site;

- The concentration of PFOA and PFOS exceeded the New York State Drinking Water Quality Council's recommended maximum contaminant level (10 parts per trillion, ppt) in groundwater collected from off-site monitoring well MW-1 (15 ppt and 24 ppt, respectively); and,

- The concentration of PFOA and PFOS did not exceed the New York State Drinking Water Quality Council's recommended maximum contaminant level in groundwater collected from on-site well MW-4 and downgradient piezometer PZ-6.

Quality Assurance/Quality Control

Eurofins TestAmerica Laboratories, Inc. of Amherst, New York performed the QA/QC procedures required for a NYSDEC Analytical Service Protocol (ASP) Category B deliverable package. Data usability evaluations were performed on the analytical data package and the data were judged suitable for their intended purpose. The analytical results from TestAmerica are provided as Appendix B along with the Data Usability Summary Report.

Recommendations

In accordance with NYSDEC correspondence dated 10 July 2019, the next monitoring event is scheduled for 2021 with samples to be collected from MW-4 and PZ-2 for total cyanide analysis. Monitoring wells and piezometers that are not included in the current sampling program will be decommissioned in accordance with the July 2019 correspondence.

Since the greatest concentrations of PFAS were detected in off-site monitoring well MW-1, the concentrations of PFAS did not exceed the recommended maximum contaminant level in samples collected from on-site well MW-4 or downgradient piezometer PZ-6, and 1,4-dioxane was not detected in groundwater, no additional sampling for emerging contaminants is recommended.

Please do not hesitate to call Doug Allen (603.391.3320) if you have any questions or comments.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

Santa E. McKenna, P.G.
Senior Geologist

Douglas C. Allen, P.G.
Associate

Enclosures:

Table I: Groundwater Elevations and NAPL Measurements
Table II: Summary of Benzene and Total Cyanide Analytical Results
Table III: Summary of PFAS and 1,4-Dioxane Analytical Results

Figure 1: Project Locus
Figure 2: Site Plan with Groundwater Elevations
Figure 3: Constituents in Groundwater

Appendix A: Low-Flow Groundwater Sampling Field Forms
Appendix B: Data Usability Summary Report and Laboratory Reports

c: Tracy L. Blazicek, CHMM, PMP - NYSEG

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TABLES

TABLE I
GROUNDWATER ELEVATIONS AND NAPL MEASUREMENTS
NEW YORK STATE ELECTRIC & GAS
OWEGO FORMER MGP SITE
OWEGO, NEW YORK

Well ID	Top of Casing Elevation (ft-msl)	Date of Measurement	Depth to Water (ft)	Water Level Elevation (ft-msl)	LNAPL Thickness (ft)	DNAPL Thickness (ft)
MW-1	811.48	4/22/2003	11.80	799.68	NP	NP
		10/22/2003	NM	-	-	-
		4/14/2004	NM	-	-	-
		10/27/2004	NM	-	-	-
		4/5/2005	NM	-	-	-
		10/3/2005	NM	-	-	-
		2/13/2006	13.72	797.76	NP	NP
		10/2/2006	NM	-	-	-
		10/22/2007	NM	-	-	-
		10/27/2008	NM	-	-	-
		10/26/2009	NM	-	-	-
		10/25/2010	NM	-	-	-
		10/24/2011	11.81	799.67	NP	NP
		10/15/2012	18.90	792.58	NP	NP
		7/11/2014	Could not locate	-	-	-
		4/21/2015	Could not locate	-	-	-
		5/26/2016	16.48	795.00	NP	NP
		1/13/2020	15.30	796.18	NP	NP
MW-4	816.57	4/22/2003	17.41	799.16	NP	NP
		10/22/2003	21.13	795.44	NP	NP
		4/14/2004	19.59	796.98	NP	NP
		10/27/2004	19.92	796.65	NP	NP
		4/5/2005	14.39	802.18	NP	NP
		10/3/2005	23.40	793.17	NP	NP
		2/13/2006	18.97	797.60	NP	NP
		10/2/2006	20.37	796.20	NP	NP
		10/22/2007	23.96	792.61	NP	NP
		10/27/2008	24.34	792.23	NP	NP
		10/26/2009	23.22	793.35	NP	NP
		10/25/2010	22.17	794.40	NP	NP
		10/24/2011	17.52	799.05	NP	NP
		10/15/2012	23.95	792.62	NP	NP
		7/11/2014	21.07	795.50	NP	NP
		4/21/2015	20.08	796.49	NP	NP
		5/26/2016	21.80	794.77	NP	NP
		1/13/2020	20.58	795.99	NP	NP
PZ-2	816.58	4/22/2003	17.58	799.00	NP	NP
		10/22/2003	21.32	795.26	NP	NP
		4/14/2004	19.90	796.68	NP	NP
		10/27/2004	20.13	796.45	NP	NP
		4/5/2005	14.28	802.30	NP	NP
		10/3/2005	23.94	792.64	NP	NP
		2/13/2006	19.35	797.23	NP	NP
		10/2/2006	20.78	795.80	NP	NP
		10/22/2007	24.40	792.18	NP	NP
		10/27/2008	24.67	791.91	NP	NP
		10/26/2009	23.75	792.83	NP	NP
		10/25/2010	22.47	794.11	NP	NP
		10/24/2011	17.78	798.80	NP	NP
		10/15/2012	24.30	792.28	NP	NP
		7/11/2014	21.41	795.17	NP	NP
		4/21/2015	20.57	796.01	NP	NP
		5/26/2016	22.15	794.43	NP	NP
		1/13/2020	19.96	796.62	NP	NP

TABLE I
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NEW YORK STATE ELECTRIC & GAS
OWEGO FORMER MGP SITE
OWEGO, NEW YORK

Well ID	Top of Casing Elevation (ft-msl)	Date of Measurement	Depth to Water (ft)	Water Level Elevation (ft-msl)	LNAPL Thickness (ft)	DNAPL Thickness (ft)
PZ-6	817.54	4/22/2003	19.10	798.44	NP	NP
		10/22/2003	NM	-	-	-
		4/14/2004	NM	-	-	-
		10/27/2004	NM	-	-	-
		4/5/2005	NM	-	-	-
		10/3/2005	NM	-	-	-
		2/13/2006	20.47	797.07	NP	NP
		10/2/2006	22.30	795.24	NP	NP
		10/22/2007	25.32	792.22	NP	NP
		10/27/2008	25.69	791.85	NP	NP
		10/26/2009	24.35	793.19	NP	NP
		10/25/2010	23.30	794.24	NP	NP
		10/24/2011	19.41	798.13	NP	NP
		10/15/2012	25.35	792.19	NP	NP
		7/11/2014	22.71	794.83	NP	NP
		4/21/2015	20.62	796.92	NP	NP
		5/26/2016	23.24	794.30	NP	NP
		1/13/2020	21.90	795.64	NP	NP
PZ-8	815.38	4/22/2003	15.83	799.55	NP	NP
		10/22/2003	NM	-	-	-
		4/14/2004	NM	-	-	-
		10/27/2004	NM	-	-	-
		4/5/2005	NM	-	-	-
		10/3/2005	NM	-	-	-
		2/13/2006	17.47	797.91	NP	NP
		10/2/2006	18.67	796.71	NP	NP
		10/22/2007	22.08	793.30	NP	NP
		10/27/2008	20.66	794.72	NP	NP
		10/26/2009	20.83	794.55	NP	NP
		10/25/2010	20.74	794.64	NP	NP
		10/24/2011	15.32	800.06	NP	NP
		10/15/2012	22.44	792.94	NP	NP
		7/11/2014	19.29	796.09	NP	NP
		4/21/2015	16.61	798.77	NP	NP
		5/26/2016	20.14	795.24	NP	NP
		1/13/2020	18.04	797.34	NP	NP

Notes and Abbreviations:

1. Water level measurements collected prior to July 2014 were obtained by Ish Inc.

NM: Not measured
NP: Indicates NAPL not present
ft-msl: feet above mean sea level

TABLE II
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
NEW YORK STATE ELECTRIC & GAS
OWEGO FORMER MGP SITE
OWEGO, NEW YORK

		Chemical Name	Cyanide, Total	Benzene
NYSDEC TOGS 1.1.1 Class GA Water Quality Standards			200	1
		Units	µg/L	µg/L
	Sample Type	Sample Name		
MW-4				
08/28/1995	N	MW-4-082895	**797**	< 5
10/16/1995	N	MW-4-101695	**996**	< 5
01/24/1996	N	MW-4-012496	**797**	< 5
04/15/1996	N	MW-4-041596	**1190**	< 5
07/25/1996	N	MW-4-072596	**3900**	< 5
10/15/1996	N	MW-4-101596	**1380**	< 5
01/20/1997	N	MW-4-012097	**757**	< 10
04/29/1997	N	MW-4-042997	**4180**	< 10
04/29/1998	N	MW-4-042998	**1600**	-
10/19/1998	N	MW-4-101998	**998**	-
04/16/1999	N	MW-4-041699	**630**	-
12/14/1999	N	MW-4-121499	**330**	-
04/26/2000	N	MW-4-042600	**570**	-
09/28/2000	N	MW-4-092800	**620**	-
01/24/2001	N	MW-4-012401	**725**	-
06/20/2001	N	MW-4-062001	**2240**	-
04/22/2003	N	MW-4-042203	-	< 0.1
04/23/2003	N	MW-4-042303	**2010**	-
10/22/2003	N	MW-4-102203	**1150**	< 0.1
04/14/2004	N	MW-4-041404	**1010**	< 0.1
10/29/2004	N	MW-4-102904	**1690**	< 0.1
04/08/2005	N	MW-4-040805	**744**	< 0.2
10/04/2005	N	MW-4-100405	**404**	**270**
02/14/2006	N	MW-4-021406	-	**1.7**
10/03/2006	N	MW-4-100306	**2240**	**1.3**
10/23/2007	N	MW-4-102307	**234**	< 0.2
10/28/2008	N	MW-4-102808	**90.4**	< 1
10/26/2009	N	MW-4-102609	**145**	**0.64**
10/26/2009	FD	MW-4-102609-DUP	**211**	**0.45**
10/26/2010	N	MW-4-102610	**180**	< 1
10/26/2010	FD	MW-4-102610-DUP	**207**	< 1
10/25/2011	N	MW-4-102511	**2700**	< 1
10/25/2011	FD	MW-4-102511-DUP	**2900**	< 1
03/12/2012	N	MW-4-031212	**810**	-
03/12/2012	FD	MW-4-031212-DUP	**990**	-
10/16/2012	N	MW-4-101612	**610**	**0.7**
10/16/2012	FD	MW-4-101612-DUP	**650**	**0.47**
07/11/2014	N	2293-071114-1355	**1700**	-
04/21/2015	N	MW04-042115-1135	**400**	-
05/26/2016	N	MW04-052616-1325	**3300 J**	-
08/23/2017	N	MW04-082317-1245	**5700**	-
01/13/2020	N	MW4-011320-1345	**2000**	-
01/13/2020	FD	4125-011320-0002	**1800**	-
PZ-2				
12/15/1999	N	PZ-2-121599	**241**	-
06/19/2000	N	PZ-2-061900	**9800**	-
09/28/2000	N	PZ-2-092800	**1550**	-
01/24/2001	N	PZ-2-012401	**1320**	-
06/20/2001	N	PZ-2-062001	**1540**	-
06/20/2001	FD	PZ-2-062001-DUP	**1650**	-
04/22/2003	N	PZ-2-042203	-	< 0.1
04/23/2003	N	PZ-2-042303	**3230**	-
10/22/2003	N	PZ-2-102203	**1860**	-

TABLE II
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
NEW YORK STATE ELECTRIC & GAS
OWEGO FORMER MGP SITE
OWEGO, NEW YORK

		Chemical Name	Cyanide, Total	Benzene
	NYSDEC TOGS 1.1.1 Class GA Water Quality Standards		200	1
		Units	µg/L	µg/L
	Sample Type	Sample Name		
PZ-2 (Continued)				
04/14/2004	N	PZ-2-041404	**1470**	-
08/03/2004	N	PZ-2-080304	**804**	-
10/29/2004	N	PZ-2-102904	**1410**	-
04/08/2005	N	PZ-2-040805	**1020**	-
10/04/2005	N	PZ-2-100405	**535**	-
10/03/2006	N	PZ-2-100306	**989**	-
10/23/2007	N	PZ-2-102307	**352**	-
10/28/2008	N	PZ-2-102808	**242**	-
10/26/2009	N	PZ-2-102609	< 10	-
10/26/2010	N	PZ-2-102610	**262**	-
10/25/2011	N	PZ-2-102511	**270**	-
03/12/2012	N	PZ-2-031212	**730**	-
10/16/2012	N	PZ-2-101612	**460**	-
07/11/2014	N	3159-071114-1520	**2900 J**	-
04/21/2015	N	PZ02-042115-1155	**580**	-
05/26/2016	N	PZ02-052616-1635	**2700 J**	-
08/23/2017	N	PZ02-082317-1430	**3600**	-
01/13/2020	N	PZ2-011320-1810	**1900**	-
PZ-8				
12/15/1999	N	PZ-8-121599	**296**	-
12/15/1999	FD	PZ-8-121599-DUP	**296**	-
06/19/2000	N	PZ-8-061900	**94**	-
09/28/2000	N	PZ-8-092800	**300**	-
01/24/2001	N	PZ-8-012401	**358**	-
04/22/2003	N	PZ-8-042203	-	**1200**
02/14/2006	N	PZ-8-021406	-	**580**
10/03/2006	N	PZ-8-100306	-	**500**
10/23/2007	N	PZ-8-102307	-	**670**
10/28/2008	N	PZ-8-102808	-	**590**
10/26/2009	N	PZ-8-102609	-	**1100**
10/26/2010	N	PZ-8-102610	-	**770**
10/25/2011	N	PZ-8-102511	-	**150**
10/16/2012	N	PZ-8-101612	-	**530**
07/11/2014	N	3159-071114-1640	-	**810**
04/21/2015	N	PZ08-042115-1315	-	**140**
05/26/2016	N	PZ08-052616-1515	-	**65 J**
05/26/2016	FD	4527-052616-0001	-	**57 J**
08/23/2017	N	PZ08-082317-1300	-	**380**
08/23/2017	FD	1234-082317-0002	-	**380**
01/13/2020	N	PZ08-011320-1710	-	**150**

Notes and Abbreviations:

