



EA Engineering, P.C.
EA Science and Technology

6712 Brooklawn Parkway, Suite 104
Syracuse, New York 13211-2158
Telephone: 315-431-4610
Fax: 315-431-4280
www.eaest.com

August 6, 2018

Mr. Glenn May
Division of Environmental Remediation
New York State Department of Environmental Conservation, Region 9
270 Michigan Avenue
Buffalo, NY 14203-2999

RE: Draft Supplemental PFAS & 1,4-dioxane Sampling Letter Report
Contract/Work Assignment No: D007624-21
Site/Spill No/Pin: 5565 River Road, Tonawanda, New York (915239)

Dear Mr. May:

This letter report describes the results of the additional groundwater sampling conducted at the 5565 River Road Site (915239) in Tonawanda, NY (**Figure 1**) in April 2018. Groundwater samples were collected for analysis of 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS) per a request by the New York State Department of Environmental Conservation (NYSDEC) in an e-mail dated 29 March 2018. Prior to conducting this additional groundwater sampling event, an extensive remedial investigation (RI) was conducted on the site beginning in August 2013 and was completed in December 2015. The draft RI report was submitted in April 2017.

Monitoring Well Purging and Redevelopment

The groundwater monitoring well network for the Site consists of twenty monitoring wells, including twelve onsite monitoring wells, and eight offsite wells, as shown on **Figure 2**. Prior to conducting groundwater sampling, a field visit was made on 4 April 2018 to document water levels at all onsite wells, and remove any sampling tubing or sampling materials such as bailers, pumps, etc. The purpose for removing the sampling tubing and purging the wells is because the standard sampling tubing and bailers are typically manufactured using low density polyethylene (LDPE) plastic. LDPE is suspected to contain some level of PFAS, which may potentially leach into the water when dedicated sampling equipment is left in a well.

The six wells selected for additional sampling were redeveloped to remove any groundwater from the wells and the surrounding formation which may have been potentially impacted by PFAS leached from the dedicated LDPE tubing. These wells include MW-01, MW-02, MW-03, MW-05, MW-08, and MW-10, and are shaded in blue on **Figure 2**.

Prior to well development, water levels and well depths were measured using an electronic water level indicator graduated to 0.01 ft and the volume of standing water in the well was calculated. Wells were purged using dedicated HDPE tubing (non-PFAS containing plastics), a peristaltic pump, and dedicated silicon tubing. Water quality parameters were recorded using a Horiba U-52 multi-parameter water quality meter at the start of the pumping, approximately half way

through development, and immediately prior to terminating the pumping. Parameters recorded include: pH, oxidation-reduction potential, temperature, conductivity, dissolved oxygen (DO) content, and turbidity. Wells were purged of approximately 10 well volumes, or until the well was pumped dry. Well development logs are provided in **Attachment A**.

Groundwater from the wells was either clear or turbid and dark brown in color. Purge water generated during development activities was pumped directly to the ground surface. All HDPE tubing was removed from the wells following development.

Monitoring Well Sampling

Groundwater was collected from the six monitoring wells on 26 April 2018 using low-flow sampling methodologies. Monitoring wells were purged at a rate no greater than 300 milliliters per minute using a peristaltic pump and dedicated HDPE tubing. Non-dedicated sampling equipment was decontaminated between well locations to prevent cross-contamination. Water levels were measured with a 100 ft Heron Skinny Dipper water level meter after sample collection, to limit the potential for PFAS contamination prior to sampling. Purge water generated during groundwater sampling activities was discharged to the ground surface.

During purging, field parameters were measured continuously using a Horiba-U52 with a flow-through cell. Parameters monitored included temperature, pH, oxidation-reduction potential, conductivity, dissolved oxygen, and turbidity. Data was recorded on groundwater sampling field forms provided in **Attachment A**. Wells were purged until the field parameters stabilized, after which groundwater samples were collected. Field parameters were considered stable when the following conditions were met for three consecutive readings:

- Consecutive pH readings are ± 0.1 pH units of each other
- Consecutive DO readings are ± 10 percent of each other
- Consecutive Redox readings are ± 0.10 units of each other
- Consecutive measured specific conductance is ± 3 percent of each other
- Turbidity < 50 NTU
- Purge rate of 300 milliliters per minute.

Due to the high sensitivity of PFAS analytes and the potential sources of trace levels of PFAS, several precautions were taken to reduce the risk of false detections within samples.

The following general preparations were taken prior to and during the sampling event:

- ***Food Considerations***
 - Field personnel avoided the use of paper bags, paper packaging, aluminum foil, and coated paper packaging, or coated textiles to be in contact with food products.
 - Avoided eating any fried foods.

- Did not eat snacks or meals within the immediate vicinity of the monitoring wells or inside the vehicle.
- Removed gloves prior to eating.
- ***Field Gear***
 - Field personnel avoided plastic coating or glued materials, waterproof field books/paper, pens, and sharpie markers. The use of aluminum clipboards was allowed with loose-leaf paper.
 - Disposable nitrile gloves were worn at all times and were changed frequently.
 - Field personnel did not wear water resistant, water proof or stain treated clothing.
 - Field clothing was laundered with minimal use of soap and no fabric softeners or scented products were used. Clothing was rinsed with water after the initial cleaning.
- ***Field Vehicle***
 - The field vehicle seats were covered with a well laundered cotton blanket for the duration of the sampling event.
- ***Personal Hygiene***
 - Field personnel did not use shampoo, conditioner, hand cream, etc. as part of their personal cleaning/showering routine on the day of the sampling event. A shower the night before the sampling event, or a rinse with water the day of was acceptable.
 - Moisturizers, cosmetics, sunscreen, or insect repellent were not used throughout the duration of the sampling event. Handwashing with soap was allowed and the field personnel allowed extra rinsing time with water after use of soap.

Samples were collected directly from the HDPE tubing. The tubing that was connected to the Horiba-U52 during the collection of water quality parameters was cut prior to sampling. Sample tubing did not touch the sample jars during sample collection.

Laboratory Analysis

After collection, 1,4-dioxane and PFAS samples were placed in separate coolers with ice. The PFAS samples were packed within HDPE bags prior to placing in the coolers. EA shipped the coolers via FedEx overnight to the Con-Test laboratory in East Longmeadow, Massachusetts under standard chain-of-custody protocols. Con-Test is a New York State Department of Health (NYSDOH) Environmental Laboratory Analytical Program (ELAP)-certified laboratory, meeting specifications for documentation, data reduction, and reporting. Con-Test analyzed the groundwater samples for 1,4-dioxane by U.S. Environmental Protection Agency (USEPA) Method SW-846 8270D and the PFAS by USEPA Method 537/SOP 434-PFAAS (method for non-potable water) in accordance with the NYSDEC Analytical Services Protocol (ASP). Analytical data reports are included as **Attachment B**.



Data Validation

Data validation services were provided by Environmental Data Services, LTD. of Pittsburgh, Pennsylvania (EDS). Each analytical data sample generated during the groundwater sampling events was sent for third-party data validation and QA review. A separate Data Usability Summary Report (DUSR) was prepared for each of the sample delivery groups (PFAS and 1,4-Dioxane). The DUSRs are provided in **Attachment C**. The DUSRs were prepared according to the guidelines established by NYSDEC Division of Environmental Remediation QA Group as described in **Section 2.14** in the Draft River Road Remedial Investigation Report. The data were validated according to the protocols and quality control requirements of the analytical methods and the USEPA Region II Data Review Standard Operating Procedures. The data reported for the sampled media (groundwater) are considered accurate and usable as qualified for the intended purpose and to be representative of site conditions at the time of collection.

Groundwater Results

Analytical results for 1,4-dioxane are compared to the USEPA Integrated Risk Information System (IRIS) 2013 guidance value for drinking water representing a 1×10^{-6} cancer risk level (0.35 micrograms per liter [$\mu\text{g/L}$]). Analytical results for PFAS are compared to USEPA health advisory level for drinking water, a combined concentration of perfluorooctanoic acid and perfluorooctanesulfonic acid (70 nanograms per liter [ng/L]). Results for PFAS and 1,4-Dioxane are summarized in **Table 1**. PFC results are presented on **Figure 3**, and 1,4-dioxane results are presented on **Figure 4**.

1,4-Dioxane was detected in one of the six sampled wells (MW-10). The concentration of 4.3 $\mu\text{g/L}$ exceeded the USEPA IRIS 2013 guidance value for drinking water.

PFAS was detected in four of the six monitoring wells (MW-01, MW-02, MW-05, and MW-10). There are no NYSDEC Ambient Water Quality Standard (AWQS) values for PFCs. However, the USEPA has a Health Advisory level of 70 ng/L for either perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), or the combined value of the two analytes. These health advisories are non-enforceable and non-regulatory, but provide technical information to state agencies and other public health officials on the human health risks of contaminants in groundwater. At monitoring well MW-01, PFOS was present at a concentration of 36 ng/L and PFOA was present at a concentration of 55 ng/L , with a combined total of 91 ng/L , which



exceeds the health advisory concentration. PFOA and PFOS were not detected above 70 ng/L either individually or combined, in any other sampled wells.

Sincerely yours,

EA SCIENCE AND TECHNOLOGY

A handwritten signature in black ink, appearing to read 'Robert S. Casey'.

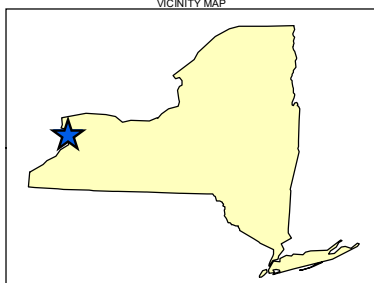
Robert S. Casey
Project Manager

This page intentionally left blank

Figures

This page intentionally left blank

G:\Projects\State&Local\NYSDEC - D007624\007624 - Work Assignments\14907 21 - 5565 River Road\GIS\Projects\PCF 14D LetterRpt\Figure1_SiteLocation.mxd



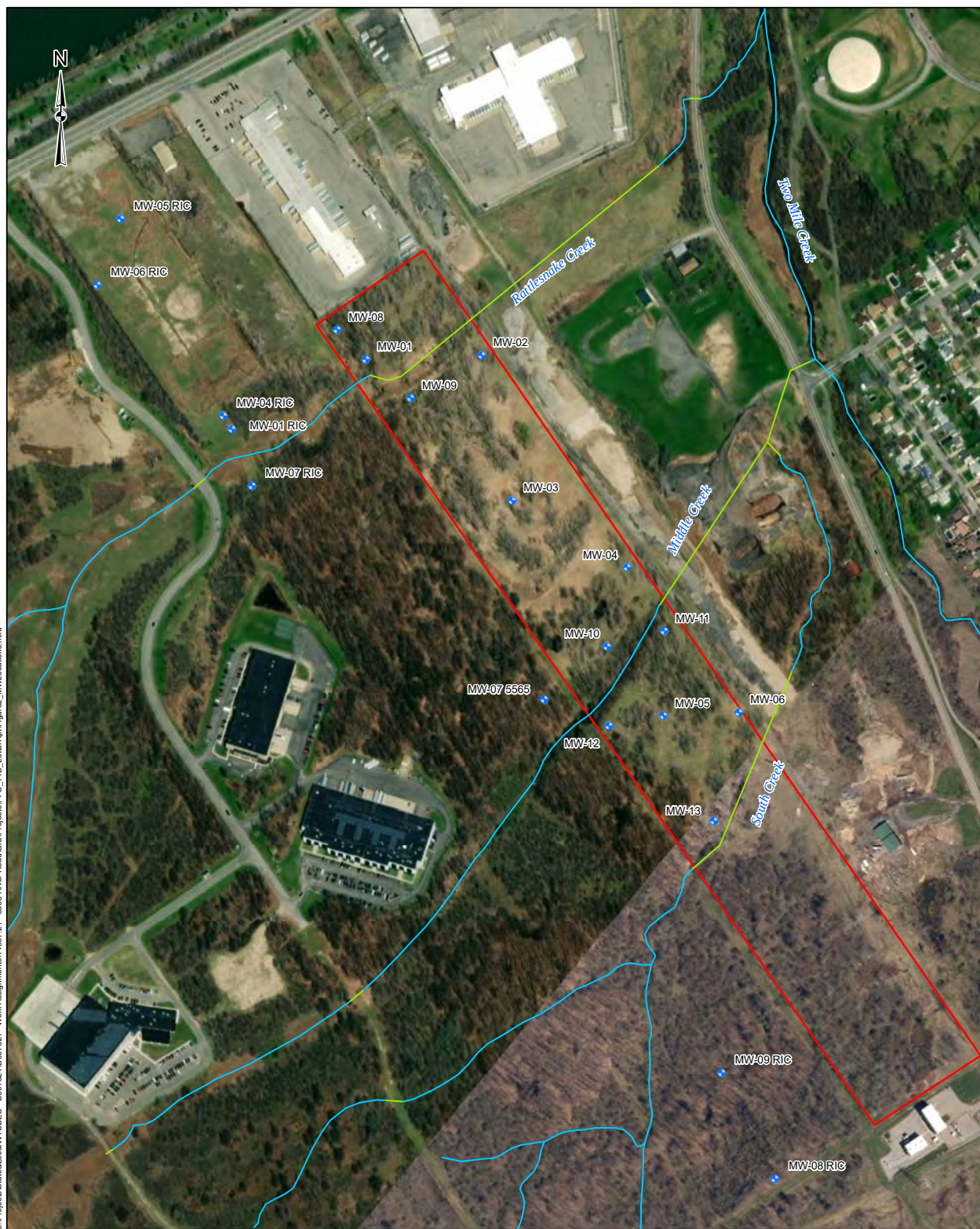
Legend
 Site Boundary

Figure 1
Site Location
5565 River Road (915239)
Tonawanda, New York

Map Date: 6/7/2018
Source: ESRI ArcGIS Map Service
Projection: NAD 1983 State Plane New York West

