MID-HUDSON GEOSCIENCES
1003 Route 44/55
P.O. Box 32
Clintondale, NY 12515-0332
Phone (845) 883-5726
Cell (845) 514-7323

rockdoctor@optonline.net

August 30, 2020

Parag Amin P.E.
Project Manager, Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, Albany, NY 12233-7014

RE: Emerging Contaminants Groundwater Sampling Report
Site: American Cleaners Middletown (ACM)
Brownfield Site ID: C336091

Dear Parag,

The work plan for the emerging contaminant groundwater sampling was submitted to DEC on October 4, 2019 and approved shortly after. Sampling for PFAS emerging contaminants occurred on December 26, 2019. York Analytical Laboratories does not include 1,4-Dioxane in the list of emerging contaminants, so the only bottles I received from the lab were the PFAS bottles. I received the lab results in January and found that we did not have 1,4-Dioxane analyses. The lab sent me a new set of bottles. The DUSR was prepared on

Definition of Emerging Contaminants

The list of Emerging contaminants consists of the 21 PFAS Analytes listed in Table 1 plus 1,4-Dioxane.

Pumping Groundwater from the Monitoring Well

Normally groundwater sampling from Monitoring Wells at the ACM site is accomplished by pumping water from the wells with ¼-inch Inner Diameter dedicated tubing and a Masterflex Peristaltic Pump using the Low Flow Purge Method (see reference below).

For PFAS, PFOS, and 1,4-Dioxane sampling, the type of tubing is critical; hence, Masterflex silicone tubing was obtained and used with the peristaltic pump. New tubing was used for each of the monitoring wells. The benefit of the peristaltic pump is that only the tubing touches the groundwater during the sampling process and there is no internal pump to clean up after use. Silicone tubing is approved by many agencies for use with the emerging contaminant analytes.

Laboratory Provided Items

York Analytical Laboratories provides the cooler, the 250 milliliter sample bottles with screw on caps, and a field notebook for the sampling event. The laboratory cannot provide the ice because it would melt. For that reason, a bag of ice from a local Stewart's store was obtained and placed in Ziploc® bags in the cooler to maintain the samples at the desired temperature range.

Collection of Purge Water, Sample and Measurement of Water Quality Parameters

The purged liquid was collected in a clean graduated cylinder and the sensor of the YSI Pro Plus (designed for 2-inch ID monitoring wells) was placed in the cylinder. Once the groundwater in the cylinder rose above the sensors, the YSI was used to measure the water quality parameters (Temperature (degrees Centigrade), Dissolved Oxygen (mg/L) Specific Conductance (µs/cm), Total Dissolved Solids (ppm), Salinity (ppt), pH (s.u.) and Oxidation Reduction Potential (mV). The time and depth to water was recorded with the water quality parameters in the notebook. Depending on the length of the column of water in the well and the recharge rate, the well was pumped at a minimum of clearing one well volume from the well prior to collecting a sample from the well. If the well is pumped dry, the well will be allowed to recover and a sample collected thereafter. The ideal situation will be to obtain two graduated cylinders of purge water or more to determine if the water quality measurements have stabilized.

Securing Groundwater Sample

The lab-provided two clean HDPE or polypropylene containers per sample to be filled with groundwater sample directly from the new silicone tubing discharge line from the pump. The containers were be filled to the neck. The cap was placed on the container carefully so as to not touch the inside of the cap. The containers, lids, ice, and plastic bags were handled with powderless nitrile gloves. The sample containers were placed in the lab-provided Ziploc® bags. Preprinted labels were placed on the outside of the container's bag, so that another potential for contamination was eliminated.

Preparation and Shipment of Samples to Laboratory

Ice was placed in Ziploc® bags to keep the samples cold in the field and when transported to the Lab by York personnel. The ice kept the cooler and samples cold at 4ºC +/-2º.

The Chain of Custody was prepared and placed in a plastic bag attached to the top of the cooler provided by the Lab. PFAS Analysis was requested for US EPA Modified (Low Level) Test Method 537. Analysis for 1,4-Dioxane was requested by US EPA Method 8270SIM. The "NY ASP B Package" was requested from the lab for data validation. The NYSDEC EQuIS formatted data was requested for submission to DEC.

York Laboratories picked up the sample cooler at at Mid-Hudson Geosciences office the following morning. Additional ice was placed in the cooler to maintain the desired temperature from office to laboratory.

Decontamination

A new 1 liter graduated cylinder was used for each well sampled, so cleaning one cylinder was not needed between wells. However, each cylinder was rinsed three times with distilled water.

Disposal of Purged Groundwater

At ACM, the normal procedure is to pour all purge water into 5-gallon bucket(s), cover the bucket(s) with lid(s), place instructions in a note on the lid(s), and place it in or at the door of the back shed near the backdoor. The water is distilled on site and the solid residue is sent to Safety Kleen.

Most Recent Groundwater Conditions

The water level elevations for the VOC sampling on September 13, 2019 are shown on Figure 4-5. The water table is quite different from previous maps probably because there has been little rainfall over the summer. A steep gradient is observed on the south side of the building close to the pavement and lower slopes are observed on the north side of the building.

Selected Samples for Emerging Contaminant Groundwater Sampling at ACM

The following samples collected (Figure 4-6);

Upgradient Well MW21
PCE Contaminant Well near NW corner of building in the Plume: MW3
Most PCE Contaminated Well in the plume in north driveway MW26
One Duplicate Sample: MW26
Equipment Blank
MS/MSD Sample – Lab QA Procedure using Sample from MW21

Additional Procedures to Avoid Potential Contamination of Samples

- A metal clipboard was for Chain of Custody, pre-printed sample labels, field notes, and recording water quality parameters.
- Field attire consisted of cotton clothing which has washed many times and dried on high heat. Fabric softener is not used. Gortex™ and Tyvek® clothing was not worn. It was not raining.
- Sunscreen, insect repellant, and scented personal care products were not be used.
- Food and drink was not brought to the monitoring wells locations. Drinking water was kept in my truck.
- Use of aluminum foil, sharpies, plastic clipboards, waterproof notebooks, spiral notebooks, and post-its was avoided.
- Items with the following chemical content was avoided:
  - Polytetrafluoroethylene (PTFE)
  - Polyvinyllidene fluoride (PVDF) including Kynar®
  - Polychlorotrifluoroethylene (PCTFE) including Neoflon®
  - Ethylene-tetrafluoro-ethylene (ETFE) including Tefzel®
  - Fluorinated ethylene propylene (FEP) including Teflon® and Hostaflon®
- Low density polyethylene (LDPE) items were not used.
- Use of items with the following content were considered safe: high-density polyethylene (HDPE), polypropylene, silicone, polyvinyl chloride (PVC), and acetate.

Reporting Sampling and Laboratory Results

The sampling event for emerging contaminants will be reported in the Final Engineering Report (FER) for American Cleaners with all other historical sampling data. The final laboratory report will be included in the Appendix with all historical Lab Reports. The data validation report will be included in the Appendix of Data Usability Reports. Significant sampling information, tables, maps and summary of results will be reported within the FER.

Schedule

Sampling for emerging contaminants was conducted on December 26, 2019 and July 7, 2020.

Reference

EQASOP-GW4 Region 1 Low-Stress (Low-Flow) SOP Revision Number: 4 Date: July 30, 1996 Revised: September 19, 2017 Page 1 of 30; U.S. ENVIRONMENTAL PROTECTION AGENCY REGION I' LOW STRESS (low flow) PURGING AND SAMPLING PROCEDURE FOR THE COLLECTION OF GROUNDWATER SAMPLES FROM MONITORING WELLS prepared by Quality Assurance Unit, U.S. Environmental Protection Agency – Region 1, 11 Technology Drive, North Chelmsford, MA 01863

Emerging Contaminants Laboratory Results

The York Analytical Laboratory final report (Date: 01/06/2020, Client Project ID: AC Middletown PFAS, York Project (SDG) No.: 19L0984) is attached. Once the samples were submitted to the Laboratory, I got a phone call about the analyte 1,4-Dioxane. Apparently, it is not on the lab's PFAS list although the DEC seems to think it is an emerging contaminant. It requires a different container, a 1 liter amber glass bottle. The samples for 1,4-Dioxane take twice as long to collect because the volume is greater. The 1,4-Dioxane samples were taken on July 7, 2020 and picked up by the laboratory at Mid-Hudson Geosciences on the morning of July 8.

The lab results are summarized on Table 1. Perfluoroundecanoic acid was detected in all four samples with the highest concentration of 5.14 ng/L detected in upgradient well and the lowest 2.81 ng/L in downgradient well MW26. Perfluoropentanoic acid was detected in MW26 with a concentration of 2.21. All analytes on the target list were "ND" in the field blank. For the 1,4-Dioxane sampling, it was detected in the upgradient well MW-21 and MW-3 near the northwest corner of the building at concentrations of 1.96 and 1.94 ug/L and ND in MW-26 and MW-26 duplicate. However, the field blank showed 2.2 ug/L 1,4-Dioxane. It is possible the commercial distilled water used for the field blank may have been contaminated, Since the emerging contaminants are detected in the upgradient well, those contaminants are migrating with groundwater flow onto the site from ungradient locations.

Yours truly,

Katherine J Beinkafner

Katherine J. Beinkafner, Ph.D.
NYS Professional Geologist #1176

Attachments:
Table 1
Screening Levels
YSI Water Quality Measurements in Monitoring Wells
Figures 4-5 and 4-6
York Analytical Laboratories Technical Report Project No. 19L0984 (01/06/2020)
York Analytical Laboratories Technical Report Project No. 20G0250 (07/15/2020)
Data Usability Summary Report

TABLE 1 Emerging Contaminant Results of December 26, 2019 Monitoring Well Sampling, American Cleaners,

York Analytical Laboratories Report Project No. 19L0984 Date: 01/06/2020
Full PFAS Target Analyte List, Reported to LOQ = 4.0 units: ng/L

Chemical Name	Abbreviation	CAS Number	MW21	MW3	MW26	MW26DUP	
Perfluorobutanesulfonic acid	**PFBS**	**375-73-5**					
Perfluorohexanesulfonic acid	**PFHxS**	**355-46-4**					
Perfluoroheptanesulfonic acid	PFHpS	375-92-8					
Perfluorooctanessulfonic acid	**PFOS**	**1763-23-1**					
Perfluorodecanesulfonic acid	PFDS	335-77-3					
Perfluorobutanoic acid	PFBA	375-22-4					
Perfluoropentanoic acid	PFPeA	2706-90-3				2.21	
Perfluorohexanoic acid	PFHxA	307-24-4					
Perfluoroheptanoic acid	**PFHpA**	**375-85-9**					
Perfluorooctanoic acid	**PFOA**	**335-67-1**					
Perfluorononanoic acid	**PFNA**	**375-95-1**					
Perfluorodecanoic acid	PFDA	335-76-2	5.14	4.75	3.84	2.81	
Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8					
Perfluorododecanoic acid	PFDoA	307-55-1					
Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8					
Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7					
6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2					
8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4					
Perfluroroctanesulfonamide	FOSA	754-91-6					
N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9					
N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6					
Bold entries depict the 6 original UCMR3 chemicals							
LOQ for Sample Analysis			4.00	4.00	2.00	2.00	FB all analytes were ND
York Analytical Laboratories Report Project No. 20G0250 Date: 07/15/2020							
1,4-Dioxane		123-91-1	1.96	1.94	ND	ND	FB = 2.22
LOQ for Sample Analysis			4.00	4.00	4.00	4.00	

No entry in data column indicates analyte was Not Detected (ND) as defined in Laboratory Notes below:

TABLE 1 Emerging Contaminant Results of December 26, 2019 Monitoring Well Sampling
American Cleaners Middletown

Laboratory Notes:

ND NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)

RL REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.

MDL METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.

LOQ LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.

LOD LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.

Reported to This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.

Screening Levels

The following guidelines should be used to evaluate groundwater and drinking water sampling results and guide decision making at all remedial sites.

Initial Screening. If groundwater sampling results exceed the following initial screening levels, additional evaluation may be required, including sampling nearby water supplies if present:

Chemical	Screening Level
1,4-dioxane in groundwater	1 ug/L (ppb)
PFOA in groundwater	10 ng/L (ppt)
PFOS in groundwater	10 ng/L (ppt)

Action Required. If water supply wells have been sampled, and concentrations of emerging contaminants in drinking water exceed the action levels noted below, treatment of provision of an alternate water supply may be required by DOH:

Chemical	Action Level
1,4-dioxane in drinking water	1 ug/L (ppb)
PFOA in drinking water	70 ng/L (ppt)
PFOS in drinking water	70 ng/L (ppt)

Awareness of Other PFAS. In addition to these screening and action levels, the following levels should be highlighted in reports as appropriate, but further evaluation would not necessarily be required:

Chemical	Awareness Level
Other PFAS in groundwater or drinking water (**not** PFOA and PFOS)	Any one compound over 100 ng/L (ppt)
Total PFAS in groundwater or drinking water (include PFOA and PFOS)	Total concentration over 500 ng/L (ppt)

PFAS/1,4-Dioxane
Water Quality in Monitoring Wells

Groundwater Field Measurement Log: American Cleaners, Middletown NY Mid-Hudson Geosciences · Date: July 7, 2020								
Tuesday 7/6/20 **MW/TW ID:**	MW26	MW3	MW21					
Time	12:20pm	137PM	2:08					
In-Situ YSI Pro. Plus with Quattro Sonde								
Parameter	D=6.01 ft	7.67ft	1.83ft					
Baro. P. (mm Hg)	746.3	746.3						
Temp. (°C)	3.6°C	3.4°C	24.6					
DO (mg/L)	1.63	3.71	5.60					
Sp. Cond. (mS/cm)	0.89	0.711	2.46					
TDS (ppm)	578	462	1605					
Salinity (ppt)	0.44	0.35	1.27					
pH (s.u.)	6.95	7.14	7.77					
ORP (mV)	-39	-62	+83					
MW/TW ID:								
Time								
In-Situ YSI Pro. Plus with Quattro Sonde								
Parameter								
Baro. P. (mm Hg)								
Temp. (°C)								
DO (mg/L)								
Sp. Cond. (mS/cm)								
TDS (ppm)								
Salinity (ppt)								
pH (s.u.)								
ORP (mV)								
Personnel/Weather								
Equipment/Materials								
*Notes								
Pump on	12:32½	138PM	2:17pm					
	1:62PM		315					

