Sterling Environmental Engineering, P.C.

May 4, 2022

Mr. Daniel R. Lanners, P.E. via email (Daniel.Lanners@dec.ny.gov)
NYS Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C
625 Broadway, 11th Floor
Albany, NY 12233-7014

Subject: Apple Valley Shopping Center, LaGrange, New York
Site No. 314084
STERLING File #23008

Dear Mr. Lanners,

In response to your request, Sterling Environmental Engineering, P.C. (STERLING) collected an effluent sample from the groundwater treatment system for analysis of Per-And Polyfluoroalkyl Substances (PFAS) Compounds during the March 18, 2022 quarterly sampling event at the Apple Valley Shopping Center (AVSC, or the "Site") in LaGrange, New York. Sampling was performed in accordance with the sampling procedures outlined in the June 2021 NYSDEC Guidance Document "Sampling, Analysis, and Assessment of Per-And Polyfluoroalkyl Substances (PFAS)".

Sample collection included an effluent discharge sample (AVS-EFF), field duplicate (DUP03182022), matrix spike (AVS-EFF MS) and matrix spike duplicate (AVS-EFF MSD). Samples were transported in a cooler with ice under chain of custody protocol to Alpha Analytical of Westborough, MA for analysis of 21 target PFAS compounds by USEPA Method 537 and preparation of a Category B Deliverable data package. Analytical results for samples are summarized in the attached table. Also attached is the laboratory analytical report and the corresponding Data Usability Summary Report (DUSR) prepared by a certified Data Validator (Donald Anné of Alpha Geoscience).

The DUSR indicates that analytical data were generally acceptable and usable. The analytical results indicated that Perfluorooctanesulfonic Acid (PFOS) was detected at a concentration of 22.6 ng/L, which exceeds the NYSDEC guidance value of 10 ng/L. Perfluorooctanoic Acid (PFOA) was detected at a concentration below the NYSDEC guidance value of 10 ng/L. The results are consistent with prior onsite sampling performed in August 2018 and offsite sampling performed at 379 Titusville Road in October 2021.

Please contact me should you have any questions or comments

Very truly yours,
STERLING ENVIRONMENTAL ENGINEERING, P.C.

Mark P. Millspaugh, P.E.
President
Mark.Millspaugh@sterlingenvironmental.com

"Serving our clients and the environment since 1993"

MPM/bc
Email
Attachments

cc: David Engel, Esq.

S:\Sterling\Projects\2003 Projects\Apple Valley - 23008\Correspondence\2022\2022-05-04_NYSDEC Effluent PFAS Sampling_Ltr.docx

TABLE

Table 1
Summary of Effluent Discharge Analytical Results: PFAS Compounds (3/18/2022)
Apple Valley Shopping Center (#314084)
LaGrange, Dutchess County, New York

ANALYTE	NYSDEC - PFAS (ng/l)	AVS-EFF 3/18/2022	DUP03182022* 3/18/2022
PERFLUORINATED ALKYL ACIDS BY ISOTOPE DILUTION			
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	---	1.12 U	1.16 U
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	---	1.24 U	1.17 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	---	0.741 U	0.772 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	---	0.597 U	0.622 U
Perfluorobutanesulfonic Acid (PFBS)	---	2.1	2.07
Perfluorobutanoic Acid (PFBA)	---	5.23	5.3
Perfluorodecanesulfonic Acid (PFDS)	---	0.903 U	0.94 U
Perfluorodecanoic Acid (PFDA)	---	0.28 U	0.292 U
Perfluorododecanoic Acid (PFDoA)	---	0.343 U	0.357 U
Perfluoroheptanesulfonic Acid (PFHpS)	---	0.634 U	0.66 U
Perfluoroheptanoic Acid (PFHpA)	---	1.8 J	1.76 J
Perfluorohexanesulfonic Acid (PFHxS)	---	1.44 J	0.998 J
Perfluorohexanoic Acid (PFHxA)	---	5.27	4.99
Perfluorononanoic Acid (PFNA)	---	0.774 J	0.844 J
Perfluorooctanesulfonamide (FOSA)	---	0.534 U	0.556 U
Perfluorooctanesulfonic Acid (PFOS)	10	**22.6**	**25.9**
Perfluorooctanoic Acid (PFOA)	10	6.38	6.99
Perfluoropentanoic Acid (PFPeA)	---	6.04	6.37
Perfluorotetradecanoic Acid (PFTA)	---	0.228 U	0.238 U
Perfluorotridecanoic Acid (PFTrDA)	---	0.301 U	0.314 U
Perfluoroundecanoic Acid (PFUnA)	---	0.24 U	0.25 U
PFOA/PFOS, Total	---	29	32.9

Notes:

NYSDEC - PFAS = Guidance Value contained in "Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS)", June 2021, which equals the MCL for drinking water.