0 0.125 0.25 0.5
Miles

G:\Projects\State&Local\NYSDC - D007624\007624 - Work Assignments\14907.21 - 5565 River Road\GIS\Projects\PFC_14D_LetterRpt\Figure2_MWLocations.mxd



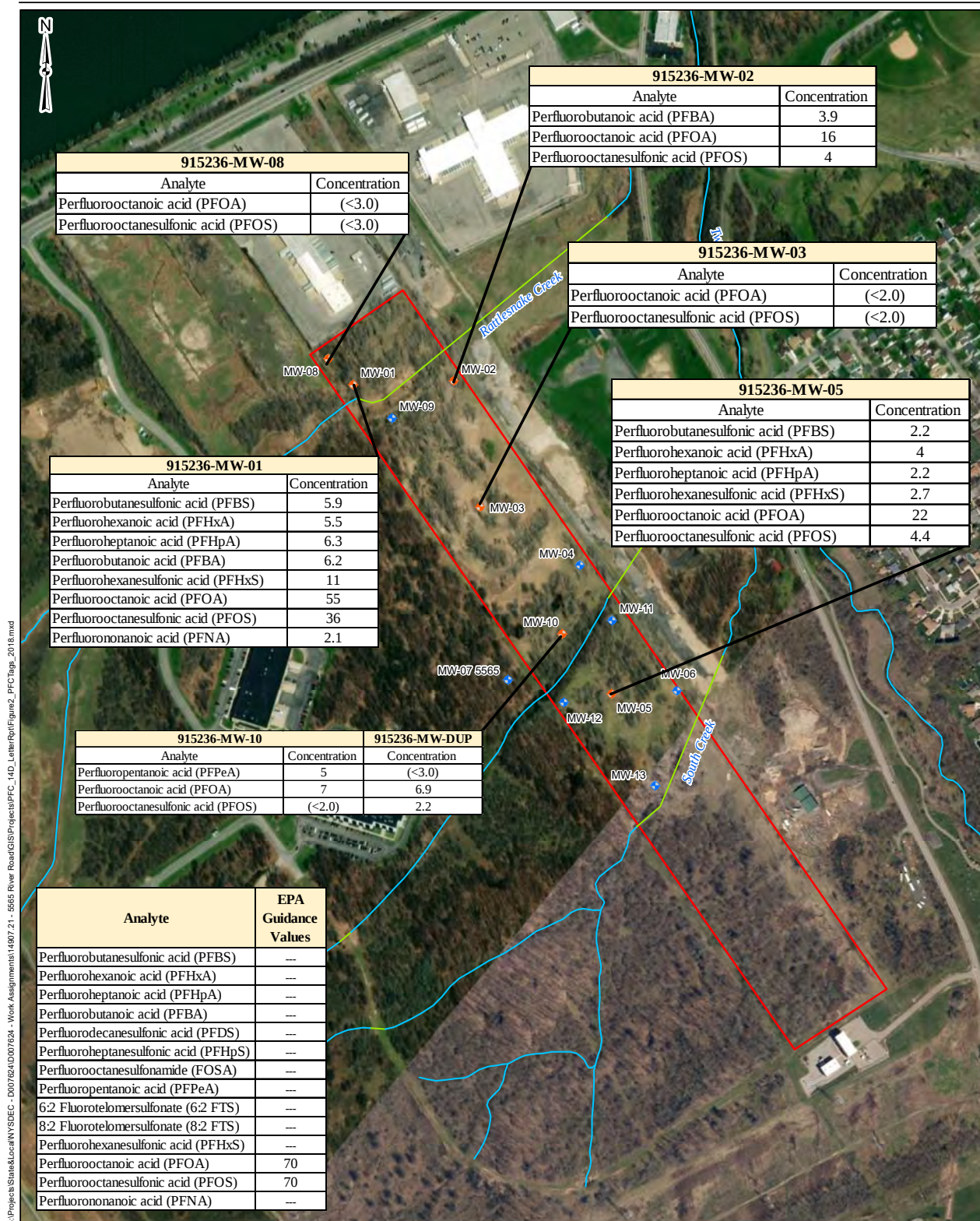
- Legend**
- Groundwater Monitoring Well Location
 - Open Surface Water Channel
 - Surface Water Conduit/Culvert
 - Site Boundary

Figure 2
Groundwater Monitoring Well Locations
5565 River Road (915239)
Tonawanda, New York

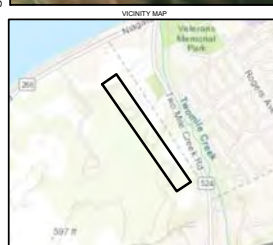
0 350 700
Feet

Map Date: 6/7/2018
Source: ESRI ArcGIS Map Service
Projection: NAD 1983 State Plane New York West





G:\Projects\State&Local\NYSDOC - 0007624\007624 - Work Assignments\14907.21 - 5565 River Road\GIS\Projects\PFCA_140_LetterRpt\Figure2_PFCtags_2018.mxd



Legend

- ◆ Monitoring Well Location
- ◆ Monitoring Well Location - Not Sampled
- ~ Open Surface Water Channel
- ~ Surface Water Conduit/Culvert
- Site Boundary

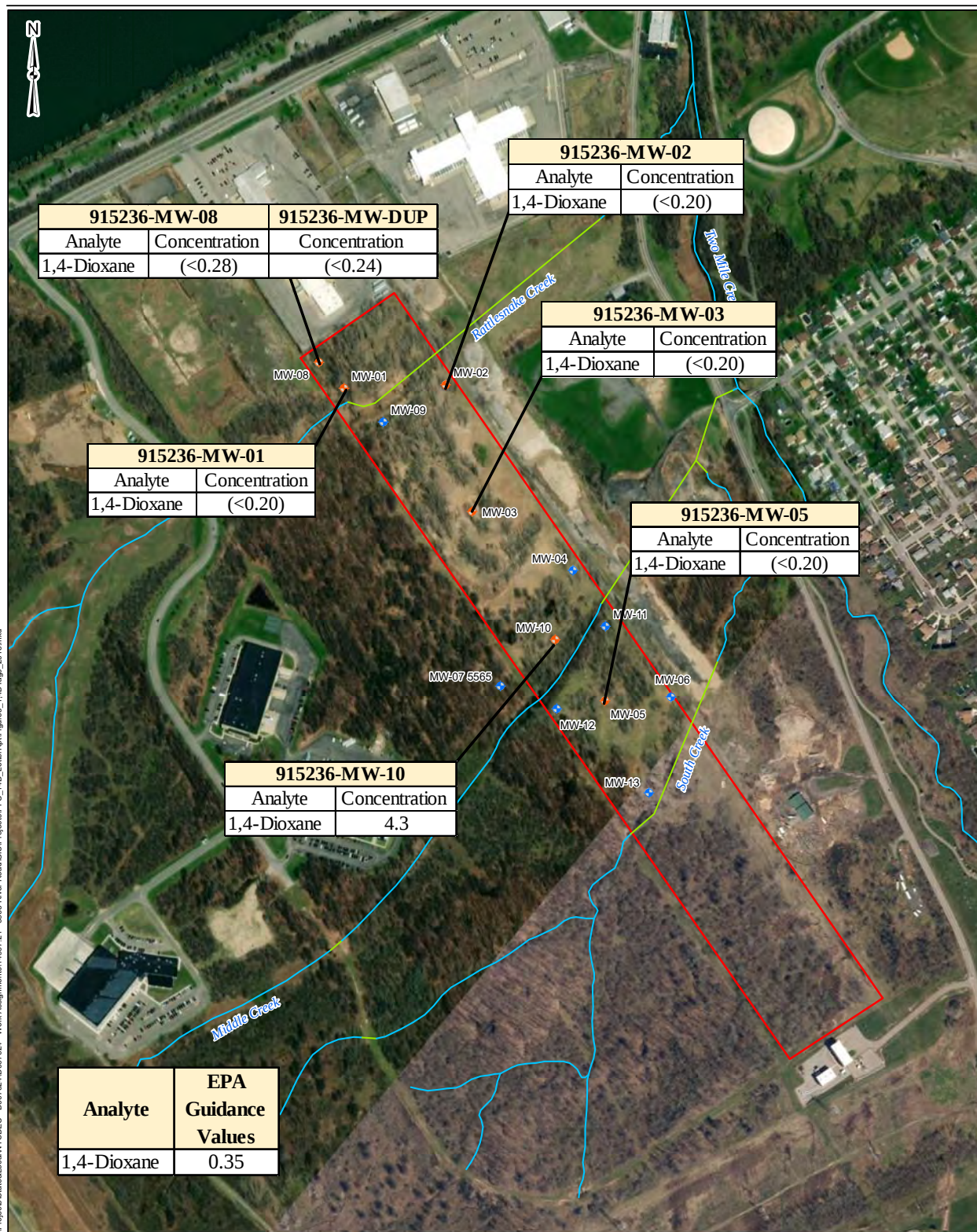
Notes:

All results reported in ng/L
 EPA = New York State Department of Environmental Conservation
 ng/L = Nanogram(s) per liter

Figure 3
Groundwater Sampling Results - April 2018
PFOS and PFOA Results and Other PFC Detects
 5565 River Road (915239)
 Tonawanda, New York

Map Date: 6/7/2018
 Source: ESRI ArcGIS Map Service
 Projection: NAD 1983 State Plane New York West

G:\Projects\State&Local\NYSDEC - D007624\007624 - Work Assignments\14907.21 - 5565 River Road\GIS\Projects\PFC_14D_LetterFig\Figure3_1_4DTags_2018.mxd



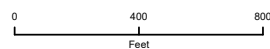
Legend

- ◆ Monitoring Well Location
- ◆ Monitoring Well Location - Not Sampled
- Open Surface Water Channel
- Surface Water Conduit/Culvert
- Site Boundary

Notes:

All results reported in ug/L
 EPA = New York State Department of Environmental Conservation
 ug/L = Microgram(s) per liter

Figure 4
Groundwater Sampling Results - April 2018
1,4-Dioxane Results
 5565 River Road (915239)
 Tonawanda, New York



Map Date: 6/7/2018
 Source: ESRI ArcGIS Map Service
 Projection: NAD 1983 State Plane New York West

Tables

This page intentionally left blank

Table 1 Summary of Detected PerFluorinated Compounds and 1,4-Dioxane in Groundwater Samples