2 sample
1 pt
1 liter gc
#3

DO

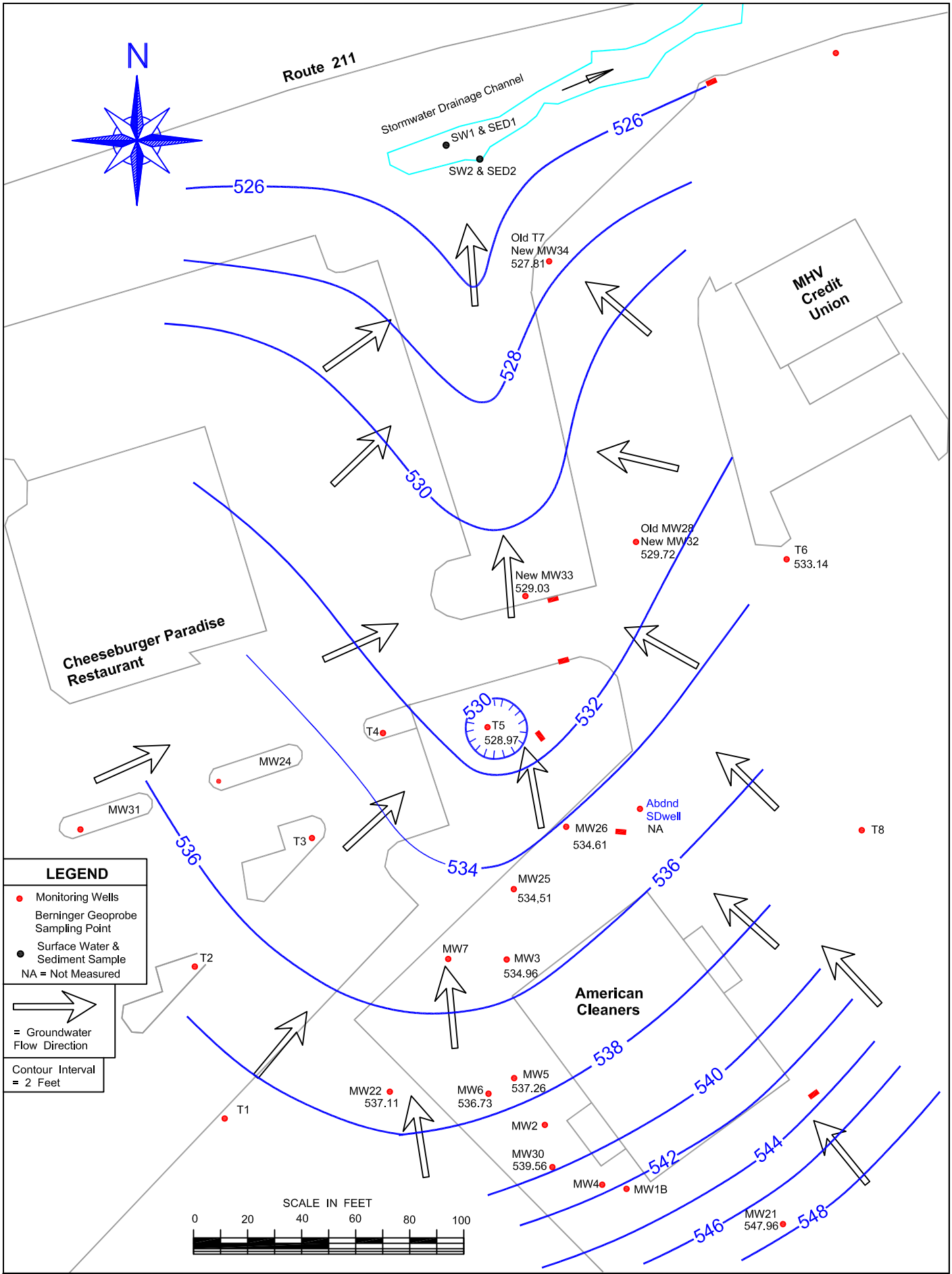

Figure 4-5. Contour Map of Groundwater Elevations for September 13, 2019. Measurements taken during Mid-Hudson Geosciences Sampling Event. Elevations in Feet relative to mean sea level.

American Cleaners at Caldor Lloyds Mall
340 Route 211 East, Middletown, NY 10940
NYSDEC DER BCP C3336091, Sep 2019

Mid-Hudson Geosciences
Katherine J. Beinkafner, PhD, CPG #6611
1003 Route 44/55, PO Box 332
Clintondale, NY 12515-0332
(845) 883-5866
rockdoctor@optonline.net

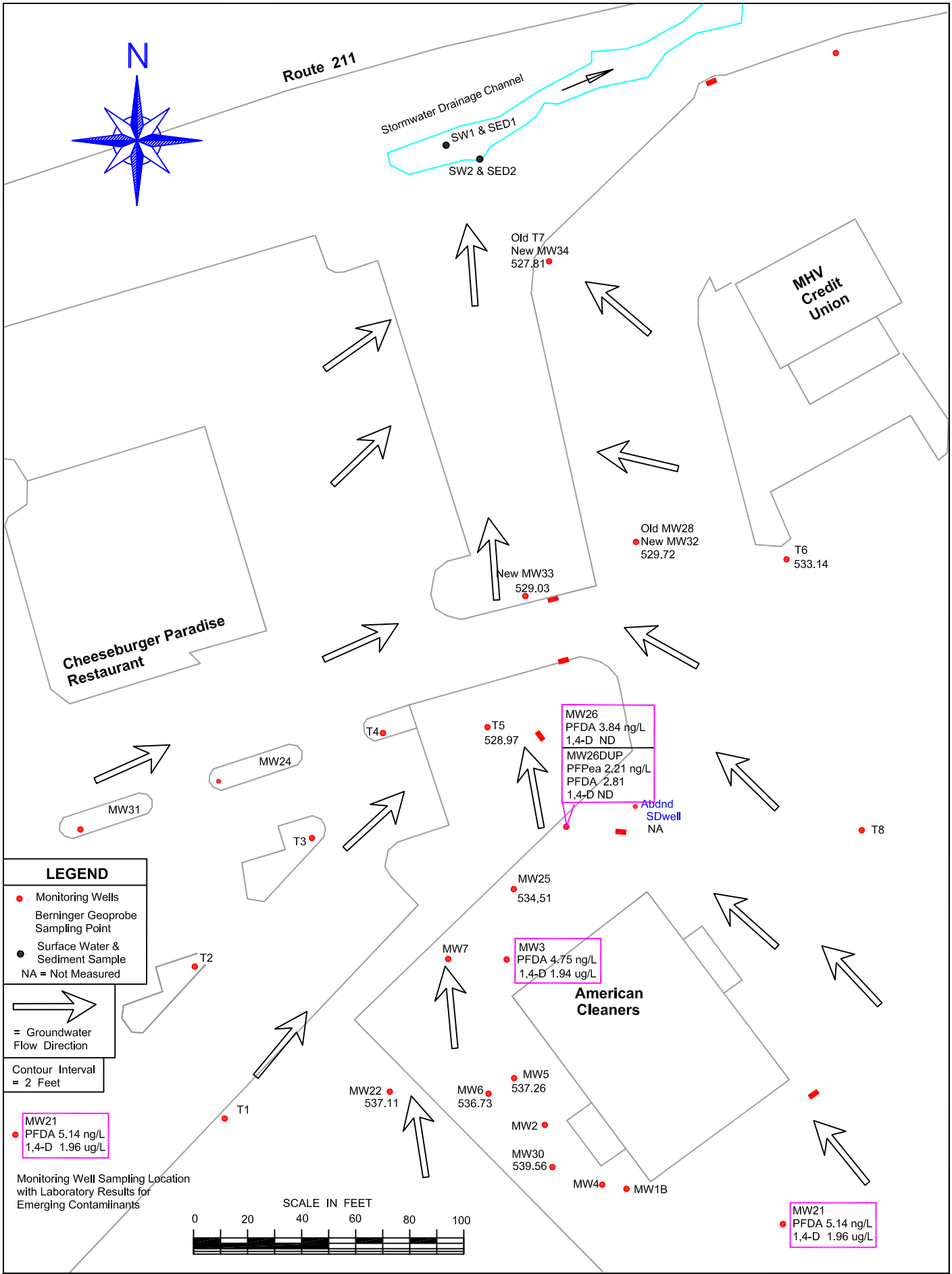

Figure 4-6. Monitoring Well Locations with Laboratory Results for Emerging Contaminants: PFAS Compounds & 1,4-Dioxane December 26, 2019 and July 7, 2020, respectively.

American Cleaners at Caldor Lloyds Mall
340 Route 211 East, Middletown, NY 10940
NYSDEC DER BCP C3336091, Sep 2019

Mid-Hudson Geosciences
Katherine J. Beinkafner, PhD, CPG #6611
1003 Route 44/55, PO Box 332
Clintondale, NY 12515-0332
(845) 883-5866
rockdoctor@optonline.net

Technical Report

prepared for:

Mid-Hudson Geosciences
1003 NY Route 44/55, P.O.Box 332
Clintondale NY, 12515-0332
Attention: Katherine Beinkafner

Report Date: 01/06/2020
Client Project ID: AC Middletown PFAS
York Project (SDG) No.: 19L0984

CT Cert. No. PH-0723 New Jersey Cert. No. CT005 and NY037 New York Cert. Nos. 10854 and 12058 PA Cert. No. 68-04440

120 RESEARCH DRIVE STRATFORD, CT 06615 ■ 132-02 89th AVENUE RICHMOND HILL, NY 11418
www.YORKLAB.com (203) 325-1371 FAX (203) 357-0166 ClientServices@yorklab.com

Report Date: 01/06/2020
Client Project ID: AC Middletown PFAS
York Project (SDG) No.: 19L0984

Mid-Hudson Geosciences
1003 NY Route 44/55, P.O.Box 332
Clintondale NY, 12515-0332
Attention: Katherine Beinkafner

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on December 27, 2019 and listed below. The project was identified as your project: **AC Middletown PFAS**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
19L0984-01	MW21	Water	12/26/2019	12/27/2019
19L0984-02	MW26	Water	12/26/2019	12/27/2019
19L0984-03	MW26 DUP	Water	12/26/2019	12/27/2019
19L0984-04	MW3	Water	12/26/2019	12/27/2019
19L0984-05	Field Blank	Water	12/26/2019	12/27/2019

General Notes for York Project (SDG) No.: 19L0984

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 01/06/2020

Benjamin Gulizia
Laboratory Director

Sample Information

Client Sample ID: MW21 **York Sample ID:** 19L0984-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 8:35 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
2355-31-9	* N-MeFOSAA	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
2991-50-6	* N-EtFOSAA	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	10.0	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT
375-22-4	*** Perfluoro-n-butanoic acid (PFBA)**	**5.14**		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 15:53	KT

Surrogate Recoveries	Result	Acceptance Range

Sample Information

Client Sample ID: MW21 **York Sample ID:** 19L0984-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 8:35 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M3PFBS	*76.5 %*			*25-150*					
	Surrogate: M5PFHxA	*83.7 %*			*25-150*					
	Surrogate: M4PFHpA	*76.7 %*			*25-150*					
	Surrogate: M3PFHxS	*79.7 %*			*25-150*					
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*97.7 %*			*25-150*					
	Surrogate: M6PFDA	*92.3 %*			*25-150*					
	Surrogate: M7PFUdA	*79.9 %*			*25-150*					
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*62.7 %*			*25-150*					
	Surrogate: M2PFTeDA	*13.6 %*			*10-150*					
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*86.2 %*			*25-150*					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*74.9 %*			*25-150*					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*80.7 %*			*25-150*					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*7.07 %*	PFSu-L		*10-150*					
	Surrogate: d3-N-MeFOSAA	*68.6 %*			*25-150*					
	Surrogate: d5-N-EtFOSAA	*66.6 %*			*25-150*					
	Surrogate: M2-6:2 FTS	*204 %*	PFSu-H		*25-150*					
	Surrogate: M2-8:2 FTS	*182 %*	PFSu-H		*25-150*					
	Surrogate: M9PFNA	*102 %*			*25-150*					

Sample Information

Client Sample ID: MW26 **York Sample ID:** 19L0984-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 9:30 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT

Sample Information

Client Sample ID: MW26 **York Sample ID:** 19L0984-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 9:30 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
2355-31-9	* N-MeFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
2991-50-6	* N-EtFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	5.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT
375-22-4	*** Perfluoro-n-butanoic acid (PFBA)**	**3.84**		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 22:20	KT

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	*60.2 %*	*25-150*
Surrogate: M5PFHxA	*69.7 %*	*25-150*
Surrogate: M4PFHpA	*69.0 %*	*25-150*
Surrogate: M3PFHxS	*63.1 %*	*25-150*
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*81.0 %*	*25-150*
Surrogate: M6PFDA	*70.0 %*	*25-150*

Sample Information

Client Sample ID: **MW26** **York Sample ID:** **19L0984-02**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 9:30 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M7PFUdA	*73.0 %*			*25-150*					
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*64.4 %*			*25-150*					
	Surrogate: M2PFTeDA	*31.5 %*			*10-150*					
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*67.9 %*			*25-150*					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*60.9 %*			*25-150*					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*64.5 %*			*25-150*					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*39.2 %*			*10-150*					
	Surrogate: d3-N-MeFOSAA	*54.4 %*			*25-150*					
	Surrogate: d5-N-EtFOSAA	*54.8 %*			*25-150*					
	Surrogate: M2-6:2 FTS	*144 %*			*25-150*					
	Surrogate: M2-8:2 FTS	*113 %*			*25-150*					
	Surrogate: M9PFNA	*80.5 %*			*25-150*					

Sample Information

Client Sample ID: **MW26 DUP** **York Sample ID:** **19L0984-03**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 9:30 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT

Sample Information

Client Sample ID: MW26 DUP

York Sample ID: 19L0984-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 9:30 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
2355-31-9	* N-MeFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
2991-50-6	* N-EtFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
2706-90-3	*** Perfluoropentanoic acid (PFPeA)**	**2.21**		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	5.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT
375-22-4	*** Perfluoro-n-butanoic acid (PFBA)**	**2.81**		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/02/2020 23:14	KT

Surrogate Recoveries	Result		Acceptance Range
Surrogate: M3PFBS	*69.3 %*		*25-150*
Surrogate: M5PFHxA	*82.3 %*		*25-150*
Surrogate: M4PFHpA	*76.4 %*		*25-150*
Surrogate: M3PFHxS	*72.4 %*		*25-150*
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*81.2 %*		*25-150*
Surrogate: M6PFDA	*81.2 %*		*25-150*
Surrogate: M7PFUdA	*56.3 %*		*25-150*
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*25.0 %*		*25-150*
Surrogate: M2PFTeDA	*3.29 %*	PFSu-L	*10-150*
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*76.2 %*		*25-150*

Sample Information

Client Sample ID: MW26 DUP **York Sample ID:** 19L0984-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 9:30 am	12/27/2019

PFAS, NYSDEC Target List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*62.4 %*		*25-150*						
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*76.5 %*		*25-150*						
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*17.8 %*		*10-150*						
	Surrogate: d3-N-MeFOSAA	*50.6 %*		*25-150*						
	Surrogate: d5-N-EtFOSAA	*45.7 %*		*25-150*						
	Surrogate: M2-6:2 FTS	*155 %*	PFSu-H	*25-150*						
	Surrogate: M2-8:2 FTS	*97.7 %*		*25-150*						
	Surrogate: M9PFNA	*84.5 %*		*25-150*						

Sample Information

Client Sample ID: MW3 **York Sample ID:** 19L0984-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 10:40 am	12/27/2019

PFAS, NYSDEC Target List **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT

Sample Information

Client Sample ID: MW3 **York Sample ID:** 19L0984-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 10:40 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
2355-31-9	* N-MeFOSAA	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
2991-50-6	* N-EtFOSAA	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	10.0	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT
375-22-4	*** Perfluoro-n-butanoic acid (PFBA)**	**4.75**		ng/L	4.00	2	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 16:47	KT