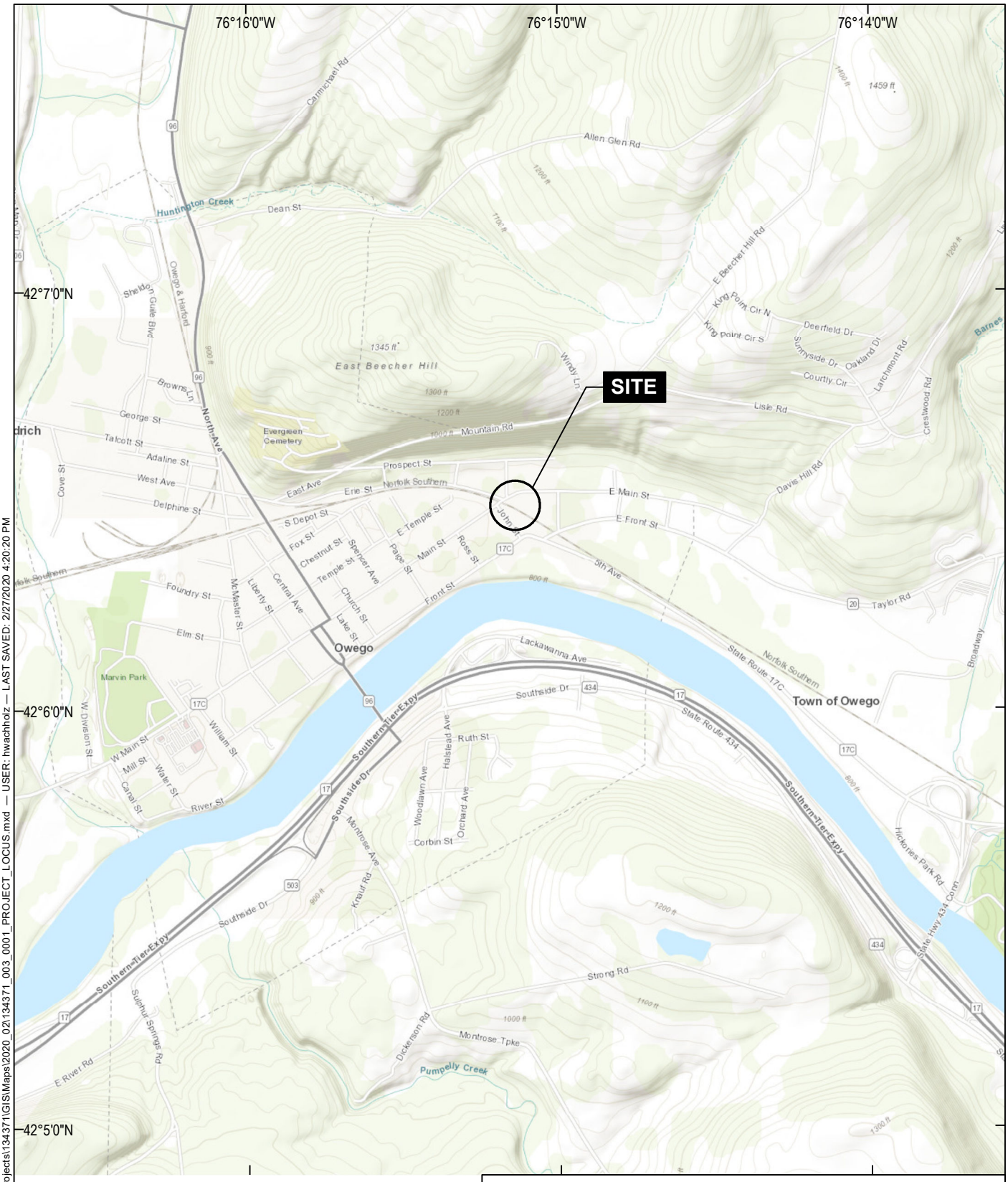
1. Results were compared to TOGS Water Quality Standards, Table 1, Class GA (June 1998). Exceedances are shaded.
2. <: Result is not detected above the indicated reporting limit.
   J: Estimated result.
   R: Rejected during validation.
3. Results in **bold** are detected.
4. Sample type codes: N - Normal, FD - Field Duplicate.
5. Samples collected prior to July 2014 were obtained from Ish Inc.

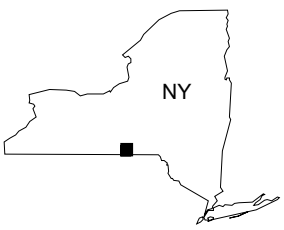
TABLE III
SUMMARY OF PFAS AND 1,4-DIOXANE ANALYTICAL RESULTS
NEW YORK STATE ELECTRIC & GAS
OWEGO FORMER MGP SITE
OWEGO, NEW YORK

Location	MW-1	MW-4	MW-4	PZ-6
Sample Date	01/13/2020	01/13/2020	01/13/2020	01/13/2020
Sample Duplicates	-	-	Duplicate	-
Sample Name	MW1-011320-1150	MW4-011320-1345	4125-011320-0002	PZ6-011320-1540
PFAS (ng/L)				
Fluorotelomer sulfonic acid (6:2 FTSA)	ND (19)	**2 J**	ND (19)	**4.1 J**
Fluorotelomer sulfonic acid (8:2 FTSA)	ND (19)	ND (20)	ND (19)	ND (19)
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	ND (19)	ND (20)	ND (19)	ND (19)
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	ND (19)	ND (20)	ND (19)	ND (19)
Perfluorobutanesulfonic Acid (PFBS)	**13**	**0.92 J**	**1 J**	**5.7**
Perfluorobutanoic Acid (PFBA)	**13**	ND (2)	ND (1.9)	2.3 U
Perfluorodecane sulfonic Acid (PFDS)	ND (1.9)	ND (2)	ND (1.9)	ND (1.9)
Perfluorodecanoic acid (PFDA)	**4.6**	ND (2)	ND (1.9)	ND (1.9)
Perfluorododecanoic acid (PFDoDA)	ND (1.9)	ND (2) J	ND (1.9)	ND (1.9)
Perfluoroheptane sulfonic acid (PFHpS)	**0.33 J**	**0.21 J**	**0.23 J**	ND (1.9)
Perfluoroheptanoic acid (PFHpA)	**6.2**	**1.4 J+**	**0.74 J+**	ND (1.9)
Perfluorohexanesulfonic acid (PFHxS)	ND (1.9)	ND (2)	ND (1.9)	ND (1.9)
Perfluorohexanoic acid (PFHxA)	**9**	ND (2)	ND (1.9)	**1.3 J**
Perfluorononanoic Acid (PFNA)	**6.2**	ND (2)	ND (1.9)	ND (1.9)
Perfluorooctane sulfonamide (FOSA)	**0.35 J**	ND (2)	ND (1.9)	ND (1.9)
Perfluorooctanesulfonic acid (PFOS)	**24**	**6.2**	**7 J+**	**1.6 J+**
Perfluorooctanoic Acid (PFOA)	**15**	**2.7**	**2.9**	**3.9**
Perfluoropentanoic Acid (PFPeA)	**12**	**1.3 J**	**1.1 J**	**1.4 J**
Perfluorotetradecanoic acid (PFTeDA)	ND (1.9)	ND (2)	ND (1.9)	ND (1.9)
Perfluorotridecanoic acid (PFTrDA)	ND (1.9)	ND (2)	ND (1.9)	ND (1.9)
Perfluoroundecanoic acid (PFUnA)	**1.4 J**	ND (2)	ND (1.9) J	ND (1.9)
1,4-DIOXANE (µg/L)				
1,4-Dioxane	ND (0.19)	ND (0.19)	ND (0.19)	ND (0.19)

Notes:
1. Results shown in **bold** were detected.
2. ND (#): Not detected above the reporting limit
   J: Estimated result or reporting limit
   J+: Estimated result, biased high

FIGURES





MAP SOURCE: ESRI
SITE COORDINATES: 42°06'29"N, 76°15'09"W

HALEY ALDRICH

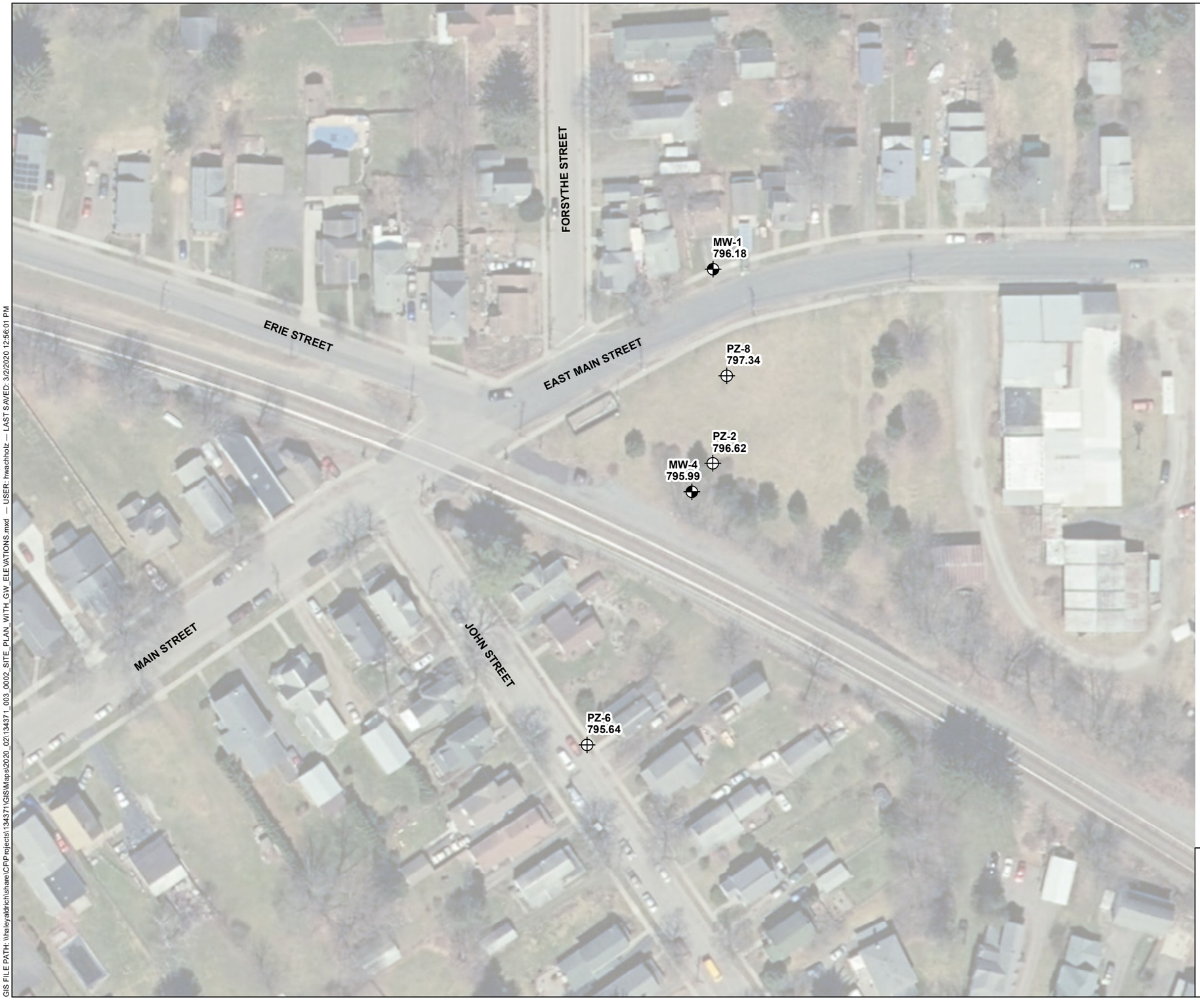
OWEGO FORMER MGP SITE
NEW YORK STATE ELECTRIC & GAS
OWEGO, NEW YORK

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
MARCH 2020

FIGURE 1

GIS FILE PATH: \\haleyaldrich\share\CF\Projects\134371\GIS\Maps\2020_02\134371_003_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 2/27/2020 4:20:20 PM



LEGEND

- MONITORING WELL WITH GORUINDWATER ELEVATIONS INDICATED IN FEET
- PIEZOMETER

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. GROUNDWATER ELEVATIONS WERE MEASURED ON 13 JANUARY 2020.
3. AERIAL IMAGERY SOURCE: ESRI

N

0 75 150

SCALE IN FEET

HALEY ALDRICH

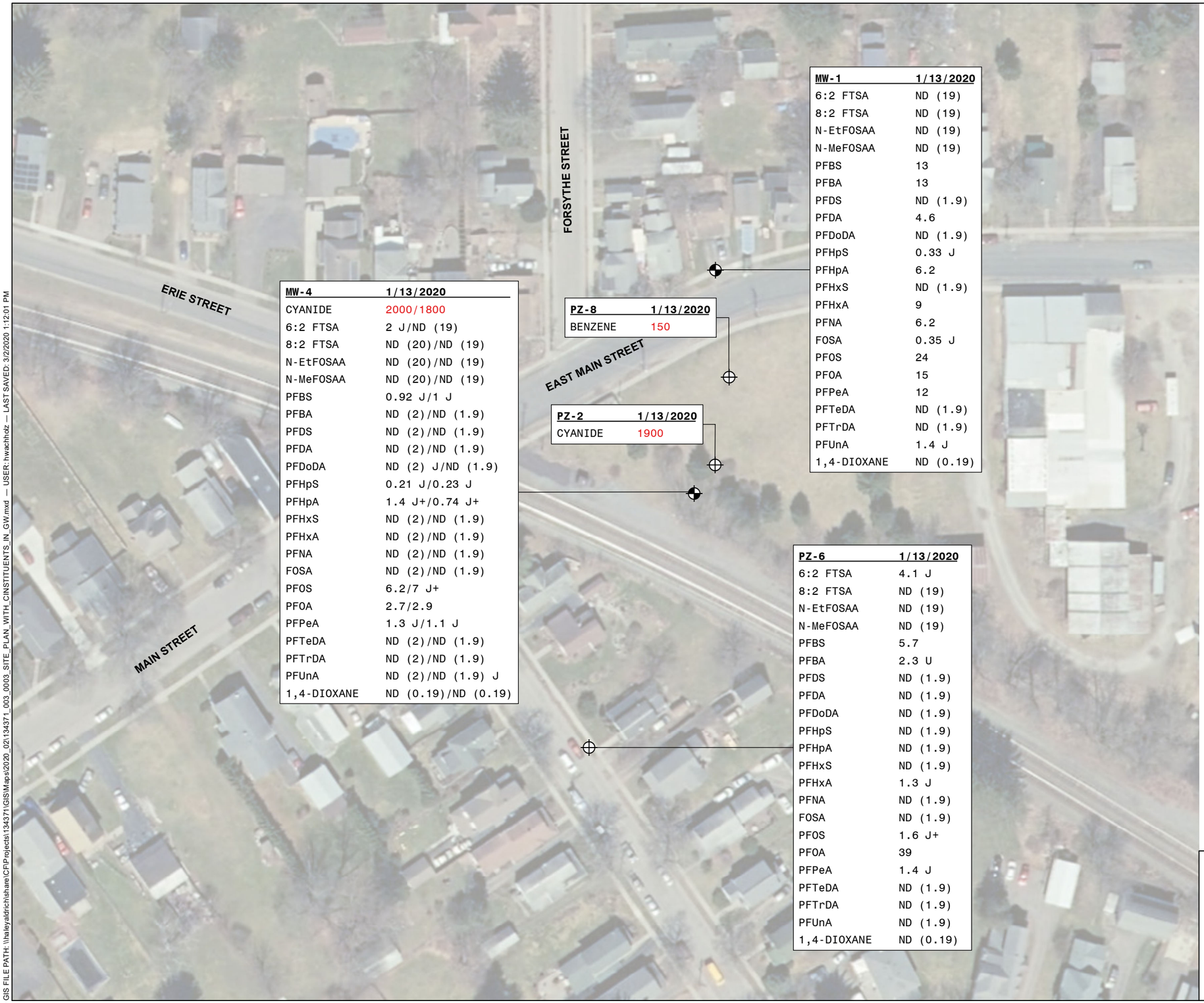
OWEGO FORMER MGP SITE
NEW YORK STATE ELECTRIC & GAS
OWEGO, NEW YORK

SITE PLAN WITH GROUNDWATER ELEVATIONS

MARCH 2020

FIGURE 2

GIS FILE PATH: \\haleyaldrich\share\CFP\projects\134371\GIS\Maps\2020_02\134371_003_0002_SITE_PLAN_WITH_GW_ELEVATIONS.mxd — USER: hwachholz — LAST SAVED: 3/2/2020 12:56:01 PM



MW-4	1/13/2020
CYANIDE	2000/1800
6:2 FTSA	2 J/ND (19)
8:2 FTSA	ND (20)/ND (19)
N-EtFOSAA	ND (20)/ND (19)
N-MeFOSAA	ND (20)/ND (19)
PFBS	0.92 J/1 J
PFBA	ND (2)/ND (1.9)
PFDS	ND (2)/ND (1.9)
PFDA	ND (2)/ND (1.9)
PFDoDA	ND (2) J/ND (1.9)
PFHpS	0.21 J/0.23 J
PFHpA	1.4 J+/0.74 J+
PFHxS	ND (2)/ND (1.9)
PFHxA	ND (2)/ND (1.9)
PFNA	ND (2)/ND (1.9)
FOSA	ND (2)/ND (1.9)
PFOS	6.2/7 J+
PFOA	2.7/2.9
PFPeA	1.3 J/1.1 J
PFTeDA	ND (2)/ND (1.9)
PFTrDA	ND (2)/ND (1.9)
PFUnA	ND (2)/ND (1.9) J
1,4-DIOXANE	ND (0.19)/ND (0.19)