--- = No applicable standard or guidance value associated with this analyte.

U = Concentration is less than laboratory Method Detection Limit (MDL).

J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.

* = DUP03182022 was collected at AVS-EFF.

DATA USABILITY SUMMARY REPORT

ALPHA GEOSCIENCE

Geology
Hydrology
Remediation
Water Supply

April 12, 2022

Mr. Paul W. Scholar
Geologist
Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

Re: Data Validation Report
Apple Valley Shopping Center
March 2022 Water Sampling Event

Dear Mr. Scholar:

The data usability summary report (DUSR) and QA/QC review are attached to this letter for the above referenced project sampling event. The data for Alpha Analytical, SDG number L2214376, are mostly acceptable with some minor issues that are identified and discussed in the validation summary. There are PFAS data that are flagged unusable, rejected (R), in the data pack. The reason for rejecting the data is outlined in the DUSR and QC review. The data are rejected based solely on the validation guidance criteria. The rejected data may be determined to be acceptable to the user based on additional information that is not contained in the data validation criteria.

A list of common data validation acronyms is attached to this letter to assist you interpreting the validation summaries. If you have any questions concerning the work performed, please contact me at (518) 348-6995. Thank you for the opportunity to assist Sterling Environmental Engineering, P.C.

Sincerely,
Alpha Geoscience

Donald Anné
Senior Chemist

DCA:dca
attachments

z:\projects\2019\19600-19620\19608-apple valley\temp-review\apple valley-221.ltr.docx

ALPHA GEOSCIENCE

Geology
Hydrology
Remediation
Water Supply

Data Usability Summary Report
for Alpha Analytical Labs
SDG Number: L2214376

1 Water Sample and 1 Field Duplicate
Collected March 18, 2022

Prepared by: Donald Anné
April 12, 2022

The data package contains the documentation as required by NYSDEC ASP. The proper chain of custody procedures were followed by the samplers. All information appears legible and complete. The data pack contained the results of PFAS analyses for 1 water sample and 1 field duplicate.

The overall performances of the analyses are acceptable. Alpha Analytical Labs did fulfill the requirements of the analytical method.

The data are acceptable with some issues that are identified in the accompanying data validation review. The following data were qualified:

- The positive PFAS results for 6:2 FTS were qualified as "rejected, unusable" (R) for samples AVS-EFF and DUP03182022 because the results for 6:2 FTS were less than 10 times the associated blank levels which contained an unacceptable level of 6:2 FTS.

All data that are not qualified as rejected (R) are considered usable. Detailed information on data quality is included in the data validation review.

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Qualified Data Section

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	Lab Number	: L2214376
Project Name	: APPLE VALLEY	Project Number	: 23008
Lab ID	: L2214376-01	Date Collected	: 03/18/22 11:00
Client ID	: AVS-EFF	Date Received	: 03/18/22
Sample Location	: LAGRANGE, NY	Date Analyzed	: 04/01/22 16:34
Sample Matrix	: WATER	Date Extracted	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	Dilution Factor	: 1
Lab File ID	: I57877	Analyst	: MP
Sample Amount	: 271.34 g	Instrument ID	: LCMS02
Extraction Method	: ALPHA 23528	GC Column	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	%Solids	: N/A
GPC Cleanup	: N	Injection Volume	: 3 uL