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	*74.0 %*	*25-150*
Surrogate: M5PFHxA	*81.5 %*	*25-150*
Surrogate: M4PFHpA	*75.1 %*	*25-150*
Surrogate: M3PFHxS	*76.7 %*	*25-150*
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*99.6 %*	*25-150*
Surrogate: M6PFDA	*92.3 %*	*25-150*
Surrogate: M7PFUdA	*91.0 %*	*25-150*
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*66.3 %*	*25-150*
Surrogate: M2PFTeDA	*26.8 %*	*10-150*
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*84.1 %*	*25-150*
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*75.3 %*	*25-150*
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*78.8 %*	*25-150*
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*13.3 %*	*10-150*
Surrogate: d3-N-MeFOSAA	*70.4 %*	*25-150*

Sample Information

Client Sample ID: MW3 **York Sample ID:** 19L0984-04

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 10:40 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: d5-N-EtFOSAA	*72.3 %*		*25-150*						
	Surrogate: M2-6:2 FTS	*191 %*	PFSu-H	*25-150*						
	Surrogate: M2-8:2 FTS	*185 %*	PFSu-H	*25-150*						
	Surrogate: M9PFNA	*95.7 %*		*25-150*						

Sample Information

Client Sample ID: Field Blank **York Sample ID:** 19L0984-05

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 9:00 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
2355-31-9	* N-MeFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
2991-50-6	* N-EtFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT

Sample Information

Client Sample ID: **Field Blank** **York Sample ID:** **19L0984-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
19L0984	AC Middletown PFAS	Water	December 26, 2019 9:00 am	12/27/2019

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	5.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ng/L	2.00	1	EPA 537m Certifications:	12/30/2019 12:28	01/03/2020 00:08	KT

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	*74.4 %*	*25-150*
Surrogate: M5PFHxA	*82.6 %*	*25-150*
Surrogate: M4PFHpA	*77.4 %*	*25-150*
Surrogate: M3PFHxS	*73.4 %*	*25-150*
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*90.0 %*	*25-150*
Surrogate: M6PFDA	*95.8 %*	*25-150*
Surrogate: M7PFUdA	*82.4 %*	*25-150*
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*74.0 %*	*25-150*
Surrogate: M2PFTeDA	*46.5 %*	*10-150*
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*74.0 %*	*25-150*
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*71.3 %*	*25-150*
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*81.0 %*	*25-150*
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*62.3 %*	*10-150*
Surrogate: d3-N-MeFOSAA	*67.9 %*	*25-150*
Surrogate: d5-N-EtFOSAA	*64.6 %*	*25-150*
Surrogate: M2-6:2 FTS	*129 %*	*25-150*
Surrogate: M2-8:2 FTS	*109 %*	*25-150*
Surrogate: M9PFNA	*91.0 %*	*25-150*

Analytical Batch Summary

Batch ID: BL91563 **Preparation Method:** SPE Ext-PFAS-EPA 537.1M **Prepared By:** WL

YORK Sample ID	Client Sample ID	Preparation Date
19L0984-01	MW21	12/30/19
19L0984-02	MW26	12/30/19
19L0984-03	MW26 DUP	12/30/19
19L0984-04	MW3	12/30/19
19L0984-05	Field Blank	12/30/19
BL91563-BLK1	Blank	12/30/19
BL91563-BS1	LCS	12/30/19
BL91563-MS1	Matrix Spike	12/30/19
BL91563-MSD1	Matrix Spike Dup	12/30/19

PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BL91563 - SPE Ext-PFAS-EPA 537.1M											
Blank (BL91563-BLK1)											Prepared: 12/30/2019 Analyzed: 01/02/2020
Perfluorobutanesulfonic acid (PFBS)	ND	2.00	ng/L								
Perfluorohexanoic acid (PFHxA)	ND	2.00	"								
Perfluoroheptanoic acid (PFHpA)	ND	2.00	"								
Perfluorohexanesulfonic acid (PFHxS)	ND	2.00	"								
Perfluorooctanoic acid (PFOA)	ND	2.00	"								
Perfluorooctanesulfonic acid (PFOS)	ND	2.00	"								
Perfluorononanoic acid (PFNA)	ND	2.00	"								
Perfluorodecanoic acid (PFDA)	ND	2.00	"								
Perfluoroundecanoic acid (PFUnA)	ND	2.00	"								
Perfluorododecanoic acid (PFDoA)	ND	2.00	"								
Perfluorotridecanoic acid (PFTrDA)	ND	2.00	"								
Perfluorotetradecanoic acid (PFTA)	ND	2.00	"								
N-MeFOSAA	ND	2.00	"								
N-EtFOSAA	ND	2.00	"								
Perfluoropentanoic acid (PFPeA)	ND	2.00	"								
Perfluoro-1-octanesulfonamide (FOSA)	ND	2.00	"								
Perfluoro-1-heptanesulfonic acid (PFHpS)	ND	2.00	"								
Perfluoro-1-decanesulfonic acid (PFDS)	ND	2.00	"								
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	5.00	"								
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	2.00	"								
Perfluoro-n-butanoic acid (PFBA)	ND	2.00	"								
Surrogate: M3PFBS	*60.9*		*"*	*74.3*		*81.9*	*25-150*				
Surrogate: M5PFHxA	*76.2*		*"*	*80.0*		*95.3*	*25-150*				
Surrogate: M4PFHpA	*63.7*		*"*	*80.0*		*79.6*	*25-150*				
Surrogate: M3PFHxS	*59.6*		*"*	*75.7*		*78.7*	*25-150*				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*83.8*		*"*	*80.0*		*105*	*25-150*				
Surrogate: M6PFDA	*78.7*		*"*	*80.0*		*98.4*	*25-150*				
Surrogate: M7PFUdA	*82.3*		*"*	*80.0*		*103*	*25-150*				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*68.7*		*"*	*80.0*		*85.9*	*25-150*				
Surrogate: M2PFTeDA	*40.2*		*"*	*80.0*		*50.3*	*10-150*				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*66.4*		*"*	*80.0*		*83.0*	*25-150*				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*59.1*		*"*	*76.6*		*77.2*	*25-150*				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*72.4*		*"*	*80.0*		*90.5*	*25-150*				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*51.0*		*"*	*80.0*		*63.8*	*10-150*				
Surrogate: d3-N-MeFOSAA	*53.9*		*"*	*80.0*		*67.3*	*25-150*				
Surrogate: d5-N-EtFOSAA	*61.1*		*"*	*80.0*		*76.4*	*25-150*				
Surrogate: M2-6:2 FTS	*153*		*"*	*75.9*		*202*	*25-150*				
Surrogate: M2-8:2 FTS	*170*		*"*	*76.6*		*222*	*25-150*				
Surrogate: M9PFNA	*76.4*		*"*	*80.0*		*95.5*	*25-150*				

PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BL91563 - SPE Ext-PFAS-EPA 537.1M											
LCS (BL91563-BS1)								Prepared: 12/30/2019 Analyzed: 01/02/2020			
Perfluorobutanesulfonic acid (PFBS)	89.6	2.00	ng/L	70.8		127	50-130				
Perfluorohexanoic acid (PFHxA)	95.9	2.00	"	80.0		120	50-130				
Perfluoroheptanoic acid (PFHpA)	106	2.00	"	80.0		132	50-130	High Bias			
Perfluorohexanesulfonic acid (PFHxS)	73.2	2.00	"	59.2		124	50-130				
Perfluorooctanoic acid (PFOA)	90.5	2.00	"	80.0		113	50-130				
Perfluorooctanesulfonic acid (PFOS)	69.3	2.00	"	58.4		119	50-130				
Perfluorononanoic acid (PFNA)	89.7	2.00	"	76.8		117	50-130				
Perfluorodecanoic acid (PFDA)	87.4	2.00	"	80.0		109	50-130				
Perfluoroundecanoic acid (PFUnA)	88.4	2.00	"	80.0		110	50-130				
Perfluorododecanoic acid (PFDoA)	93.1	2.00	"	80.0		116	50-130				
Perfluorotridecanoic acid (PFTrDA)	81.3	2.00	"	80.0		102	50-130				
Perfluorotetradecanoic acid (PFTA)	86.9	2.00	"	80.0		109	50-130				
N-MeFOSAA	91.6	2.00	"	80.0		114	50-130				
N-EtFOSAA	96.3	2.00	"	80.0		120	50-130				
Perfluoropentanoic acid (PFPeA)	93.4	2.00	"	80.0		117	50-130				
Perfluoro-1-octanesulfonamide (FOSA)	93.0	2.00	"	80.0		116	50-130				
Perfluoro-1-heptanesulfonic acid (PFHpS)	99.6	2.00	"	79.6		125	50-130				
Perfluoro-1-decanesulfonic acid (PFDS)	84.4	2.00	"	77.2		109	50-130				
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	90.3	5.00	"	76.0		119	50-130				
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	97.8	2.00	"	76.8		127	50-130				
Perfluoro-n-butanoic acid (PFBA)	94.5	2.00	"	80.0		118	50-130				
Surrogate: M3PFBS	*49.2*		*"*	*74.3*		*66.3*	*25-150*				
Surrogate: M5PFHxA	*59.3*		*"*	*80.0*		*74.2*	*25-150*				
Surrogate: M4PFHpA	*54.1*		*"*	*80.0*		*67.6*	*25-150*				
Surrogate: M3PFHxS	*48.6*		*"*	*75.7*		*64.2*	*25-150*				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*64.5*		*"*	*80.0*		*80.6*	*25-150*				
Surrogate: M6PFDA	*67.7*		*"*	*80.0*		*84.6*	*25-150*				
Surrogate: M7PFUdA	*60.1*		*"*	*80.0*		*75.1*	*25-150*				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*60.2*		*"*	*80.0*		*75.2*	*25-150*				
Surrogate: M2PFTeDA	*47.8*		*"*	*80.0*		*59.8*	*10-150*				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*54.7*		*"*	*80.0*		*68.4*	*25-150*				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*49.8*		*"*	*76.6*		*65.1*	*25-150*				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*58.6*		*"*	*80.0*		*73.2*	*25-150*				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*46.9*		*"*	*80.0*		*58.6*	*10-150*				
Surrogate: d3-N-MeFOSAA	*48.3*		*"*	*80.0*		*60.4*	*25-150*				
Surrogate: d5-N-EtFOSAA	*43.7*		*"*	*80.0*		*54.6*	*25-150*				
Surrogate: M2-6:2 FTS	*106*		*"*	*75.9*		*139*	*25-150*				
Surrogate: M2-8:2 FTS	*63.8*		*"*	*76.6*		*83.3*	*25-150*				
Surrogate: M9PFNA	*67.1*		*"*	*80.0*		*83.8*	*25-150*				

PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BL91563 - SPE Ext-PFAS-EPA 537.1M											
Matrix Spike (BL91563-MS1)	*Source sample: 19L0984-01 (MW21)							Prepared: 12/30/2019 Analyzed: 01/02/2020			
Perfluorobutanesulfonic acid (PFBS)	86.0	2.00	ng/L	70.8	3.37	117	25-150				
Perfluorohexanoic acid (PFHxA)	91.1	2.00	"	80.0	3.25	110	25-150				
Perfluoroheptanoic acid (PFHpA)	98.0	2.00	"	80.0	ND	123	25-150				
Perfluorohexanesulfonic acid (PFHxS)	82.4	2.00	"	59.2	ND	139	25-150				
Perfluorooctanoic acid (PFOA)	83.7	2.00	"	80.0	2.51	101	25-150				
Perfluorooctanesulfonic acid (PFOS)	93.0	2.00	"	58.4	ND	159	25-150	High Bias			
Perfluorononanoic acid (PFNA)	81.6	2.00	"	76.8	ND	106	25-150				
Perfluorodecanoic acid (PFDA)	85.9	2.00	"	80.0	ND	107	25-150				
Perfluoroundecanoic acid (PFUnA)	91.4	2.00	"	80.0	ND	114	25-150				
Perfluorododecanoic acid (PFDoA)	79.1	2.00	"	80.0	ND	98.8	25-150				
Perfluorotridecanoic acid (PFTrDA)	50.9	2.00	"	80.0	ND	63.6	25-150				
Perfluorotetradecanoic acid (PFTA)	85.5	2.00	"	80.0	ND	107	25-150				
N-MeFOSAA	87.6	2.00	"	80.0	ND	109	25-150				
N-EtFOSAA	87.4	2.00	"	80.0	ND	109	25-150				
Perfluoropentanoic acid (PFPeA)	92.4	2.00	"	80.0	2.86	112	25-150				
Perfluoro-1-octanesulfonamide (FOSA)	86.0	2.00	"	80.0	ND	108	25-150				
Perfluoro-1-heptanesulfonic acid (PFHpS)	106	2.00	"	79.6	ND	133	25-150				
Perfluoro-1-decanesulfonic acid (PFDS)	34.9	2.00	"	77.2	ND	45.2	25-150				
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	85.0	5.00	"	76.0	ND	112	25-150				
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	95.2	2.00	"	76.8	ND	124	25-150				
Perfluoro-n-butanoic acid (PFBA)	92.6	2.00	"	80.0	5.14	109	25-150				
Surrogate: M3PFBS	*48.8*		"	*74.3*		*65.7*	*25-150*				
Surrogate: M5PFHxA	*58.6*		"	*80.0*		*73.2*	*25-150*				
Surrogate: M4PFHpA	*56.2*		"	*80.0*		*70.3*	*25-150*				
Surrogate: M3PFHxS	*51.7*		"	*75.7*		*68.3*	*25-150*				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*64.1*		"	*80.0*		*80.1*	*25-150*				
Surrogate: M6PFDA	*53.9*		"	*80.0*		*67.4*	*25-150*				
Surrogate: M7PFUdA	*37.1*		"	*80.0*		*46.4*	*25-150*				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*22.0*		"	*80.0*		*27.5*	*25-150*				
Surrogate: M2PFTeDA	*9.90*		"	*80.0*		*12.4*	*10-150*				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*62.2*		"	*80.0*		*77.8*	*25-150*				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*44.5*		"	*76.6*		*58.1*	*25-150*				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*54.0*		"	*80.0*		*67.5*	*25-150*				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*7.60*		"	*80.0*		*9.49*	*10-150*				
Surrogate: d3-N-MeFOSAA	*28.7*		"	*80.0*		*35.9*	*25-150*				
Surrogate: d5-N-EtFOSAA	*24.9*		"	*80.0*		*31.1*	*25-150*				
Surrogate: M2-6:2 FTS	*138*		"	*75.9*		*181*	*25-150*				
Surrogate: M2-8:2 FTS	*95.2*		"	*76.6*		*124*	*25-150*				
Surrogate: M9PFNA	*61.2*		"	*80.0*		*76.5*	*25-150*				

PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BL91563 - SPE Ext-PFAS-EPA 537.1M											
Matrix Spike Dup (BL91563-MSD1)	*Source sample: 19L0984-01 (MW21)								Prepared: 12/30/2019 Analyzed: 01/02/2020		
Perfluorobutanesulfonic acid (PFBS)	87.1	2.00	ng/L	70.8	3.37	118	25-150		1.26	35	
Perfluorohexanoic acid (PFHxA)	94.3	2.00	"	80.0	3.25	114	25-150		3.43	35	
Perfluoroheptanoic acid (PFHpA)	107	2.00	"	80.0	ND	134	25-150		8.89	35	
Perfluorohexanesulfonic acid (PFHxS)	86.1	2.00	"	59.2	ND	145	25-150		4.38	35	
Perfluorooctanoic acid (PFOA)	87.8	2.00	"	80.0	2.51	107	25-150		4.75	35	
Perfluorooctanesulfonic acid (PFOS)	96.2	2.00	"	58.4	ND	165	25-150	High Bias	3.42	35	
Perfluorononanoic acid (PFNA)	86.0	2.00	"	76.8	ND	112	25-150		5.24	35	
Perfluorodecanoic acid (PFDA)	102	2.00	"	80.0	ND	127	25-150		17.1	35	
Perfluoroundecanoic acid (PFUnA)	87.1	2.00	"	80.0	ND	109	25-150		4.90	35	
Perfluorododecanoic acid (PFDoA)	104	2.00	"	80.0	ND	130	25-150		27.6	35	
Perfluorotridecanoic acid (PFTrDA)	69.5	2.00	"	80.0	ND	86.9	25-150		31.0	35	
Perfluorotetradecanoic acid (PFTA)	95.2	2.00	"	80.0	ND	119	25-150		10.7	35	
N-MeFOSAA	90.4	2.00	"	80.0	ND	113	25-150		3.17	35	
N-EtFOSAA	91.5	2.00	"	80.0	ND	114	25-150		4.56	35	
Perfluoropentanoic acid (PFPeA)	94.6	2.00	"	80.0	2.86	115	25-150		2.35	35	
Perfluoro-1-octanesulfonamide (FOSA)	92.0	2.00	"	80.0	ND	115	25-150		6.75	35	
Perfluoro-1-heptanesulfonic acid (PFHpS)	106	2.00	"	79.6	ND	133	25-150		0.128	35	
Perfluoro-1-decanesulfonic acid (PFDS)	38.8	2.00	"	77.2	ND	50.3	25-150		10.8	35	
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	89.3	5.00	"	76.0	ND	117	25-150		4.86	35	
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	96.5	2.00	"	76.8	ND	126	25-150		1.35	35	
Perfluoro-n-butanoic acid (PFBA)	96.6	2.00	"	80.0	5.14	114	25-150		4.18	35	
Surrogate: M3PFBS	*52.3*		"	*74.3*		*70.3*	*25-150*				
Surrogate: M5PFHxA	*64.9*		"	*80.0*		*81.2*	*25-150*				
Surrogate: M4PFHpA	*62.0*		"	*80.0*		*77.5*	*25-150*				
Surrogate: M3PFHxS	*54.4*		"	*75.7*		*71.9*	*25-150*				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	*69.2*		"	*80.0*		*86.5*	*25-150*				
Surrogate: M6PFDA	*55.8*		"	*80.0*		*69.7*	*25-150*				
Surrogate: M7PFUdA	*41.7*		"	*80.0*		*52.1*	*25-150*				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	*22.9*		"	*80.0*		*28.6*	*25-150*				
Surrogate: M2PFTeDA	*17.2*		"	*80.0*		*21.5*	*10-150*				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	*61.8*		"	*80.0*		*77.3*	*25-150*				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	*49.2*		"	*76.6*		*64.2*	*25-150*				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	*61.7*		"	*80.0*		*77.2*	*25-150*				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	*19.3*		"	*80.0*		*24.2*	*10-150*				
Surrogate: d3-N-MeFOSAA	*38.6*		"	*80.0*		*48.2*	*25-150*				
Surrogate: d5-N-EtFOSAA	*34.0*		"	*80.0*		*42.5*	*25-150*				
Surrogate: M2-6:2 FTS	*121*		"	*75.9*		*160*	*25-150*				
Surrogate: M2-8:2 FTS	*70.1*		"	*76.6*		*91.4*	*25-150*				
Surrogate: M9PFNA	*66.6*		"	*80.0*		*83.2*	*25-150*				

Sample and Data Qualifiers Relating to This Work Order

QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data are acceptable.
PFSu-L	The isotopically labeled surrogate recovered below lab control limits due to a matrix effect. Isotope Dilution was applied.
PFSu-H	The isotopically labeled surrogate recovered above lab control limits due to a matrix effect. Isotope Dilution was applied.
PF-LCS-H	The LCS recovery was slightly above acceptable limits for the qualified compound. However, sample results are not biased high becuase results are corrected for isotope recovery.
PF-CCV-H	The CCV recovery was slightly above acceptable limits for the qualified compound. However, sample results are not biased high because results are corrected for isotope recovery.

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

York Analytical Laboratories, Inc.
120 Research Drive, Stratford, CT 06615
132-02 89th Ave, Queens, NY 11418
clientservices@yorklab.com
www.yorklab.com

Field Chain-of-Custody Record

NOTE: YORK's Standard Terms & Conditions are listed on the back side of this document.
This document serves as your written authorization for YORK to proceed with the analyses requested below and signature binds you to YORK's Standard Terms & Conditions.

YORK Project No.: 19L0984

Page ____ of ____

YOUR Information	Report To:	Invoice To:	YOUR Project Number	Turn-Around Time
Company: Mid-Hudson Geosciences	Company:	Company: American Cleaners		RUSH - Next Day
Address: 203 Route 44/55 Clintondale, NY 12515	Address:	Address: 360 Route 211 East Middletown, NY 10940		RUSH - Two Day
Phone: 845-883-5726	Phone:	Phone: 845 343-1100 x 102	YOUR Project Name: AC Middletown PFAS-	RUSH - Three Day
Contact: Kathie BeinKafner	Contact:	Contact: Mr. Erez Halevan		RUSH - Four Day
E-mail: rockdoctor@optonline.net	E-mail:	E-mail: erezh19@gmail.com	YOUR PO#:	Standard (5-7 Day) ✓

Please print clearly and legibly. All information must be complete. Samples will not be logged in and the turn-around-time clock will not begin until any questions by YORK are resolved.

Katherine J. BeinKafner

Samples Collected by: (print your name above and sign below)

Katherine J. BeinKafner

Matrix Codes	Samples From	Report / EDD Type (circle selections)			YORK Reg. Comp.
S - soil / solid	New York ✓	Summary Report ✓	CT RCP	Standard Excel EDD	Compared to the following Regulation(s): (please fill in) NY Drinking Water
GW - groundwater	New Jersey	QA Report	CT RCP DQA/DUE	EQuIS (Standard)	
DW - drinking water	Connecticut	NY ASP A Package	NJDEP Reduced Deliverables	NYSDEC EQuIS ✓	
WW - wastewater	Pennsylvania	NY ASP B Package ✓	NJDKQP	NJDEP SRP HazSite	
O - Oil / Other	Other			Other	

Sample Identification	Sample Matrix	Date/Time Sampled	Analysis Requested	Container Description
MW21	GW	12/26/19 835am	PFAS Target Analytical List	2-250 ml
MW21 ms/msd	GW	12/26/19 835am	USEPA method 537 to achieve 2ng/L (ppt) reporting limits	2-250 ml
MW26	GW	12/26/19 930AM		2-250ml
MW26 DUP	GW	12/26/19 930AM		2-250 ml
MW3	GW	12/26/19 1040AM	1,4-Dioxane USEPA method 8270 SIM mol no higher than 0.35ug/L (ppb)	2-250 ml
Field Blank	~~GW~~ Distilled water	12/26/19 900AM		1-250 ml

Comments: Chlorinated Solvents (PCE) is currently treated by NaLactate & BAC9

Preservation: (check all that apply)
HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___
Ascorbic Acid ___ Other: ___

Special Instruction
Field Filtered ___
Lab to Filter ___

Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time	Samples Relinquished by / Company	Date/Time
K. BeinKafner / MKGS	12/27/19 10AM		12-27-19 10:50		12-27-19 1517
Samples Received by / Company	Date/Time	Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time
Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time	Samples Received in LAB by	Date/Time / Temp. Received at Lab
					12-27-19 1517 / 1.1 Degrees C

Technical Report

prepared for:

Mid-Hudson Geosciences
1003 NY Route 44/55, P.O.Box 332
Clintondale NY, 12515-0332
Attention: Katherine Beinkafner

Report Date: 07/15/2020
Client Project ID: American Cleaners
York Project (SDG) No.: 20G0250

Report Date: 07/15/2020
Client Project ID: American Cleaners
York Project (SDG) No.: 20G0250

Mid-Hudson Geosciences
1003 NY Route 44/55, P.O.Box 332
Clintondale NY, 12515-0332
Attention: Katherine Beinkafner

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on July 08, 2020 and listed below. The project was identified as your project: **American Cleaners**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

York Sample ID	Client Sample ID	Matrix	Date Collected	Date Received
20G0250-01	MW 26	Water	07/07/2020	07/08/2020
20G0250-02	MW 26 DUP	Water	07/07/2020	07/08/2020
20G0250-03	MW 3	Water	07/07/2020	07/08/2020
20G0250-04	MW 21	Water	07/07/2020	07/08/2020
20G0250-05	Field Blank	Water	07/07/2020	07/08/2020

General Notes for York Project (SDG) No.: 20G0250

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 07/15/2020

Benjamin Gulizia
Laboratory Director

Sample Information

Client Sample ID: MW 26 **York Sample ID:** 20G0250-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
20G0250	American Cleaners	Water	July 7, 2020 1:00 pm	07/08/2020

Semi-Volatiles, 1,4-Dioxane 8270 SIM-Aqueous **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3535A

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
123-91-1	1,4-Dioxane	ND		ug/L	0.400	1	EPA 8270D SIM Certifications: NJDEP,NELAC-NY10854	07/13/2020 15:00	07/14/2020 13:47	KH

	Surrogate Recoveries	Result	Acceptance Range
17647-74-4	*Surrogate: 1,4-Dioxane-d8*	*80.0 %*	*36.6-118*

Sample Information

Client Sample ID: MW 26 DUP **York Sample ID:** 20G0250-02

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
20G0250	American Cleaners	Water	July 7, 2020 1:00 pm	07/08/2020

Semi-Volatiles, 1,4-Dioxane 8270 SIM-Aqueous **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3535A

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
123-91-1	1,4-Dioxane	ND		ug/L	0.400	1	EPA 8270D SIM Certifications: NJDEP,NELAC-NY10854	07/13/2020 15:00	07/14/2020 14:05	KH

	Surrogate Recoveries	Result	Acceptance Range
17647-74-4	*Surrogate: 1,4-Dioxane-d8*	*60.0 %*	*36.6-118*

Sample Information

Client Sample ID: MW 3 **York Sample ID:** 20G0250-03

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
20G0250	American Cleaners	Water	July 7, 2020 1:45 pm	07/08/2020

Semi-Volatiles, 1,4-Dioxane 8270 SIM-Aqueous **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3535A

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
123-91-1	**1,4-Dioxane**	**1.94**		ug/L	0.400	1	EPA 8270D SIM Certifications: NJDEP,NELAC-NY10854	07/13/2020 15:00	07/14/2020 14:22	KH

	Surrogate Recoveries	Result	Acceptance Range
17647-74-4	*Surrogate: 1,4-Dioxane-d8*	*72.0 %*	*36.6-118*

Sample Information

Client Sample ID: **MW 21** **York Sample ID:** **20G0250-04**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
20G0250	American Cleaners	Water	July 7, 2020 3:00 pm	07/08/2020

Semi-Volatiles, 1,4-Dioxane 8270 SIM-Aqueous **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3535A

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
123-91-1	**1,4-Dioxane**	**1.76**		ug/L	0.400	1	EPA 8270D SIM	07/13/2020 15:00	07/14/2020 14:39	KH
							Certifications: NJDEP,NELAC-NY10854			

	Surrogate Recoveries	Result	Acceptance Range
17647-74-4	*Surrogate: 1,4-Dioxane-d8*	*68.0 %*	*36.6-118*

Sample Information

Client Sample ID: **Field Blank** **York Sample ID:** **20G0250-05**

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
20G0250	American Cleaners	Water	July 7, 2020 9:00 am	07/08/2020

Semi-Volatiles, 1,4-Dioxane 8270 SIM-Aqueous **Log-in Notes:** **Sample Notes:**

Sample Prepared by Method: EPA 3535A

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
123-91-1	**1,4-Dioxane**	**2.22**		ug/L	0.400	1	EPA 8270D SIM	07/13/2020 15:00	07/14/2020 14:56	KH
							Certifications: NJDEP,NELAC-NY10854			

	Surrogate Recoveries	Result	Acceptance Range
17647-74-4	*Surrogate: 1,4-Dioxane-d8*	*72.0 %*	*36.6-118*

Analytical Batch Summary

Batch ID: BG00592 **Preparation Method:** EPA 3535A **Prepared By:** SGM

YORK Sample ID	Client Sample ID	Preparation Date
20G0250-01	MW 26	07/13/20
20G0250-02	MW 26 DUP	07/13/20
20G0250-03	MW 3	07/13/20
20G0250-04	MW 21	07/13/20
20G0250-05	Field Blank	07/13/20
BG00592-BLK1	Blank	07/13/20
BG00592-BS1	LCS	07/13/20

Semivolatile Organic Compounds by GC/MS/SIM - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BG00592 - EPA 3535A											
Blank (BG00592-BLK1)											Prepared: 07/13/2020 Analyzed: 07/14/2020
1,4-Dioxane	ND	0.400	ug/L								
Surrogate: 1,4-Dioxane-d8	*4.00*		*"*	*5.00*		*80.0*	*36.6-118*				
LCS (BG00592-BS1)											Prepared: 07/13/2020 Analyzed: 07/14/2020
1,4-Dioxane	3.62	0.400	ug/L	5.00		72.4	50-130				
Surrogate: 1,4-Dioxane-d8	*3.60*		*"*	*5.00*		*72.0*	*36.6-118*				

Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

York Analytical Laboratories, Inc.
120 Research Drive, Stratford, CT 06615 | 132-02 89th Ave, Queens, NY 11418
clientservices@yorklab.com
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Field Chain-of-Custody Record

NOTE: YORK's Standard Terms & Conditions are listed on the back side of this document.
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YORK Project No. 20G0250

Page ____ of ____

YOUR Information	Report To:	Invoice To:	YOUR Project Number	Turn-Around Time
Company: Mid-Hudson Geosciences	Company:	Company: American Cleaners		RUSH - Next Day
Address: 1003 Rt 44/55 Clintondale, NY 12515	Address:	Address: 360 Route 211 East Middletown, NY 10940	YOUR Project Name	RUSH - Two Day
Phone.: 845 883 5726	Phone.:	Phone: 845 343 1100 x102		RUSH - Three Day
Contact: Kathie Beinkafner	Contact:	Contact: Mr. EREZ HALEVAH		RUSH - Four Day
E-mail: rockdoctor@optonline.net	E-mail:	E-mail: ErezH19@gmail.com	YOUR PO#:	Standard (5-7 Day) ✓

Please print clearly and legibly. All information must be complete. Samples will not be logged in and the turn-around-time clock will not begin until any questions by YORK are resolved.