PZ-8	1/13/2020
BENZENE	150

PZ-2	1/13/2020
CYANIDE	1900

MW-1	1/13/2020
6:2 FTSA	ND (19)
8:2 FTSA	ND (19)
N-EtFOSAA	ND (19)
N-MeFOSAA	ND (19)
PFBS	13
PFBA	13
PFDS	ND (1.9)
PFDA	4.6
PFDoDA	ND (1.9)
PFHpS	0.33 J
PFHpA	6.2
PFHxS	ND (1.9)
PFHxA	9
PFNA	6.2
FOSA	0.35 J
PFOS	24
PFOA	15
PFPeA	12
PFTeDA	ND (1.9)
PFTrDA	ND (1.9)
PFUnA	1.4 J
1,4-DIOXANE	ND (0.19)

PZ-6	1/13/2020
6:2 FTSA	4.1 J
8:2 FTSA	ND (19)
N-EtFOSAA	ND (19)
N-MeFOSAA	ND (19)
PFBS	5.7
PFBA	2.3 U
PFDS	ND (1.9)
PFDA	ND (1.9)
PFDoDA	ND (1.9)
PFHpS	ND (1.9)
PFHpA	ND (1.9)
PFHxS	ND (1.9)
PFHxA	1.3 J
PFNA	ND (1.9)
FOSA	ND (1.9)
PFOS	1.6 J+
PFOA	39
PFPeA	1.4 J
PFTeDA	ND (1.9)
PFTrDA	ND (1.9)
PFUnA	ND (1.9)
1,4-DIOXANE	ND (0.19)

LEGEND

- MONITORING WELL
- PIEZOMETER

NOTES

1. ALL LOCATIONS ARE APPROXIMATE.
2. BENZENE, CYANIDE, AND 1,4-DIOXANE RESULTS ARE IN MICROGRAMS PER LITER (µg/L); PFAS RESULTS ARE IN NANOGRAMS PER LITER (NG/L).
3. J = ESTIMATED RESULT
4. J+ = ESTIMATED RESULT BIASED HIGH
5. / = INDICATES DUPLICATE SAMPLE RESULT
6. BENZENE AND CYANIDE RESULTS WERE COMPARED AGAINTS TOGS WATER QUALITY STANDARDS; EXCEEDANCES ARE SHOWN IN RED.
7. AERIAL IMAGERY SOURCE: ESRI

N

0 75 150
SCALE IN FEET

HALEY ALDRICH

OWEGO FORMER MGP SITE
NEW YORK STATE ELECTRIC & GAS
OWEGO, NEW YORK

CONSTITUENTS IN GROUNDWATER

MARCH 2020

FIGURE 3

GIS FILE PATH: \\haleyaldrich\share\CFP\projects\134371\GIS\Maps\2020_02\134371_003_0003_SITE_PLAN_WITH_CINSTITUENTS_IN_GW.mxd — USER: hwachholz — LAST SAVED: 3/2/2020 1:12:01 PM

APPENDIX A

Low-Flow Groundwater Sampling Field Forms

Low Flow Ground Water Sampling Log

Date	12/18/19/01/13/2020	Personnel	RSL/DMN	Weather	Cloudy 40°
Site Name	Owego MGP	Evacuation Method	Peristal Pump	Well #	MW-1
Site Location	Owego, NY	Sampling Method	Peri Pump	Project #	134371-002

Well Information:

Depth of Well	26.50	ft.
Depth to Water	15.70	ft. 15.30 (01/13)
H_{wc}		ft.
Depth to Intake	25.0	ft.

*Measurements taken from:

X	Top of Well Casing
	Top of Protective Casing
	(Other, Specify)

Start Purge Time: 11:15

		10%	0.1	3%	10 mV	10%	10%	100 - 500 mL/min
Elapsed Time (min)	Depth to Water (ft)	Temperature (celsius)	pH	Conductivity (ms/cm)	Oxidation Reduction Potential	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Flow Rate (mL/min)
11:15 0.0	15.3	8.8	6.21	2.41	5.1	6.17	2029AU	150
11:20 5.0	15.3	11.0	5.86	2.51	23.4	5.45	645AU	150
11:25 10.0	15.3	10.8	5.87	2.46	22.1	4.99	104.8	NTU 150
11:30 15.0	15.3	10.9	5.85	2.44	20.7	4.73	71.7	150
11:35 20.0	15.32	11.1	5.86	2.34	19.6	4.71	67.9	150
11:40 25.0	15.32	10.9	5.87	2.27	17.1	4.52	69.3	150
11:45 30.0	15.32	10.9	5.86	2.22	15.2	4.56	70.1	150

End Purge Time:

Water Sample

Time Collected: 1150

Total volume of purged water removed: 1.5 (gallons)

Physical appearance at start:		Physical appearance at stop:	
Color	Slight yellow-brown	Color	Same
Odor	SEPTIC-LIKE	Odor	Same
Sheen/Free Product	NO	Sheen/Free Product	N

Field Test Results:

Dissolved ferrous iron: NA

Dissolved total iron: NA

Dissolved total manganese: NA

Sample	Container Type	# Collected	Field Filtered	Preservative	Container pH
VOCs - 8260	40mL Voa			HCL	-
PAH +1,4 Dx - 8270	1000mL Amber			None	-
Metals/Hg	500mL Plastic			HNO3	-
PFC Mod 537	250mL Plastic			None	-
PFAS	1L AMBER	6	N	None	

MW1-01320-1150

Low Flow Ground Water Sampling Log

Date	1/13/20	Personnel	R. Lydell, D. Nostrant	Weather	40's
Site Name	Owego, MGP	Evacuation Method	Peristaltic	Well #	MW-4
Site Location	Owego, NY	Sampling Method	Peristaltic	Project #	134371-002

Well Information:

Depth of Well	31.45 ft.	*Measurements taken from:	
Depth to Water	20.58 ft.	X	Top of Well Casing
H_{wc}	ft.		Top of Protective Casing
Depth to Intake	30.0 ft.		(Other, Specify)

Start Purge Time: 13:10

Elapsed Time (min)	Depth to Water (ft)	10% Temperature (celsius)	0.1 pH	3% Conductivity (ms/cm)	10 mV Oxidation Reduction Potential	10% Dissolved Oxygen (mg/L)	10% Turbidity (NTU)	100 - 500 mL/min Flow Rate (mL/min)
1310 0	20.58	10.0	5.63	0.84	-10.3	9.63	59	120ML
1315 5	20.58	10.3	5.36	0.653	19.5	1.90	63.3	180ML
1320 10	20.61	10.5	5.14	0.514	257.7	1.55	50.2	180ml
1325 15	20.62	10.5	5.10	0.519	266.1	1.64	37.6	180 ml
1330 20	20.62	10.4	5.07	0.496	267.1	1.75	22.5	180 ml
1335 30	20.62	10.5	5.02	0.481	266.7	1.82	11.7	180ml
1340 35	20.63	10.4	5.01	0.479	269.2	1.85	9.34	180ml
1345 40	20.63	10.5	5.00	0.475	264.5	1.91	7.11	180ml

End Purge Time: 1345

Water Sample

Time Collected: 1345

Total volume of purged water removed: ~2 (gallons)

Physical appearance at start:
Color: Slightly turbid/cloudy
Odor: none
Sheen/Free Product: none

Physical appearance at stop:
Color: Clear
Odor: none
Sheen/Free Product: none

Field Test Results:

Dissolved ferrous iron:
Dissolved total iron:
Dissolved total manganese:

Sample	Container Type	# Collected	Field Filtered	Preservative	Container pH
VOCs - 8260	40mL Voa			HCL	-
PAH +1,4 Dx - 8270	1000mL Amber			None	-
Metals/Hg	500mL Plastic			HNO3	-
PFC Mod 537	250mL Plastic			None	-

MW4-011320-1345
4125-011320-0002

Low Flow Ground Water Sampling Log

Date	01/13/20	Personnel	RSL/DMN	Weather	Cloudy
Site Name	OWEGO MGP	Evacuation Method	PERI PUMP	Well #	PZ-6
Site Location	Owego, NY	Sampling Method	PERI PUMP	Project #	134371-002

Well Information:

Depth of Well	27.96	ft.
Depth to Water	21.90	ft.
H_{wc}	~~27.96~~	ft.
Depth to Intake		ft.

*Measurements taken from:

X	Top of Well Casing
	Top of Protective Casing
	(Other, Specify)

Start Purge Time: 1500

Elapsed Time (min)	Depth to Water (ft)	10% Temperature (celsius)	0.1 pH	3% Conductivity (ms/cm)	10 mV Oxidation Reduction Potential	10% Dissolved Oxygen (mg/L)	10% Turbidity (NTU)	100 - 500 mL/min Flow Rate (mL/min)
1500 0	21.90	10.8	5.63	0.93	34.6	7.53	>10,000	180
1505 5	21.96	11.0	5.66	0.89	23.4	7.06	1418 AM	180
1510 10	22.00	11.3	5.63	0.95	27.7	7.46	6682 AM	180
1515 15	22.00	11.4	5.64	0.91	29.3	7.28	>10,000	180
1520 20	22.00	11.4	5.65	0.89	31.9	7.12	>10,000	180
1525 25	22.00	11.4	5.65	0.92	32.4	7.54	>10,000	180
1530 30	22.00	11.3	5.64	0.93	32.4	7.24	858 AM	180
1535 35	22.00	11.3	5.66	0.92	31.5	6.98	115 MM	180
1540 40	22.00	11.4	5.66	0.92	32.5	7.27	61.3	180

End Purge Time:

Water Sample

Time Collected: 1540

Total volume of purged water removed: ~2 (gallons)

Physical appearance at start:		Physical appearance at stop:	
Color	Cloudy	Color	SL. TURB 10
Odor	None	Odor	None
Sheen/Free Product	None	Sheen/Free Product	None

Field Test Results:

Dissolved ferrous iron: _____

Dissolved total iron: _____

Dissolved total manganese: _____

Sample	Container Type	# Collected	Field Filtered	Preservative	Container pH
VOCs - 8260	40mL Voa			HCL	-
PAH +1,4 Dx - 8270	1000mL Amber			None	-
Metals/Hg	500mL Plastic			HNO3	-
PFC Mod 537	250mL Plastic			None	-

PZ-6
21.92 - DTW
27.95 - DTB

Well Condition
Good

PZ6-011320-1540

Low Flow Ground Water Sampling Log

Date	01/13/20	Personnel	R. Lydell, D. Nostrant	Weather	Cloudy 40°
Site Name	Owego MGP	Evacuation Method	Peri Pump	Well #	PZ-2
Site Location	Owego	Sampling Method	Peri Pump	Project #	

Well Information:

Depth of Well 27.27 ft.
Depth to Water 19.96 ft.
H_{wc} ft.
Depth to Intake ft.

*Measurements taken from:
- [X] Top of Well Casing
- [ ] Top of Protective Casing
- [ ] (Other, Specify)

Start Purge Time: 17:45

	Elapsed Time (min)	Depth to Water (ft)	10% Temperature (celsius)	0.1 pH	3% Conductivity (ms/cm)	10 mV Oxidation Reduction Potential	10% Dissolved Oxygen (mg/L)	10% Turbidity (NTU)	100 - 500 mL/min Flow Rate (mL/min)
17:45	0.0	21.17	9.1	5.05	0.361	190.6	5.63	23	100
17:50	5	21.13	9.4	4.66	0.348	243.0	3.87	11.12	100
17:55	10	21.12	9.5	4.64	0.348	254.3	3.64	10.87	100
18:00	15	21.12	9.9	4.70	0.348	255.9	3.52	9.56	100
18:05	20	21.12	9.60	4.75	0.349	259.6	3.45	8.73	100

End Purge Time:

Water Sample

Time Collected: 1810
Total volume of purged water removed: ~ 1/2 (gallons)

Physical appearance at start:
Color Slightly cloudy
Odor none
Sheen/Free Product none

Physical appearance at stop:
Color Clear
Odor none
Sheen/Free Product none

Field Test Results:

Dissolved ferrous iron: ~~Slightly cloudy~~
Dissolved total iron:
Dissolved total manganese:

Sample	Container Type	# Collected	Field Filtered	Preservative	Container pH
VOCs - 8260	40mL Voa			HCL	-
PAH +1,4 Dx - 8270	1000mL Amber			None	-
Metals/Hg	500mL Plastic			HNO3	-
PFC Mod 537	250mL Plastic			None	-

PZ2-011320-1810

Low Flow Ground Water Sampling Log

Date	1/13/2020	Personnel	DMN	Weather	cloudy 40°
Site Name	Owego MGP	Evacuation Method	Peri Pump	Well #	PZ-08
Site Location	Owego, NY	Sampling Method	Bailer	Project #	

Well Information:

Depth of Well: 27.53 ft.
Depth to Water: 18.04 ft.
H_{wc}: _____ ft.
Depth to Intake: _____ ft.

*Measurements taken from:

- [X] Top of Well Casing
- [ ] Top of Protective Casing
- [ ] (Other, Specify)

Start Purge Time:

Elapsed Time (min)	Depth to Water (ft)	10% Temperature (celsius)	0.1 pH	3% Conductivity (ms/cm)	10 mV Oxidation Reduction Potential	10% Dissolved Oxygen (mg/L)	10% Turbidity (NTU)	100 - 500 mL/min Flow Rate (mL/min)
1625 0	18.07	11.5	5.76	0.77	-90.0	4.94	7.13	200 ml/min
1630 5	18.57	11.2	5.84	0.75	-115.6	1.84	7.60	100 ml
1635 10	18.57	11.2	5.85	0.75	-139.1	0.62	2.41	100
1640 15	18.51	11.1	5.87	0.75	-155.0	0.38	3.02	100
1645 20	18.50	10.9	5.88	0.75	-166.0	0.31	2.35	100
1650 25	18.48	10.9	5.87	0.75	-177.0	0.25	2.90	100
1655 30	18.47	10.9	5.87	0.75	-184.0	0.20	2.08	100
1700 35	18.45	10.4	5.88	0.75	-189.4	0.19	2.44	100
1705 40		10.5	5.89	0.75	-191.6	0.19	2.03	100

End Purge Time: 1705

Water Sample

Time Collected: 1710

Total volume of purged water removed: ~1 (gallons)

Physical appearance at start:
Color: clear
Odor: none
Sheen/Free Product: none

Physical appearance at stop:
Color: clear
Odor: none
Sheen/Free Product: none

Field Test Results:

Dissolved ferrous iron: _____
Dissolved total iron: _____
Dissolved total manganese: _____

Sample	Container Type	# Collected	Field Filtered	Preservative	Container pH
VOCs - 8260	40mL Voa			HCL	-
PAH +1,4 Dx - 8270	1000mL Amber			None	-
Metals/Hg	500mL Plastic			HNO3	-
PFC Mod 537	250mL Plastic			None	-

PZ08-011320-1710 + MS/MSD

APPENDIX B

Data Usability Summary Report and Laboratory Reports

Haley & Aldrich, Inc.
600 South Meyer Ave
Suite 100
Tucson, AZ 85701
520.289.8621

Data Usability Summary Report

Project Name: Owego Former MGP Site

Analytical Laboratory: Eurofins TestAmerica Laboratories, Inc. – Amherst, NY;

Eurofins TestAmerica Laboratories, Inc. – Sacramento, CA

Validation Performed by: Santa McKenna

Validation Reviewed by: Katherine Miller and Denis Conley

Validation Date: 10 February 2020

Haley & Aldrich, Inc., prepared this Data Usability Summary Report (DUSR) to summarize the review and validation of the Owego Former MGP Site groundwater samples collected on 14 January 2020 and submitted to Eurofins TestAmerica Laboratories, Inc. – Amherst, NY. The analytical results for Sample Delivery Group(s) (SDG) listed below were reviewed to determine the data's usability.