Parameter List	Location ID	915236-MW-01	915236-MW-02	915236-MW-03	915236-MW-05	915236-MW-08	915236-MW-10	915236-MW-DUP	Guidance Values					
	1,4-Dioxane Samples Lab ID	18D1337-01	18D1337-02	18D1337-03	18D1337-04	18D1337-05	18D1337-06	18D1337-07						
	PFC Samples Lab ID	18D1336-01	18D1336-02	18D1336-03	18D1336-04	18D1336-05	18D1336-06	18D1336-07						
	Sample Type	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater						
	Sample Date	26-Apr-18	26-Apr-18	26-Apr-18	26-Apr-18	26-Apr-18	26-Apr-18	26-Apr-18						
Method SW-846 8270D														
1,4-Dioxane	µg/l	(<0.20)	U	(<0.20)	U	(<0.20)	U	(<0.28)	U	4.3	U	(<0.24)	U	0.35 ¹
Method SOP 434-PFAAS														
NEtFOSAA	ng/L	< 2	U	< 2	U	< 2	U	< 3	U	< 2	U	< 2	U	---
Perfluorobutanesulfonic acid (PFBS)	ng/L	5.9		< 2	U	< 2	U	2.2	U	< 3	U	< 2	U	---
Perfluorobutanoic acid	ng/L	6.2		3.9		< 3	U	< 3	U	< 4.5	U	< 3	U	---
Perfluorodecanesulfonic acid	ng/L	< 3	U	< 3	U	< 3	U	< 3	U	< 4.5	U	< 3	U	---
Perfluorodecanoic acid	ng/L	< 2	U	< 2	U	< 2	U	< 2	U	< 3	U	< 2	U	---
Perfluorododecanoic acid	ng/L	< 2	U	< 2	U	< 2	U	< 2	U	< 3	U	< 2	U	---
Perfluoroheptanesulfonic acid	ng/L	< 3	U	< 3	U	< 3	U	< 3	U	< 4.5	U	< 3	U	---
Perfluoroheptanoic acid	ng/L	6.3		< 2	U	< 2	U	2.2		< 3	U	< 2	U	---
Perfluorohexanesulfonic acid (PFHxS)	ng/L	11		< 2	U	< 2	U	2.7		< 3	U	< 2	U	---
Perfluorohexanoic acid	ng/L	5.5		< 2	U	< 2	U	4		< 3	U	< 2	U	---
Perfluorononanoic acid	ng/L	2.1		< 2	U	< 2	U	< 2	U	< 3	U	< 2	U	---
Perfluorooctanesulfonic acid (PFOS)	ng/L	36		4		< 2	U	4.4		< 3	U	< 2	U	70 ²
Perfluorooctanoic acid (PFOA)	ng/L	55		16		< 2	U	22		< 3	U	7		70 ²
Perfluoropentanoic acid	ng/L	< 3	U	< 3	U	< 3	U	< 3	U	< 4.5	U	5		< 3
Perfluorotetradecanoic acid	ng/L	< 2	U	< 2	U	< 2	U	< 2	U	< 3	U	< 2	U	---
Perfluorotridecanoic acid	ng/L	< 2	U	< 2	U	< 2	U	< 2	U	< 3	U	< 2	U	---
Perfluoroundecanoic acid	ng/L	< 2	U	< 2	U	< 2	U	< 2	U	< 3	U	< 2	U	---
PFOSA	ng/L	< 3	U	< 3	U	< 3	U	< 3	U	< 4.5	U	< 3	U	---

¹ Environmental Protection Agency (EPA)'s Integrated Risk Information System (IRIS) 2013 for drinking water representing a 1 x 10⁻⁶ cancer risk level.
² EPA health advisory level for drinking water - combined concentrations of PFOA and PFAS.
-- = Not analyzed.
U = The analyte was analyzed for, but was not detected above the sample reporting limit.
µg/l = micrograms per liter = parts per billion (ppb)
ng/l = nanograms per liter = parts per trillion (ppt)
Values shown in **bold** exceed the guidance value indicated.
Data provided by Con-Test Analytical.

This page intentionally left blank

Attachment A

Groundwater Purge Logs

This page left intentionally blank



EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: 915239-MW-01	EA Personnel: Stephen Soldner/Lindsay Mairs	Client: NYSDEC
Location: 5565 River Road Tonawanda, New York	Well Condition: Good	Weather: Clear, Mod. Wind, 45F
Sounding Method: Heron Skinny Dipper WLM (PFC Free)	Gauge Date: 26-Apr-18	Measurement Ref: TOC
Stick Up/Down (ft): +3.0'	Gauge Time: 1450	Well Diameter (in): 2

Purge Date: 26-Apr-18	Purge Time: 1123
Purge Method: Peristaltic Pump	Field Technician: SS/LM

Well Volume

A. Well Depth (ft): 13.55	D. Well Volume (ft): 0.163	Depth/Height of Top of PVC: -0.2
B. Depth to Water (ft): 8.18	E. Well Volume (gal) C*D): 0.875	Pump Type: Peristaltic
C. Liquid Depth (ft) (A-B): 5.37	F. Three Well Volumes (gal) (E3): 2.63	Pump Intake Depth: 13.5

Water Quality Parameters

Time (hrs)	Temperature (°C)	pH (Std. Units)	ORP (mV)	Conductivity (S/m)	Turbidity (NTU)	DO (mg/L)	DTW (ft btoc)	Rate (Lpm)	Volume (liters)
1124	10.77	7.79	-129	2.56	434	13.52	*	0.30	---
1127	7.15	7.06	-107	1.86	32.6	1.18		0.30	0.9
1130	6.79	6.95	-83	1.55	8.5	0.00		0.30	1.8
1133	6.68	6.90	-72	1.52	5.9	0.00		0.30	2.7
1136	6.70	6.89	-71	1.52	5.1	0.00		0.30	3.6
1139	6.62	6.88	-68	1.51	3.7	0.00		0.30	4.5
1142	6.67	6.87	-66	1.51	3.0	0.00		0.30	5.4
1145	6.64	6.85	-65	1.50	2.8	0.00		0.30	6.3

Total Quantity of Water Removed (gal): 6.3	Sampling Time: 1145
Samplers: SS/LM	Split Sample With: MS/MSD
Sampling Date: 4/26/2018	Sample Type: GW Grab

COMMENTS AND OBSERVATIONS:

*Gauged after sampling due to PFC analysis

MS/MSD for 1,4 Dioxane and PFC



EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: 915239-MW-02	EA Personnel: Stephen Soldner/Lindsay Mairs	Client: NYSDEC
Location: 5565 River Road Tonawanda, New York	Well Condition: Good	Weather: Clear, Mod. Wind, 50F
Sounding Method: Heron Skinny Dipper WLM (PFC Free)	Gauge Date: 26-Apr-18	Measurement Ref: TOC
Stick Up/Down (ft): +3.0'	Gauge Time: 1455	Well Diameter (in): 2

Purge Date: 26-Apr-18	Purge Time: 1254
Purge Method: Peristaltic Pump	Field Technician: SS/LM

Well Volume

A. Well Depth (ft): 11.52	D. Well Volume (ft): 0.163	Depth/Height of Top of PVC: -0.2
B. Depth to Water (ft): 4.78	E. Well Volume (gal) C*D): 1.10	Pump Type: Peristaltic
C. Liquid Depth (ft) (A-B): 6.74	F. Three Well Volumes (gal) (E3): 3.30	Pump Intake Depth: 11.5

Water Quality Parameters

Time	Temperature	pH	ORP	Conductivity	Turbidity	DO	DTW	Rate	Volume
(hrs)	(°C)	(Std. Units)	(mV)	(S/m)	(NTU)	(mg/L)	(ft btoc)	(Lpm)	(liters)
1256	10.59	6.91	-51	1.17	28.0	17.08	*	0.3	---
1259	9.51	6.85	-36	0.914	21.1	13.01		0.3	0.9
1302	8.68	6.75	-9	0.820	9.0	9.45		0.3	1.8
1305	8.32	6.71	1	0.806	5.3	7.19		0.3	2.7
1308	8.34	6.69	5	0.802	3.9	5.61		0.3	3.6
1311	8.74	6.69	4	0.891	9.7	4.53		0.3	4.5
1314	8.78	6.68	-5	0.897	9.5	3.71		0.3	5.4
1317	8.77	6.68	-6	0.897	9.7	3.53		0.3	6.3
1320	8.75	6.68	-4	0.895	9.1	3.11		0.3	7.2

Total Quantity of Water Removed (gal): 7.2	Sampling Time: 1320
Samplers: SS/LM	Split Sample With: N/A
Sampling Date: 4/26/2018	Sample Type: GW Grab

COMMENTS AND OBSERVATIONS:

*Gauged after sampling due to PFC analysis



EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: 915239-MW-03	EA Personnel: Stephen Soldner/Lindsay Mairs	Client: NYSDEC
Location: 5565 River Road Tonawanda, New York	Well Condition: Good	Weather: Sunny, 42F
Sounding Method: Heron Skinny Dipper WLM (PFC Free)	Gauge Date: 26-Apr-18	Measurement Ref: TOC
Stick Up/Down (ft): +2.5'	Gauge Time: 1358	Well Diameter (in): 2

Purge Date: 26-Apr-18	Purge Time: 1252
Purge Method: Peristaltic Pump	Field Technician: SS/LM

Well Volume

A. Well Depth (ft): 22.2	D. Well Volume (ft): 0.163	Depth/Height of Top of PVC: -0.2
B. Depth to Water (ft): 12.98	E. Well Volume (gal) C*D): 1.5	Pump Type: Peristaltic
C. Liquid Depth (ft) (A-B): 9.22	F. Three Well Volumes (gal) (E3): 4.51	Pump Intake Depth: 22

Water Quality Parameters

Time	Temperature	pH	ORP	Conductivity	Turbidity	DO	DTW	Rate	Volume
(hrs)	(°C)	(Std. Units)	(mV)	(S/m)	(NTU)	(mg/L)	(ft btoc)	(Lpm)	(liters)
1255	16.25	7.73	138	0.023	12.4	7.65	*	0.25	---
1258	16.16	7.34	142	0.622	9.7	3.45		0.25	0.75
1301	15.94	7.08	144	0.620	7.9	2.38		0.25	1.5
1304	15.65	7.07	146	0.618	13.8	2.11		0.25	2.25
1307	15.39	7.07	147	0.614	12.2	1.92		0.25	3
1310	15.20	7.04	149	0.614	10.6	1.82		0.25	3.75
1313	15.00	7.03	150	0.617	12.5	1.82		0.25	4.5
1316	14.80	7.00	152	0.612	12.0	1.82		0.25	5.25
1319	14.71	6.99	153	0.605	11.0	1.78		0.25	6
1322	14.68	6.98	154	0.598	10.8	1.87		0.25	6.75

Total Quantity of Water Removed (gal): 6.75	Sampling Time: 1322
Samplers: SS/LM	Split Sample With: N/A
Sampling Date: 4/26/2018	Sample Type: GW Grab

COMMENTS AND OBSERVATIONS:

*Gauged after sampling due to PFC analysis



EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: 915239-MW-05	EA Personnel: Stephen Soldner/Lindsay Mairs	Client: NYSDEC
Location: 5565 River Road Tonawanda, New York	Well Condition: Good	Weather: Sunny, 42F
Sounding Method: Heron Skinny Dipper WLM (PFC Free)	Gauge Date: 26-Apr-18	Measurement Ref: TOC
Stick Up/Down (ft): +3.0'	Gauge Time: 1525	Well Diameter (in): 2

Purge Date: 26-Apr-18	Purge Time: 1405
Purge Method: Peristaltic Pump	Field Technician: SS/LM

Well Volume

A. Well Depth (ft): 15.66	D. Well Volume (ft): 0.163	Depth/Height of Top of PVC: -0.2
B. Depth to Water (ft): 6.06	E. Well Volume (gal) C*D): 1.57	Pump Type: Peristaltic
C. Liquid Depth (ft) (A-B): 9.6	F. Three Well Volumes (gal) (E3): 4.69	Pump Intake Depth: 15.5