Katherine J. Beinkafner

Samples Collected by: (print your name above and sign below)

Katherine J Beinkafner

Matrix Codes
S - soil / solid
GW - groundwater
DW - drinking water
WW - wastewater
O - Oil ¦ Other

Samples From
New York ✓
New Jersey
Connecticut
Pennsylvania
Other

Report / EDD Type (circle selections)
Summary Report ✓ | CT RCP | Standard Excel EDD
QA Report | CT RCP DQA/DUE | EQuIS (Standard)
NY ASP A Package | NJDEP Reduced Deliverables | NYSDEC EQuIS ✓
NY ASP B Package ✓ | NJDKQP | NJDEP SRP HazSite
Other:

YORK Reg. Comp.
Compared to the following Regulation(s): (please fill in)
NYS Drinking Water

Sample Identification	Sample Matrix	Date/Time Sampled	Analysis Requested	Container Description
MW 26	GW	7/7/20 1PM	1,4-Dioxane USEPA Method 8270SIM mdl no higher than 0.35 ug/L (ppb)	1 Liter Glass Amber
MW 26 DUP	GW	7/7/20 1PM		1 Liter Glass Amber
MW 3	GW	7/7/20 1458PM		1 Liter Glass Amber
MW 21	GW	7/7/20 3PM		1 Liter Glass Amber
Field Blank	Distilled Water	7/7/20 9AM		1 Liter Glass Amber

Comments: Drought conditions, no Rain for 6 weeks
MW 21 could not produce enough water for MS/MSD
Is there enough water from MW21 or another well?

Preservation: (check all that apply)
HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___
Ascorbic Acid ___ Other: ___

Special Instruction
Field Filtered ____
Lab to Filter ____

Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time	Samples Relinquished by / Company	Date/Time
Katherine J Beinkafner MHGS	7/8/20 9AM	Client	7-8-20 11:30	Client	7-8-20 1440
Samples Received by / Company	Date/Time	Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time
Samples Relinquished by / Company	Date/Time	Samples Received by / Company	Date/Time	Samples Received in LAB by / Date/Time	Temp. Received at Lab
				T Gale 7/8/2020 1440	1.4 Degrees C

Data Usability Summary Report

American Cleaners
Middletown, NY

Groundwater and Soil Vapor Samples
Collected between 2017 and 2020

Data Reviewed August 2020

ZDataReports
Data Management and Validation Services
118 Rose Lane Terrace, Syracuse, NY 13219, (716) 907-2341

Data Usability Summary Report

Samples Collected
April 2017 through July 2020

American Cleaners
Middletown, New York

Prepared By:

ZDataReports
Data Management and Validation Service
118 Rose Lane Terrace
Syracuse, New York 13219

EXECUTIVE SUMMARY

This report addresses data quality for sixty-eight water samples including seven trip blanks, six equipment blanks and one field blank and seven air samples collected at the American Cleaners site located in Middletown, New York between the dates 04/13/2017 and 12/26/2019. The samples were analyzed for Volatile organics (VOC), 1,4-Dioxane (SVOC) and Perfluorinated Alkyl Acid Substances (PFAS) following New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) methodologies (2005 update). Sample collection was performed by Mid-Hudson Geosciences located in Clintondale, New York. Analytical services for the water samples were provided by York Analytical Laboratories, Inc. located in Stratford, Connecticut.

The volatile organics analyses data were determined to be usable for qualitative and quantitative purposes with the exceptions of Vinyl Acetate data for all samples in SDG **19C1119** which were rejected due to continuing calibration deviations, cis-1,2-Dichoroethylene and Vinyl Chloride in all sample from SDG **19I0643** which were rejected due to matrix spike recovery deviations, and in Bromomethane in all sample from SDG **19L0842** which were rejected due to matrix spike recovery deviations. Sample results for several compounds were also qualified based on deviations from initial and continuing calibration criteria, matrix spike recoveries and laboratory control sample criteria.

The 1,4-Dioxane analyses data were determined to be usable for qualitative and quantitative purposes as reported.

The Perfluorinated Alkyl Acid analyses data were determined to be usable for qualitative and quantitative purposes as reported by the laboratory with the exceptions of PFTrDA in sample MW26 DUP (12/26/2019) and FOSA in sample MW21 (12/26/2019) which were rejected due to surrogate recovery deviations. Several compounds were qualified as estimated detection limit (UJ) due to deviations in surrogate recovery, continuing calibration recovery, matrix spike recovery and laboratory control sample recovery criteria.

The overall percent usability or completeness of the data was 98.77 percent.

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Appendices

SECTION 1 - INTRODUCTION

1.1 Introduction

This report addresses data quality for sixty-three water samples and seven air sample collected at the American Cleaners site located in Middletown, New York. The samples were analyzed for volatile organics (EPA 8260 and TO-15) and polyfluoroalkyl substances (PFAS by EPA 537) following New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP) methodologies. Sample collection was performed by Mid-Hudson Geosciences located in Clintondale, New York. Analytical services for water samples were provided by York Analytical Laboratories, Inc. located in Stratford, Connecticut. The quantity and types of samples submitted for data validation are tabulated below. Due to the fact that many sample ID have multiple sampling dates, the collection data has been added to the sample ID though this document for clarity.

Table 1: Introduction - Sample Summary Table

SDG#	Date Collected	Matrix	Sample Identification	
			Client ID	Laboratory ID
17D0581	04/13/2017	Water	MW25	17D0581-01
			MW25 Duplicate	17D0581-02
			MW26	17D0581-03
			T5	17D0581-04
			Trip Blank	17D0581-05
			Equip Blank	17D0581-06
17F0052	6/1/2017	Water	MW33	17F0052-01
			MW32	17F0052-02
			MW32 Duplicate	17F0052-03
			MW31	17F0052-04
			Trip Blank	17F0052-05
			Equip Blank	17F0052-06
17F0808	6/20/2017	Air	XP4 (18310/F 25)	17F0808-01
			XP3 (17350/F 1)	17F0808-02
			XP1 (466/F 21)	17F0808-03
			XP2 (15524/F 29)	17F0808-04
18H1137	8/23/2018	Water	MW30	18H1137-01
			Trip Blank	18H1137-02
19C1119	3/26/2019	Water	TRIP BLANK	19C1119-01
			EQUIP BLANK	19C1119-02
			MW21	19C1119-03
			MW25	19C1119-04
			MW26	19C1119-05
			T5	19C1119-06
			MW33	19C1119-07
			MW32	19C1119-08
			MW34	19C1119-09
			MW22	19C1119-10
			MW22 DUP	19C1119-11
			SW1	19C1119-12

SDG#	Date Collected	Matrix	Sample Identification	
			Client ID	Laboratory ID
19E0163	5/3/2019	Water	Trip Blank	19E0163-01
			Equipment Blank	19E0163-02
			MW5	19E0163-03
			MW3	19E0163-04
19I0643	9/13/2019	Water	Trip Blank	19I0643-01
			Equip Blank	19I0643-02
			MW21	19I0643-03
			MW6	19I0643-04
			MW22	19I0643-05
			MW5	19I0643-06
			MW3	19I0643-07
			MW25	19I0643-08
			MW26	19I0643-09
			MW26DUP	19I0643-10
			MW33	19I0643-11
			MW32	19I0643-12
			MW34	19I0643-13
			T5	19I0643-14
19L0842	12/18/2019	Water	Trip Blank	19L0842-01
			Equip Blank	19L0842-02
			MW21	19L0842-03
			MW30	19L0842-04
			MW5	19L0842-05
			MW3	19L0842-06
			MW26	19L0842-07
			MW26DUP	19L0842-08
			MW25	19L0842-09
			MW32	19L0842-10
			MW33	19L0842-11
			T5	19L0842-12
			MW22	19L0842-13
			MW6	19L0842-14
19L0979	12/26/2019	Air	XP1	19L0979-01
			XP2	19L0979-02
			XP4	19L0979-03
19L0984	12/26/2019	Water	MW21	19L0984-01
			MW26	19L0984-02
			MW26DUP	19L0984-03
			MW23	19L0984-04
			Field Blank	19L0984-05
20G0250	07/07/2020	Water	MW26	20G0250-01
			MW26DUP	20G0250-02
			MW3	20G0250-03
			MW21	20G0250-04
			Field Blank	20G0250-05

1.2 Analytical Methods

The samples were analyzed for volatile organics (EPA 8260C and TO-15) and PFAS (EPA 537) following New York State Department of Environmental Conservation (NYSDEC) Analytical

Services Protocol (ASP) methodologies (2005 update). Laboratory analyses were provided by York Analytical Laboratories, Inc. located in Stratford, Connecticut.

1.3 Validation Protocols

Data validation is a process that involves the evaluation of analytical data against prescribed quality control criteria to determine the usefulness of the data. The analytical data addressed in this report were evaluated utilizing the quality control criteria presented in the following documents:

- *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, USEPA-540-R-08-01, June 2008.
- *CLP Organics Data Review and Preliminary Review*, SOP No. HW-6 Revision #14, USEPA Region II, September 2006.
- *USEPA Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537*, EPA 910-R-18-001, November 2018
- *Validating Volatile Organic Compounds By Gas Chromatography/Mass Spectrometry SW-846 Method 8260B*, SOP No. HW-24 Revision #2, USEPA Hazardous Waste Support Branch, August 2008.
- *Exhibit E of New York State Department of Environmental Conservation Analytical Services Protocol (NYSDEC ASP)*, NYSDEC June 2005.

1.3.1 Organic Parameters

The validation of organic parameters for this project followed the requirements presented in the analytical methodology and the data validation guidelines presented above. The following QA/QC parameters were evaluated:

Volatile and Semivolatile Organics and PFAS Analyses

1. Holding Times
2. GC/MS Instrument Tuning Criteria
3. Calibration
   a. Initial Calibration
   b. Continuing Calibration
4. Blank Analysis
5. Surrogate Recovery
6. Matrix Spike / Matrix Spike Duplicate Analysis
7. Reference Standard Analysis
8. Internal Standards Recovery
9. Compound Identification and Quantification
10. Field Duplicate Analysis
11. System Performance

12. Documentation Completeness
13. Overall Data Assessment

1.4 Data Qualifiers

The following qualifiers as specified in the guidance documents presented in Section 1.3 of this report have been used for this data validation.

U — Indicates that the compound was analyzed for, but was not detected. The sample quantification limit is presented and adjusted for dilution. This qualifier is also used to signify that the detection limit of an analyte was raised due to blank contamination.

J — Indicates that the result should be considered approximate. This qualifier is used when the data validation procedure identifies a deficiency in the data generation process.

UJ — Indicates that the detection limit for the analyte in this sample should be considered approximate. This qualifier is used when the data validation process identifies a deficiency in the data generation process.

R — Indicates that the previously reported detection limit or sample result has been rejected due to a major deficiency in the data generation procedure. The data are considered to be unusable for both qualitative and quantitative purposes.

The following sections of this document present a summary of the data validation process. Section 2 discusses data compliance with established QA/QC criteria and qualifications performed on the sample data. A discussion of the Precision, Accuracy, Representativeness, Comparability, and Completeness (PARCC) of the data and data usability are discussed in Section 3. The USEPA Region II Data Validation Checklists are presented in Appendix A.

SECTION 2 - DATA VALIDATION SUMMARY

This section presents a discussion of QA/QC parameter compliance with established criteria and the qualification of data performed when QA/QC parameter deviations were identified. When several deviations from established QA/QC criteria were observed, the final qualifier assigned to the data was based on the cumulative effect of the deviations.

2.1 Volatiles Analysis

Data validation was performed for sixty-three water samples (8260) and seven air samples (TO-15). The QA/QC parameters presented in Section 1.3.2 of this report were found to be within specified limits with the exception of the following:

Blank Analysis

The trip and equipment blanks in SDG 19I0643 contained detectable concentrations of acetone, which is considered to be a common laboratory contaminant. Therefore, blank action levels were calculated at ten times the blank concentrations for Acetone. In the method blank (BI80837) for SDG 19(0643, 2-Butanone was detected and action levels for this compound are calculated at five times the blanks concentration. Detected sample results, which were less than the blank action levels were qualified with a "U" in the associated samples. Results that were detected below the contract required detection limit (CRDL) were raised to the CRDL and qualified with a "U" qualifier. The "U" qualifier indicates that the volatile organic was analyzed for but was not detected above the CRDL. Samples qualified for blank contamination are tabulated below.

Table 2: Volatile Organics Analyses - Blank Analysis Deviations

Blank Matrix	Compound	Blank Action Level	Associated Samples	Qualified Sample Result
Water Equp Blank 19I0643	Acetone	27.3 ug/L	MW21 (09/13/2019)	5.80 U ug/L
			MW6 (09/13/2019)	1410 J ug/L
			MW22 (09/13/2019)	25.9 U ug/L
			MW5 (09/13/2019)	1770 J ug/L
			MW3 (09/13/2019)	2.00 U ug/L
			MW25 (09/13/2019)	9.47 U ug/L
			MW26 (09/13/2019)	2.00 U ug/L
			MW26DUP (09/13/2019)	2.00 U ug/L
			MW33 (09/13/2019)	2.00 U ug/L
			MW32 (09/13/2019)	2.00 U ug/L
			MW34 (09/13/2019)	2.00 U ug/L
			T5 (09/13/2019)	6.88 U ug/L
Water BI90837 19I0643	2-Butanone	3.9 ug/L	MW21 (09/13/2019)	3.68 U ug/L
			MW22 (09/13/2019)	66.7 J ug/L
			MW3 (09/13/2019)	2.00 U ug/L
			MW25 (09/13/2019)	2.00 U ug/L
			MW26 (09/13/2019)	2.00 U ug/L
			MW33 (09/13/2019)	2.00 U ug/L
			MW32 (09/13/2019)	2.00 U ug/L
			MW34 (09/13/2019)	2.00 U ug/L
			T5 (09/13/2019)	5.62 J ug/L

Blank Matrix	Compound	Blank Action Level	Associated Samples	Qualified Sample Result
Water BI90838 19I0643	2-Butanone	3.95 ug/L	MW26DUP (09/13/2019)	0.500 U ug/L
Water BI90839 19I0643	2-Butanone	2.35 ug/L	MW6 (09/13/2019)	132 J ug/L
Water BI90940 19I0643	1,2,3-Trichlorobenzene	3.15 ug/L	MW5 (09/13/2019)	5.00 U ug/L
Water BI90940 19I0643	1,2,4-Trichlorobenzene	1.00 ug/L	MW5 (09/13/2019)	5.00 U ug/L
Water BI90940 19I0643	Naphthalene	6.50 ug/L	MW5 (09/13/2019)	38.4 J ug/L
Water Trip Blank 19L0842	Acetone	38.8 ug/L	Equip Blank (12/18/2019) MW21 (12/18/2019) MW30 (12/18/2019) MW5 (12/18/2019) MW3 (12/18/2019) MW26 (12/18/2019) MW26DUP (12/18/2019) MW25 (12/18/2019) MW32 (12/18/2019) MW33 (12/18/2019) T5 (12/18/2019) MW22 (12/18/2019) MW6 (12/18/2019)	3.63 U ug/L 4.95 U ug/L 7.04 U ug/L 17.6 U ug/L 2.00 U ug/L 2.00 U ug/L 2.00 U ug/L 2.00 U ug/L 2.00 U ug/L 2.00 U ug/L 2.00 U ug/L 2.00 U ug/L 34.6 U ug/L
Water BL80787 19L0842	Toluene	1.05 ug/L	MW21 (12/18/2019) MW30 (12/18/2019) MW5 (12/18/2019) MW3 (12/18/2019) MW26 (12/18/2019) MW26DUP (12/18/2019) MW25 (12/18/2019)	0.500 U ug/L 0.500 U ug/L 1.00 U ug/L 0.500 U ug/L 0.500 U ug/L 0.500 U ug/L 0.500 U ug/L
Water BL90789 19L0842	Toluene	1.05 ug/L	Trip Blank (12/18/2019) Equip Blank (12/18/2019) MW22 (12/18/2019) MW32 (12/18/2019) MW33 (12/18/2019)	0.500 U ug/L 0.500 U ug/L 0.500 U ug/L 0.500 U ug/L 0.500 U ug/L

Initial Calibration

The initial calibration relative standard deviation (%RSD) limit, which requires the %RSD to be less than 30 percent, was exceeded for several compounds. Sample qualification included the approximation (J, UJ) of results when %RSD criteria were exceeded. Samples requiring qualification due to these deviations are tabulated below.