This data validation and usability assessment was performed as per the guidance and requirements established by the U.S. Environmental Protection Agency's (EPA) *Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537* and the *Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3, Table B-15*. The QSM was used as a reference only. These samples were not analyzed in accordance with DoD protocol. The project-specific Quality Assurance Project Plan (QAPP) was also followed, herein referred to as the specified limits. The following quality assurance/quality control (QA/QC) criteria from the analysis of the project samples were reviewed as applicable:

1. Sample Delivery Group Number 480-165164-1 (TestAmerica)

- Holding Times/Preservation
- Reporting Limits and Sample Dilution
- Sample Preparation
- Blank Sample Analysis
- Laboratory Control Samples
- Matrix Spike Samples
- PFAS Identification
- Extraction Internal Standards
- Laboratory and Field Duplicate Sample Analysis
- Initial Calibration
- Initial and Continuing Calibration Verification
- Internal Standards
- Target Analyte Identification
- System Performance and Overall Assessment

Analytical precision and accuracy were evaluated based on the laboratory control or matrix spike analyses performed concurrently with the project samples or based on field duplicates collected at the site.

Data reported in this sampling event were reported to the laboratory method detection limit (MDL). Results found between the MDL and reporting limit (RL) are flagged "J" as estimated.

Sample data were qualified in accordance with laboratory's standard operating procedures (SOPs). The results presented in each laboratory report were found to be compliant with the data quality objectives for the project and therefore usable; any exceptions are noted in the following pages.

Results flagged by the laboratory as "I" for transition mass ratio for the indicated analyte(s) was outside of the established ratio limit were qualified J as estimated. This qualifier is unique to the method procedure at TestAmerica – Sacramento.

1. Sample Delivery Group Number 480-165164-1 (TestAmerica)

1.1 SAMPLE MANAGEMENT

This DUSR summarizes the review of SDG number 480-165164-1, dated 28 January 2020. Samples were collected, preserved, and shipped following standard chain of custody (COC) protocol. Samples were also received appropriately, identified correctly, and analyzed according to the chain of custody. COCs were appropriately signed and dated by the field and/or laboratory personnel with the following exceptions:

- Custody seals were not used on the sample cooler(s).

Analyses were performed on the following samples:

Sample ID	Sample Type	Lab ID	Sample Collection Date	Matrix	Methods
MW1-011320-1150	N	480-165364-1	1/13/2020	Groundwater	A, B
MW4-011320-1345	N	480-165164-2	1/13/2020	Groundwater	A, B
PZ6-011320-1540	N	480-165164-3	1/13/2017	Groundwater	A, B
4125-011420-0001	EB	480-165164-4	1/14/2020	Blank	A, B
4125-011320-0002	FD	480-165164-5	1/13/2020	Groundwater	A, B

Holding Times:

A. PFAS by Modified EPA Method 357, analyzed by TestAmerica - Sacramento ---------- 14 days/40 days*
B. 1,4-Dioxane by EPA 8270D (not included in this validation report) ----------7 days / 40 days*

**# days/# days notation indicates the holding time is # days for extraction and then an additional # days for analysis.*

1.2 HOLDING TIMES/PRESERVATION

The samples arrived at the laboratory at the proper temperature and were prepared and analyzed within the holding time and preservation criteria specified as per method's protocol.

Cooler temperature on arrival to the laboratory was: 3.3 degrees Celsius.

1.3 REPORTING LIMITS AND SAMPLE DILUTION

The reporting limits for the samples within this SDG met or were below the minimum reporting limit requirements specified by the project-specific QAPP. All dilutions were reviewed and found to be justified. Only detected analytes were reported from a dilution.

1.4 SAMPLE PREPARATION

Analysis of Per- and Polyfluoroalkyl Substances (PFAS) requires specific sample preparation. Aqueous samples must be prepared using Solid Phase Extraction (SPE), unless samples are known to contain high PFAS concentrations or the samples are injected directly into the LC/MS/MS instrument. Samples with > 1% solids may require centrifugation prior to SPE extraction. The entire sample plus bottle rinsate must be extracted using SPE. If high PFAS concentrations are known, the samples may alternately be prepared using serial dilution performed in duplicate. If prepared by serial dilution, there must be documented project approval for this deviation.

The reviewer confirmed SPE was used for sample preparation. Sample -1 contained sediment prior to extraction. No data qualification required.

1.5 BLANK SAMPLE ANALYSIS

Method blanks are prepared by the analytical laboratory and analyzed concurrently with the project samples to assess possible laboratory contamination. Method blank samples had no detections, indicating that no contamination from laboratory activities occurred with the following exceptions:

Blank Type	Batch ID	Analyte Detected in Blank	Concentration (ng/L)	Qualifier	Affected Samples
Method Blank	352287	Perfluorobutanoic acid (PFBA)	0.411 J	Sample result U	480-165164-3
				RL U	480-165164-2, -4, -5
	352287	Perfluorohexanesulfonic acid (PFHxS)	0.275 J	RL U	480-165164-1, -2, -3, -4, -5

Equipment blanks are prepared to identify contamination that may have been introduced while decontaminating sampling equipment. The analysis of the equipment blank sample for field quality control were free of target compounds, with the following exceptions:

Blank Type	Date of Blank	Analyte Detected in Blank	Concentration (ng/L)	Qualifier	Affected Samples
Equipment Blank	1/13/2020	Perfluorobutanoic acid (PFBA)	0.96 J	none	See method blank
Equipment Blank	1/13/2020	Perfluorohexanesulfonic acid (PFHxS)	0.27 J	none	See method blank

1.6 LABORATORY CONTROL SAMPLES

The laboratory control sample (LCS) analyses are used to assess the precision and accuracy of the analytical method independent of matrix interferences. Compounds associated with the LCS/ analyses exhibited recoveries and relative percent differences (RPDs) within the specified limits with the following exceptions:

- A LCSD was not reported for EPA Method 537. Because a site-specific matrix spike duplicate and field duplicate were analyzed, this data set includes site-specific precision quality control information.

1.7 MATRIX SPIKE SAMPLES

Matrix spike/matrix spike duplicate (MS/MSD) data are used to assess the precision and accuracy of the analytical method and evaluate the effects of the sample matrix on the sample preparation procedures and measurement methodologies. The sample(s) below were used for MS/MSD:

Lab Sample Number	Matrix Spike/ Matrix Spike Duplicate Sample Client ID	Method(s)
480-165364-1	MW1-011320-1150	PFAS

The MS/MSD recoveries and the RPD between the MS and MSD results were within the specified limits.

1.8 PFAS IDENTIFICATION

Identification of Per- and Polyfluoroalkyl Substances (PFAS) requires dual confirmation. The chemical derivation of the ion transitions must be documented. A minimum of two ion transitions and the ion transitions ratio per analyte are required for confirmation (except for PFBA and PFPeA). Ion ratios were reviewed and were within the limits of 50-150% and the signal to noise ratios (S/N) were ≥ 10 for all ions used for quantitation/ ≥ 3 for all ions used for confirmation, with the following exceptions:

Sample ID	Analyte	Qualifier
MW4-011320-1345	Perfluoroheptanoic acid Perfluorododecanoic acid	J+
PZ26-011320-1540	Perfluorooctanesulfonic acid	J+
4125-011320-0002	Perfluoroheptanoic acid Perfluorooctanesulfonic acid Perfluoroundecanoic acid	J+

Identification of Per- and Polyfluoroalkyl Substances (PFAS) also requires the proper assessment of branched and linear peaks. Standards for both isomers are not currently available for every PFAS compound, resulting in the common error of quantifying the area of only the branched or the linear isomers, which results in erroneous concentrations. Peaks were reviewed and the reviewer confirmed that, when applicable, the laboratory summed the branched and linear peaks.

1.9 EXTRACTION INTERNAL STANDARDS

Analysis of Per- and Polyfluoroalkyl Substances (PFAS) includes the use of internal standards (IS), which are stable isotope analogs of the PFAS compounds of interest added to each sample prior to extraction of the sample matrix. Matrix interferences that affect the quantification of the IS will affect the calculated target compound concentrations. Recoveries were reviewed and found to be within the limits of 50-150% of the ICAL midpoint standard/ initial CCV.

1.10 LABORATORY AND FIELD DUPLICATE SAMPLES

The laboratory duplicate sample analysis is used by the laboratory at the time of analysis to demonstrate acceptable method precision. The laboratory did not analyze any laboratory duplicates in this SDG.

The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The RPD comparison for any field duplicates in this SDG is shown below. RPDs were all below 35% for water (or the absolute difference rule was satisfied if detects were less than 5x the RL).

1.11 INITIAL CALIBRATION

Organic methods require an initial calibration to ensure the instrument is capable of producing acceptable qualitative and quantitative data. Standards of varying concentrations are run to create a calibration curve, which is then used to ensure the validity of compound quantitation. Proper concentrations for standards were used for the instruments and Relative Response Factors (RRFs) and %RSDs were within the specified limits.

1.12 INITIAL AND CONTINUING CALIBRATION VERIFICATION

Organic methods require an additional Initial Calibration Verification (ICV) and Continuing Calibration Verification (CCV) to ensure that the instrument continues to meet the sensitivity and linearity criteria to produce acceptable qualitative and quantitative data throughout each analytical sequence. CCVs must be run at the beginning and end of every 12-hour period of operation. Relative Response Factors (RRFs) and the Percent Difference (%D) and were within the specified limits.

1.13 INTERNAL STANDARDS

Internal standards are compounds added to each sample by the laboratory prior to sample analysis to ensure that instrument sensitivity and response are stable during each analysis. Area response and retention time were reviewed and found to be within the specified limits.

1.14 TARGET ANALYTE IDENTIFICATION

A review of the sample chromatographs and retention times for all organic compounds indicated no problems with target compound identification.

1.15 SAMPLE RESULT VERIFICATION

The below sample result(s) were tracked through the relevant sample preparation steps, raw data outputs, transcriptions, conversions and/or calculations and have been confirmed to be accurate and representative of the site.

Sample ID	Method	Analyte	Reported Result	Recalculated Result	Result Status
MW1-011320-1150	357	Perfluorooctanesulfonic acid (PFOS)	24	24.5	rounding
		Perfluoroundecanoic acid (PFUnA)	1.4	1.4	Confirmed
		Perfluoropentanoic Acid (PFPeA)	12	12	Confirmed

1.16 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

The results presented in this report were found to comply with the data quality objectives for the project and the guidelines specified by the analytical method. Based on the review of this report, the data are 100% useable. A summary of qualifiers applied to this SDG are shown below.

Sample ID	Analyte	Reported Result	Validated Result	Reason for Qualifier
4125-011320-0002	Perfluorooctanesulfonic acid (PFOS)	I	J+	Transition mass ratio for the indicated analyte(s) was outside of the established ratio limit and failed signal ratio
4125-011320-0002	Perfluoroheptanoic acid (PFHpA)	JI	J+	
MW4-011320-1345	Perfluorododecanoic acid (PFDoDA)	UI	UJ	
MW4-011320-1345	Perfluoroheptanoic acid (PFHpA)	JI	J+	
PZ6-011320-1540	Perfluorooctanesulfonic acid (PFOS)	JI	J+	
4125-011320-0002	Perfluoroundecanoic acid (PFUnA)	U	UJ	Failed signal ratio
4125-011320-0002	Perfluorohexanesulfonic acid (PFHxS)	0.76 J	1.9 U	Method blank contamination
4125-011320-0002	Perfluorobutanoic Acid (PFBA)	1.1 J	1.9 U	
4125-011420-0001	Perfluorohexanesulfonic acid (PFHxS)	0.27 J	1.9 U	
4125-011420-0001	Perfluorobutanoic Acid (PFBA)	0.96 J	1.9 U	
MW1-011320-1150	Perfluorohexanesulfonic acid (PFHxS)	1.7 J	1.9 U	
MW4-011320-1345	Perfluorohexanesulfonic acid (PFHxS)	0.66 J	2.0 U	
MW4-011320-1345	Perfluorobutanoic Acid (PFBA)	1.5 J	2.0 U	
PZ6-011320-1540	Perfluorohexanesulfonic acid (PFHxS)	0.62 J	1.9 U	
PZ6-011320-1540	Perfluorobutanoic Acid (PFBA)	2.3	2.3 U	

Glossary

- Sample Types:
  - N Primary Sample
  - FD Field Duplicate Sample
  - FB Field Blank Sample
  - EB Equipment Blank Sample
  - TB Trip Blank Sample
- Units:
  - µg/kg or ug/kg microgram per kilogram
  - µg/L or ug/L microgram per liter
  - mg/L milligram per liter
  - ng/L nanogram per liter
- Table Footnotes
  - NA Not applicable
  - ND Non-detect
  - NR Not reported
- Abbreviations
  - DUSR Data Usability Summary Report
  - SDG Sample Delivery Group
  - EPA Environmental Protection Agency
  - NFG National Functional Guidelines
  - PFAS Per- and Polyfluoroalkyl Substances
  - QAPP Quality Assurance Project Plan
  - QA/QC Quality Assurance/Quality Control
  - RL Laboratory Reporting Limit
  - MDL Laboratory Method Detection Limit
  - SOP Laboratory Standard Operating Procedures
  - COC Chain of Custody
  - SPE Solid Phase Extraction
  - %R Percent Recovery
  - RPD Relative Percent Difference
  - LCS/LCSD Laboratory Control Sample/Laboratory Control Sample Duplicate
  - MS/MSD Matrix Spike/Matrix Spike Duplicate
  - IS Internal Standards
  - ICAL Initial Calibration

Qualifiers

Results are qualified with the following codes in accordance with EPA National Functional Guidelines:

- Concentration (C) Qualifiers:
  - U The compound was analyzed for but not detected. The associated value is either the compound quantitation limit if not detected by the analytical instrument or could be the reported or blank concentration if qualified by blank contamination. This can also be displayed as less than the associated compound quantitation limit (<RL or <MDL), or "ND".
  - B The compound was found in the sample and its associated blank. Its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers:
  - E The compound was quantitated above the calibration range.
  - D The concentration is based on a diluted sample analysis.
- Validation Qualifiers:
  - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UJ The compound was not detected above the reported sample quantitation limit; however, the reported limit is estimated and may or may not represent the actual limit of quantitation.
  - NJ The analysis indicated the presence of a compound for which there is presumptive evidence to make a tentative identification; the associated numerical value is therefore an estimated concentration only.
  - R The sample results were rejected as unusable; the compound may or may not be present in the sample.

References

1. United States Environmental Protection Agency, 2014. R10 Data Validation and Review Guidelines for Polychlorinated Dibenzo-p-Dioxin and Polychlorinated Dibenzofuran Data (PCDD/PCDF) Using Method 1613B, and SW846 Method 8290A. EPA-910-R-14-003. May.

2. United States Environmental Protection Agency, 2018. Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537. EPA 910-R-18-001. November.

3. Department of Defense (DoD)/Department of Energy (DoE), 2019. Quality Systems Manual (QSM) for Environmental Laboratories. Version 5.3. Table B-15. Per- and Polyfluoroalkyl Substances (PFAS) Using Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS) With Isotope Dilution or Internal Standard Quantification in Matrices Other Than Drinking Water.

4. Parsons, New York State Specific Quality Assurance Project Plan, prepared for Avangrid. September 2018

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ANALYTICAL REPORT

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

Laboratory Job ID: 480-165164-1
Client Project/Site: Owego Former MGP Site

For:
Haley & Aldrich, Inc.
3 Bedford Farms Drive
Beford, New Hampshire 03110

Attn: Douglas C. Allen

Authorized for release by:
1/28/2020 3:45:40 PM
Alexander Gilbert, Project Management Assistant I
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Designee for

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Table of Contents

Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
E	Result exceeded calibration range.
U	Indicates the analyte was analyzed for but not detected.

LCMS

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-165164-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-165164-1

Comments
No additional comments.