Water Quality Parameters

Time	Temperature	pH	ORP	Conductivity	Turbidity	DO	DTW	Rate	Volume
(hrs)	(°C)	(Std. Units)	(mV)	(S/m)	(NTU)	(mg/L)	(ft btoc)	(Lpm)	(liters)
1408	11.48	7.13	-85	1.45	43.5	0.35	*	0.25	---
1411	10.82	6.91	-91	1.38	15.2	0.00		0.25	0.75
1414	10.73	6.91	-90	1.28	11.0	0.00		0.25	1.5
1417	10.11	6.87	-61	1.12	15.7	0.00		0.25	2.25
1420	10.14	6.83	-42	1.10	13.5	0.00		0.25	3
1423	10.06	6.82	-31	1.10	13.6	0.00		0.25	3.75
1427	10.32	6.81	-18	1.06	17.1	0.00		0.25	4.5
1430	10.18	6.82	-13	0.944	14.8	0.00		0.25	5.25
1433	10.10	6.86	-11	0.845	10.0	0.00		0.25	6
1436	10.05	6.89	-10	0.821	8.6	0.00		0.25	6.75
1439	10.15	6.90	-10	0.813	7.6	0.00		0.25	7.5
1442	10.22	6.90	-10	0.814	7.4	0.00		0.25	8.25

Total Quantity of Water Removed (gal): 8.25	Sampling Time: 1442
Samplers: SS/LM	Split Sample With: N/A
Sampling Date: 4/26/2018	Sample Type: GW Grab

COMMENTS AND OBSERVATIONS:

*Gauged after sampling due to PFC analysis



EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: 915239-MW-08	EA Personnel: Stephen Soldner/Lindsay Mairs	Client: NYSDEC
Location: 5565 River Road Tonawanda, New York	Well Condition: Good	Weather: Sunny, 41F
Sounding Method: Heron Skinny Dipper WLM (PFC Free)	Gauge Date: 26-Apr-18	Measurement Ref: TOC
Stick Up/Down (ft): +3.0'	Gauge Time: Dry after sample	Well Diameter (in): 2

Purge Date: 26-Apr-18	Purge Time: 1115
Purge Method: Peristaltic Pump	Field Technician: SS/LM

Well Volume

A. Well Depth (ft): 17.79	D. Well Volume (ft): 0.163	Depth/Height of Top of PVC: -0.2
B. Depth to Water (ft): Dry after sample	E. Well Volume (gal) C*D): N/A	Pump Type: Peristaltic
C. Liquid Depth (ft) (A-B): N/A	F. Three Well Volumes (gal) (E3): N/A	Pump Intake Depth: 17.5

Water Quality Parameters

Time	Temperature	pH	ORP	Conductivity	Turbidity	DO	DTW	Rate	Volume
(hrs)	(°C)	(Std. Units)	(mV)	(S/m)	(NTU)	(mg/L)	(ft btoc)	(Lpm)	(liters)
1118	10.46	7.77	80	1.41	>1000	15.52	*	0.25	---
1121	9.68	7.48	104	1.42	490	11.53		0.25	0.75
1124	9.56	7.46	112	1.42	139	11.85		0.25	1.5
1127	9.27	7.44	118	1.41	32.0	11.20		0.25	2.25
1130	9.25	7.43	122	1.42	17.7	10.58		0.25	3
1133	9.41	7.40	125	1.42	11.0	9.79		0.25	3.75
1136	9.49	7.36	128	1.43	10.8	7.12		0.25	4.5
1139	9.50	7.34	130	1.43	12.0	6.26		0.25	5.25
1142	9.61	7.35	132	1.42	12.7	5.91		0.25	6
1145	9.57	7.36	133	1.41	10.0	6.30		0.25	6.75

Total Quantity of Water Removed (gal): 6.75	Sampling Time: 1145
Samplers: SS/LM	Split Sample With: Duplicate
Sampling Date: 4/26/2018	Sample Type: GW Grab

COMMENTS AND OBSERVATIONS: Field duplicate for 1, 4 Dioxane collected at this location
*Gauged after sampling due to PFC analysis



EA Engineering, P.C.
EA Science and Technology

GROUNDWATER SAMPLING PURGE FORM

Well I.D.: 915239-MW-10	EA Personnel: Stephen Soldner/Lindsay Mairs	Client: NYSDEC
Location: 5565 River Road Tonawanda, New York	Well Condition: Good	Weather: Clear, mod. Wind, 50F
Sounding Method: Heron Skinny Dipper WLM (PFC Free)	Gauge Date: 26-Apr-18	Measurement Ref: TOC
Stick Up/Down (ft): +3.0'	Gauge Time: 1500	Well Diameter (in): 2

Purge Date: 26-Apr-18	Purge Time: 1417
Purge Method: Peristaltic Pump	Field Technician: SS/LM

Well Volume

A. Well Depth (ft): 17.55	D. Well Volume (ft): 0.163	Depth/Height of Top of PVC: -0.2
B. Depth to Water (ft): 10.44	E. Well Volume (gal) C*D): 1.16	Pump Type: Peristaltic
C. Liquid Depth (ft) (A-B): 7.11	F. Three Well Volumes (gal) (E3): 3.48	Pump Intake Depth: 17.5

Water Quality Parameters

Time	Temperature	pH	ORP	Conductivity	Turbidity	DO	DTW	Rate	Volume
(hrs)	(°C)	(Std. Units)	(mV)	(S/m)	(NTU)	(mg/L)	(ft btoc)	(Lpm)	(liters)
1419	8.44	7.53	-79	0.905	5.4	0.00	*	0.30	---
1422	8.16	7.54	-84	0.770	13.80	0.00		0.30	0.9
1425	7.11	7.63	-92	0.581	21.70	0.00		0.30	1.8
1428	7.21	7.62	-94	0.577	21.30	0.00		0.30	2.7
1431	7.01	7.69	-104	0.543	14.9	0.00		0.30	3.6
1434	6.90	7.77	-110	0.517	13.7	0.00		0.30	4.5
1437	6.91	7.82	-115	0.500	10.90	0.00		0.30	5.4
1440	6.89	7.89	-127	0.469	6.7	0.00		0.30	6.3
1443	6.88	8.07	-135	0.468	6.8	0.00		0.30	7.2
1446	6.86	8.12	-142	0.467	6.7	0.00		0.30	8.1
1449	6.85	8.12	-144	0.465	6.7	0.00		0.30	9

Total Quantity of Water Removed (gal):	9	Sampling Time:	1450
Samplers:	SS/LM	Split Sample With:	Duplicate - PFC only
Sampling Date:	4/26/2018	Sample Type:	GW Grab

COMMENTS AND OBSERVATIONS: Duplicate for PFC only here

*Gauged after sampling due to PFC analysis

Attachment B

Laboratory Analytical Data

This page left intentionally blank

May 15, 2018

Nate Krans
EA Engineering, Science & Tech. - NY
6712 Brooklawn Parkway, Suite 104
Syracuse, NY 13211

Project Location: Tonawanda, NY
Client Job Number:
Project Number: 14907-21
Laboratory Work Order Number: 18D1336

Enclosed are results of analyses for samples received by the laboratory on April 27, 2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Aaron L. Benoit", with a long horizontal line extending to the right.

Aaron L. Benoit
Project Manager

Table of Contents

Sample Summary	3
Case Narrative	4
Sample Results	5
18D1336-01	5
18D1336-02	6
18D1336-03	7
18D1336-04	8
18D1336-05	9
18D1336-06	10
18D1336-07	11
18D1336-08	12
Sample Preparation Information	13
QC Data	14
Miscellaneous Organic Analyses	14
B202675	14
Flag/Qualifier Summary	16
Certifications	17
Chain of Custody/Sample Receipt	18

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

EA Engineering, Science & Tech. - NY
6712 Brooklawn Parkway, Suite 104
Syracuse, NY 13211
ATTN: Nate Kranes

REPORT DATE: 5/15/2018

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 14907-21

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18D1336

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Tonawanda, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
915239-MW-01	18D1336-01	Ground Water		SOP 434-PFAAS	
915239-MW-02	18D1336-02	Ground Water		SOP 434-PFAAS	
915239-MW-03	18D1336-03	Ground Water		SOP 434-PFAAS	
915239-MW-05	18D1336-04	Ground Water		SOP 434-PFAAS	
915239-MW-08	18D1336-05	Ground Water		SOP 434-PFAAS	
915239-MW-10	18D1336-06	Ground Water		SOP 434-PFAAS	
915239-MW-DUP	18D1336-07	Ground Water		SOP 434-PFAAS	
915239-FB042618	18D1336-08	Field Blank		SOP 434-PFAAS	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

SOP 434-PFAAS**Qualifications:****MS-07**

Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possibility of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:**Perfluorooctanesulfonic acid (PFO)**

B202675-MS1, B202675-MSD1

MS-15

Matrix spike and matrix spike duplicate recoveries are outside of control limits. Data validation is not affected since results for this compound in this sample are "not detected", and recovery bias is on the high side.

Analyte & Samples(s) Qualified:**6:2 Fluorotelomersulfonate (6:2 FT)**

B202675-MS1, B202675-MSD1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1336

Date Received: 4/27/2018

Field Sample #: 915239-MW-01

Sampled: 4/26/2018 11:45

Sample ID: 18D1336-01

Sample Matrix: Ground Water

Miscellaneous Organic Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	5.9	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorohexanoic acid (PFHxA)	5.5	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluoroheptanoic acid (PFHpA)	6.3	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorobutanoic acid (PFBA)	6.2	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorodecanesulfonic acid (PFDS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluoroheptanesulfonic acid (PFHpS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorooctanesulfonamide (FOSA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluoropentanoic acid (PFPeA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorohexanesulfonic acid (PFHxS)	11	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorooctanoic acid (PFOA)	55	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorooctanesulfonic acid (PFOS)	36	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorononanoic acid (PFNA)	2.1	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
NMeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
NEtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:53	KAF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
13C-PFHxA	94.2	70-130							
13C-PFDA	109	70-130							
d5-NEtFOSAA	83.4	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1336

Date Received: 4/27/2018

Field Sample #: 915239-MW-02

Sampled: 4/26/2018 13:20

Sample ID: 18D1336-02

Sample Matrix: Ground Water

Miscellaneous Organic Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorobutanoic acid (PFBA)	3.9	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorodecanesulfonic acid (PFDS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluoroheptanesulfonic acid (PFHpS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorooctanesulfonamide (FOSA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluoropentanoic acid (PFPeA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorooctanoic acid (PFOA)	16	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorooctanesulfonic acid (PFOS)	4.0	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
NMeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
NEtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:40	KAF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
13C-PFHxA	88.1	70-130							
13C-PFDA	97.1	70-130							
d5-NEtFOSAA	78.2	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1336

Date Received: 4/27/2018

Field Sample #: 915239-MW-03

Sampled: 4/26/2018 13:22

Sample ID: 18D1336-03

Sample Matrix: Ground Water

Miscellaneous Organic Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorobutanoic acid (PFBA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorodecanesulfonic acid (PFDS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluoroheptanesulfonic acid (PFHpS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorooctanesulfonamide (FOSA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluoropentanoic acid (PFPeA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
NMeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
NEtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:36	KAF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
13C-PFHxA	127	70-130							
13C-PFDA	128	70-130							
d5-NEtFOSAA	129	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1336

Date Received: 4/27/2018

Field Sample #: 915239-MW-05

Sampled: 4/26/2018 14:42

Sample ID: 18D1336-04

Sample Matrix: Ground Water

Miscellaneous Organic Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	2.2	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorohexanoic acid (PFHxA)	4.0	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluoroheptanoic acid (PFHpA)	2.2	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorobutanoic acid (PFBA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorodecanesulfonic acid (PFDS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluoroheptanesulfonic acid (PFHpS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorooctanesulfonamide (FOSA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluoropentanoic acid (PFPeA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorohexanesulfonic acid (PFHxS)	2.7	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorooctanoic acid (PFOA)	22	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorooctanesulfonic acid (PFOS)	4.4	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
NMeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
NEtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:02	KAF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
13C-PFHxA	102	70-130							
13C-PFDA	95.9	70-130							
d5-NEtFOSAA	89.0	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1336