Table 3: Volatile Organics Analyses – Initial Calibration Deviations

Date Analyzed	Compound	%RSD	Result Qualifier	Affected Samples
MSVOA2 04/19/2017	Acetone	36.6 %	UJ	MW25 (04/13/2017) MW25 Duplicate (04/13/2017) MW26 (04/13/2017) T5 (04/13/2017) Trip Blank (04/13/2017) Equip Blank (04/13/2017)
MSVOA1 06/05/2017	1,2,3-Trichloropropane	46.1 %	UJ	MW33 (06/01/2017) MW32 (06/01/2017) MW32 Duplicate (06/01/2017) MW31 (06/01/2017) Trip Blank (06/01/2017) Equip Blank (06/01/2017)

Continuing Calibration

The continuing calibration percent difference (%D) limit, which requires the %D to be less than 25 percent, was exceeded for several compounds. Sample qualification included the approximation (J, UJ) of results when %D criteria were exceeded but were less than 90 percent. Non-detected results were rejected (R) for compounds with %D values greater than 90 percent. Samples requiring qualification due to these deviations are tabulated below.

Table 4: Volatile Organics Analysis - Continuing Calibration Deviations

Date Analyzed	Compound	%D	Result Qualifier	Affected Samples
MSVOA2 04/22/2017 02:02	Vinyl Acetate 2-Butanone 2,2-Dichloropropane Tetrachloroethylene 2-Chlorotoluene t-Butylbenzene	26.5 % -50.7 % 34.4 % -81.1 % -26.7 % 35.8 %	UJ UJ UJ J, UJ UJ UJ	MW26 (04/13/2017) Trip Blank (04/13/2017) Equip Blank (04/13/2017)
MSVOA2 04/24/2017 09:35	Acetone	43.3 %	UJ	MW25 (04/13/2017) MW25 Duplicate (04/13/2017) T5 (04/13/2017)
MSVOA1 06/08/2017 09:08	Chloromethane Bromomethane Methylene Chloride Acetone 1,2,3-Trichloropropane 1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene Naphthalene	37.7 % 70.5 % 27.9 % 29.2 % 27.5 % 67.6 % 38.2 % 46.7 %	UJ UJ UJ UJ UJ UJ UJ UJ	MW33 (06/01/2017) MW32 (06/01/2017) MW32 Duplicate (06/01/2017) MW31 (06/01/2017) Trip Blank (06/01/2017) Equip Blank (06/01/2017)
5975C 06/21/2017 11:42	Chloroethane Vinyl Bromide	43.2 % 35.0 %	UJ UJ	XP4 (18310/F 25) XP3 (17350/F 1) XP1 (466/F 21) XP2 (15524/F 29)
MSVOA7 08/28/2018 09:29	Bromomethane Acetone Vinyl Acetate	86.6 % -31.4 % -50.4 %	UJ J, UJ UJ	MW30 (08/23/2018) Trip Blank (08/23/2018)

Date Analyzed	Compound	%D	Result Qualifier	Affected Samples
	2,2-Dichloropropane	-27.3 %	UJ	
QVOA6	1,1-Dichloroethylene	26.4 %	UJ	TRIP BLANK (03/26/2019)
03/29/2019	Bromochloromethane	25.1 %	UJ	EQUIP BLANK (03/26/2019)
21:47	Bromoform	-36.3 %	UJ	MW32 (03/26/2019)
	Chloromethane	50.0 %	UJ	MW34 (03/26/2019)
	Dichlorodifluoromethane	41.3 %	UJ	MW22 (03/26/2019)
	Hexachlorobutadiene	-36.9 %	UJ	MW22 DUP (03/26/2019)
	Methylene Chloride	25.2 %	UJ	SW1 (03/26/2019)
	Vinyl Acetate	137 %	R	
QVOA6	2,2-Dichloropropane	33.2 %	UJ	MW21 (03/26/2019)
03/29/2019	Acetone	37.4 %	UJ	MW25 (03/26/2019)
08:05	Bromoform	-31.6 %	UJ	MW26 (03/26/2019)
	Dichlorodifluoromethane	-28.2 %	UJ	T5 (03/26/2019)
	Hexachlorobutadiene	-36.7 %	UJ	MW33 (03/26/2019)
	Vinyl Acetate	136 %	R	
VOA No.8	2-Butanone	50.3 %	UJ	Trip Blank (05/03/2019)
05/08/2019	Acetone	50.6 %	J, UJ	Equipment Blank (05/03/2019)
10:10	Bromomethane	-43.2 %	UJ	MW5 (05/03/2019)
				MW3 (05/03/2019)
QVOA9	1,1,2,2-Tetrachloroethane	29.7 %	UJ	Trip Blank (09/13/2019)
09/18/2019	1,2,3-Trichlorobenzene	-27.9 %	UJ	Equipment Blank (09/13/2019)
07:53	2-Butanone	43.7 %	UJ	MW21 (09/13/2019)
	Acetone	27.5 %	UJ	MW22 (09/13/2019)
	Bromomethane	-49.0 %	UJ	MW3 (09/13/2019)
	Chloromethane	-33.5 %	UJ	MW25 (09/13/2019)
	Hexachlorobutadiene	-30.5 %	UJ	MW26 (09/13/2019)
				MW33 (09/13/2019)
				MW32 (09/13/2019)
				MW34 (09/13/2019)
				T5 (09/13/2019)
QVOA6	1,2,3-Trichlorobenzene	-44.4 %	UJ	MW5 (09/13/2019)
09/18/2019	1,2,4-Trichlorobenzene	-27.9 %	UJ	
08:18	Bromomethane	-31.6 %	UJ	
	Hexachlorobutadiene	-32.9 %	UJ	
QVOA9	2-Butanone	39.6 %	UJ	MW6 (09/13/2019)
09/19/2019	Bromomethane	-61.3 %	UJ	
11:30	Hexachlorobutadiene	-34.8 %	UJ	
QVOA9	1,1,2,2-Tetrachloroethane	27.8 %	UJ	MW26 DUP (09/13/2019)
09/20/.2019	2-Butanone	43.1 %	UJ	
07:53	Acetone	44.3 %	UJ	
	Bromomethane	-69.1 %	UJ	
	Chloromethane	-47.8 %	UJ	
	Dichlorodifluoromethane	-34.1 %	UJ	
	Vinyl Acetate	-39.6 %	UJ	
QVOA9	Acetone	31.6 %	J	MW5 (09/13/2019) DL
09/23/2019				MW6 (09/13/2019) DL
10:25				
QVOA9	2-Butanone	27.0 %	J, UJ	MW21 (12/18/2019)
12/24/2019	Acetone	59.4 %	UJ	MW30 (12/18/2019)
11:09	Bromomethane	-78.1 %	UJ	MW5 (12/18/2019)
	Chloromethane	-59.3 %	UJ	MW3 (12/18/2019)

Date Analyzed	Compound	%D	Result Qualifier	Affected Samples
	Vinyl Chloride	-41.0 %	J, UJ	MW26 (12/18/2019) MW26DUP (12/18/2019) MW25 (12/18/2019)
QVOA9 12/24/2019 23:54	Bromomethane Chloromethane	-76.6 % -48.2 %	UJ UJ	Trip Blank (12/18/2019) Equip Blank (12/18/2019) MW22 (12/18/2019) MW32 (12/18/2019) MW33 (12/18/2019)
QVOA9 12/27/2019 11:17	Acetone Bromomethane Chloromethane	43.7 % -81.6 % -51.4 %	UJ UJ UJ	T5 (12/18/2019)
QVOA9 12/30/2019 09:18	2,2-Dichloropropane 2-Butanone Bromomethane Chloromethane Naphthalene Tetrachloroethylene Vinyl Acetate Vinyl Chloride	-73.4 % -70.1 % -84.1 % -54.2 % -41.8 % 37.9 % 51.6 % -27.8 %	UJ J UJ UJ UJ J UJ J	MW6 (12/18/2019)
TO15-AIR2 12/30/2019 15:15	1,2-Dichlorotetrafluoroethane Dichlorodifluoromethane	44.1 % 43.4 %	UJ UJ	XP1 (12/26/2019) XP2 (12/26/2019) XP4 (12/26/2019)

Matrix Spike Sample Analysis

The Matrix Spike and Matrix Spike Duplicate sample (MS/MSD) recovery criteria requiring recoveries to be within laboratory generated control limits were exceeded for several compounds. Qualification of sample data included the approximation of results when spike recoveries were greater than the upper limit, but less than 200 percent or less than the lower limit, but greater than 10 percent. Non-detected sample results were rejected (R) for compounds with recoveries that were less than 10 percent. Samples qualified due to MS/MSD recovery deviations are tabulated below.

Table 5: Volatile Organics Analysis – Matrix Spike Sample Deviations

Matrix	Compound	Percent Recovery	Control Limits	Qualifier	Affected Samples
Water MW25 (09/13/2019)	Bromomethane cis-1,2-Dichloroethylene trans-1,2-Dichloroethylene Trichlorofluoromethane Vinyl Acetate Vinyl Chloride	26.9 % / 24.1 % 765 % / 733 % 75.1 % / 69.1 % 60.4 % / 58.2 % 110 % / 112 % 305 % / 244 %	30 % to 158 % 76 % to 126 % 79 % to 131 % 61 % to 142 % 10 % to 87 % 31 % to 165 %	UJ R J, UJ UJ UJ R	Trip Blank (09/13/2019) Equip Blank (09/13/2019 MW21 (09/13/2019) MW6 (09/13/2019) MW22 (09/13/2019) MW5 (09/13/2019) MW3 (09/13/2019) MW25 (09/13/2019) MW26 (09/13/2019) MW26DUP (09/13/2019) MW33 (09/13/2019) MW32 (09/13/2019) MW34 (09/13/2019) T5 (09/13/2019)

Matrix	Compound	Percent Recovery	Control Limits	Qualifier	Affected Samples
Water MW25 (12/18/2019)	Bromomethane cis-1,2-Dichloroethylene Tetrachloroethylene Trichlorofluoromethane Vinyl Acetate	3.5 % / 3.7 % 0 % / 64.7 % 867 % / 140 % 60.5 % / 58.2 % 126 % / 133 %	30% to 158 % 76 % to 125 % 64 % to 139 % 61 % to 142 % 10 % to 87 %	R UJ UJ UJ UJ	Trip Blank (12/18/2019) Equip Blank (12/18/2019) MW21 (12/18/2019) MW30 (12/18/2019) MW5 (12/18/2019) MW3 (12/18/2019) MW26 (12/18/2019) MW26DUP (12/18/2019) MW25 (12/18/2019) MW32 (12/18/2019) MW33 (12/18/2019) T5 (12/18/2019) MW22 (12/18/2019) MW6 (12/18/2019)

Laboratory Control Sample Analysis

Laboratory control sample (LCS) recovery criteria requiring recoveries to be within laboratory generated control limits were exceeded for several compounds. Qualification of sample data included the approximation of results when spike recoveries were greater than the upper limit, but less than 200 percent or less than the lower limit, but greater than 10 percent. Non-detected sample results were rejected (R) for compounds with recoveries that were less than 10 percent. Samples qualified due to LCS recovery deviations are tabulated below.

Table 6: Volatile Organics Analysis - Laboratory Control Sample Deviations

Matrix	Compound	Percent Recovery	Control Limits	Qualifier	Affected Samples
Water BD71042	1,2,3-Trichloropropane 1,3,5-Trimethylbenzene Benzene cis-1,2-Dichloroethylene Tetrachloroethylene t-Butylbenzene	67.1 % / 75.4 % 65.6 % / 64.8 % 136% / 134 % 140 % / 139 % 153 % / 178 % 76.1 % / 64.4 %	79 % to 127 % 78 % to 128 % 72 % to 134 % 73 % to 134 % 78 % to 133 % 75 % to 131 %	UJ UJ UJ UJ J, UJ UJ	MW26 Trip Blank Equip Blank
Water BD71096	1,2,3-Trichloropropane 1,3,5-Trimethylbenzene Tetrachloroethylene Toluene	75.3 % / 73.7 % 73.0 % / 73.7 % 134 % / 114 % 124 % / 122 %	79 % to 127 % 78 % to 128 % 78 % to 133 % 83 % to 122 %	UJ UJ J, UJ UJ	MW25 MW25 Duplicate T5
Water BF70375	1,2,3-Trichlorobenzene 1,2,4-Trichlorobenzene Naphthalene 1,2,3-Trichloropropane	167 % / 206 % 138 % / 151 % 166 % / 187 % 80.9 % / 77.4 %	77 % to 140 % 75 % to 141 % 79 % to 144 % 74 % to 127 %	UJ UJ UJ UJ	MW33 MW32 MW32 Duplicate MW31 Trip Blank Equip Blank
Air BF71200	Chloroethane Vinyl Bromide	150 % 138 %	70 % to 130 % 70 % to 130 %	UJ UJ	XP4 (18310/F 25) XP3 (17350/F 1) XP1 (466/F 21) XP2 (15524/F 29)