Receipt
The samples were received on 1/14/2020 3:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3º C.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

LCMS
Method 537 (modified): The “I” qualifier means the transition mass ratio for the indicated analyte(s) was outside of the established ratio limits. The qualitative identification of the analyte(s) has/have some degree of uncertainty. However, analyst judgement was used to positively identify the analyte(s): PZ26-011320-1540 (480-165164-3)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3535: The following samples were observed to contain sediment prior to extraction: MW1-011320-1150 (480-165164-1), MW1-011320-1150 (480-165164-1[MS]) and MW1-011320-1150 (480-165164-1[MSD])

Method 3535: The following samples contain non-settleable particulate matter which clogged the solid-phase extraction column: MW1-011320-1150 (480-165164-1), MW1-011320-1150 (480-165164-1[MS]) and MW1-011320-1150 (480-165164-1[MSD])

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

Client Sample ID: MW1-011320-1150 — Lab Sample ID: 480-165164-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	13	B	1.9	0.33	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	12		1.9	0.46	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	9.0		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.2		1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	15		1.9	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	6.2		1.9	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	4.6		1.9	0.29	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.4	J	1.9	1.0	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	13		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.7	J B	1.9	0.16	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.33	J	1.9	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	24		1.9	0.51	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	0.35	J	1.9	0.33	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW4-011320-1345 — Lab Sample ID: 480-165164-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.5	J B	2.0	0.34	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	1.3	J	2.0	0.48	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.4	J I	2.0	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.7		2.0	0.83	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.92	J	2.0	0.20	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.66	J B	2.0	0.17	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.21	J	2.0	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.2		2.0	0.53	ng/L	1		537 (modified)	Total/NA
6:2 FTS	2.0	J	20	2.0	ng/L	1		537 (modified)	Total/NA

Client Sample ID: PZ6-011320-1540 — Lab Sample ID: 480-165164-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.3	B	1.9	0.33	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	1.4	J	1.9	0.47	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.3	J	1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	3.9		1.9	0.81	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.7		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.62	J B	1.9	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6	J I	1.9	0.51	ng/L	1		537 (modified)	Total/NA
6:2 FTS	4.1	J	19	1.9	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 4125-011420-0001 — Lab Sample ID: 480-165164-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.96	J B	1.9	0.32	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.27	J B	1.9	0.16	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 4125-011320-0002 — Lab Sample ID: 480-165164-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.1	J B	1.9	0.34	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	1.1	J	1.9	0.47	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.74	J I	1.9	0.24	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Buffalo

Client Sample ID: 4125-011320-0002 (Continued)

Lab Sample ID: 480-165164-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	2.9		1.9	0.82	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.0	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.76	J B	1.9	0.16	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.23	J	1.9	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.0	I	1.9	0.52	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

Client Sample ID: MW1-011320-1150
Date Collected: 01/13/20 11:50
Date Received: 01/14/20 15:30

Lab Sample ID: 480-165164-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.19	U	0.19	0.095	ug/L		01/17/20 08:51	01/20/20 19:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*27*		*15 - 110*	*01/17/20 08:51*	*01/20/20 19:00*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**13**	**B**	1.9	0.33	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluoropentanoic acid (PFPeA)	**12**		1.9	0.46	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorohexanoic acid (PFHxA)	**9.0**		1.9	0.55	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluoroheptanoic acid (PFHpA)	**6.2**		1.9	0.24	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorooctanoic acid (PFOA)	**15**		1.9	0.80	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorononanoic acid (PFNA)	**6.2**		1.9	0.26	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorodecanoic acid (PFDA)	**4.6**		1.9	0.29	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluoroundecanoic acid (PFUnA)	**1.4**	**J**	1.9	1.0	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorododecanoic acid (PFDoA)	1.9	U	1.9	0.52	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorotridecanoic acid (PFTriA)	1.9	U	1.9	1.2	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorotetradecanoic acid (PFTeA)	1.9	U	1.9	0.27	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorobutanesulfonic acid (PFBS)	**13**		1.9	0.19	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorohexanesulfonic acid (PFHxS)	**1.7**	**J B**	1.9	0.16	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.33**	**J**	1.9	0.18	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorooctanesulfonic acid (PFOS)	**24**		1.9	0.51	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorodecanesulfonic acid (PFDS)	1.9	U	1.9	0.30	ng/L		01/21/20 05:58	01/23/20 17:58	1
Perfluorooctanesulfonamide (FOSA)	**0.35**	**J**	1.9	0.33	ng/L		01/21/20 05:58	01/23/20 17:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19	U	19	2.9	ng/L		01/21/20 05:58	01/23/20 17:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19	U	19	1.8	ng/L		01/21/20 05:58	01/23/20 17:58	1
6:2 FTS	19	U	19	1.9	ng/L		01/21/20 05:58	01/23/20 17:58	1
8:2 FTS	19	U	19	1.9	ng/L		01/21/20 05:58	01/23/20 17:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*34*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C5 PFPeA	*32*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C2 PFHxA	*39*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C4 PFHpA	*37*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C4 PFOA	*37*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C5 PFNA	*36*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C2 PFDA	*40*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C2 PFUnA	*41*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C2 PFDoA	*38*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C2 PFTeDA	*36*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C3 PFBS	*35*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
18O2 PFHxS	*36*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C4 PFOS	*35*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
13C8 FOSA	*33*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
d3-NMeFOSAA	*31*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*

Client Sample ID: MW1-011320-1150

Lab Sample ID: 480-165164-1
Matrix: Water
Date Collected: 01/13/20 11:50
Date Received: 01/14/20 15:30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*37*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
M2-6:2 FTS	*44*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*
M2-8:2 FTS	*60*		*25 - 150*	*01/21/20 05:58*	*01/23/20 17:58*	*1*

Client Sample ID: MW4-011320-1345

Lab Sample ID: 480-165164-2
Matrix: Water
Date Collected: 01/13/20 13:45
Date Received: 01/14/20 15:30

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.19	U	0.19	0.095	ug/L		01/17/20 08:51	01/20/20 22:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*26*		*15 - 110*	*01/17/20 08:51*	*01/20/20 22:29*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**1.5**	**J B**	2.0	0.34	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluoropentanoic acid (PFPeA)	**1.3**	**J**	2.0	0.48	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorohexanoic acid (PFHxA)	2.0	U	2.0	0.57	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluoroheptanoic acid (PFHpA)	**1.4**	**J I**	2.0	0.24	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorooctanoic acid (PFOA)	**2.7**		2.0	0.83	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorononanoic acid (PFNA)	2.0	U	2.0	0.26	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorodecanoic acid (PFDA)	2.0	U	2.0	0.30	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluoroundecanoic acid (PFUnA)	2.0	U	2.0	1.1	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorododecanoic acid (PFDoA)	2.0	U I	2.0	0.54	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorotridecanoic acid (PFTriA)	2.0	U	2.0	1.3	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorotetradecanoic acid (PFTeA)	2.0	U	2.0	0.28	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorobutanesulfonic acid (PFBS)	**0.92**	**J**	2.0	0.20	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorohexanesulfonic acid (PFHxS)	**0.66**	**J B**	2.0	0.17	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.21**	**J**	2.0	0.19	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorooctanesulfonic acid (PFOS)	**6.2**		2.0	0.53	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorodecanesulfonic acid (PFDS)	2.0	U	2.0	0.31	ng/L		01/21/20 05:58	01/23/20 18:28	1
Perfluorooctanesulfonamide (FOSA)	2.0	U	2.0	0.34	ng/L		01/21/20 05:58	01/23/20 18:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	20	U	20	3.0	ng/L		01/21/20 05:58	01/23/20 18:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	20	U	20	1.9	ng/L		01/21/20 05:58	01/23/20 18:28	1
6:2 FTS	**2.0**	**J**	20	2.0	ng/L		01/21/20 05:58	01/23/20 18:28	1
8:2 FTS	20	U	20	2.0	ng/L		01/21/20 05:58	01/23/20 18:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*80*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C5 PFPeA	*81*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C2 PFHxA	*106*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C4 PFHpA	*97*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C4 PFOA	*96*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C5 PFNA	*98*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C2 PFDA	*99*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*

Client Sample ID: MW4-011320-1345

Lab Sample ID: 480-165164-2

Date Collected: 01/13/20 13:45

Matrix: Water

Date Received: 01/14/20 15:30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFUnA	*107*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C2 PFDoA	*111*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C2 PFTeDA	*114*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C3 PFBS	*98*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
18O2 PFHxS	*104*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C4 PFOS	*101*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
13C8 FOSA	*94*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
d3-NMeFOSAA	*92*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
d5-NEtFOSAA	*98*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
M2-6:2 FTS	*109*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*
M2-8:2 FTS	*104*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:28*	*1*

Client Sample ID: PZ6-011320-1540

Lab Sample ID: 480-165164-3

Date Collected: 01/13/20 15:40

Matrix: Water

Date Received: 01/14/20 15:30

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.19	U	0.19	0.095	ug/L		01/17/20 08:51	01/20/20 22:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*26*		*15 - 110*	*01/17/20 08:51*	*01/20/20 22:52*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.3**	**B**	1.9	0.33	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluoropentanoic acid (PFPeA)	**1.4**	**J**	1.9	0.47	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorohexanoic acid (PFHxA)	**1.3**	**J**	1.9	0.55	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	1.9	0.24	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorooctanoic acid (PFOA)	**3.9**		1.9	0.81	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorononanoic acid (PFNA)	1.9	U	1.9	0.26	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorodecanoic acid (PFDA)	1.9	U	1.9	0.30	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluoroundecanoic acid (PFUnA)	1.9	U	1.9	1.0	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorododecanoic acid (PFDoA)	1.9	U	1.9	0.52	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorotridecanoic acid (PFTriA)	1.9	U	1.9	1.2	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorotetradecanoic acid (PFTeA)	1.9	U	1.9	0.28	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorobutanesulfonic acid (PFBS)	**5.7**		1.9	0.19	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorohexanesulfonic acid (PFHxS)	**0.62**	**J B**	1.9	0.16	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	1.9	0.18	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**J I**	1.9	0.51	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorodecanesulfonic acid (PFDS)	1.9	U	1.9	0.30	ng/L		01/21/20 05:58	01/23/20 18:38	1
Perfluorooctanesulfonamide (FOSA)	1.9	U	1.9	0.33	ng/L		01/21/20 05:58	01/23/20 18:38	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19	U	19	3.0	ng/L		01/21/20 05:58	01/23/20 18:38	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19	U	19	1.8	ng/L		01/21/20 05:58	01/23/20 18:38	1
6:2 FTS	**4.1**	**J**	19	1.9	ng/L		01/21/20 05:58	01/23/20 18:38	1
8:2 FTS	19	U	19	1.9	ng/L		01/21/20 05:58	01/23/20 18:38	1

Client Sample ID: PZ6-011320-1540

Date Collected: 01/13/20 15:40
Date Received: 01/14/20 15:30

Lab Sample ID: 480-165164-3

Matrix: Water

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*87*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C5 PFPeA	*85*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C2 PFHxA	*100*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C4 PFHpA	*96*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C4 PFOA	*100*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C5 PFNA	*97*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C2 PFDA	*97*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C2 PFUnA	*103*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C2 PFDoA	*100*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C2 PFTeDA	*108*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C3 PFBS	*97*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
18O2 PFHxS	*104*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C4 PFOS	*95*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
13C8 FOSA	*98*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
d5-NEtFOSAA	*93*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
M2-6:2 FTS	*109*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*
M2-8:2 FTS	*108*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:38*	*1*

Client Sample ID: 4125-011420-0001

Date Collected: 01/14/20 10:00
Date Received: 01/14/20 15:30

Lab Sample ID: 480-165164-4

Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.19	U	0.19	0.095	ug/L		01/17/20 08:51	01/20/20 23:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*29*		*15 - 110*	*01/17/20 08:51*	*01/20/20 23:15*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**0.96**	**J B**	1.9	0.32	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluoropentanoic acid (PFPeA)	1.9	U	1.9	0.45	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorohexanoic acid (PFHxA)	1.9	U	1.9	0.54	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	1.9	0.23	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorooctanoic acid (PFOA)	1.9	U	1.9	0.79	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorononanoic acid (PFNA)	1.9	U	1.9	0.25	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorodecanoic acid (PFDA)	1.9	U	1.9	0.29	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluoroundecanoic acid (PFUnA)	1.9	U	1.9	1.0	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorododecanoic acid (PFDoA)	1.9	U	1.9	0.51	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorotridecanoic acid (PFTriA)	1.9	U	1.9	1.2	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorotetradecanoic acid (PFTeA)	1.9	U	1.9	0.27	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorobutanesulfonic acid (PFBS)	1.9	U	1.9	0.19	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorohexanesulfonic acid (PFHxS)	**0.27**	**J B**	1.9	0.16	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.9	U	1.9	0.18	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorooctanesulfonic acid (PFOS)	1.9	U	1.9	0.50	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorodecanesulfonic acid (PFDS)	1.9	U	1.9	0.30	ng/L		01/21/20 05:58	01/23/20 18:48	1
Perfluorooctanesulfonamide (FOSA)	1.9	U	1.9	0.32	ng/L		01/21/20 05:58	01/23/20 18:48	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19	U	19	2.9	ng/L		01/21/20 05:58	01/23/20 18:48	1

Client Sample ID: 4125-011420-0001

Lab Sample ID: 480-165164-4

Date Collected: 01/14/20 10:00
Date Received: 01/14/20 15:30

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19	U	19	1.8	ng/L		01/21/20 05:58	01/23/20 18:48	1
6:2 FTS	19	U	19	1.9	ng/L		01/21/20 05:58	01/23/20 18:48	1
8:2 FTS	19	U	19	1.9	ng/L		01/21/20 05:58	01/23/20 18:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*96*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C5 PFPeA	*96*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C2 PFHxA	*104*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C4 PFHpA	*100*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C4 PFOA	*97*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C5 PFNA	*101*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C2 PFDA	*99*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C2 PFUnA	*103*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C2 PFDoA	*102*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C2 PFTeDA	*110*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C3 PFBS	*101*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
18O2 PFHxS	*106*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C4 PFOS	*98*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
13C8 FOSA	*95*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
d5-NEtFOSAA	*94*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
M2-6:2 FTS	*103*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*
M2-8:2 FTS	*110*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:48*	*1*

Client Sample ID: 4125-011320-0002

Lab Sample ID: 480-165164-5

Date Collected: 01/13/20 10:00
Date Received: 01/14/20 15:30

Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.19	U	0.19	0.095	ug/L		01/17/20 08:51	01/20/20 23:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*27*		*15 - 110*	*01/17/20 08:51*	*01/20/20 23:38*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**1.1**	**J B**	1.9	0.34	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluoropentanoic acid (PFPeA)	**1.1**	**J**	1.9	0.47	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorohexanoic acid (PFHxA)	1.9	U	1.9	0.56	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluoroheptanoic acid (PFHpA)	**0.74**	**J I**	1.9	0.24	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorooctanoic acid (PFOA)	**2.9**		1.9	0.82	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorononanoic acid (PFNA)	1.9	U	1.9	0.26	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorodecanoic acid (PFDA)	1.9	U	1.9	0.30	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluoroundecanoic acid (PFUnA)	1.9	U	1.9	1.1	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorododecanoic acid (PFDoA)	1.9	U	1.9	0.53	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorotridecanoic acid (PFTriA)	1.9	U	1.9	1.3	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorotetradecanoic acid (PFTeA)	1.9	U	1.9	0.28	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorobutanesulfonic acid (PFBS)	**1.0**	**J**	1.9	0.19	ng/L		01/21/20 05:58	01/23/20 18:58	1

Client Sample ID: 4125-011320-0002
Date Collected: 01/13/20 10:00
Date Received: 01/14/20 15:30

Lab Sample ID: 480-165164-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	**0.76**	**J B**	1.9	0.16	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.23**	**J**	1.9	0.18	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorooctanesulfonic acid (PFOS)	**7.0**	**I**	1.9	0.52	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorodecanesulfonic acid (PFDS)	1.9	U	1.9	0.31	ng/L		01/21/20 05:58	01/23/20 18:58	1
Perfluorooctanesulfonamide (FOSA)	1.9	U	1.9	0.34	ng/L		01/21/20 05:58	01/23/20 18:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19	U	19	3.0	ng/L		01/21/20 05:58	01/23/20 18:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19	U	19	1.8	ng/L		01/21/20 05:58	01/23/20 18:58	1
6:2 FTS	19	U	19	1.9	ng/L		01/21/20 05:58	01/23/20 18:58	1
8:2 FTS	19	U	19	1.9	ng/L		01/21/20 05:58	01/23/20 18:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*79*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C5 PFPeA	*80*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C2 PFHxA	*102*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C4 PFHpA	*95*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C4 PFOA	*95*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C5 PFNA	*95*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C2 PFDA	*95*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C2 PFUnA	*107*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C2 PFDoA	*104*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C2 PFTeDA	*109*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C3 PFBS	*93*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
18O2 PFHxS	*99*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C4 PFOS	*99*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
13C8 FOSA	*95*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
d3-NMeFOSAA	*91*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
M2-6:2 FTS	*105*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*
M2-8:2 FTS	*102*		*25 - 150*	*01/21/20 05:58*	*01/23/20 18:58*	*1*