		ng/l				
CAS NO.	Parameter	Results	RL	MDL	Qualifier	
375-22-4	Perfluorobutanoic Acid (PFBA)	5.23	1.84	0.376		
2706-90-3	Perfluoropentanoic Acid (PFPeA)	6.04	1.84	0.365		
375-73-5	Perfluorobutanesulfonic Acid (PFBS)	2.10	1.84	0.219		
307-24-4	Perfluorohexanoic Acid (PFHxA)	5.27	1.84	0.302		
375-85-9	Perfluoroheptanoic Acid (PFHpA)	1.80	1.84	0.207	J	
355-46-4	Perfluorohexanesulfonic Acid (PFHxS)	1.44	1.84	0.346	J	
335-67-1	Perfluorooctanoic Acid (PFOA)	6.38	1.84	0.217		
27619-97-2	1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	3.43	1.84	1.23	B	R
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND	1.84	0.634	U	
375-95-1	Perfluorononanoic Acid (PFNA)	0.774	1.84	0.287	J	
1763-23-1	Perfluorooctanesulfonic Acid (PFOS)	22.6	1.84	0.464		
335-76-2	Perfluorodecanoic Acid (PFDA)	ND	1.84	0.280	U	
39108-34-4	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	1.84	1.12	U	
2355-31-9	N-Methyl Perfluorooctanesulfonamidoaceti c Acid (NMeFOSAA)	ND	1.84	0.597	U	
2058-94-8	Perfluoroundecanoic Acid (PFUnA)	ND	1.84	0.240	U	
335-77-3	Perfluorodecanesulfonic Acid (PFDS)	ND	1.84	0.903	U	
2991-50-6	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	1.84	0.741	U	
307-55-1	Perfluorododecanoic Acid (PFDoA)	ND	1.84	0.343	U	

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Lab ID	: L2214376-01	**Date Collected**	: 03/18/22 11:00
Client ID	: AVS-EFF	**Date Received**	: 03/18/22
Sample Location	: LAGRANGE, NY	**Date Analyzed**	: 04/01/22 16:34
Sample Matrix	: WATER	**Date Extracted**	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	**Dilution Factor**	: 1
Lab File ID	: I57877	**Analyst**	: MP
Sample Amount	: 271.34 g	**Instrument ID**	: LCMS02
Extraction Method	: ALPHA 23528	**GC Column**	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	**%Solids**	: N/A
GPC Cleanup	: N	**Injection Volume**	: 3 uL

		ng/l			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
72629-94-8	Perfluorotridecanoic Acid (PFTrDA)	ND	1.84	0.301	U
376-06-7	Perfluorotetradecanoic Acid (PFTA)	ND	1.84	0.228	U
NONE	PFOA/PFOS, Total	29.0	1.84	0.217	

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Lab ID	: L2214376-01	**Date Collected**	: 03/18/22 11:00
Client ID	: AVS-EFF	**Date Received**	: 03/18/22
Sample Location	: LAGRANGE, NY	**Date Analyzed**	: 04/03/22 15:42
Sample Matrix	: WATER	**Date Extracted**	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	**Dilution Factor**	: 1
Lab File ID	: M02948	**Analyst**	: SG
Sample Amount	: 271.34 g	**Instrument ID**	: LCMS02
Extraction Method	: ALPHA 23528	**GC Column**	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	**%Solids**	: N/A
GPC Cleanup	: N	**Injection Volume**	: 3 uL

		ng/l			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND	1.84	0.534	U

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Lab ID	: L2214376-01RE	**Date Collected**	: 03/18/22 11:00
Client ID	: AVS-EFF	**Date Received**	: 03/18/22
Sample Location	: LAGRANGE, NY	**Date Analyzed**	: 04/04/22 04:24
Sample Matrix	: WATER	**Date Extracted**	: 04/03/22
Analytical Method	: 134,LCMSMS-ID	**Dilution Factor**	: 1
Lab File ID	: I58055	**Analyst**	: SG
Sample Amount	: 269.01 g	**Instrument ID**	: LCMS02
Extraction Method	: ALPHA 23528	**GC Column**	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	**%Solids**	: N/A
GPC Cleanup	: N	**Injection Volume**	: 3 uL

		ng/l			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
27619-97-2	1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	1.86	1.24	U