Matrix	Compound	Percent Recovery	Control Limits	Qualifier	Affected Samples
Water	Bromomethane	18.4 % / 22.0 %	50 % to 156 %	UJ	MW30 (08/23/2018)
BH81374	Dichlorodifluormethane	147 % / 146 %	38 % to 139 %	UJ	Trip Blank (08/23/2018)
	Vinyl Acetate	224 % / 222 %	32 % to 165 %	UJ	
Water	Bromoform	68.6 % / 67.3 %	78 % to 133 %	UJ	MW21 (03/26/2019)
BC91529	Hexachlorobutadiene	73.5 % / 66.8 %	67 % to 146 %	UJ	MW25 (03/26/2019)
	Tetrachloroethylene	82.9 % / 77.5 %	87 % to 131 %	J, UJ	MW26 (03/26/2019)
	Vinyl Acetate	130 % / 125 %	21 % to 90 %	UJ	T5 (03/26/2019)
					MW33 (03/26/2019)
Water	1,1,1-Trichloroethane	137 % / 132 %	78 % to 136 %	UJ	TRIP BLANK (03/26/2019)
BD90003	1,2-Dichlorethane	134 % / 127 %	82 % to 129 %	UJ	EQUIP BLANK (03/26/2019)
	Benzene	127 % / 124 %	85 % to 126 %	UJ	MW32 (03/26/2019)
	Bromochloromethane	134 % / 130 %	77 % to 128 %	UJ	MW34 (03/26/2019)
	Bromoform	70.2 % / 69.9 %	78 % to 133 %	UJ	MW22 (03/26/2019)
	Hexachlorobutadiene	73.2 % / 66.8 %	67 % to 146 %	UJ	MW22 DUP (03/26/2019)
	Methylene Chloride	140 % / 135 %	55 % to 137 %	UJ	SW1 (03/26/2019)
	Tetrachloroethylene	85.9 % / 81.3 %	82 % to 131 %	J, UJ	
	Vinyl Acetate	135 % / 133 %	21 % to 90 %	UJ	
Water	Dichlorodifluormethane	146 % / 137 %	44 % to 144 %	UJ	Trip Blank (05/03/2019)
BE90467	Tetrachloroethylene	76.3 % / 71.5 %	82 % to 130 %	J, UJ	Equipment Blank (05/03/2019)
	Vinyl Acetate	107 % / 105 %	21 % to 90 %	UJ	MW5 (05/03/2019)
	Vinyl Chloride	135 % / 126 %	70 % to 130 %	UJ	MW3 (05/03/2019)
Water	Hexachlorobutadiene	63.3 % / 64.0 %	67 % to 146 %	UJ	MW21 (09/13/2019)
BI90837	Vinyl Acetate	133 % / 120 %	21 % to 90 %	UJ	MW22 (09/13/2019)
					MW3 (09/13/2019)
					MW25 (09/13/2019)
					MW26 (09/13/2019)
					MW33 (09/13/2019)
					MW32 (09/13/2019)
					MW34 (09/13/2019)
					T5 (09/13/2019)
Water	Vinyl Acetate	130 % / 127 %	21 % to 90 %	UJ	MW26DUP (09/13/2019)
BI90838					
Water	1,2,3-Trichlorobenzene	67.2 % / 83.5 %	76 % to 136 %	UJ	MW6 (09/13/2019)
BI90839	Bromomethane	43.0 % / 40.1 %	43 % to 168 %	UJ	
	Hexachlorobutadiene	64.5 % / 59.7 %	67 % to 146 %	UJ	
	Tetrachloroethylene	86.0 % / 77.7 %	82 % to 131 %	J	
	Vinyl Acetate	119 % / 124 %	21 % to 90 %	UJ	
Water	1,2,3-Trichlorobenzene	64.9 % / 78.8 %	76 % to 136 %	UJ	MW5 (09/13/2019)
BI90940	1,2,4-Trichlorobenzene	70.5 % / 78.6 %	76 % to 137 %	UJ	
	Tetrachloroethylene	80.6 % / 85.0 %	82 % to 131 %	J	
	Vinyl Acetate	93.9 % / 96.0 %	21 % to 90 %	UJ	
Water	Bromomethane	32.0 % / 33.2 %	43 % to 168 %	UJ	MW21 (12/18/2019)
BL90787	Vinyl Acetate	135 % / 135 %	21 % to 90 %	UJ	MW30 (12/18/2019)
					MW5 (12/18/2019)
					MW3 (12/18/2019)
					MW26 (12/18/2019)
					MW26DUP (12/18/2019)
					MW25 (12/18/2019)

Matrix	Compound	Percent Recovery	Control Limits	Qualifier	Affected Samples
Water BL90789	Bromomethane Chloromethane Vinyl Acetate	26.7 % / 22.5 % 48.5 %/ 37.5 % 118 % / 124 %	43 % to 168 % 43 % to 155 % 21 % to 90 %	UJ UJ UJ	Trip Blank (12/18/2019) Equip Blank (12/18/2019) MW22 (12/18/2019) MW32 (12/18/2019) MW33 (12/18/2019)
Water BL91215	Bromomethane Chloroethane Chloromethane Vinyl Acetate	25. 7 % / 27.3 % 64.2 % / 70.5 % 34.0 % / 35.5 % 114 % / 137 %	43 % to 168 % 65 % to 136 % 43 % to 155 % 21 % to 90 %	UJ UJ UJ UJ	T5 (12/18/2019)
Water BL91555	Bromomethane Vinyl Acetate	28.9 % / 35.7 % 127 % / 125 %	43 % to 168 % 21 % to 90 %	UJ UJ	MW6 (12/18/2019)
Air BL91402	1,2-Dichlorotetrafluoroethane Dichlorodifluoromethane	132 % 141 %	70 % to 130 % 70 % to 130 %	UJ UJ	XP1 (12/26/2019) XP2 (12/26/2019) XP4 (12/26/2019)

Overall Data Assessment

Overall, the laboratory performed volatile organics analyses in accordance with the requirements specified in the method listed in Section 1.2. These data were determined to be usable for qualitative and quantitative purposes with the exceptions of Vinyl Acetate data for all samples in SDG **19C1119** which were rejected due to continuing calibration deviations, cis-1,2-Dichoroethylene and Vinyl Chloride in all sample from SDG **19I0643** which were rejected due to matrix spike recovery deviations, and in Bromomethane in all sample from SDG **19L0842** which were rejected due to matrix spike recovery deviations. Sample results for several compounds were also qualified based on deviations from initial and continuing calibration criteria, matrix spike recoveries and laboratory control sample criteria.

2.2 Semivolatiles Analysis

Data validation was performed for five groundwater samples for 1,4-Dioxane by method 8270D SIM. The QA/QC parameters presented in Section 1.3.2 of this report were found to be within specified limits with no exceptions.

Overall Data Assessment

Overall, the laboratory performed 1,4-Dioxane analyses in accordance with the requirements specified in the method listed in Section 1.2. These data were determined to be usable for qualitative and quantitative purposes with no exception

2.3 Perfluorinated Alkyl Acids Analyses

Data validation was performed six water samples. The QA/QC parameters presented in Section 1.3. 2 of this report were found to be within specified limits with the following exceptions.

Surrogate Recovery

Surrogate compounds are added to the samples prior to sample preparation to evaluate the efficiency of the sample preparation procedures. The data validation guidelines require the surrogate compounds to have percent recovery values within the laboratory generated control limits. When one or more of the surrogate compounds exceed the recovery limits the associated sample data require qualification. Samples that required qualification for surrogate compound deficiencies are tabulated below.

Table 7: PFAS Analysis - Surrogate Compound Deviations

Sample ID	Surrogate Compound	Surrogate Recovery	Control Limits	Qualifier	Affected Compounds
MW26 DUP (12/26/2019)	M2PFTeDA	3.29 %	25 % to 150 %	R	PFTrDA
	M2-5:2 FTS	155 %	25 % to 150 %	UJ	6:2 FTS
MW21 (12/26/2019)	M8FOSA	7.07 %	10 % to 150 %	R	FOSA
	M2-6:2 FTS	204 %	25 % to 150 %	UJ	6:2 FTS
	M2-8:2 FTS	182 %	25 % to 150 %	UJ	8:2 FTS
MW3 (12/26/2019)	M2-6:2 FTS	191 %	25 % to 150 %	UJ	6:2 FTS
	M2-8:2 FTS	185 %	25 % to 150 %	UJ	8:2 FTS

Continuing Calibration

The continuing calibration percent difference (%D) limit, which requires the %D to be less than 30 percent, was exceeded for several compounds. Sample qualification included the approximation (J, UJ) of results when %D criteria were exceeded but were less than 90 percent. Non-detected results were rejected (R) for compounds with %D values greater than 90 percent. Samples requiring qualification due to these deviations are tabulated below.

Table 8: PFAS Analysis - Continuing Calibration Deviations

Date Analyzed	Compound	%D	Result Qualifier	Affected Samples
LCQQQ 01/03/2020 11:20	PFDoA	33.1 %	UJ	MW-21 (12/26/2019)

Matrix Spike Sample Analysis

The Matrix Spike and Matrix Spike Duplicate sample (MS/MSD) recovery criteria requiring recoveries to be within laboratory generated control limits were exceeded for several compounds. Qualification of sample data included the approximation of results when spike recoveries were greater than the upper limit, but less than 200 percent or less than the lower limit, but greater than 10 percent. Non-detected sample results were rejected (R) for compounds with recoveries that were less than 10 percent. Samples qualified due to MS/MSD recovery deviations are tabulated below.

Table 9: PFAS Analysis – Matrix Spike Sample Deviations

Matrix	Compound	Percent Recovery	Control Limits	Qualifier	Affected Samples

Matrix	Compound	Percent Recovery	Control Limits	Qualifier	Affected Samples
Water MW21 19L0984	PFOS	159 % / 165 %	25 % to 150 %	UJ	MW21 (12/26/2019) MW26 (12/26/2019) MW26DUP (12/26/2019) MW23 (12/26/2019) Field Blank (12/26/2019)

Laboratory Control Sample Analysis

Laboratory control sample (LCS) recovery criteria requiring recoveries to be within laboratory generated control limits were exceeded for several compounds. Qualification of sample data included the approximation of results when spike recoveries were greater than the upper limit, but less than 200 percent or less than the lower limit, but greater than 10 percent. Non-detected sample results were rejected (R) for compounds with recoveries that were less than 10 percent. Samples qualified due to LCS recovery deviations are tabulated below.

Table 10: PFAS Analysis - Laboratory Control Sample Deviations

Matrix Batch	Compound	Percent Recovery	Control Limits	Qualifier	Affected Samples
Water BL91563-BS1	PFHpA	132 %	50 % to 130 %	UJ	MW21 (12/26/2019) MW26 (12/26/2019) MW26DUP (12/26/2019) MW23 (12/26/2019) Field Blank (12/26/2019)

Overall Data Assessment

Overall, the laboratory performed Perfluorinated Alkyl Acids analyses in accordance with the requirements specified in the method listed in Section 1.2. These data were determined to be usable for qualitative and quantitative purposes as reported by the laboratory with the exceptions of PFTrDA in sample MW26 DUP (12/26/2019) and FOSA in sample MW21 (12/26/2019) which were rejected due to surrogate recovery deviations. Several compounds were qualified as estimated detection limit (UJ) due to deviations in surrogate recovery, continuing calibration recovery, matrix spike recovery and laboratory control sample recovery criteria.

SECTION 3 - DATA USABILITY and PARCC EVALUATION

3.1 Data Usability

This section presents a summary of the usability of the analytical data and an evaluation of the PARCC parameters. Data usability was calculated as the percentage of data that was not qualified as rejected based on a significant deviation from established QA/QC criteria. Data usability, which was calculated separately for each type of analysis, is tabulated below.

Table 11: Data Usability and PARCC Evaluation - Data Usability

Parameter	Usability	Deviations
Volatile Organic Parameters	98.78 %	Sample results for 1.22 percent of the analytes were rejected due to continuing calibration and matrix spike recovery criteria.
Semivolatile Organic Parameters	100 %	None resulting in the rejection of data.
PFAS Parameters	98.10 %	Sample results for 1.90 percent of the analytes were rejected due to surrogate recovery criteria.

3.2 PARCC Evaluation

The following sections provide an evaluation of the analytical data with respect to the precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters.

3.2.1 Precision

Precision is measured through field duplicate samples, split samples, and laboratory duplicate samples. For this sampling program, none the analytical data required qualification from field duplicate criteria deviations.

3.2.2 Accuracy

Matrix spike sample, surrogate recovery, internal standard recovery, laboratory control samples, and calibration criteria indicate the accuracy of the data. For this sampling program, 3.57 percent of the data were qualified for deviations from matrix spike recovery criteria, 0.16 percent of the data were qualified due to surrogate standard recovery criteria deviations, 5.40 percent of the data were qualified due to deviations in laboratory control sample recoveries, none of the data were qualified due to internal standard recovery criteria deviations, and 7.60 percent of the data were qualified for calibration criteria deviations.

3.2.3 Representativeness

Holding times, sample preservation, and blank analysis are indicators of the representativeness of the analytical data. For this investigation, 0.13 percent of the analytical data required qualification for blank analysis deviations.

3.2.4 Comparability

Comparability is not compromised provided that the analytical methods did not change over time. A major component of comparability is the use of standard reference materials for calibration and QC. These standards are compared to other unknowns to verify their concentrations. Since standard analytical methods and reporting procedures were consistently used by the laboratory, the comparability criteria for the analytical data were met.

3.2.5 Completeness

The overall percent usability or completeness of the data was 98.77 percent.

APPENDIX A

DATA VALIDATION CHECKLISTS

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Data Validation Checklist - Part A: VOA Analyses

No:	Parameter	YES	NO	N/A
1.0	**Traffic Reports and Laboratory Narrative**			
1.1	Are the traffic Report Forms present for all samples?	X		
1.2	Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
2.0	**Holding Times**			
2.1	Have any VOA technical holding times, determined from date of collection to date of analysis, been exceeded?		X	
3.0	**System Monitoring Compound (SMC) Recovery (Form II)**			
3.1	Are the VOA SMC Recovery Summaries (FORM II) present for each of the following matrices:			
	a. Low Water	X		
	b. Low Soil			X
	c. Air	X		
3.2	Are all the VOA samples listed on the appropriate System Monitoring Compound Recovery Summary for each of the following matrices:			
	a. Low Water	X		
	b. Low Soil			X
	c. Air	X		
3.3	Were outliers marked correctly with an asterisk?			X
3.4	Was one or more VOA system monitoring compound recovery outside of contract specifications for any sample or method blank?		X	
	If yes, were samples re-analyzed?			X
	Were method blanks re-analyzed?			X
3.5	Are there any transcription/calculation errors between raw data and Form II?		X	
4.0	**Matrix Spikes (Form III)**			
4.1	Is the Matrix Spike/Matrix Spike Duplicate Recovery Form (Form III) present?	X		
4.2	Were matrix spikes analyzed at the required frequency for each of the following matrices?			
	a. Low Water	X		
	b. Low Soil			X
	c. Air			X
4.3	How many VOA spike recoveries are outside QC limits?			
	Water 11 out of 134 Soils 0 out of 0			
4.4	How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?			
	Water 0 out of 134 Soils 0 out of 0			