Date Received: 4/27/2018

Field Sample #: 915239-MW-08

Sampled: 4/26/2018 11:45

Sample ID: 18D1336-05

Sample Matrix: Ground Water

Miscellaneous Organic Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorohexanoic acid (PFHxA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluoroheptanoic acid (PFHpA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorobutanoic acid (PFBA)	ND	4.5	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorodecanesulfonic acid (PFDS)	ND	4.5	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluoroheptanesulfonic acid (PFHpS)	ND	4.5	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorooctanesulfonamide (FOSA)	ND	4.5	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluoropentanoic acid (PFPeA)	ND	4.5	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	4.5	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	4.5	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorohexanesulfonic acid (PFHxS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorooctanoic acid (PFOA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorooctanesulfonic acid (PFOS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorononanoic acid (PFNA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorodecanoic acid (PFDA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
NMeFOSAA	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluoroundecanoic acid (PFUnA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
NEtFOSAA	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorododecanoic acid (PFDoA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorotridecanoic acid (PFTrDA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Perfluorotetradecanoic acid (PFTA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:49	KAF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
13C-PFHxA	92.5	70-130							
13C-PFDA	85.5	70-130							
d5-NEtFOSAA	77.1	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1336

Date Received: 4/27/2018

Field Sample #: 915239-MW-10

Sampled: 4/26/2018 14:50

Sample ID: 18D1336-06

Sample Matrix: Ground Water

Miscellaneous Organic Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorobutanoic acid (PFBA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorodecanesulfonic acid (PFDS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluoroheptanesulfonic acid (PFHpS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorooctanesulfonamide (FOSA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluoropentanoic acid (PFPeA)	5.0	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorooctanoic acid (PFOA)	7.0	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
NMeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
NEtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:27	KAF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
13C-PFHxA	101	70-130							
13C-PFDA	104	70-130							
d5-NEtFOSAA	91.9	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1336

Date Received: 4/27/2018

Field Sample #: 915239-MW-DUP

Sampled: 4/26/2018 00:00

Sample ID: 18D1336-07

Sample Matrix: Ground Water

Miscellaneous Organic Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorobutanoic acid (PFBA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorodecanesulfonic acid (PFDS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluoroheptanesulfonic acid (PFHpS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorooctanesulfonamide (FOSA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluoropentanoic acid (PFPeA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorooctanoic acid (PFOA)	6.9	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorooctanesulfonic acid (PFOS)	2.2	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
NMeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
NEtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 16:15	KAF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
13C-PFHxA	106	70-130							
13C-PFDA	99.5	70-130							
d5-NEtFOSAA	74.3	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1336

Date Received: 4/27/2018

Field Sample #: 915239-FB042618

Sampled: 4/26/2018 15:00

Sample ID: 18D1336-08

Sample Matrix: Field Blank

Miscellaneous Organic Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorobutanoic acid (PFBA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorodecanesulfonic acid (PFDS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluoroheptanesulfonic acid (PFHpS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorooctanesulfonamide (FOSA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluoropentanoic acid (PFPeA)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	3.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
NMeFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
NEtFOSAA	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP 434-PFAAS	5/10/18	5/14/18 15:24	KAF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
13C-PFHxA	105	70-130							
13C-PFDA	89.1	70-130							
d5-NEtFOSAA	91.9	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**Sample Extraction Data****Prep Method: EPA 537-SOP 434-PFAAS**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
18D1336-01 [915239-MW-01]	B202675	250	1.00	05/10/18
18D1336-02 [915239-MW-02]	B202675	250	1.00	05/10/18
18D1336-03 [915239-MW-03]	B202675	250	1.00	05/10/18
18D1336-04 [915239-MW-05]	B202675	250	1.00	05/10/18
18D1336-05 [915239-MW-08]	B202675	166	1.00	05/10/18
18D1336-06 [915239-MW-10]	B202675	250	1.00	05/10/18
18D1336-07 [915239-MW-DUP]	B202675	250	1.00	05/10/18
18D1336-08 [915239-FB042618]	B202675	250	1.00	05/10/18

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Miscellaneous Organic Analyses - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch B202675 - EPA 537

Blank (B202675-BLK1)

Prepared: 05/10/18 Analyzed: 05/14/18

Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L							
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L							
Perfluorobutanoic acid (PFBA)	ND	3.0	ng/L							
Perfluorodecanesulfonic acid (PFDS)	ND	3.0	ng/L							
Perfluoroheptanesulfonic acid (PFHpS)	ND	3.0	ng/L							
Perfluorooctanesulfonamide (FOSA)	ND	3.0	ng/L							
Perfluoropentanoic acid (PFPeA)	ND	3.0	ng/L							
6:2 Fluorotelomersulfonate (6:2 FTS)	ND	3.0	ng/L							
8:2 Fluorotelomersulfonate (8:2 FTS)	ND	3.0	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L							
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L							
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L							
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L							
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L							
NMeFOSAA	ND	2.0	ng/L							
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L							
NEtFOSAA	ND	2.0	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L							
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L							
Surrogate: 13C-PFHxA	43.8		ng/L	40.0		109	70-130			
Surrogate: 13C-PFDA	38.1		ng/L	40.0		95.2	70-130			
Surrogate: d5-NEtFOSAA	113		ng/L	160		70.8	70-130			

LCS (B202675-BS1)

Prepared: 05/10/18 Analyzed: 05/14/18

Perfluorobutanesulfonic acid (PFBS)	1.84	2.0	ng/L	1.77		104	50-150			
Perfluorohexanoic acid (PFHxA)	2.58	2.0	ng/L	2.00		129	50-150			
Perfluoroheptanoic acid (PFHpA)	2.25	2.0	ng/L	2.00		113	50-150			
Perfluorobutanoic acid (PFBA)	1.35	3.0	ng/L	2.00		67.4	30-110			
Perfluorodecanesulfonic acid (PFDS)	1.58	3.0	ng/L	1.93		81.7	50-150			
Perfluoroheptanesulfonic acid (PFHpS)	2.22	3.0	ng/L	1.90		117	50-150			
Perfluorooctanesulfonamide (FOSA)	1.03	3.0	ng/L	2.00		51.3	30-110			
Perfluoropentanoic acid (PFPeA)	1.86	3.0	ng/L	2.00		93.0	50-150			
6:2 Fluorotelomersulfonate (6:2 FTS)	2.71	3.0	ng/L	1.90		143	50-150			
8:2 Fluorotelomersulfonate (8:2 FTS)	2.86	3.0	ng/L	1.92		149	50-150			
Perfluorohexanesulfonic acid (PFHxS)	2.25	2.0	ng/L	1.82		123	50-150			
Perfluorooctanoic acid (PFOA)	2.45	2.0	ng/L	2.00		123	50-150			
Perfluorooctanesulfonic acid (PFOS)	2.50	2.0	ng/L	1.85		135	50-150			
Perfluorononanoic acid (PFNA)	2.58	2.0	ng/L	2.00		129	50-150			
Perfluorodecanoic acid (PFDA)	2.48	2.0	ng/L	2.00		124	50-150			
NMeFOSAA	2.35	2.0	ng/L	2.00		118	50-150			
Perfluoroundecanoic acid (PFUnA)	1.81	2.0	ng/L	2.00		90.4	50-150			
NEtFOSAA	1.96	2.0	ng/L	2.00		98.1	50-150			
Perfluorododecanoic acid (PFDoA)	1.91	2.0	ng/L	2.00		95.4	50-150			
Perfluorotridecanoic acid (PFTrDA)	2.02	2.0	ng/L	2.00		101	50-150			
Perfluorotetradecanoic acid (PFTA)	1.68	2.0	ng/L	2.00		84.0	50-150			
Surrogate: 13C-PFHxA	47.9		ng/L	40.0		120	70-130			
Surrogate: 13C-PFDA	45.3		ng/L	40.0		113	70-130			
Surrogate: d5-NEtFOSAA	154		ng/L	160		96.4	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Miscellaneous Organic Analyses - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B202675 - EPA 537										
Matrix Spike (B202675-MS1)	Source: 18D1336-01			Prepared: 05/10/18 Analyzed: 05/14/18						
Perfluorobutanesulfonic acid (PFBS)	7.92	2.0	ng/L	1.77	5.87	116	50-150			
Perfluorohexanoic acid (PFHxA)	8.25	2.0	ng/L	2.00	5.46	139	50-150			
Perfluoroheptanoic acid (PFHpA)	8.55	2.0	ng/L	2.00	6.29	113	50-150			
Perfluorobutanoic acid (PFBA)	8.03	3.0	ng/L	2.00	6.18	92.2	30-110			
Perfluorodecanesulfonic acid (PFDS)	1.91	3.0	ng/L	1.93	ND	98.9	50-150			
Perfluoroheptanesulfonic acid (PFHpS)	2.48	3.0	ng/L	1.90	1.10	73.1	50-150			
Perfluorooctanesulfonamide (FOSA)	0.724	3.0	ng/L	2.00	ND	36.2	30-110			
Perfluoropentanoic acid (PFPeA)	5.16	3.0	ng/L	2.00	2.80	118	50-150			
6:2 Fluorotelomersulfonate (6:2 FTS)	7.74	3.0	ng/L	1.90	ND	407 *	50-150			MS-15
8:2 Fluorotelomersulfonate (8:2 FTS)	3.35	3.0	ng/L	1.92	1.24	110	50-150			
Perfluorohexanesulfonic acid (PFHxS)	12.0	2.0	ng/L	1.82	10.6	76.8	50-150			
Perfluorooctanoic acid (PFOA)	57.0	2.0	ng/L	2.00	55.3	85.5	50-150			
Perfluorooctanesulfonic acid (PFOS)	31.5	2.0	ng/L	1.85	36.3	-260 *	50-150			MS-07
Perfluorononanoic acid (PFNA)	3.80	2.0	ng/L	2.00	2.05	87.5	50-150			
Perfluorodecanoic acid (PFDA)	2.71	2.0	ng/L	2.00	ND	136	50-150			
NMeFOSAA	1.49	2.0	ng/L	2.00	ND	74.5	50-150			
Perfluoroundecanoic acid (PFUnA)	2.44	2.0	ng/L	2.00	ND	122	50-150			
NEtFOSAA	2.55	2.0	ng/L	2.00	ND	127	50-150			
Perfluorododecanoic acid (PFDoA)	1.68	2.0	ng/L	2.00	ND	83.9	50-150			
Perfluorotridecanoic acid (PFTrDA)	2.26	2.0	ng/L	2.00	ND	113	50-150			
Perfluorotetradecanoic acid (PFTA)	2.29	2.0	ng/L	2.00	ND	114	50-150			
Surrogate: 13C-PFHxA	35.7		ng/L	40.0		89.3	70-130			
Surrogate: 13C-PFDA	49.5		ng/L	40.0		124	70-130			
Surrogate: d5-NEtFOSAA	133		ng/L	160		83.1	70-130			
Matrix Spike Dup (B202675-MSD1)	Source: 18D1336-01			Prepared: 05/10/18 Analyzed: 05/14/18						
Perfluorobutanesulfonic acid (PFBS)	8.24	2.0	ng/L	1.77	5.87	134	50-150	3.95	30	
Perfluorohexanoic acid (PFHxA)	7.36	2.0	ng/L	2.00	5.46	94.8	50-150	11.4	30	
Perfluoroheptanoic acid (PFHpA)	8.20	2.0	ng/L	2.00	6.29	95.5	50-150	4.12	30	
Perfluorobutanoic acid (PFBA)	8.28	3.0	ng/L	2.00	6.18	105	30-110	3.07	30	
Perfluorodecanesulfonic acid (PFDS)	1.79	3.0	ng/L	1.93	ND	92.9	50-150	6.26	30	
Perfluoroheptanesulfonic acid (PFHpS)	2.68	3.0	ng/L	1.90	1.10	83.4	50-150	7.57	30	
Perfluorooctanesulfonamide (FOSA)	0.768	3.0	ng/L	2.00	ND	38.4	30-110	5.96	30	
Perfluoropentanoic acid (PFPeA)	5.25	3.0	ng/L	2.00	2.80	123	50-150	1.83	30	
6:2 Fluorotelomersulfonate (6:2 FTS)	5.79	3.0	ng/L	1.90	ND	305 *	50-150	28.7	30	MS-15
8:2 Fluorotelomersulfonate (8:2 FTS)	3.27	3.0	ng/L	1.92	1.24	106	50-150	2.36	30	
Perfluorohexanesulfonic acid (PFHxS)	12.1	2.0	ng/L	1.82	10.6	81.7	50-150	0.747	30	
Perfluorooctanoic acid (PFOA)	57.1	2.0	ng/L	2.00	55.3	90.3	50-150	0.169	30	
Perfluorooctanesulfonic acid (PFOS)	36.5	2.0	ng/L	1.85	36.3	10.8 *	50-150	14.7	30	MS-07
Perfluorononanoic acid (PFNA)	3.61	2.0	ng/L	2.00	2.05	77.9	50-150	5.19	30	
Perfluorodecanoic acid (PFDA)	2.67	2.0	ng/L	2.00	ND	134	50-150	1.56	30	
NMeFOSAA	1.93	2.0	ng/L	2.00	ND	96.4	50-150	25.6	30	
Perfluoroundecanoic acid (PFUnA)	2.20	2.0	ng/L	2.00	ND	110	50-150	10.3	30	
NEtFOSAA	2.18	2.0	ng/L	2.00	ND	109	50-150	15.6	30	
Perfluorododecanoic acid (PFDoA)	1.55	2.0	ng/L	2.00	ND	77.5	50-150	7.85	30	
Perfluorotridecanoic acid (PFTrDA)	1.69	2.0	ng/L	2.00	ND	84.3	50-150	28.9	30	
Perfluorotetradecanoic acid (PFTA)	2.03	2.0	ng/L	2.00	ND	101	50-150	12.0	30	
Surrogate: 13C-PFHxA	30.3		ng/L	40.0		75.8	70-130			
Surrogate: 13C-PFDA	42.5		ng/L	40.0		106	70-130			
Surrogate: d5-NEtFOSAA	138		ng/L	160		86.0	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**FLAG/QUALIFIER SUMMARY**