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	Lab Number	: L2214376
Project Name	: APPLE VALLEY	Project Number	: 23008
Lab ID	: L2214376-02	Date Collected	: 03/18/22 00:00
Client ID	: DUP03182022	Date Received	: 03/18/22
Sample Location	: LAGRANGE, NY	Date Analyzed	: 04/01/22 17:40
Sample Matrix	: WATER	Date Extracted	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	Dilution Factor	: 1
Lab File ID	: I57881	Analyst	: MP
Sample Amount	: 260.52 g	Instrument ID	: LCMS02
Extraction Method	: ALPHA 23528	GC Column	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	%Solids	: N/A
GPC Cleanup	: N	Injection Volume	: 3 uL

		ng/l				
CAS NO.	Parameter	Results	RL	MDL	Qualifier	
375-22-4	Perfluorobutanoic Acid (PFBA)	5.30	1.92	0.392		
2706-90-3	Perfluoropentanoic Acid (PFPeA)	6.37	1.92	0.380		
375-73-5	Perfluorobutanesulfonic Acid (PFBS)	2.07	1.92	0.228		
307-24-4	Perfluorohexanoic Acid (PFHxA)	4.99	1.92	0.315		
375-85-9	Perfluoroheptanoic Acid (PFHpA)	1.76	1.92	0.216	J	
355-46-4	Perfluorohexanesulfonic Acid (PFHxS)	0.998	1.92	0.361	J	
335-67-1	Perfluorooctanoic Acid (PFOA)	6.99	1.92	0.226		
27619-97-2	1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	4.80	1.92	1.28	B	R
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND	1.92	0.660	U	
375-95-1	Perfluorononanoic Acid (PFNA)	0.844	1.92	0.299	J	
1763-23-1	Perfluorooctanesulfonic Acid (PFOS)	25.9	1.92	0.484		
335-76-2	Perfluorodecanoic Acid (PFDA)	ND	1.92	0.292	U	
39108-34-4	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	1.92	1.16	U	
2355-31-9	N-Methyl Perfluorooctanesulfonamidoaceti c Acid (NMeFOSAA)	ND	1.92	0.622	U	
2058-94-8	Perfluoroundecanoic Acid (PFUnA)	ND	1.92	0.250	U	
335-77-3	Perfluorodecanesulfonic Acid (PFDS)	ND	1.92	0.940	U	
2991-50-6	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	1.92	0.772	U	
307-55-1	Perfluorododecanoic Acid (PFDoA)	ND	1.92	0.357	U	

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Lab ID	: L2214376-02	**Date Collected**	: 03/18/22 00:00
Client ID	: DUP03182022	**Date Received**	: 03/18/22
Sample Location	: LAGRANGE, NY	**Date Analyzed**	: 04/01/22 17:40
Sample Matrix	: WATER	**Date Extracted**	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	**Dilution Factor**	: 1
Lab File ID	: I57881	**Analyst**	: MP
Sample Amount	: 260.52 g	**Instrument ID**	: LCMS02
Extraction Method	: ALPHA 23528	**GC Column**	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	**%Solids**	: N/A
GPC Cleanup	: N	**Injection Volume**	: 3 uL

		ng/l			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
72629-94-8	Perfluorotridecanoic Acid (PFTrDA)	ND	1.92	0.314	U
376-06-7	Perfluorotetradecanoic Acid (PFTA)	ND	1.92	0.238	U
NONE	PFOA/PFOS, Total	32.9	1.92	0.226	

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Lab ID	: L2214376-02	**Date Collected**	: 03/18/22 00:00
Client ID	: DUP03182022	**Date Received**	: 03/18/22
Sample Location	: LAGRANGE, NY	**Date Analyzed**	: 04/03/22 16:03
Sample Matrix	: WATER	**Date Extracted**	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	**Dilution Factor**	: 1
Lab File ID	: M02951	**Analyst**	: SG
Sample Amount	: 260.52 g	**Instrument ID**	: LCMS02
Extraction Method	: ALPHA 23528	**GC Column**	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	**%Solids**	: N/A
GPC Cleanup	: N	**Injection Volume**	: 3 uL

		ng/l			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND	1.92	0.556	U

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Lab ID	: L2214376-02RE	**Date Collected**	: 03/18/22 00:00
Client ID	: DUP03182022	**Date Received**	: 03/18/22
Sample Location	: LAGRANGE, NY	**Date Analyzed**	: 04/04/22 05:14
Sample Matrix	: WATER	**Date Extracted**	: 04/03/22
Analytical Method	: 134,LCMSMS-ID	**Dilution Factor**	: 1
Lab File ID	: I58058	**Analyst**	: SG
Sample Amount	: 285.18 g	**Instrument ID**	: LCMS02
Extraction Method	: ALPHA 23528	**GC Column**	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	**%Solids**	: N/A
GPC Cleanup	: N	**Injection Volume**	: 3 uL

		ng/l			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
27619-97-2	1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	1.75	1.17	U

PFAS

Data Section

ALPHA GEOSCIENCE

Geology
Hydrology
Remediation
Water Supply

QA/QC Review of Method 537 (Modified) PFAS Data
for Alpha Analytical Labs SDG Number: L2214376

1 Water Sample and 1 Field Duplicate
Collected March 18, 2022

Prepared by: Donald Anné
April 12, 2022

Holding Times: The samples were analyzed within USEPA holding times.