Isotope Dilution Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DXE (15-110)
480-165164-1	MW1-011320-1150	27
480-165164-1 MS	MW1-011320-1150	26
480-165164-1 MSD	MW1-011320-1150	26
480-165164-2	MW4-011320-1345	26
480-165164-3	PZ6-011320-1540	26
480-165164-4	4125-011420-0001	29
480-165164-5	4125-011320-0002	27
LCS 480-513951/2-A	Lab Control Sample	31
MB 480-513951/1-A	Method Blank	32

Surrogate Legend

DXE = 1,4-Dioxane-d8

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	PFHpA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
480-165164-1	MW1-011320-1150	34	32	39	37	37	36	40	41
480-165164-1 MS	MW1-011320-1150	38	36	43	43	42	44	45	46
480-165164-1 MSD	MW1-011320-1150	42	39	50	47	47	45	48	51
480-165164-2	MW4-011320-1345	80	81	106	97	96	98	99	107
480-165164-3	PZ6-011320-1540	87	85	100	96	100	97	97	103
480-165164-4	4125-011420-0001	96	96	104	100	97	101	99	103
480-165164-5	4125-011320-0002	79	80	102	95	95	95	95	107
LCS 320-351984/2-A	Lab Control Sample	99	103	101	99	101	97	97	99
MB 320-351984/1-A	Method Blank	96	94	94	97	97	91	94	100

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	3C3-PFB (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	-NMeFOS (25-150)	-NEtFOS (25-150)
480-165164-1	MW1-011320-1150	38	36	35	36	35	33	31	37
480-165164-1 MS	MW1-011320-1150	42	41	41	42	39	39	32	42
480-165164-1 MSD	MW1-011320-1150	47	47	46	47	45	43	36	49
480-165164-2	MW4-011320-1345	111	114	98	104	101	94	92	98
480-165164-3	PZ6-011320-1540	100	108	97	104	95	98	88	93
480-165164-4	4125-011420-0001	102	110	101	106	98	95	88	94
480-165164-5	4125-011320-0002	104	109	93	99	99	95	91	97
LCS 320-351984/2-A	Lab Control Sample	99	110	100	101	101	94	93	98
MB 320-351984/1-A	Method Blank	96	102	97	98	97	92	88	96

		Percent Isotope Dilution Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	M262FTS (25-150)	M282FTS (25-150)
480-165164-1	MW1-011320-1150	44	60
480-165164-1 MS	MW1-011320-1150	54	69
480-165164-1 MSD	MW1-011320-1150	55	76
480-165164-2	MW4-011320-1345	109	104
480-165164-3	PZ6-011320-1540	109	108
480-165164-4	4125-011420-0001	103	110
480-165164-5	4125-011320-0002	105	102

Isotope Dilution Summary

Client: Haley & Aldrich, Inc.
Job ID: 480-165164-1
Project/Site: Owego Former MGP Site

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Water
Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	**Client Sample ID**	**M262FTS (25-150)**	**M282FTS (25-150)**								
LCS 320-351984/2-A	Lab Control Sample	97	117								
MB 320-351984/1-A	Method Blank	93	101								

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
PFHpA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
13C3-PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
PFOSA = 13C8 FOSA
d3-NMeFOSAA = d3-NMeFOSAA
d5-NEtFOSAA = d5-NEtFOSAA
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Lab Sample ID: MB 480-513951/1-A
Matrix: Water
Analysis Batch: 514183

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 513951

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20	U	0.20	0.10	ug/L		01/17/20 08:51	01/20/20 15:32	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*32*		*15 - 110*	*01/17/20 08:51*	*01/20/20 15:32*	*1*

Lab Sample ID: LCS 480-513951/2-A
Matrix: Water
Analysis Batch: 514183

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 513951

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	1.00	1.19		ug/L		119	40 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8	*31*		*15 - 110*

Lab Sample ID: 480-165164-1 MS
Matrix: Water
Analysis Batch: 514183

Client Sample ID: MW1-011320-1150
Prep Type: Total/NA
Prep Batch: 513951

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	0.19	U	0.952	1.16	E	ug/L		122	40 - 140

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
1,4-Dioxane-d8	*26*		*15 - 110*

Lab Sample ID: 480-165164-1 MSD
Matrix: Water
Analysis Batch: 514183

Client Sample ID: MW1-011320-1150
Prep Type: Total/NA
Prep Batch: 513951

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	0.19	U	0.962	1.16	E	ug/L		121	40 - 140	0	20

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,4-Dioxane-d8	*26*		*15 - 110*

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-351984/1-A
Matrix: Water
Analysis Batch: 352287

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 351984

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.411	J	2.0	0.35	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluoropentanoic acid (PFPeA)	2.0	U	2.0	0.49	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorohexanoic acid (PFHxA)	2.0	U	2.0	0.58	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluoroheptanoic acid (PFHpA)	2.0	U	2.0	0.25	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorooctanoic acid (PFOA)	2.0	U	2.0	0.85	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorononanoic acid (PFNA)	2.0	U	2.0	0.27	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorodecanoic acid (PFDA)	2.0	U	2.0	0.31	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluoroundecanoic acid (PFUnA)	2.0	U	2.0	1.1	ng/L		01/21/20 05:58	01/22/20 17:42	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-351984/1-A
Matrix: Water
Analysis Batch: 352287

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 351984

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	2.0	U	2.0	0.55	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorotridecanoic acid (PFTriA)	2.0	U	2.0	1.3	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorotetradecanoic acid (PFTeA)	2.0	U	2.0	0.29	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.0	0.20	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorohexanesulfonic acid (PFHxS)	0.275	J	2.0	0.17	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluoroheptanesulfonic Acid (PFHpS)	2.0	U	2.0	0.19	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorooctanesulfonic acid (PFOS)	2.0	U	2.0	0.54	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorodecanesulfonic acid (PFDS)	2.0	U	2.0	0.32	ng/L		01/21/20 05:58	01/22/20 17:42	1
Perfluorooctanesulfonamide (FOSA)	2.0	U	2.0	0.35	ng/L		01/21/20 05:58	01/22/20 17:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	20	U	20	3.1	ng/L		01/21/20 05:58	01/22/20 17:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	20	U	20	1.9	ng/L		01/21/20 05:58	01/22/20 17:42	1
6:2 FTS	20	U	20	2.0	ng/L		01/21/20 05:58	01/22/20 17:42	1
8:2 FTS	20	U	20	2.0	ng/L		01/21/20 05:58	01/22/20 17:42	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*96*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C5 PFPeA	*94*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C2 PFHxA	*94*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C4 PFHpA	*97*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C4 PFOA	*97*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C5 PFNA	*91*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C2 PFDA	*94*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C2 PFUnA	*100*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C2 PFDoA	*96*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C2 PFTeDA	*102*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C3 PFBS	*97*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
18O2 PFHxS	*98*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C4 PFOS	*97*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
13C8 FOSA	*92*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
d5-NEtFOSAA	*96*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
M2-6:2 FTS	*93*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*
M2-8:2 FTS	*101*		*25 - 150*	*01/21/20 05:58*	*01/22/20 17:42*	*1*

Lab Sample ID: LCS 320-351984/2-A
Matrix: Water
Analysis Batch: 352287

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 351984

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	47.7		ng/L		119	70 - 130
Perfluoropentanoic acid (PFPeA)	40.0	45.1		ng/L		113	70 - 130
Perfluorohexanoic acid (PFHxA)	40.0	48.1		ng/L		120	70 - 130
Perfluoroheptanoic acid (PFHpA)	40.0	48.5		ng/L		121	70 - 130
Perfluorooctanoic acid (PFOA)	40.0	44.3		ng/L		111	70 - 130
Perfluorononanoic acid (PFNA)	40.0	47.8		ng/L		119	70 - 130
Perfluorodecanoic acid (PFDA)	40.0	47.8		ng/L		119	70 - 130

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-351984/2-A
Matrix: Water
Analysis Batch: 352287

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 351984

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroundecanoic acid (PFUnA)	40.0	43.6		ng/L		109	70 - 130
Perfluorododecanoic acid (PFDoA)	40.0	48.7		ng/L		122	70 - 130
Perfluorotridecanoic acid (PFTriA)	40.0	49.5		ng/L		124	70 - 130
Perfluorotetradecanoic acid (PFTeA)	40.0	45.4		ng/L		113	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.4	42.6		ng/L		120	70 - 130
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.4		ng/L		103	70 - 130
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	45.1		ng/L		118	70 - 130
Perfluorooctanesulfonic acid (PFOS)	37.1	41.4		ng/L		112	70 - 130
Perfluorodecanesulfonic acid (PFDS)	38.6	43.0		ng/L		111	70 - 130
Perfluorooctanesulfonamide (FOSA)	40.0	46.6		ng/L		116	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	44.0		ng/L		110	70 - 130
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	43.9		ng/L		110	70 - 130
6:2 FTS	37.9	43.6		ng/L		115	70 - 130
8:2 FTS	38.3	36.8		ng/L		96	70 - 130

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*99*		*25 - 150*
13C5 PFPeA	*103*		*25 - 150*
13C2 PFHxA	*101*		*25 - 150*
13C4 PFHpA	*99*		*25 - 150*
13C4 PFOA	*101*		*25 - 150*
13C5 PFNA	*97*		*25 - 150*
13C2 PFDA	*97*		*25 - 150*
13C2 PFUnA	*99*		*25 - 150*
13C2 PFDoA	*99*		*25 - 150*
13C2 PFTeDA	*110*		*25 - 150*
13C3 PFBS	*100*		*25 - 150*
18O2 PFHxS	*101*		*25 - 150*
13C4 PFOS	*101*		*25 - 150*
13C8 FOSA	*94*		*25 - 150*
d3-NMeFOSAA	*93*		*25 - 150*
d5-NEtFOSAA	*98*		*25 - 150*
M2-6:2 FTS	*97*		*25 - 150*
M2-8:2 FTS	*117*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-165164-1 MS
Matrix: Water
Analysis Batch: 352654

Client Sample ID: MW1-011320-1150
Prep Type: Total/NA
Prep Batch: 351984

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	13	B	38.7	54.6		ng/L		106	76 - 136
Perfluoropentanoic acid (PFPeA)	12		38.7	56.8		ng/L		115	71 - 131
Perfluorohexanoic acid (PFHxA)	9.0		38.7	54.8		ng/L		118	73 - 133
Perfluoroheptanoic acid (PFHpA)	6.2		38.7	51.4		ng/L		117	72 - 132
Perfluorooctanoic acid (PFOA)	15		38.7	60.9		ng/L		119	70 - 130
Perfluorononanoic acid (PFNA)	6.2		38.7	50.6		ng/L		115	75 - 135
Perfluorodecanoic acid (PFDA)	4.6		38.7	47.3		ng/L		110	76 - 136
Perfluoroundecanoic acid (PFUnA)	1.4	J	38.7	43.4		ng/L		109	68 - 128
Perfluorododecanoic acid (PFDoA)	1.9	U	38.7	39.8		ng/L		103	71 - 131
Perfluorotridecanoic acid (PFTriA)	1.9	U	38.7	41.1		ng/L		106	71 - 131
Perfluorotetradecanoic acid (PFTeA)	1.9	U	38.7	39.0		ng/L		101	70 - 130
Perfluorobutanesulfonic acid (PFBS)	13		34.2	49.3		ng/L		106	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	1.7	J B	35.2	40.3		ng/L		110	59 - 119
Perfluoroheptanesulfonic Acid (PFHpS)	0.33	J	36.8	46.3		ng/L		125	76 - 136
Perfluorooctanesulfonic acid (PFOS)	24		35.9	69.9		ng/L		127	70 - 130
Perfluorodecanesulfonic acid (PFDS)	1.9	U	37.3	40.9		ng/L		110	71 - 131
Perfluorooctanesulfonamide (FOSA)	0.35	J	38.7	41.9		ng/L		107	73 - 133
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19	U	38.7	46.3		ng/L		120	76 - 136
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19	U	38.7	43.6		ng/L		113	76 - 136
6:2 FTS	19	U	36.7	39.2		ng/L		107	59 - 175
8:2 FTS	19	U	37.1	43.4		ng/L		117	75 - 135

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFBA	*38*		*25 - 150*
13C5 PFPeA	*36*		*25 - 150*
13C2 PFHxA	*43*		*25 - 150*
13C4 PFHpA	*43*		*25 - 150*
13C4 PFOA	*42*		*25 - 150*
13C5 PFNA	*44*		*25 - 150*
13C2 PFDA	*45*		*25 - 150*
13C2 PFUnA	*46*		*25 - 150*
13C2 PFDoA	*42*		*25 - 150*
13C2 PFTeDA	*41*		*25 - 150*
13C3 PFBS	*41*		*25 - 150*
18O2 PFHxS	*42*		*25 - 150*
13C4 PFOS	*39*		*25 - 150*
13C8 FOSA	*39*		*25 - 150*
d3-NMeFOSAA	*32*		*25 - 150*
d5-NEtFOSAA	*42*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-165164-1 MS
Matrix: Water
Analysis Batch: 352654

Client Sample ID: MW1-011320-1150
Prep Type: Total/NA
Prep Batch: 351984

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
M2-6:2 FTS	54		25 - 150
M2-8:2 FTS	69		25 - 150

Lab Sample ID: 480-165164-1 MSD
Matrix: Water
Analysis Batch: 352654

Client Sample ID: MW1-011320-1150
Prep Type: Total/NA
Prep Batch: 351984

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	13	B	38.7	53.3		ng/L		103	76 - 136	2	30
Perfluoropentanoic acid (PFPeA)	12		38.7	54.4		ng/L		109	71 - 131	4	30
Perfluorohexanoic acid (PFHxA)	9.0		38.7	51.5		ng/L		110	73 - 133	6	30
Perfluoroheptanoic acid (PFHpA)	6.2		38.7	52.5		ng/L		120	72 - 132	2	30
Perfluorooctanoic acid (PFOA)	15		38.7	57.6		ng/L		110	70 - 130	6	30
Perfluorononanoic acid (PFNA)	6.2		38.7	52.2		ng/L		119	75 - 135	3	30
Perfluorodecanoic acid (PFDA)	4.6		38.7	47.8		ng/L		112	76 - 136	1	30
Perfluoroundecanoic acid (PFUnA)	1.4	J	38.7	43.0		ng/L		107	68 - 128	1	30
Perfluorododecanoic acid (PFDoA)	1.9	U	38.7	40.6		ng/L		105	71 - 131	2	30
Perfluorotridecanoic acid (PFTriA)	1.9	U	38.7	44.0		ng/L		114	71 - 131	7	30
Perfluorotetradecanoic acid (PFTeA)	1.9	U	38.7	42.5		ng/L		110	70 - 130	9	30
Perfluorobutanesulfonic acid (PFBS)	13		34.2	53.4		ng/L		118	67 - 127	8	30
Perfluorohexanesulfonic acid (PFHxS)	1.7	J B	35.2	39.3		ng/L		107	59 - 119	3	30
Perfluoroheptanesulfonic Acid (PFHpS)	0.33	J	36.8	45.5		ng/L		123	76 - 136	2	30
Perfluorooctanesulfonic acid (PFOS)	24		35.9	60.5		ng/L		101	70 - 130	15	30
Perfluorodecanesulfonic acid (PFDS)	1.9	U	37.3	42.2		ng/L		113	71 - 131	3	30
Perfluorooctanesulfonamide (FOSA)	0.35	J	38.7	42.3		ng/L		108	73 - 133	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	19	U	38.7	47.1		ng/L		122	76 - 136	2	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	19	U	38.7	41.9		ng/L		108	76 - 136	4	30
6:2 FTS	19	U	36.7	39.6		ng/L		108	59 - 175	1	30
8:2 FTS	19	U	37.1	38.7		ng/L		104	75 - 135	11	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C4 PFBA	42		25 - 150
13C5 PFPeA	39		25 - 150
13C2 PFHxA	50		25 - 150
13C4 PFHpA	47		25 - 150
13C4 PFOA	47		25 - 150
13C5 PFNA	45		25 - 150
13C2 PFDA	48		25 - 150
13C2 PFUnA	51		25 - 150
13C2 PFDoA	47		25 - 150