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
MS-07	Matrix spike recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possibility of sample matrix effects that lead to low bias for reported result or non-homogeneous sample aliquot cannot be eliminated.
MS-15	Matrix spike and matrix spike duplicate recoveries are outside of control limits. Data validation is not affected since results for this compound in this sample are "not detected", and recovery bias is on the high side.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CERTIFICATIONS

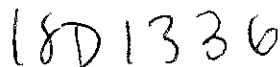
Certified Analyses included in this Report

Analyte	Certifications
---------	----------------

No certified Analyses included in this Report

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	03/1/2020
MA	Massachusetts DEP	M-MA100	06/30/2018
CT	Connecticut Department of Public Health	PH-0567	09/30/2019
NY	New York State Department of Health	10899 NELAP	04/1/2019
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2019
RI	Rhode Island Department of Health	LAO00112	12/30/2018
NC	North Carolina Div. of Water Quality	652	12/31/2018
NJ	New Jersey DEP	MA007 NELAP	06/30/2018
FL	Florida Department of Health	E871027 NELAP	06/30/2018
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2018
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2018
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2018
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2018
NC-DW	North Carolina Department of Health	25703	07/31/2018



Page _____ of _____

Requested Turnaround Time	
7-Day ☐	10-Day ☐
Due Date: <u>Standard</u>	
Rush-Approval Required	
1-Day ☐	3-Day ☐
2-Day ☐	4-Day ☐
Data Delivery	
Format: PDF ☐	EXCEL ☐
Other: <u>Full CD ROM CD ROM Equiv.</u>	
CLP Like Data Pkg Required: ☐	
Email To: <u>NKRAWES@earth.com</u>	
Fax To #:	

[illegible]

# of Containers	
² Preservation Code	
³ Container Code	
<i>Dissolved Metals Samples</i>	
☐ Field Filtered	
☐ Lab to Filter	
<i>Orthophosphate Samples</i>	
☐ Field Filtered	
☐ Lab to Filter	
¹ Matrix Codes: GW = Ground Water WW = Waste Water DW = Drinking Water A = Air S = Soil SL = Sludge SOL = Solid O = Other (please define)	
² Preservation Codes: I = Iced H = HCL M = Methanol N = Nitric Acid S = Sulfuric Acid B = Sodium Bisulfate X = Sodium Hydroxide T = Sodium Thiosulfate O = Other (please define)	

2 250 mL PLASTIC PER SAMPLE (1 FOR FB
MS/MSD @ MW-1 ONLY 1 BOTTLE
FOR MW-2 (well dry)

H - High; M - Medium; L - Low; C - Clean; U - Unknown

Detection Limit Requirements		Special Requirements	
MA		☐	MA MCP Required
			MCP Certification Form Required
CT		☐	CT RCP Required
			RCP Certification Form Required
		☐	MA State DW Required
Other:		PWSID #	
Project Entity			
☒	Government	☐	Municipality
☐	Federal	☐	21 J
☐	City	☐	Brownfield
		☐	MWRA
		☐	School
		☐	MBTA



NELAC and ANA-LAP, LLC Accredited

Other ☐ Chromatogram ☐ **AIHA-LAP, LLC**

³ Container Codes:
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

PCB ONLY

☐	Soxhlet
☐	Non Soxhlet

**IMPORTANT!**

FedEx is closely monitoring the winter storms across portions of the U.S. [Learn More](#)

FedEx[®] Tracking

780712435119

Ship date:

Thu 4/26/2018

Syracuse, NY US



Delivered

Signed for by: B.BECCA

Actual delivery:

Fri 4/27/2018 9:35 am

EAST LONGMEADOW, MA US

Travel History

▲ Date/Time	Activity	Location
■ 4/27/2018 - Friday		
9:35 am	Delivered	EAST LONGMEADOW, MA
7:52 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
7:40 am	At local FedEx facility	WINDSOR LOCKS, CT
6:31 am	At destination sort facility	EAST GRANBY, CT
3:22 am	Departed FedEx location	MEMPHIS, TN
■ 4/26/2018 - Thursday		
10:57 pm	Arrived at FedEx location	MEMPHIS, TN
7:19 pm	Picked up	CHEERTOWAGA, NY
6:25 pm	Shipment information sent to FedEx	

Shipment Facts

Tracking Number	780712435119	Service	FedEx Priority Overnight
Weight	25 lbs / 11.34 kgs	Dimensions	16x11x12 in.
Delivered To	Shipping/Receiving	Total pieces	1
Total shipment weight	25 lbs / 11.34 kgs	Terms	Recipient
Packaging	Your Packaging	Special handling section	Deliver Weekday, Additional Handling Surcharge
Standard transit	4/27/2018 by 10:30 am		

OUR COMPANY

[About FedEx](#)

[Our Portfolio](#)

[Investor Relations](#)

[Careers](#)

[FedEx Blog](#)

[Corporate Responsibility](#)

[Newsroom](#)

[Contact Us](#)

MORE FROM FEDEX

[FedEx Compatible](#)

[Developer Resource Center](#)

[FedEx Cross Border](#)

Ask FedEx


con-test®
 ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False

Statement will be brought to the attention of the Client - State True or False

Client EA EngineeringReceived By mspDate 4/27/18Time 9:35
 How were the samples received? In Cooler T No Cooler On Ice T No Ice
 Direct from Sampling Ambient Melted Ice
Were samples within Temperature? 2-6°C T By Gun # 577 Actual Temp - 2.1By Blank # Actual Temp - Was Custody Seal Intact? NA Were Samples Tampered with? NAWas COC Relinquished? T Does Chain Agree With Samples? TAre there broken/leaking/loose caps on any samples? FIs COC in ink/ Legible? T Were samples received within holding time? TDid COC include all Client T Analysis T Sampler Name Tpertinent Information? Project T ID's T Collection Dates/Times TAre Sample labels filled out and legible? TAre there Lab to Filters? F Who was notified? Are there Rushes? F Who was notified? Are there Short Holds? F Who was notified? Is there enough Volume? TIs there Headspace where applicable? F MS/MSD? NA TProper Media/Containers Used? T Is splitting samples required? FWere trip blanks received? F On COC? FDo all samples have the proper pH? NA Acid Base

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic	<u>18</u>	4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

May 3, 2018

Nate Krans
EA Engineering, Science & Tech. - NY
6712 Brooklawn Parkway, Suite 104
Syracuse, NY 13211

Project Location: Tonawanda, NY
Client Job Number:
Project Number: 14907-21
Laboratory Work Order Number: 18D1337

Enclosed are results of analyses for samples received by the laboratory on April 27, 2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Aaron L. Benoit", with a long horizontal line extending to the right.

Aaron L. Benoit
Project Manager

Table of Contents

Sample Summary	3
Case Narrative	4
Sample Results	5
18D1337-01	5
18D1337-02	6
18D1337-03	7
18D1337-04	8
18D1337-05	9
18D1337-06	10
18D1337-07	11
18D1337-08	12
Sample Preparation Information	13
QC Data	14
1,4-Dioxane by isotope dilution GC/MS	14
B202214	14
Flag/Qualifier Summary	15
Certifications	16
Chain of Custody/Sample Receipt	17

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

EA Engineering, Science & Tech. - NY
6712 Brooklawn Parkway, Suite 104
Syracuse, NY 13211
ATTN: Nate Kranes

REPORT DATE: 5/3/2018

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 14907-21

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18D1337

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Tonawanda, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
915236-MW-01	18D1337-01	Ground Water		SW-846 8270D	
915236-MW-02	18D1337-02	Ground Water		SW-846 8270D	
915236-MW-03	18D1337-03	Ground Water		SW-846 8270D	
915236-MW-05	18D1337-04	Ground Water		SW-846 8270D	
915236-MW-08	18D1337-05	Ground Water		SW-846 8270D	
915236-MW-10	18D1337-06	Ground Water		SW-846 8270D	
915236-MW-DUP	18D1337-07	Ground Water		SW-846 8270D	
915236-MW-FB042818	18D1337-08	Field Blank		SW-846 8270D	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Lisa Worthington", is written over a light pink rectangular background.

Lisa A. Worthington
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1337

Date Received: 4/27/2018

Field Sample #: 915236-MW-01

Sampled: 4/26/2018 11:45

Sample ID: 18D1337-01

Sample Matrix: Ground Water

1,4-Dioxane by isotope dilution GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,4-Dioxane	ND	0.20	µg/L	1		SW-846 8270D	5/1/18	5/2/18 16:15	IMR
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,4-Dioxane-d8	21.0	15-110						5/2/18 16:15	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1337

Date Received: 4/27/2018

Field Sample #: 915236-MW-02

Sampled: 4/26/2018 13:20

Sample ID: 18D1337-02

Sample Matrix: Ground Water

1,4-Dioxane by isotope dilution GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,4-Dioxane	ND	0.20	µg/L	1		SW-846 8270D	5/1/18	5/2/18 16:35	IMR
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,4-Dioxane-d8	26.1	15-110						5/2/18 16:35	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1337

Date Received: 4/27/2018

Field Sample #: 915236-MW-03

Sampled: 4/26/2018 13:22

Sample ID: 18D1337-03

Sample Matrix: Ground Water

1,4-Dioxane by isotope dilution GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,4-Dioxane	ND	0.20	µg/L	1		SW-846 8270D	5/1/18	5/2/18 16:56	IMR
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,4-Dioxane-d8	25.8	15-110						5/2/18 16:56	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1337

Date Received: 4/27/2018

Field Sample #: 915236-MW-05

Sampled: 4/26/2018 14:42

Sample ID: 18D1337-04

Sample Matrix: Ground Water

1,4-Dioxane by isotope dilution GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,4-Dioxane	ND	0.20	µg/L	1		SW-846 8270D	5/1/18	5/2/18 17:16	IMR
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,4-Dioxane-d8	28.3	15-110						5/2/18 17:16	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1337

Date Received: 4/27/2018

Field Sample #: 915236-MW-08

Sampled: 4/26/2018 11:45

Sample ID: 18D1337-05

Sample Matrix: Ground Water

1,4-Dioxane by isotope dilution GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,4-Dioxane	ND	0.28	µg/L	1		SW-846 8270D	5/1/18	5/3/18 9:13	IMR
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,4-Dioxane-d8	34.4	15-110						5/3/18 9:13	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1337