Initial Calibration: The %RSDs for applicable PFAS were below the method maximum (20%) or the R or R squared were above the method minimums, as required.

Continuing Calibration: The percent recoveries for applicable PFAS were within QC limits, as required.

Blanks: Method blank WG1622056-1BLANK contained a trace of 8:2 FTS (3.80 ng/L). Positive results for 8:2 FTS that are below the reporting limit (RL) should be reported as not detected (U) at the reporting limit in associated samples. Positive results for 8:2 FTS that are above the RL and less than ten times the highest blank level should be considered estimated, biased high (J+) in associated samples.

Method blank WG1622056-1BLANK contained an unacceptable level of 6:2 FTS (83.9 ng/L). Positive results for 6:2 FTS that are less than ten times the blank level should be considered rejected, unusable (R) in associated samples.

Surrogate Recovery: One of eighteen surrogate recoveries for both the initial and re-analyses of samples AVS-EFF and DUP03182022 was above QC limits. Positive results for compounds that are quantitated using these compounds should be considered estimated (J) in the samples.

Matrix Spike/Matrix Spike Duplicate: The relative percent differences for target PFAS were not above the allowable maximum and the percent recoveries were within QC limit for aqueous MS/MSD sample AVS-EFF.

Laboratory Control Sample: The percent recoveries (%Rs) for target PFAS were within QC limit aqueous samples WG1622850-2.

679 Plank Road ● Clifton Park, New York 12065 ● (518) 348-6995 ● Fax (518) 348-6966
www.alphageoscience.com

The %R for 6:2 FTS was above the QC limits for aqueous sample WG1622056-2. Positive results for 6:2 FTS should be considered estimated, biased high (J+) in associated aqueous samples.

Field Duplicates: The relative percent difference for 6:2 FTS was above the allowable maximum (20%) for aqueous field duplicate pair AVS-EFF/DUP03182022 (attached table). Positive results for 6:2 FTS should be considered estimated (J) in samples AVS-EFF and DUP03182022.

Compound ID: Checked compounds were within LC quantitation limits.

Surrogate (Extracted Internal Standard) Recovery Summary
Form 2
Semivolatiles

Client: Sterling Environmental Engineering
Project Name: APPLE VALLEY

Lab Number: L2214376
Project Number: 23008
Matrix: Water

CLIENT ID (LAB SAMPLE NO.)	S1 ()	S2 ()	S3 ()	S4 ()	S5 ()	S6 ()	S7 ()
AVS-EFF (L2214376-01)	NA	NA	NA	NA	NA	NA	NA
AVS-EFF (L2214376-01)	92	119	110	85	93	118	94
AVS-EFF (L2214376-01RE)	NA	NA	NA	NA	NA	NA	NA
DUP03182022 (L2214376-02)	85	111	111	81	88	119	88
DUP03182022 (L2214376-02RE)	NA	NA	NA	NA	NA	NA	NA
DUP03182022 (L2214376-02)	NA	NA	NA	NA	NA	NA	NA
WG1622056-1BLANK	109	129	113	110	111	119	106
WG1622056-1BLANK	NA	NA	NA	NA	NA	NA	NA
WG1622056-2LCS	102	121	106	105	102	110	99
WG1622056-2LCS	NA	NA	NA	NA	NA	NA	NA
AVS-EFFMS	NA	NA	NA	NA	NA	NA	NA
AVS-EFFMS	78	105	100	71	77	105	78
AVS-EFFMSD	88	119	107	81	88	112	89
AVS-EFFMSD	NA	NA	NA	NA	NA	NA	NA
WG1622850-1BLANK	100	112	104	97	98	105	99
WG1622850-2LCS	100	111	105	100	100	102	99
AVS-EFFMS	NA	NA	NA	NA	NA	NA	NA
AVS-EFFMSD	NA	NA	NA	NA	NA	NA	NA