Data Validation Checklist - Part A: VOA Analyses

No:	Parameter	YES	NO	N/A
5.0	**Blanks (Form IV)**			
5.1	Is the Method Blank Summary (Form IV) present?	X		
5.2	Frequency of Analysis: for the analysis of VOA TCL compounds, has a reagent/method blank been analyzed for each SDG or every 20 samples of similar matrix (low water, low soil, medium soil), whichever is more frequent?	X		
5.3	Has a VOA method/instrument blank been analyzed at least once every twelve hours for each concentration level and GC/MS system used?	X		
5.4	Is the chromatographic performance (baseline stability) for each instrument acceptable for VOAs?	X		
6.0	**Contamination**			
6.1	Do any method/instrument/reagent blanks have positive results (TCL and/or TIC) for VOAs?	X		
6.2	Do any field/trip/rinse blanks have positive VOA results (TCL and/or TIC)?	X		
6.3	Are there field/rinse/equipment blanks associated with every sample?	X		
7.0	**GC/MS Instrument Performance Check (Form V)**			
7.1	Are the GC/MS Instrument Performance Check Forms (Form V) present for Bromofluorobenzene (BFB)?	X		
7.2	Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift?	X		
7.3	Has an instrument performance compound been analyzed for every twelve hours of sample analysis per instrument?	X		
7.4	Have the ion abundances been normalized to m/z 95?	X		
7.5	Have the ion abundance criteria been met for each instrument used?	X		
7.6	Are there any transcription/calculation errors between mass lists and Form V's?		X	
7.7	Have the appropriate number of significant figures (two) been reported?	X		
7.8	Are the spectra of the mass calibration compound acceptable?	X		
8.0	**Target Compound List (TCL) Analytes**			
8.1	Are the Organic Analysis Data Sheets (Form I VOA) present with required header information on each page, for each of the following:			
	a. Sample and/or fractions as appropriate?	X		
	b. Matrix spikes and matrix spike duplicates?	X		
	c. Blanks?	X		
8.2	Are the VOA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
	a. Samples and/or fractions as appropriate?	X		
	b. Matrix spikes and matrix spike duplicates (Mass spectra not required)?	X		
	c. Blanks?	X		
8.3	Are the response factors shown in the Quant Report?	X		

Data Validation Checklist - Part A: VOA Analyses

No:	Parameter	YES	NO	N/A
8.4	Is the chromatographic performance acceptable with respect to:			
	Baseline stability?	X		
	Resolution?	X		
	Peak shape?	X		
	Full-scale graph (attenuation)?	X		
	Other:			X
8.5	Are the lab-generated standard mass spectra of the identified VOA compounds present for each sample?	X		
8.6	Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X		
8.7	Are all ions in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?	X		
8.8	Do sample and standard relative ion intensities agree within 20%?	X		
9.0	**Tentatively Identified Compounds (TIC)**			
9.1	Are all Tentatively Identified Compound Forms (Form I Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?			X
9.2	Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:			
	a. Samples and/or fractions as appropriate?			X
	b. Blanks?			X
9.3	Are any TCL compounds (from any fraction) listed as TIC compounds?			X
9.4	Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?			X
9.5	Do TIC and "best match" standard relative ion intensities agree within 20%?			X
10.0	**Compound Quantitation and Reported Detection Limits**			
10.1	Are there any transcription/calculation errors in Form I results?		X	
10.2	Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X		
11.0	**Standards Data (GC/MS)**			
11.1	Are the Reconstructed Ion Chromatograms, and data system printouts present for initial and continuing calibration?	X		
12.0	**GC/MS Initial Calibration (Form VI)**			
12.1	Are the Initial Calibration Forms (Form VI) present and complete for the volatile fraction at concentrations of 10, 20, 50, 100, 200 ug/L? Are there separate calibrations for low/med soils and low soil samples?	X		
12.2	Were all low level soil standards, blanks, and samples analyzed by heated purge?	X		
12.3	Are the response factors stable for VOA's over the concentration range of the calibration (%Relative Standard Deviation (%RSD) <30%)		X	
12.4	Are the RRFs above 0.01?	X		
12.5	Are there any transcription/calculation errors in the reporting of average response factors (RRF) or %RSD?		X	

Data Validation Checklist - Part A: VOA Analyses

No:	Parameter	YES	NO	N/A
13.0	**GC/MS Continuing Calibration (Form VII)**			
13.1	Are the Continuing Calibration Forms (Form VII) present and complete for the volatile fraction?	X		
13.2	Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?	X		
13.3	Do any volatile compounds have a percent difference (%D) between the initial and continuing RRF which exceeds the +/- 25% criteria?	X		
13.4	Do any volatile compounds have a RRF <0.01?		X	
13.5	Are there any transcription/calculation errors in the reporting of average response factor (RRF) or %difference (%D) between initial and continuing RRFs?		X	
14.0	**Internal Standard (Form VIII)**			
14.1	Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to +100%) for each continuing calibration?	X		
14.2	Are the retention times of the internal standards within 30 seconds of the associated calibration standard?	X		
15.0	**Field Duplicates**			
15.1	Were any field duplicates submitted for VOA analysis?	X		

Data Validation Checklist - Part B SVOA Analyses

No:	Parameter	YES	NO	N/A
1.0	**Traffic Reports and Laboratory Narrative**			
1.1	Are the traffic Report Forms present for all samples?	X		
1.2	Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
2.0	**Holding Times**			
2.1	Have any BNA technical holding times, determined from date of collection to date of extraction, been exceeded?		X	
3.0	**System Monitoring Compound (SMC) Recovery (Form II)**			
3.1	Are the BNA Surrogate Recovery Summaries (FORM II) present for each of the following matrices:			
	a. Low Water	X		
	b. Low Soil			X
	c. Med Soil			X
3.2	Are all the BNA samples listed on the appropriate System Monitoring Compound Recovery Summary for each of the following matrices:			
	a. Low Water	X		
	b. Low Soil			X
	c. Med Soil			X
3.3	Were outliers marked correctly with an asterisk?	X		
3.4	Were two or more base neutral or acid surrogate compound recoveries out of specification for any sample or method blank?		X	
	If yes, were samples re-analyzed?			X
	Were method blanks re-analyzed?			X
3.5	Are there any transcription/calculation errors between raw data and Form II?		X	
4.0	**Matrix Spikes (Form III)**			
4.1	Is the Matrix Spike/Matrix Spike Duplicate Recovery Form (Form III) present?	X		
4.2	Were matrix spikes analyzed at the required frequency for each of the following matrices?			
	a. Low Water		X	
	b. Low Soil			X
	c. Med Soil			X
4.3	How many BNA spike recoveries are outside QC limits?			
	Water 0 out of 1 Soils 0 out of 1			
4.4	How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?			
	Water 0 out of 1 Soils 0 out of 1			

Data Validation Checklist - Part B SVOA Analyses

No:	Parameter	YES	NO	N/A
5.0	**Blanks (Form IV)**			
5.1	Is the Method Blank Summary (Form IV) present?	X		
5.2	Frequency of Analysis: Has a reagent/method blank analysis been reported per 20 samples of a similar matrix, or concentration level, for each extraction batch?	X		
5.3	Has a BNA method blank been analyzed for each GC/MS system used?	X		
5.4	Is the chromatographic performance (baseline stability) for each instrument acceptable for BNAs?	X		
6.0	**Contamination**			
6.1	Do any method/instrument/reagent blanks have positive results (TCL and/or TIC) for BNAs?		X	
6.2	Do any field/rinse blanks have positive BNA results (TCL and/or TIC)?		X	
6.3	Are there field/rinse/equipment blanks associated with every sample?	X		
7.0	**GC/MS Instrument Performance Check (Form V)**			
7.1	Are the GC/MS Instrument Performance Check Forms (Form V) present for Decafluorotriphenylphosphine (DFTPP)?	X		
7.2	Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the DFTPP provided for each twelve-hour shift?	X		
7.3	Has an instrument performance check solution been analyzed for every twelve hours of sample analysis per instrument?	X		
7.4	Have the ion abundances been normalized to m/z 198?	X		
7.5	Have the ion abundance criteria been met for each instrument used?	X		
7.6	Are there any transcription/calculation errors between mass lists and Form V's?		X	
7.7	Have the appropriate number of significant figures (two) been reported?	X		
7.8	Are the spectra of the mass calibration compound acceptable?	X		
8.0	**Target Compound List (TCL) Analytes**			
8.1	Are the Organic Analysis Data Sheets (Form I BNA) present with required header information on each page, for each of the following:			
	a. Sample and/or fractions as appropriate?	X		
	b. Matrix spikes and matrix spike duplicates?			X
	c. Blanks?	X		
8.2	Has GPC cleanup been performed on all soil/sediment sample extracts?			X
8.3	Are the BNA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?			
	a. Samples and/or fractions as appropriate?	X		
	b. Matrix spikes and matrix spike duplicates (Mass spectra not required)?			X
	c. Blanks?	X		
8.4	Are the response factors shown in the Quant Report?	X		
8.5	Is the chromatographic performance acceptable with respect to:			

Data Validation Checklist - Part B SVOA Analyses

No:	Parameter	YES	NO	N/A
	Baseline stability?	X		
	Resolution	X		
	Peak shape?	X		
	Full-scale graph (attenuation)?	X		
	Other:			
8.6	Are the lab-generated standard mass spectra of identified BNA compounds present for each sample?	X		
8.7	Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X		
8.8	Are all ions in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum?	X		
8.9	Do sample and standard relative ion intensities agree within 20%?	X		
9.0	**Tentatively Identified Compounds (TIC)**			
9.1	Are all Tentatively Identified Compound Forms (Form I, Part B) present; and do listed TICs include scan number or retention time, estimated concentration and "JN" qualifier?			X
9.2	Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:			
	a. Samples and/or fractions as appropriate?			X
	b. Blanks?			X
9.3	Are any TCL compounds (from any fraction) listed as TIC compounds?			X
9.4	Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?			X
9.5	Do TIC and "best match" standard relative ion intensities agree within 20%?			X
10.0	**Compound Quantitation and Reported Detection Limits**			
10.1	Are there any transcription/calculation errors in Form I results?		X	
10.2	Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X		
11.0	**Standards Data (GC/MS)**			
11.1	Are the Reconstructed Ion Chromatograms, and data system printouts present for initial and continuing calibration?	X		
12.0	**GC/MS Initial Calibration (Form VI)**			
12.1	Are the Initial Calibration Forms (Form VI) present and complete for the BNA fraction?	X		
12.2	Are response factors stable for BNA's over the concentration range of the calibration (%Relative Standard Deviation (%RSD) <30%)	X		
12.3	Are all BNA compound RRFs > 0.01?	X		
12.4	Are there any transcription/calculation errors in the reporting of average response factors (RRF) or %RSD?	X		
13.0	**GC/MS Continuing Calibration (Form VII)**			

Data Validation Checklist - Part B SVOA Analyses

No:	Parameter	YES	NO	N/A
13.1	Are the Continuing Calibration Forms (Form VII) present and complete for the BNA fraction?	X		
13.2	Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?	X		
13.3	Do any semivolatile compounds have a percent difference (%D) between the initial and continuing RRF which exceeds the +/- 25% criteria?		X	
13.4	Do any semivolatile compounds have a RRF <0.01?		X	
13.5	Are there any transcription/calculation errors in the reporting of average response factor (RRF) or percent difference (%D) between initial and continuing RRFs?	X		
14.0	**Internal Standard (Form VIII)**			
14.1	Are the internal standard areas (Form VIII) of every sample and blank within the upper and lower limits (-50% to +100%) for each continuing calibration?	X		
14.2	Are the retention times of the internal standards within 30 seconds of the associated calibration standard?	X		
15.0	**Field Duplicates**			
15.1	Were any field duplicates submitted for BNA analysis?	X		

Data Validation Checklist - Part C: PFAS Analyses

No:	Parameter	YES	NO	N/A
1.0	**Traffic Reports and Laboratory Narrative**			
1.1	Are the traffic Report Forms present for all samples?	X		
1.2	Do the Traffic Reports or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
2.0	**Holding Times**			
2.1	Have any PFAS technical holding times, determined from date of collection to date of extraction, been exceeded?		X	
3.0	**System Monitoring Compound (SMC) Recovery (Form II)**			
3.1	Are the PFAS Surrogate Recovery Summaries (FORM II) present for each of the following matrices:			
	a. Low Water	X		
	b. Low Soil			X
	c. Med Soil			X
3.2	Are all the PFAS samples listed on the appropriate System Monitoring Compound Recovery Summary for each of the following matrices:			
	a. Low Water	X		
	b. Low Soil			X
	c. Med Soil			X
3.3	Were outliers marked correctly with an asterisk?	X		
3.4	Were any PFAS surrogate compound recoveries out of specification for any sample or method blank?	X		
	If yes, were samples re-analyzed?		X	
	Were method blanks re-analyzed?			X
3.5	Are there any transcription/calculation errors between raw data and Form II?		X	
4.0	**Matrix Spikes (Form III)**			
4.1	Is the Matrix Spike/Matrix Spike Duplicate Recovery Form (Form III) present?	X		
4.2	Were matrix spikes analyzed at the required frequency for each of the following matrices?			
	a. Low Water	X		
	b. Low Soil			X
	c. Med Soil			X
4.3	How many PFAS spike recoveries are outside QC limits?			
	Water 1 out of 21 Soils 0 out of 0			
4.4	How many RPD's for matrix spike and matrix spike duplicate recoveries are outside QC limits?			
	Water 0 out of 21 Soils 0 out of 0			

Data Validation Checklist - Part C: PFAS Analyses

5.0	**Blanks (Form IV)**			
5.1	Is the Method Blank Summary (Form IV) present?	X		
5.2	Frequency of Analysis: Has a reagent/method blank analysis been reported per 20 samples of a similar matrix, or concentration level, for each extraction batch?	X		
5.3	Has a PFAS method blank been analyzed for each system used?	X		
5.4	Is the chromatographic performance (baseline stability) for each instrument acceptable for PFAS?	X		
6.0	**Contamination**			
6.1	Do any method/instrument/reagent blanks have positive results for PFAS?		X	
6.2	Do any field/rinse blanks have positive PFAS results?		X	
6.3	Are there field/rinse/equipment blanks associated with every sample?	X		
7.0	**Target Compound List (TCL) Analytes**			
7.1	Are the Organic Analysis Data Sheets (Form I PFAS) present with required header information on each page, for each of the following:			
	a. Sample and/or fractions as appropriate?	X		
	b. Matrix spikes and matrix spike duplicates?	X		
	c. Blanks?	X		
7.2	Has GPC cleanup been performed on all soil/sediment sample extracts?			X
7.3	Is the chromatographic performance acceptable with respect to:			
	Baseline stability?	X		
	Resolution	X		
	Peak shape?	X		
	Full-scale graph (attenuation)?	X		
	Other:			
7.4	Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X		
8.0	**Compound Quantitation and Reported Detection Limits**			
8.1	Are there any transcription/calculation errors in Form I results?		X	
8.2	Are the CRQLs adjusted to reflect sample dilutions and, for soils, sample moisture?	X		
9.0	**PFAS Initial Calibration (Form VI)**			
9.1	Are the Initial Calibration Forms (Form VI) present and complete for the PFAS fraction?	X		
9.2	Are response factors stable for PFAS over the concentration range of the calibration (%Relative Standard Deviation (%RSD) <30%)	X		
9.3	Are all PFAS compound RRFs > 0.01?	X		
9.4	Are there any transcription/calculation errors in the reporting of average response factors (RRF) or %RSD?	X		

Data Validation Checklist - Part C: PFAS Analyses

10.0	**PFAS Continuing Calibration (Form VII)**			
10.1	Are the Continuing Calibration Forms (Form VII) present and complete for the PFAS fraction?	X		
10.2	Has a continuing calibration standard been analyzed for every twelve hours of sample analysis per instrument?	X		
10.3	Do any PFAS compounds have a percent difference (%D) between the initial and continuing RRF which exceeds the +/- 25% criteria?	X		
10.4	Do any PFAS compounds have a RRF <0.01?		X	
10.5	Are there any transcription/calculation errors in the reporting of average response factor (RRF) or percent difference (%D) between initial and continuing RRFs?	X		
11.0	**Field Duplicates**			
11.1	Were any field duplicates submitted for BNA analysis?	X		