Date Received: 4/27/2018

Field Sample #: 915236-MW-10

Sampled: 4/26/2018 14:50

Sample ID: 18D1337-06

Sample Matrix: Ground Water

1,4-Dioxane by isotope dilution GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,4-Dioxane	4.3	0.20	µg/L	1		SW-846 8270D	5/1/18	5/3/18 9:33	IMR
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,4-Dioxane-d8	28.1	15-110						5/3/18 9:33	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1337

Date Received: 4/27/2018

Field Sample #: 915236-MW-DUP

Sampled: 4/26/2018 00:00

Sample ID: 18D1337-07

Sample Matrix: Ground Water

1,4-Dioxane by isotope dilution GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,4-Dioxane	ND	0.24	µg/L	1		SW-846 8270D	5/1/18	5/3/18 9:53	IMR
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,4-Dioxane-d8	33.3	15-110						5/3/18 9:53	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Tonawanda, NY

Sample Description:

Work Order: 18D1337

Date Received: 4/27/2018

Field Sample #: 915236-MW-FB042818

Sampled: 4/26/2018 15:00

Sample ID: 18D1337-08

Sample Matrix: Field Blank

1,4-Dioxane by isotope dilution GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,4-Dioxane	ND	0.20	µg/L	1		SW-846 8270D	5/1/18	5/3/18 10:13	IMR
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,4-Dioxane-d8	29.5	15-110						5/3/18 10:13	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**Sample Extraction Data****Prep Method: SW-846 3510C-SW-846 8270D**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
18D1337-01 [915236-MW-01]	B202214	1000	1.00	05/01/18
18D1337-02 [915236-MW-02]	B202214	1000	1.00	05/01/18
18D1337-03 [915236-MW-03]	B202214	1000	1.00	05/01/18
18D1337-04 [915236-MW-05]	B202214	1000	1.00	05/01/18
18D1337-05 [915236-MW-08]	B202214	720	1.00	05/01/18
18D1337-06 [915236-MW-10]	B202214	1000	1.00	05/01/18
18D1337-07 [915236-MW-DUP]	B202214	840	1.00	05/01/18
18D1337-08 [915236-MW-FB042818]	B202214	1000	1.00	05/01/18

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
1,4-Dioxane by isotope dilution GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B202214 - SW-846 3510C										
Blank (B202214-BLK1)				Prepared: 05/01/18 Analyzed: 05/02/18						
1,4-Dioxane	ND	0.20	µg/L							
Surrogate: 1,4-Dioxane-d8	3.62		µg/L	10.0		36.2	15-110			
LCS (B202214-BS1)				Prepared: 05/01/18 Analyzed: 05/02/18						
1,4-Dioxane	12.6	0.20	µg/L	10.0		126	40-140			
Surrogate: 1,4-Dioxane-d8	2.27		µg/L	10.0		22.7	15-110			
LCS Dup (B202214-BSD1)				Prepared: 05/01/18 Analyzed: 05/02/18						
1,4-Dioxane	12.6	0.20	µg/L	10.0		126	40-140	0.302	30	
Surrogate: 1,4-Dioxane-d8	2.46		µg/L	10.0		24.6	15-110			
Matrix Spike (B202214-MS1)				Source: 18D1337-01		Prepared: 05/01/18 Analyzed: 05/02/18				
1,4-Dioxane	10.6	0.20	µg/L	10.0	ND	106	40-140			
Surrogate: 1,4-Dioxane-d8	2.94		µg/L	10.0		29.4	15-110			
Matrix Spike Dup (B202214-MSD1)				Source: 18D1337-01		Prepared: 05/01/18 Analyzed: 05/02/18				
1,4-Dioxane	11.6	0.20	µg/L	10.0	ND	116	40-140	8.48	20	
Surrogate: 1,4-Dioxane-d8	2.39		µg/L	10.0		23.9	15-110			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
---------	----------------

SW-846 8270D in Water

1,4-Dioxane NY

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	03/1/2020
MA	Massachusetts DEP	M-MA100	06/30/2018
CT	Connecticut Department of Public Health	PH-0567	09/30/2019
NY	New York State Department of Health	10899 NELAP	04/1/2019
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2019
RI	Rhode Island Department of Health	LAO00112	12/30/2018
NC	North Carolina Div. of Water Quality	652	12/31/2018
NJ	New Jersey DEP	MA007 NELAP	06/30/2018
FL	Florida Department of Health	E871027 NELAP	06/30/2018
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2018
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2018
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2018
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2018
NC-DW	North Carolina Department of Health	25703	07/31/2018

**IMPORTANT!**

FedEx is closely monitoring the winter storms across portions of the U.S. [Learn More](#)

FedEx® Tracking

806832457681

Ship date:

Thu 4/26/2018

SYR US



Delivered

Signed for by: B.BECCA

Actual delivery:

Fri 4/27/2018 9:35 am

EAST LONGMEADOW, MA US

Travel History

Date/Time	Activity	Location
4/27/2018 - Friday		
9:35 am	Delivered	MA
7:49 am	On FedEx vehicle for delivery	WINDSOR LOCKS CT
7:37 am	At local FedEx facility	WINDSOR LOCKS CT
6:31 am	At destination sort facility	EAST GRANBY CT
3:22 am	Departed FedEx location	MEMPHIS TN
4/26/2018 - Thursday		
10:57 pm	Arrived at FedEx location	MEMPHIS TN
7:07 pm	Picked up	CHEEKTOWAGA NY

Shipment Facts

Tracking Number	806832457681	Service	FedEx Priority Overnight
Dimensions	24x14x14 in.	Delivered To	Shipping/Receiving
Total pieces	1	Terms	Recipient
Packaging	Your Packaging	Special handling section	Deliver Weekday, Additional Handling Surcharge
Standard transit	4/27/2018 by 10:30 am		

OUR COMPANY

About FedEx

Our Portfolio

Investor Relations

Careers

FedEx Blog

Corporate Responsibility

Newsroom

Contact Us

MORE FROM FEDEX

FedEx Compatible

Developer Resource Center

FedEx Cross Border

LANGUAGE

Ask FedEx


con-test®
 ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client E A Engineering
 Received By Ray Date 4/27/18 Time 935

How were the samples received? In Cooler T No Cooler On Ice T No Ice
 Direct from Sampling Ambient Melted Ice

Were samples within Temperature? 2-6°C T By Gun # 577 Actual Temp - 3.9/4.6
 By Blank # Actual Temp -

Was Custody Seal Intact? NA Were Samples Tampered with? NA
 Was COC Relinquished? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T
 Did COC include all pertinent Information? Client T Analysis T Sampler Name T
 Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T
 Are there Lab to Filters? F Who was notified?
 Are there Rushes? F Who was notified?
 Are there Short Holds? F Who was notified?

Is there enough Volume? T
 Is there Headspace where applicable? F MS/MSD? NA T
 Proper Media/Containers Used? T Is splitting samples required? F
 Were trip blanks received? F On COC? F
 Do all samples have the proper pH? NA Acid Base

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Unused Media

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Comments:

Samples received in 2 coolers. One of the ambers for sample MW-03 was received broken.
 Sample labels have 915239; doesn't match COC.

Attachment C

Final Data Validation Report



DATA VALIDATION REPORT

5565 River Road

**Per-fluorinated Compounds, and 1,4-Dioxane
SDGs 18D1336 and 18D1337**

Chemical Analyses Performed by:

Con-Test Analytical Laboratory

Prepared by

ENVIRONMENTAL DATA SERVICES, LTD.

Prepared for

EA Engineering, Science and Technology, Inc.

Report Released

July 25, 2018

**5 Brilliant Avenue, Pittsburgh, PA 15215
412.408.3288 | www.eds-pa.com**



DATA VALIDATION REPORT FOR PER-FLUORINATED COMPOUNDS

SITE: 5565 River Road

LABORATORY: Con-Test Analytical Laboratory

SAMPLE DELIVERY GROUP: 18D1336

MATRIX: Water

VALIDATION LEVEL: 4

This sample delivery group consists of the following samples:

915239-MW-01	915239-MW-08
915239-MW-02	915239-MW-10
915239-MW-03	915239-MW-DUP
915239-MW-05	915239-FB042618

The samples described above were analyzed via USEPA 537 to determine concentrations of selected per-fluorinated alkyl acids (PFAAs), perfluorooctanoic acids (PFOA), and perfluorooctyl sulfonates (PFOS).

Performance criteria specified in the analytical method, USEPA 537, Determination of Selected Per-fluorinated Alkyl Acids (PFAAs) in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), Version 1.1, September 2009; as well as the USEPA National Functional Guidelines for Organic Superfund Methods Data Review, 2017, have been considered during validation of this data and its usability.

Table 1 provides a summary of major and minor data quality issues identified for this data set. All data are acceptable except those results which have been qualified with "R," rejected. Data validation qualifiers along with associated descriptions are provided in Table 2. All data qualification related to this group of samples is detailed on the attached sheets.

Per USEPA Region 2 Validation Guidance, "All data users should note two facts. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables even as a last resort. The second, no analyte concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error."

HOLDING TIME/SAMPLE HANDLING

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Proper sample handling and preservation also play a role in the chemical stability of analytes in the sample matrix. If samples are not collected and stored using proper containers and/or preservatives, data may not be valid.

The samples in this delivery group were prepared and analyzed within the holding time specified in the validation and method specified guidelines.

The samples in this delivery group were received by the laboratory within the proper temperature range as specified in the validation and method guidance.

BLANK CONTAMINATION

Quality assurance blanks include method, storage, trip, field, or rinse blanks. Blanks are prepared to identify any contamination, which may have been introduced into the samples during laboratory preparation and analysis or field activity. Method and storage blanks measure laboratory contamination. Trip blanks measure cross contamination during shipment. Field and rinse blanks measure cross contamination during field operations.

Method Blanks

Method blanks were prepared and analyzed in association with the samples in this delivery group at the specified frequency. Upon examination of the method blank data, no analyte was positively identified at a concentration equal to or above the method detection limit (MDL) in any associated method blank.

Field Blanks

Sample 915239-FB042618 was submitted as a field blank in association with this sample delivery group (SDG). Upon examination of the field blank data, no analyte was positively identified at a concentration equal to or above the method detection limit (MDL) in the associated field blank.

PEAK ASYMMETRY FACTOR

A peak asymmetry factor must be calculated initially and every time a calibration curve is generated. The peak asymmetry factor for the first two eluting peaks in a midlevel calibration standard must fall in the range of 0.8 to 1.5.

All peak asymmetry factors were fully compliant.

CALIBRATION

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative results. The initial calibration curve demonstrates that the instrument is capable of giving acceptable performance at the beginning of an analytical sequence. The continuing calibration verifies that the instrument is continuing to provide satisfactory daily performance. Additionally, a continuing calibration is analyzed at the end of each 12-hour analytical sequence, denoted as a "closing" calibration verification and ascertains acceptable performance at the conclusion of the analytical sequence.

Percent Relative Standard Deviation and Percent Deviation

Percent relative standard deviation (%RSD) is calculated from the initial calibration and is used to indicate stability of a specific compound over the calibration range. Percent deviation (%D) compares the response factor of the continuing calibration with the mean response factor of the initial calibration. Therefore, %D is a measure of the instrument's daily performance.

The following QC criteria have been applied for this project:

The %RSD of initial calibration must be <30%.

An RSD value outside the initial calibration limit indicates the potential for quantitation errors. For this reason, all positive and non-detected results are qualified as estimated. Severe performance failures (RSD >90%) requires rejection of non-detected results.

The %D for all analytes and surrogates in the continuing calibration must be <30% with the exception of the lowest level continuing calibration which must have all a %D for all analytes <50% and surrogates <30%.

A value outside these limits indicates the potential for detection and quantitation errors. For these reasons, all positive results are qualified as estimated "J," and non-detects are qualified with "UJ."

All initial calibration and continuing calibration %RSD and %D values were within defined QC criteria.

Note: both an opening and closing continuing calibration were performed.

INTERNAL STANDARDS PERFORMANCE

Internal standard performance criteria are meant to ensure that the liquid chromatograph/tandem mass spectrometer (LC/MS/MS) sensitivity and response are stable during every experimental run.