QC LIMITS

(58-132) S1 = PERFLUORO[13C4]BUTANOIC ACID (MPFBA)
(62-163) S2 = PERFLUORO[13C5]PENTANOIC ACID (M5PFPEA)
(70-131) S3 = PERFLUORO[2,3,4-13C3]BUTANESULFONIC ACID (M3PFBS)
(57-129) S4 = PERFLUORO[1,2,3,4,6-13C5]HEXANOIC ACID (M5PFHXA)
(60-129) S5 = PERFLUORO[1,2,3,4-13C4]HEPTANOIC ACID (M4PFHPA)
(71-134) S6 = PERFLUORO[1,2,3-13C3]HEXANESULFONIC ACID (M3PFHXS)
(71-134) S7 = PERFLUORO[13C8]OCTANOIC ACID (M8PFOA)

* Values outside of QC limits

Surrogate (Extracted Internal Standard) Recovery Summary
Form 2
Semivolatiles

Client: Sterling Environmental Engineering
Project Name: APPLE VALLEY

Lab Number: L2214376
Project Number: 23008
Matrix: Water

CLIENT ID (LAB SAMPLE NO.)	S8 ()	S9 ()	S10 ()	S11 ()	S12 ()	S13 ()	S14 ()
AVS-EFF (L2214376-01)	NA	NA	NA	NA	NA	NA	NA
AVS-EFF (L2214376-01)	167*	95	106	93	110	100	93
AVS-EFF (L2214376-01RE)	176*	NA	NA	NA	NA	NA	NA
DUP03182022 (L2214376-02)	158*	88	100	79	97	83	77
DUP03182022 (L2214376-02RE)	174*	NA	NA	NA	NA	NA	NA
DUP03182022 (L2214376-02)	NA	NA	NA	NA	NA	NA	NA
WG1622056-1BLANK	135	108	110	103	123	109	111
WG1622056-1BLANK	NA	NA	NA	NA	NA	NA	NA
WG1622056-2LCS	130	101	100	102	128	109	108
WG1622056-2LCS	NA	NA	NA	NA	NA	NA	NA
AVS-EFFMS	NA	NA	NA	NA	NA	NA	NA
AVS-EFFMS	147	78	91	75	100	80	74
AVS-EFFMSD	164*	89	96	80	96	91	78
AVS-EFFMSD	NA	NA	NA	NA	NA	NA	NA
WG1622850-1BLANK	160*	103	102	98	157	88	98
WG1622850-2LCS	163*	104	104	97	154	94	103
AVS-EFFMS	176*	NA	NA	NA	NA	NA	NA
AVS-EFFMSD	184*	NA	NA	NA	NA	NA	NA

QC LIMITS

(14-147) S8 = 1H,1H,2H,2H-PERFLUORO[1,2-13C2]OCTANESULFONIC ACID (M2-6:2FTS)
(59-139) S9 = PERFLUORO[13C9]NONANOIC ACID (M9PFNA)
(69-131) S10 = PERFLUORO[13C8]OCTANESULFONIC ACID (M8PFOS)
(62-124) S11 = PERFLUORO[1,2,3,4,5,6-13C6]DECANOIC ACID (M6PFDA)
(10-162) S12 = 1H,1H,2H,2H-PERFLUORO[1,2-13C2]DECANESULFONIC ACID (M2-8:2FTS)
(24-116) S13 = N-DEUTERIOMETHYLPERFLUORO-1-OCTANESULFONAMIDOACETIC ACID (D3-NMEFOSAA)
(24-116) S14 = PERFLUORO[1,2,3,4,5,6,7-13C7]UNDECANOIC ACID (M7-PFUDA)