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-165164-1 MSD
Matrix: Water
Analysis Batch: 352654

Client Sample ID: MW1-011320-1150
Prep Type: Total/NA
Prep Batch: 351984

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFTeDA	47		25 - 150
13C3 PFBS	46		25 - 150
18O2 PFHxS	47		25 - 150
13C4 PFOS	45		25 - 150
13C8 FOSA	43		25 - 150
d3-NMeFOSAA	36		25 - 150
d5-NEtFOSAA	49		25 - 150
M2-6:2 FTS	55		25 - 150
M2-8:2 FTS	76		25 - 150

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

GC/MS Semi VOA

Prep Batch: 513951

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-165164-1	MW1-011320-1150	Total/NA	Water	3510C	
480-165164-2	MW4-011320-1345	Total/NA	Water	3510C	
480-165164-3	PZ6-011320-1540	Total/NA	Water	3510C	
480-165164-4	4125-011420-0001	Total/NA	Water	3510C	
480-165164-5	4125-011320-0002	Total/NA	Water	3510C	
MB 480-513951/1-A	Method Blank	Total/NA	Water	3510C	
LCS 480-513951/2-A	Lab Control Sample	Total/NA	Water	3510C	
480-165164-1 MS	MW1-011320-1150	Total/NA	Water	3510C	
480-165164-1 MSD	MW1-011320-1150	Total/NA	Water	3510C	

Analysis Batch: 514183

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-165164-1	MW1-011320-1150	Total/NA	Water	8270D SIM ID	513951
480-165164-2	MW4-011320-1345	Total/NA	Water	8270D SIM ID	513951
480-165164-3	PZ6-011320-1540	Total/NA	Water	8270D SIM ID	513951
480-165164-4	4125-011420-0001	Total/NA	Water	8270D SIM ID	513951
480-165164-5	4125-011320-0002	Total/NA	Water	8270D SIM ID	513951
MB 480-513951/1-A	Method Blank	Total/NA	Water	8270D SIM ID	513951
LCS 480-513951/2-A	Lab Control Sample	Total/NA	Water	8270D SIM ID	513951
480-165164-1 MS	MW1-011320-1150	Total/NA	Water	8270D SIM ID	513951
480-165164-1 MSD	MW1-011320-1150	Total/NA	Water	8270D SIM ID	513951

LCMS

Prep Batch: 351984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-165164-1	MW1-011320-1150	Total/NA	Water	3535	
480-165164-2	MW4-011320-1345	Total/NA	Water	3535	
480-165164-3	PZ6-011320-1540	Total/NA	Water	3535	
480-165164-4	4125-011420-0001	Total/NA	Water	3535	
480-165164-5	4125-011320-0002	Total/NA	Water	3535	
MB 320-351984/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-351984/2-A	Lab Control Sample	Total/NA	Water	3535	
480-165164-1 MS	MW1-011320-1150	Total/NA	Water	3535	
480-165164-1 MSD	MW1-011320-1150	Total/NA	Water	3535	

Analysis Batch: 352287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-351984/1-A	Method Blank	Total/NA	Water	537 (modified)	351984
LCS 320-351984/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	351984

Analysis Batch: 352654

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-165164-1	MW1-011320-1150	Total/NA	Water	537 (modified)	351984
480-165164-2	MW4-011320-1345	Total/NA	Water	537 (modified)	351984
480-165164-3	PZ6-011320-1540	Total/NA	Water	537 (modified)	351984
480-165164-4	4125-011420-0001	Total/NA	Water	537 (modified)	351984
480-165164-5	4125-011320-0002	Total/NA	Water	537 (modified)	351984
480-165164-1 MS	MW1-011320-1150	Total/NA	Water	537 (modified)	351984
480-165164-1 MSD	MW1-011320-1150	Total/NA	Water	537 (modified)	351984

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

Client Sample ID: MW1-011320-1150
Lab Sample ID: 480-165164-1
Date Collected: 01/13/20 11:50
Matrix: Water
Date Received: 01/14/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			513951	01/17/20 08:51	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	514183	01/20/20 19:00	JMM	TAL BUF
Total/NA	Prep	3535			351984	01/21/20 05:58	AF	TAL SAC
Total/NA	Analysis	537 (modified)		1	352654	01/23/20 17:58	D1R	TAL SAC

Client Sample ID: MW4-011320-1345
Lab Sample ID: 480-165164-2
Date Collected: 01/13/20 13:45
Matrix: Water
Date Received: 01/14/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			513951	01/17/20 08:51	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	514183	01/20/20 22:29	JMM	TAL BUF
Total/NA	Prep	3535			351984	01/21/20 05:58	AF	TAL SAC
Total/NA	Analysis	537 (modified)		1	352654	01/23/20 18:28	D1R	TAL SAC

Client Sample ID: PZ6-011320-1540
Lab Sample ID: 480-165164-3
Date Collected: 01/13/20 15:40
Matrix: Water
Date Received: 01/14/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			513951	01/17/20 08:51	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	514183	01/20/20 22:52	JMM	TAL BUF
Total/NA	Prep	3535			351984	01/21/20 05:58	AF	TAL SAC
Total/NA	Analysis	537 (modified)		1	352654	01/23/20 18:38	D1R	TAL SAC

Client Sample ID: 4125-011420-0001
Lab Sample ID: 480-165164-4
Date Collected: 01/14/20 10:00
Matrix: Water
Date Received: 01/14/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			513951	01/17/20 08:51	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	514183	01/20/20 23:15	JMM	TAL BUF
Total/NA	Prep	3535			351984	01/21/20 05:58	AF	TAL SAC
Total/NA	Analysis	537 (modified)		1	352654	01/23/20 18:48	D1R	TAL SAC

Client Sample ID: 4125-011320-0002
Lab Sample ID: 480-165164-5
Date Collected: 01/13/20 10:00
Matrix: Water
Date Received: 01/14/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			513951	01/17/20 08:51	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	514183	01/20/20 23:38	JMM	TAL BUF
Total/NA	Prep	3535			351984	01/21/20 05:58	AF	TAL SAC
Total/NA	Analysis	537 (modified)		1	352654	01/23/20 18:58	D1R	TAL SAC

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Job ID: 480-165164-1
Project/Site: Owego Former MGP Site

Laboratory: Eurofins TestAmerica, Buffalo

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	88-0686	07-06-20
California	State	2931	04-01-20 *
Connecticut	State	PH-0568	09-30-20
Florida	NELAP	E87672	06-30-20
Georgia	State	10026 (NY)	03-31-20 *
Georgia (DW)	State	956	03-31-20 *
Illinois	NELAP	200003	09-30-19 *
Iowa	State	374	02-28-21
Kansas	NELAP	E-10187	01-31-20
Kentucky (DW)	State	90029	12-31-20 *
Kentucky (UST)	State	30	03-31-20 *
Kentucky (WW)	State	KY90029	12-31-20
Louisiana	NELAP	02031	06-30-20
Maine	State	NY00044	12-04-20
Maryland	State	294	03-31-20 *
Massachusetts	State	M-NY044	06-30-20
Michigan	State	9937	03-31-20 *
Minnesota	NELAP	1524384	12-31-20
New Hampshire	NELAP	2337	11-17-19 *
New Jersey	NELAP	NY455	06-30-20
New York	NELAP	10026	04-01-20 *
North Dakota	State	R-176	03-31-20 *
Oklahoma	State	9421	09-01-20
Oregon	NELAP	NY200003	06-10-20
Pennsylvania	NELAP	68-00281	07-31-20
Rhode Island	State	LAO00328	12-30-20 *
Tennessee	State	02970	03-31-20 *
Texas	NELAP	T104704412-18-10	08-01-20
USDA	US Federal Programs	P330-18-00039	02-06-21
Virginia	NELAP	460185	09-14-20
Washington	State	C784	02-10-20 *
Wisconsin	State	998310390	08-31-20

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Job ID: 480-165164-1
Project/Site: Owego Former MGP Site

Laboratory: Eurofins TestAmerica, Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
New York	NELAP	11666	04-01-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
537 (modified)	3535	Water	6:2 FTS
537 (modified)	3535	Water	8:2 FTS
537 (modified)	3535	Water	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)
537 (modified)	3535	Water	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)
537 (modified)	3535	Water	Perfluorobutanesulfonic acid (PFBS)
537 (modified)	3535	Water	Perfluorobutanoic acid (PFBA)
537 (modified)	3535	Water	Perfluorodecanesulfonic acid (PFDS)
537 (modified)	3535	Water	Perfluorodecanoic acid (PFDA)
537 (modified)	3535	Water	Perfluorododecanoic acid (PFDoA)
537 (modified)	3535	Water	Perfluoroheptanesulfonic Acid (PFHpS)
537 (modified)	3535	Water	Perfluoroheptanoic acid (PFHpA)
537 (modified)	3535	Water	Perfluorohexanesulfonic acid (PFHxS)
537 (modified)	3535	Water	Perfluorohexanoic acid (PFHxA)
537 (modified)	3535	Water	Perfluorononanoic acid (PFNA)
537 (modified)	3535	Water	Perfluorooctanesulfonamide (FOSA)
537 (modified)	3535	Water	Perfluorooctanesulfonic acid (PFOS)
537 (modified)	3535	Water	Perfluorooctanoic acid (PFOA)
537 (modified)	3535	Water	Perfluoropentanoic acid (PFPeA)
537 (modified)	3535	Water	Perfluorotetradecanoic acid (PFTeA)
537 (modified)	3535	Water	Perfluorotridecanoic acid (PFTriA)
537 (modified)	3535	Water	Perfluoroundecanoic acid (PFUnA)

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

Method	Method Description	Protocol	Laboratory
8270D SIM ID	Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)	SW846	TAL BUF
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL BUF
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165164-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-165164-1	MW1-011320-1150	Water	01/13/20 11:50	01/14/20 15:30	
480-165164-2	MW4-011320-1345	Water	01/13/20 13:45	01/14/20 15:30	
480-165164-3	PZ6-011320-1540	Water	01/13/20 15:40	01/14/20 15:30	
480-165164-4	4125-011420-0001	Water	01/14/20 10:00	01/14/20 15:30	
480-165164-5	4125-011320-0002	Water	01/13/20 10:00	01/14/20 15:30	

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

eurofins | Environment Testing TestAmerica

480-165164 Chain of Custody

Client Information	Sampler: Robert Lydell	Lab PM: Hartmann, Steve	Carrier Tracking No(s):	COC No: 480-139668-31404.3
Client Contact: Santa McKenna	Phone: 614-564-7088	E-Mail: steve.hartmann@testamericainc.c		Page: Page 3 of 3
Company: Haley & Aldrich, Inc.				
Address: 200 Town Centre Drive #2	Due Date Requested:			
City: Rochester	TAT Requested (days): Std.			
State, Zip: NY, 14623-4264				
Phone:	PO #: Purchase Order not required			
Email: SMcKenna@haleyaldrich.com	WO #: 134371-002			
Project Name: Owego Former MGP Site	Project #: 48021440			
Site:	SSOW#:			

Codes:
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID - 1,4-Dioxane	9012B - Cyanide, Total	8260C - Benzene	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	B	A		
MW1-011320-1150	1/13/20	1150	G	Water	N	Y	X	X			12	MS/MSD
MW4-011320-1345		1345	G		N	N	X	X			4	Normal
PZ6-011320-1540		1540	G		N	N	X	X			4	Normal
4125-011320-0001	1/14/20	10:00	G		N	N	X	X			4	Equipment Blank
4125-011320-0002	1/13/20	—	G		N	N	X	X			4	—

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		1/14/20	HDA		1/14/20 1330	TAL
2		1/14/20 1530	TAL		1/14/20 1530	TAL
3		Date/Time:	Company		Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 3.3 #1

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

eurofins Environment Testing TestAmerica

480-165164 Chain of Custody

Client Information	Sampler: Robert Lydell	Lab PM: Hartmann, Steve	Carrier Tracking No(s):	COC No: 480-139668-31404.3
Client Contact: Santa McKenna	Phone: 614-504-7088	E-Mail: steve.hartmann@testamericainc.c		Page: Page 3 of 3
Company: Haley & Aldrich, Inc.				
Address: 200 Town Centre Drive #2	Due Date Requested:			
City: Rochester	TAT Requested (days): Std.			
State, Zip: NY, 14623-4264				
Phone:	PO #: Purchase Order not required			
Email: SMcKenna@haleyaldrich.com	WO #: 134371-002			
Project Name: Owego Former MGP Site	Project #: 48021440			
Site:	SSOW#:			

Codes:
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D SIM_MS_ID - 1,4-Dioxane	9012B - Cyanide, Total	8260C - Benzene	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	B	A		
MW1-011320-1150	1/13/20	1150	G	Water	N	Y	X	X			12	MS/MSD
MW4-011320-1345		1345	G		N	N	X	X			4	Normal
PZ6-011320-1540		1540	G		N	N	X	X			4	Normal
4125-011320-0001	1/14/20	10:00	G		N	N	X	X			4	Equipment Blank
4125-011320-0002	1/13/20	—	G		N	N	X	X			4	—

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		1/14/20	H&A		1/14/20 1330	TAS
2		1/14/20 1530	TAS		1/14/20 530	TAS
3		Date/Time:	Company		1/16/20 905	EASAL

Custody Seals Intact: ☒ Yes ☐ No | Custody Seal No.: 992683

Cooler Temperature(s) °C and Other Remarks: 3.3 #1

Ver: 01/16/2019

* COC not relinquished ST 1/16/20

1.4 cor 1.8

1/28/2020

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Sacramento Sample Receiving Notes

480-165164 Field Sheet

Tracking # : 4276 0722 3476

Job: ____

SO / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier

GSO / OnTrac / Goldstreak / USPS / Other ____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes: ____

Therm. ID: AK5 Corr. Factor: (+/-) 0.4 °C

Ice ✓ Wet ____ Gel ____ Other ____

Cooler Custody Seal: 442683

Cooler ID: 2 of 2

Temp Observed: 1.4 °C Corrected: 1.8 °C

From: Temp Blank ☐ Sample ☑

During Initial Triage	Yes	No	NA
Cooler compromised/tampered with?	☐	☑	☐
Cooler Temperature is acceptable?	☑	☐	☐
CoC is complete w/o discrepancies?	☑	☑	☐
Samples received within holding time?	☑	☐	☐

Initials: SG Date: 1/16/20 (SG 1/16/20)

During Labeling	Yes	No	NA
Samples compromised/tampered with?	☐	☑	☐
Sample containers have legible labels?	☑	☐	☐
Sample custody seal?	☐	☑	☐
Containers are not broken or leaking?	☑	☐	☐
Sample date/times are provided?	☑	☐	☐
Appropriate containers are used?	☑	☐	☐
Sample bottles are completely filled?	☑	☐	☐
Sample preservatives verified?	☐	☐	☑
Samples w/o discrepancies?	☑	☐	☐
Zero headspace?*	☐	☐	☑
Alkalinity has no headspace?	☐	☐	☑
Perchlorate has headspace? (Methods 314, 331, 6850)	☐	☐	☑
Multiphasic samples are not present?	☑	☐	☐
NCM Filed	☐	☐	☑

Initials: JG Date: 1/16/20

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

W13-A

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Sacramento
Sample Receiving Notes

Place Field Sheet Label Here

Tracking # : 4276-0722-3965

Job: _____

SO / PO / FO / SAT / 2-Day / Ground / UPS / CDO / Courier
GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations.
File in the job folder with the COC.