The internal standard area count must not vary by more than +/- 50% from the associated midlevel initial calibration standard. The retention time of the internal standard must not vary by more than +/-30 seconds from the associated midlevel initial calibration standard. The area count must be within -50% to 150% range of the associated standard. If area count is >150%, non-detected results are not qualified while positive results are qualified "J," estimated. When an observed area count is <50%, results are qualified "J" or "UJ" as appropriate; however, should area counts be <25%, all associated non-detects are qualified "R," rejected.

The reported sample analyses and associated method blank had internal standard areas and retention times within QC criteria in all cases.

SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

The reported sample analyses and method blank had observed surrogate recoveries within the established limits (recovery 70-130%) in all cases.

COMPOUND IDENTIFICATION

Per-fluorinated Compounds

The project target analyte compounds are identified on the LC/MS/MS by using the analytes relative retention time (RRT) and ion spectra. For the results to be a positive hit, the sample peak must be within ± 0.06 RRT units of the standard compound, and have ion spectra with primary and secondary characteristic ions present. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

All samples were evaluated at a Stage level 4. Compound identification verification was performed at this validation level and all identification criteria were met for positive results reported.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

The matrix spike and matrix spike duplicate (MS/MSD) are generated to determine the precision and accuracy of the analytical procedure in a given sample matrix.

Sample 915239-MW-01 was submitted for MS/MSD evaluation in association with this SDG. Upon evaluation all precision and accuracy indicators were favorable with the exceptions described below.

Observed recoveries for 6:2 Fluorotelomersulfonate were higher than the highest acceptance limit. No qualification of sample results was necessary on this basis as high bias is indicated and 6:2 Fluorotelomersulfonate has been reported as not detected in sample 915239-MW-01.

Note; a low-level matrix spike solution was used in the evaluation described above. Accuracy acceptance limits used for a low-level evaluation are 50-150%, while medium level evaluation acceptance criteria are 70-130%.

Also, accuracy and precision are not evaluated when the amount of an analyte native to the sample is greater than four times the amount of spike added during the matrix spike determination.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) is spiked with the same analytes at the same concentrations as the matrix spike. The LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Two associated LCS duplicate (LCSD) evaluation were performed, all observed recoveries and relative percent differences were found to be acceptable (low level spike added recovery 50-150%).

REPORTING

No dilutions, re-extractions, or other re-analyses were performed.

Contract required quantitation limits (CRQLs) achieved could not be compared to project-specific objectives as the analyses evaluated were not included in the project specific Quality Assurance Project Plan.

OTHER QUALITY CONTROL DATA OUT OF SPECIFICATION

None.

FIELD DUPLICATE

Field duplicates are two (or more) field samples collected at the same time in the same location. Each of the samples represents the same population and is carried through all steps of the sampling and analytical procedures in an identical manner. Field duplicate results are used to assess precision of the total method, including sampling, analysis, and site heterogeneity.

Samples 915239-MW-10 and 915239-MW-DUP comprise the field duplicate pair collected in association with this SDG. Upon evaluation adequate field precision was demonstrated in all cases.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria, with the exceptions identified in this report and as summarized in Table 1.

Table 1
Review Elements Summary

	Were acceptance criteria met?		
	Yes	No	
Per-fluorinated Compounds		Major	Minor
Holding Time/Sample Handling	x		
Method Blanks	x		
Field Blanks	x		
Peak Asymmetry Factor	x		
Calibration Percent Relative Standard Deviation and Percent Difference	x		
Internal Standards Performance	x		
Surrogates	x		
Compound Identification	x		
Matrix Spike/Matrix Spike Duplicate	x		
Laboratory Control Sample	x		
Other Quality Control Data out of Specification	x		
Field Duplicate	x		

Major= Major data quality issue identified resulting in rejection of data.

Minor= Minor data quality issue identified resulting in the qualification of data. Data qualification should be used to inform the data users of data limitations.

NA = Not applicable

Table 2
Data Validation Qualifiers

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
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.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
UJ-	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise, and the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.



DATA VALIDATION REPORT FOR 1,4-DIOXANE

SITE: 5565 River Road

LABORATORY: Con-Test Analytical Laboratory

SAMPLE DELIVERY GROUP: 18D1337

MATRIX: Water

VALIDATION LEVEL: 4

This sample delivery group consists of the following samples:

915236-MW-01	915236-MW-08
915236-MW-02	915236-MW-10
915236-MW-03	915236-MW-DUP
915236-MW-05	915236-FB042818

The samples described above were analyzed via USEPA SW-846 8270D to determine the concentrations of 1,4-dioxane. The method was modified to include isotopic dilution quantitation.

Project specific quality assurance (QA) objectives, as well as the USEPA Region II SOP, Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8270D, HW-22 Revision 5, December 2010, have been considered during validation of this data and its usability.

Table 1 provides a summary of major and minor data quality issues identified for this data set. All data are acceptable except those results which have been qualified with "R," rejected. Data validation qualifiers along with associated descriptions are provided in Table 2. All data qualification related to this group of samples is detailed on the attached sheets.

Per USEPA Region 2 Validation Guidance, "All data users should note two facts. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables even as a last resort. The second, no analyte concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error."

HOLDING TIME/SAMPLE HANDLING

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Proper sample handling and preservation also play a role in the chemical stability of analytes in the sample matrix. If samples are not collected and stored using proper containers and/or preservatives, data may not be valid.

The samples in this delivery group were prepared and analyzed within the holding time specified in the validation guidelines.

The samples in this delivery group were received by the laboratory within the proper temperature range as specified in the validation guidance.

BLANK CONTAMINATION

Quality assurance blanks include method, storage, trip, field, or rinse blanks. Blanks are prepared to identify any contamination, which may have been introduced into the samples during laboratory preparation and analysis or field activity. Method and storage blanks measure laboratory contamination. Trip blanks measure cross contamination during shipment. Field and rinse blanks measure cross contamination during field operations.

Method Blanks

Method blanks were prepared and analyzed in association with the samples in this delivery group at the specified frequency. Upon examination of the method blank data, no analyte was positively identified at a concentration equal to or above the reporting detection limit in any associated method blank.

Field Blanks

Sample 915236-FB042818 was the field/rinse blanks submitted in association with this sample delivery group (SDG). Upon examination of the field blank data, no analyte was positively identified at a concentration equal to or above the reporting detection limit.

MASS SPECTROMETER TUNING

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds, and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances.

The tuning standard for semivolatiles is decafluorotriphenylphosphine (DFTPP).

All instrument tunes were fully compliant.

CALIBRATION

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative results. The initial calibration curve demonstrates that the instrument is capable of giving acceptable performance at the beginning of an analytical sequence. The continuing calibration verifies that the instrument is continuing to provide satisfactory daily performance. Additionally, a continuing calibration is analyzed at the end of each 12-hour analytical sequence, denoted as a "closing" calibration verification and ascertains acceptable performance at the conclusion of the analytical sequence.

Response Factor

The relative response factor (RRF) measures the instrument's responses to specific chemical compounds. The response factors for the base neutral acid (BNA) target compound list (TCL) analytes must be ≥ 0.05 in both the initial and continuing calibrations. A value less than the respective criteria indicates serious detection and quantitation problems. If the mean RRF of the initial calibration or the continuing calibration RRF is < 0.05 for any analyte, those analytes detected in environmental samples will be qualified as estimated. All non-detects for those analytes will be rejected.

The RRF values in all initial and continuing calibrations were found to be acceptable in all cases.

Note: no closing continuing calibration was performed.

Percent Relative Standard Deviation and Percent Deviation

Percent relative standard deviation (%RSD) is calculated from the initial calibration and is used to indicate stability of a specific compound over the calibration range. Percent deviation (%D) compares the response factor of the continuing calibration with the mean response factor of the initial calibration. Therefore, %D is a measure of the instrument's daily performance.

The following QC criteria have been applied for this project:

The %RSD of initial calibration must be $< 20\%$.

An RSD value outside the initial calibration limit indicates the potential for quantitation errors. For this reason, all positive and non-detected results are qualified as estimated. Severe performance failures (RSD $> 90\%$) requires rejection of non-detected results.

The %D for continuing calibration must be $< 20\%$.

A value outside these limits indicates the potential for detection and quantitation errors. For these reasons, all positive results are qualified as estimated "J," and non-detects are qualified with "UJ."

All initial calibration and continuing calibration %RSD and %D values were within defined quality control criteria without exception.

Note: no closing continuing calibration was performed.

INTERNAL STANDARDS PERFORMANCE

Internal standard performance criteria are meant to ensure that the gas chromatograph/mass spectrometer (GC/MS) sensitivity and response are stable during every experimental run.

The internal standard area count must not vary by more than a factor of two from the associated continuing calibration standard. The retention time of the internal standard must not vary by more than +/-30 seconds from the associated continuing calibration standard. The area count must be within -50% to 200% range of the associated standard. If area count is >200%, non-detected results are not qualified while positive results are qualified "J," estimated. When an observed area count is <50%, results are qualified "J" or "UJ" as appropriate; however, should area counts be <25%, all associated non-detects are qualified "R," rejected.

The reported sample analyses and associated method blank had internal standard areas and retention times within QC criteria in all cases.

SURROGATES

All samples are spiked with surrogate compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique.

The reported sample analyses and method blank had observed surrogate recoveries within the limits established by the laboratory in all cases.

COMPOUND IDENTIFICATION

Semivolatile

The project target analyte compounds are identified on the GC/MS by using the analytes relative retention time (RRT) and ion spectra. For the results to be a positive hit, the sample peak must be within ± 0.06 RRT units of the standard compound, and have ion spectra which has a ratio of the primary and secondary ion intensities within 20% of that in the standard compound. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

All samples were validated to level 4. Compound identification verification was performed at this validation level and no anomalies were identified.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

The matrix spike and matrix spike duplicate (MS/MSD) are generated to determine the precision and accuracy of the analytical procedure in a given sample matrix.

Sample 915236-MW-01 was submitted for MS/MSD evaluation in association with this SDG. Laboratory derived acceptance criteria were used to assess the MS/MSD performance. Upon evaluation all precision and accuracy indicators were acceptable.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample (LCS) is spiked with the same analytes at the same concentrations as the matrix spike. The LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Two associated LCS and LCS duplicate (LCSD) evaluations were performed. Laboratory derived acceptance criteria were used to assess the LCS/LCSD performance. Upon evaluation, all observed recoveries and relative percent differences were found to be acceptable.

REPORTING

No dilutions, re-extractions, or other re-analyses were performed.

Contract required quantitation limits (CRQLs) achieved could not be compared to project-specific objectives as the analyses evaluated were not included in the project specific Quality Assurance Project Plan.

OTHER QUALITY CONTROL DATA OUT OF SPECIFICATION

None.

FIELD DUPLICATE

Field duplicates are two (or more) field samples collected at the same time in the same location. Each of the samples represents the same population and is carried through all steps of the sampling and analytical procedures in an identical manner. Field duplicate results are used to assess precision of the total method, including sampling, analysis, and site heterogeneity.

Samples 915236-MW-DUP and 915236-MW-08 comprise the field duplicate pair associated with samples in this SDG. Upon evaluation adequate field precision was demonstrated.

SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall the laboratory data generated met the project goals and quality control criteria, with the exceptions identified in this report and as summarized in Table 1.

Table 1
Review Elements Summary

	Were acceptance criteria met?		
	Yes	No	
1,4-Dioxane		Major	Minor
Holding Time/Sample Handling	x		
Method Blanks	x		
Field Blanks	x		
Mass Spectrometer Tuning	x		
Calibration Response Factor	x		
Calibration Percent Relative Standard Deviation and Percent Difference	x		
Internal Standards Performance	x		
Surrogates	x		
Compound Identification - Semivolatile	x		
Tentatively Identified Compounds - Semivolatile	x		
Matrix Spike/Matrix Spike Duplicate	x		
Laboratory Control Sample	x		
Other Quality Control Data out of Specification	x		
Field Duplicate	x		

Major= Major data quality issue identified resulting in rejection of data.

Minor= Minor data quality issue identified resulting in the qualification of data. Data qualification should be used to inform the data users of data limitations.

NA = Not applicable

Table 2
Data Validation Qualifiers

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
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.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
UJ-	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise, and the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.