* Values outside of QC limits

Surrogate (Extracted Internal Standard) Recovery Summary
Form 2
Semivolatiles

Client: Sterling Environmental Engineering
Project Name: APPLE VALLEY

Lab Number: L2214376
Project Number: 23008
Matrix: Water

CLIENT ID (LAB SAMPLE NO.)	S15 ()	S16 ()	S17 ()	S18 ()	S19 ()	S20 ()	S21 ()	TOT OUT
AVS-EFF (L2214376-01)	78	NA	NA	NA	--	--	--	0
AVS-EFF (L2214376-01)	NA	93	93	73	--	--	--	1
AVS-EFF (L2214376-01RE)	NA	NA	NA	NA	--	--	--	1
DUP03182022 (L2214376-02)	NA	72	77	63	--	--	--	1
DUP03182022 (L2214376-02RE)	NA	NA	NA	NA	--	--	--	1
DUP03182022 (L2214376-02)	67	NA	NA	NA	--	--	--	0
WG1622056-1BLANK	28	108	113	84	--	--	--	0
WG1622056-1BLANK	88	NA	NA	NA	--	--	--	0
WG1622056-2LCS	25	104	115	91	--	--	--	0
WG1622056-2LCS	78	NA	NA	NA	--	--	--	0
AVS-EFFMS	71	NA	NA	NA	--	--	--	0
AVS-EFFMS	NA	64	75	62	--	--	--	0
AVS-EFFMSD	NA	79	75	61	--	--	--	1
AVS-EFFMSD	72	NA	NA	NA	--	--	--	0
WG1622850-1BLANK	46	92	96	89	--	--	--	1
WG1622850-2LCS	54	96	97	92	--	--	--	1
AVS-EFFMS	NA	NA	NA	NA	--	--	--	1
AVS-EFFMSD	NA	NA	NA	NA	--	--	--	1

QC LIMITS

(10-112) S15 = PERFLUORO[13C8]OCTANESULFONAMIDE (M8FOSA)
(27-126) S16 = N-DEUTERIOETHYLPERFLUORO-1-OCTANESULFONAMIDOACETIC ACID (D5-NETFOSAA)
(48-131) S17 = PERFLUORO[1,2-13C2]DODECANOIC ACID (MPFDOA)
(22-136) S18 = PERFLUORO[1,2-13C2]TETRADECANOIC ACID (M2PFTEDA)

* Values outside of QC limits

FORM II A2-NY-537-ISOTOPE (Continued)

Laboratory Control Sample Summary
Form 3
Semivolatiles

Client	: Sterling Environmental Engineering			**Lab Number**	: L2214376
Project Name	: APPLE VALLEY			**Project Number**	: 23008
Matrix	: WATER				
LCS Sample ID	: WG1622056-2	**Analysis Date**	: 04/01/22 15:27	**File ID**	: I57873
LCSD Sample ID	:	**Analysis Date**	:	**File ID**	:

	Laboratory Control Sample			Laboratory Control Duplicate					
Parameter	**True (ng/l)**	**Found (ng/l)**	**%R**	**True (ng/l)**	**Found (ng/l)**	**%R**	**RPD**	**Recovery Limits**	**RPD Limit**
Perfluorobutanoic Acid (PFBA)	40	39.8	99				-	67-148	30
Perfluoropentanoic Acid (PFPeA)	40	39.7	99				-	63-161	30
Perfluorobutanesulfonic Acid (PFBS)	35.5	34.6	97				-	65-157	30
Perfluorohexanoic Acid (PFHxA)	40	41.2	103				-	69-168	30
Perfluoroheptanoic Acid (PFHpA)	40	39.9	100				-	58-159	30
Perfluorohexanesulfonic Acid (PFHxS)	36.6	44.6	122				-	69-177	30
Perfluorooctanoic Acid (PFOA)	40	41.0	103				-	63-159	30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	38.1	123	324 Q				-	49-187	30
Perfluoroheptanesulfonic Acid (PFHpS)	38.2	41.6	109				-	61-179	30
Perfluorononanoic Acid (PFNA)	40	42.8	107				-	68-171	30
Perfluorooctanesulfonic Acid (PFOS)	37.1	43.1	116				-	52-151	30
Perfluorodecanoic Acid (PFDA)	40	42.8	107				-	63-171	30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	38.4	44.5	116				-	56-173	30

Laboratory Control Sample Summary
Form 3
Semivolatiles

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Matrix	: WATER		
LCS Sample ID	: WG1622056-2	**Analysis Date** : 04/01/22 15:27	**File ID** : I57873
LCSD Sample ID	:	**Analysis Date** :	**File ID** :