Notes: _____

Therm. ID: Ak-5 Corr. Factor: (+) -) 0.4 °C

Ice ✓ Wet ✓ Gel _____ Other _____

Cooler Custody Seal: —

Cooler ID: 1052

Temp Observed: 1.6 °C Corrected: 2.0 °C

From: Temp Blank ☐ Sample ☑

During Initial Triage	Yes	No	NA
Cooler compromised/tampered with?	☐	☑	☐
Cooler Temperature is acceptable?	☑	☐	☐
CoC is complete w/o discrepancies?	☑	☑	☐
Samples received within holding time?	☑	☐	☐

SG 1/16/20

Initials: JG Date: 1/16/20

During Labeling	Yes	No	NA
Samples compromised/tampered with?	☐	☑	☐
Sample containers have legible labels?	☑	☐	☐
Sample custody seal?	☐	☑	☐
Containers are not broken or leaking?	☑	☐	☐
Sample date/times are provided?	☑	☐	☐
Appropriate containers are used?	☑	☐	☐
Sample bottles are completely filled?	☑	☐	☐
Sample preservatives verified?	☐	☐	☑
Samples w/o discrepancies?	☑	☐	☐
Zero headspace?*	☐	☐	☑
Alkalinity has no headspace?	☐	☐	☑
Perchlorate has headspace? (Methods 314, 331, 6850)	☐	☐	☑
Multiphasic samples are not present?	☑	☐	☐
NCM Filed	☐	☐	☑

Initials: JG Date: 1/16/20

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

W13-A

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 480-165164-1

Login Number: 165164
List Number: 1
Creator: Stopa, Erik S

List Source: Eurofins TestAmerica, Buffalo

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	H+A
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 480-165164-1

Login Number: 165164
List Number: 2
Creator: Guzman, Juan

List Source: Eurofins TestAmerica, Sacramento
List Creation: 01/16/20 12:56 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	992683
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	obs 1.4 corr 1.8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

Laboratory Job ID: 480-165168-1
Client Project/Site: Owego Former MGP Site

For:
Haley & Aldrich, Inc.
3 Bedford Farms Drive
Beford, New Hampshire 03110

Attn: Douglas C. Allen

Authorized for release by:
1/22/2020 1:34:15 PM

Steve Hartmann, Project Manager I
(413)572-4000
steve.hartmann@testamericainc.com

Table of Contents

Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165168-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-165168-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative
480-165168-1

Comments
No additional comments.

Receipt
The samples were received on 1/15/2020 3:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.8º C.

GC/MS VOA
Method 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: PZ08-011320-1710 (480-165168-1), PZ08-011320-1710 (480-165168-1[MS]) and PZ08-011320-1710 (480-165168-1[MSD]). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165168-1

Client Sample ID: PZ08-011320-1710 — Lab Sample ID: 480-165168-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	150		4.0	1.6	ug/L	4		8260C	Total/NA

Client Sample ID: PZ2-011320-1810 — Lab Sample ID: 480-165168-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	1.9		0.050	0.025	mg/L	5		9012B	Total/NA

Client Sample ID: MW4-011320-1345 — Lab Sample ID: 480-165168-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	2.0		0.050	0.025	mg/L	5		9012B	Total/NA

Client Sample ID: 4125-011320-0002 — Lab Sample ID: 480-165168-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cyanide, Total	1.8		0.050	0.025	mg/L	5		9012B	Total/NA

Client Sample ID: 4125-011320-0001 — Lab Sample ID: 480-165168-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: PZ08-011320-1710

Lab Sample ID: 480-165168-1
Matrix: Water
Date Collected: 01/13/20 17:10
Date Received: 01/15/20 15:30

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	150		4.0	1.6	ug/L			01/18/20 13:22	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*80 - 120*		*01/18/20 13:22*	*4*
1,2-Dichloroethane-d4 (Surr)	*92*		*77 - 120*		*01/18/20 13:22*	*4*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*01/18/20 13:22*	*4*
Dibromofluoromethane (Surr)	*99*		*75 - 123*		*01/18/20 13:22*	*4*

Client Sample ID: PZ2-011320-1810

Lab Sample ID: 480-165168-2
Matrix: Water
Date Collected: 01/13/20 18:10
Date Received: 01/15/20 15:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	1.9		0.050	0.025	mg/L		01/20/20 14:00	01/21/20 12:14	5

Client Sample ID: MW4-011320-1345

Lab Sample ID: 480-165168-3
Matrix: Water
Date Collected: 01/13/20 13:45
Date Received: 01/15/20 15:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	2.0		0.050	0.025	mg/L		01/20/20 14:00	01/21/20 12:16	5

Client Sample ID: 4125-011320-0002

Lab Sample ID: 480-165168-4
Matrix: Water
Date Collected: 01/13/20 00:00
Date Received: 01/15/20 15:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	1.8		0.050	0.025	mg/L		01/20/20 14:00	01/21/20 12:17	5

Client Sample ID: 4125-011320-0001

Lab Sample ID: 480-165168-5
Matrix: Water
Date Collected: 01/13/20 00:00
Date Received: 01/15/20 15:30

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0	0.41	ug/L			01/17/20 12:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*93*		*80 - 120*		*01/17/20 12:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*77 - 120*		*01/17/20 12:28*	*1*
4-Bromofluorobenzene (Surr)	*118*		*73 - 120*		*01/17/20 12:28*	*1*
Dibromofluoromethane (Surr)	*100*		*75 - 123*		*01/17/20 12:28*	*1*

Surrogate Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165168-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	BFB	DBFM
Lab Sample ID	Client Sample ID	(80-120)	(77-120)	(73-120)	(75-123)
480-165168-1	PZ08-011320-1710	98	92	99	99
480-165168-1 MS	PZ08-011320-1710	99	94	100	100
480-165168-1 MSD	PZ08-011320-1710	98	94	99	102
480-165168-5	4125-011320-0001	93	99	118	100
LCS 480-513919/5	Lab Control Sample	93	99	112	100
LCS 480-514042/5	Lab Control Sample	97	93	96	103
MB 480-513919/7	Method Blank	98	90	120	97
MB 480-514042/8	Method Blank	98	95	99	105

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 480-513919/7
Matrix: Water
Analysis Batch: 513919

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0	0.41	ug/L			01/17/20 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*80 - 120*		*01/17/20 10:57*	*1*
1,2-Dichloroethane-d4 (Surr)	*90*		*77 - 120*		*01/17/20 10:57*	*1*
4-Bromofluorobenzene (Surr)	*120*		*73 - 120*		*01/17/20 10:57*	*1*
Dibromofluoromethane (Surr)	*97*		*75 - 123*		*01/17/20 10:57*	*1*

Lab Sample ID: LCS 480-513919/5
Matrix: Water
Analysis Batch: 513919

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	25.0	26.5		ug/L		106	71 - 124

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*93*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*99*		*77 - 120*
4-Bromofluorobenzene (Surr)	*112*		*73 - 120*
Dibromofluoromethane (Surr)	*100*		*75 - 123*

Lab Sample ID: MB 480-514042/8
Matrix: Water
Analysis Batch: 514042

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.0	U	1.0	0.41	ug/L			01/18/20 12:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*98*		*80 - 120*		*01/18/20 12:02*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*77 - 120*		*01/18/20 12:02*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*01/18/20 12:02*	*1*
Dibromofluoromethane (Surr)	*105*		*75 - 123*		*01/18/20 12:02*	*1*

Lab Sample ID: LCS 480-514042/5
Matrix: Water
Analysis Batch: 514042

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	25.0	26.3		ug/L		105	71 - 124

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*97*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*93*		*77 - 120*
4-Bromofluorobenzene (Surr)	*96*		*73 - 120*
Dibromofluoromethane (Surr)	*103*		*75 - 123*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 480-165168-1 MS
Matrix: Water
Analysis Batch: 514042

Client Sample ID: PZ08-011320-1710
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene	150		100	231		ug/L		86	71 - 124		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*94*		*77 - 120*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*
Dibromofluoromethane (Surr)	*100*		*75 - 123*

Lab Sample ID: 480-165168-1 MSD
Matrix: Water
Analysis Batch: 514042

Client Sample ID: PZ08-011320-1710
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	150		100	228		ug/L		82	71 - 124	2	13

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*98*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*94*		*77 - 120*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*
Dibromofluoromethane (Surr)	*102*		*75 - 123*

Method: 9012B - Cyanide, Total andor Amenable

Lab Sample ID: MB 480-514202/1-A
Matrix: Water
Analysis Batch: 514352

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 514202

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.010	U	0.010	0.0050	mg/L		01/20/20 14:00	01/21/20 11:37	1

Lab Sample ID: LCS 480-514202/2-A
Matrix: Water
Analysis Batch: 514352

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 514202

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Cyanide, Total			0.250	0.240		mg/L		96	90 - 110		

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165168-1

GC/MS VOA

Analysis Batch: 513919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-165168-5	4125-011320-0001	Total/NA	Water	8260C	
MB 480-513919/7	Method Blank	Total/NA	Water	8260C	
LCS 480-513919/5	Lab Control Sample	Total/NA	Water	8260C	

Analysis Batch: 514042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-165168-1	PZ08-011320-1710	Total/NA	Water	8260C	
MB 480-514042/8	Method Blank	Total/NA	Water	8260C	
LCS 480-514042/5	Lab Control Sample	Total/NA	Water	8260C	
480-165168-1 MS	PZ08-011320-1710	Total/NA	Water	8260C	
480-165168-1 MSD	PZ08-011320-1710	Total/NA	Water	8260C	

General Chemistry

Prep Batch: 514202

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-165168-2	PZ2-011320-1810	Total/NA	Water	9012B	
480-165168-3	MW4-011320-1345	Total/NA	Water	9012B	
480-165168-4	4125-011320-0002	Total/NA	Water	9012B	
MB 480-514202/1-A	Method Blank	Total/NA	Water	9012B	
LCS 480-514202/2-A	Lab Control Sample	Total/NA	Water	9012B	

Analysis Batch: 514352

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-165168-2	PZ2-011320-1810	Total/NA	Water	9012B	514202
480-165168-3	MW4-011320-1345	Total/NA	Water	9012B	514202
480-165168-4	4125-011320-0002	Total/NA	Water	9012B	514202
MB 480-514202/1-A	Method Blank	Total/NA	Water	9012B	514202
LCS 480-514202/2-A	Lab Control Sample	Total/NA	Water	9012B	514202

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165168-1

Client Sample ID: PZ08-011320-1710
Lab Sample ID: 480-165168-1
Date Collected: 01/13/20 17:10
Matrix: Water
Date Received: 01/15/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		4	514042	01/18/20 13:22	RJF	TAL BUF

Client Sample ID: PZ2-011320-1810
Lab Sample ID: 480-165168-2
Date Collected: 01/13/20 18:10
Matrix: Water
Date Received: 01/15/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	9012B			514202	01/20/20 14:00	JRF	TAL BUF
Total/NA	Analysis	9012B		5	514352	01/21/20 12:14	CRK	TAL BUF

Client Sample ID: MW4-011320-1345
Lab Sample ID: 480-165168-3
Date Collected: 01/13/20 13:45
Matrix: Water
Date Received: 01/15/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	9012B			514202	01/20/20 14:00	JRF	TAL BUF
Total/NA	Analysis	9012B		5	514352	01/21/20 12:16	CRK	TAL BUF

Client Sample ID: 4125-011320-0002
Lab Sample ID: 480-165168-4
Date Collected: 01/13/20 00:00
Matrix: Water
Date Received: 01/15/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	9012B			514202	01/20/20 14:00	JRF	TAL BUF
Total/NA	Analysis	9012B		5	514352	01/21/20 12:17	CRK	TAL BUF

Client Sample ID: 4125-011320-0001
Lab Sample ID: 480-165168-5
Date Collected: 01/13/20 00:00
Matrix: Water
Date Received: 01/15/20 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	513919	01/17/20 12:28	OMI	TAL BUF

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Job ID: 480-165168-1
Project/Site: Owego Former MGP Site

Laboratory: Eurofins TestAmerica, Buffalo

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	88-0686	07-06-20
California	State	2931	04-01-20 *
Connecticut	State	PH-0568	09-30-20
Florida	NELAP	E87672	06-30-20
Georgia	State	10026 (NY)	03-31-20 *
Georgia (DW)	State	956	03-31-20 *
Illinois	NELAP	200003	09-30-19 *
Iowa	State	374	02-28-21
Kansas	NELAP	E-10187	01-31-20
Kentucky (DW)	State	90029	12-31-20 *
Kentucky (UST)	State	30	03-31-20 *
Kentucky (WW)	State	KY90029	12-31-20
Louisiana	NELAP	02031	06-30-20
Maine	State	NY00044	12-04-20
Maryland	State	294	03-31-20 *
Massachusetts	State	M-NY044	06-30-20
Michigan	State	9937	03-31-20 *
Minnesota	NELAP	1524384	12-31-20
New Hampshire	NELAP	2337	11-17-19 *
New Jersey	NELAP	NY455	06-30-20
New York	NELAP	10026	04-01-20 *
North Dakota	State	R-176	03-31-20 *
Oklahoma	State	9421	09-01-20
Oregon	NELAP	NY200003	06-10-20
Pennsylvania	NELAP	68-00281	07-31-20
Rhode Island	State	LAO00328	12-30-20 *
Tennessee	State	02970	03-31-20 *
Texas	NELAP	T104704412-18-10	08-01-20
USDA	US Federal Programs	P330-18-00039	02-06-21
Virginia	NELAP	460185	09-14-20
Washington	State	C784	02-10-20 *
Wisconsin	State	998310390	08-31-20

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165168-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL BUF
9012B	Cyanide, Total andor Amenable	SW846	TAL BUF
5030C	Purge and Trap	SW846	TAL BUF
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	TAL BUF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUF = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Owego Former MGP Site

Job ID: 480-165168-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-165168-1	PZ08-011320-1710	Water	01/13/20 17:10	01/15/20 15:30	
480-165168-2	PZ2-011320-1810	Water	01/13/20 18:10	01/15/20 15:30	
480-165168-3	MW4-011320-1345	Water	01/13/20 13:45	01/15/20 15:30	
480-165168-4	4125-011320-0002	Water	01/13/20 00:00	01/15/20 15:30	
480-165168-5	4125-011320-0001	Water	01/13/20 00:00	01/15/20 15:30	

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone (716) 691-2600 Fax (716) 691-7991

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: R. LYDELL	Lab PM: Hartmann, Steve	Carrier Tracking No(s):	COC No: 480-139668-31404.3
Client Contact: Santa McKenna	Phone:	E-Mail: steve.hartmann@testamericainc.com		Page: Page 3 of 3
Company: Haley & Aldrich, Inc.				Job #:
Address: 200 Town Centre Drive #2	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Rochester	TAT Requested (days): Std.			A - HCl
State, Zip: NY, 14623-4264				L - EDA
Phone:	PO #: Purchase Order not required			Other:
Email: SMcKenna@haleyaldrich.com	WO #: 134371-002			
Project Name: Owego Former MGP Site	Project #: 48021440			
Site:	SSOW#:			

480-165168 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - PFAS, Standard List (21 Analytes)	8270D_SIM_MS_ID - 1,4-Dioxane	9012B - Cyanide, Total	8260C - Benzene	Total Number of contai.	Special Instructions/Note:
			Preservation Code:				N	N	B	A		
PZ08-011320-1710	01/13/20	1710	G	Water	N	Y				X	9	MS/MSD, N
PZ2-011320-1810	01/13/20	1810	G	WATER	N	N			X		1	N
MW4-011320-1345	01/13/20	1345	G	WATER	N	N			X		1	N
4125-011320-0002	01/13/20	—	G	WATER	N	N			X		1	FD
4125-011320-0001	01/13/20	—	G	Water	N	N				X	2	Trip Blank

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		1/14/20	HEA		1/14/20 1300	TAB
2		1/14/20 1530	TAB		1/14/20 1530	TAB
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: #1 2.8

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 480-165168-1

Login Number: 165168
List Number: 1
Creator: Wallace, Cameron

List Source: Eurofins TestAmerica, Buffalo

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	H&A
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	True	
Chlorine Residual checked.	N/A	