	Laboratory Control Sample			Laboratory Control Duplicate					
Parameter	True (ng/l)	Found (ng/l)	%R	True (ng/l)	Found (ng/l)	%R	RPD	Recovery Limits	RPD Limit
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	40	39.9	100				-	60-166	30
Perfluoroundecanoic Acid (PFUnA)	40	40.9	102				-	60-153	30
Perfluorodecanesulfonic Acid (PFDS)	38.6	40.7	105				-	38-156	30
Perfluorooctanesulfonamide (FOSA)	40	49.0	122				-	46-170	30
Perfluorooctanesulfonamide (FOSA)	40	36.9F	92				-	46-170	30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	40	44.5	111				-	45-170	30
Perfluorododecanoic Acid (PFDoA)	40	39.9	100				-	67-153	30
Perfluorotridecanoic Acid (PFTrDA)	40	48.1	120				-	48-158	30
Perfluorotetradecanoic Acid (PFTA)	40	46.8	117				-	59-182	30

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	Lab Number	: L2214376
Project Name	: APPLE VALLEY	Project Number	: 23008
Lab ID	: WG1622056-1	Date Collected	: NA
Client ID	: WG1622056-1BLANK	Date Received	: NA
Sample Location	:	Date Analyzed	: 04/01/22 15:11
Sample Matrix	: WATER	Date Extracted	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	Dilution Factor	: 1
Lab File ID	: I57872	Analyst	: MP
Sample Amount	: 250 g	Instrument ID	: LCMS02
Extraction Method	: ALPHA 23528	GC Column	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	%Solids	: N/A
GPC Cleanup	: N	Injection Volume	: 3 uL

		ng/l			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
375-22-4	Perfluorobutanoic Acid (PFBA)	ND	2.00	0.408	U
2706-90-3	Perfluoropentanoic Acid (PFPeA)	ND	2.00	0.396	U
375-73-5	Perfluorobutanesulfonic Acid (PFBS)	ND	2.00	0.238	U
307-24-4	Perfluorohexanoic Acid (PFHxA)	ND	2.00	0.328	U
375-85-9	Perfluoroheptanoic Acid (PFHpA)	ND	2.00	0.225	U
355-46-4	Perfluorohexanesulfonic Acid (PFHxS)	ND	2.00	0.376	U
335-67-1	Perfluorooctanoic Acid (PFOA)	ND	2.00	0.236	U
27619-97-2	1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	83.9	2.00	1.33	
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND	2.00	0.688	U
375-95-1	Perfluorononanoic Acid (PFNA)	ND	2.00	0.312	U
1763-23-1	Perfluorooctanesulfonic Acid (PFOS)	ND	2.00	0.504	U
335-76-2	Perfluorodecanoic Acid (PFDA)	ND	2.00	0.304	U
39108-34-4	1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	3.80	2.00	1.21	F
2355-31-9	N-Methyl Perfluorooctanesulfonamidoaceti c Acid (NMeFOSAA)	ND	2.00	0.648	U
2058-94-8	Perfluoroundecanoic Acid (PFUnA)	ND	2.00	0.260	U
335-77-3	Perfluorodecanesulfonic Acid (PFDS)	ND	2.00	0.980	U
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND	2.00	0.580	U
2991-50-6	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	2.00	0.804	U

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Lab ID	: WG1622056-1	**Date Collected**	: NA
Client ID	: WG1622056-1BLANK	**Date Received**	: NA
Sample Location	:	**Date Analyzed**	: 04/01/22 15:11
Sample Matrix	: WATER	**Date Extracted**	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	**Dilution Factor**	: 1
Lab File ID	: I57872	**Analyst**	: MP
Sample Amount	: 250 g	**Instrument ID**	: LCMS02
Extraction Method	: ALPHA 23528	**GC Column**	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	**%Solids**	: N/A
GPC Cleanup	: N	**Injection Volume**	: 3 uL

		ng/l			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
307-55-1	Perfluorododecanoic Acid (PFDoA)	ND	2.00	0.372	U
72629-94-8	Perfluorotridecanoic Acid (PFTrDA)	ND	2.00	0.327	U
376-06-7	Perfluorotetradecanoic Acid (PFTA)	ND	2.00	0.248	U
NONE	PFOA/PFOS, Total	ND	2.00	0.236	U

Results Summary
Form 1
Perfluorinated Alkyl Acids by Isotope Dilution

Client	: Sterling Environmental Engineering	**Lab Number**	: L2214376
Project Name	: APPLE VALLEY	**Project Number**	: 23008
Lab ID	: WG1622056-1	**Date Collected**	: NA
Client ID	: WG1622056-1BLANK	**Date Received**	: NA
Sample Location	:	**Date Analyzed**	: 04/03/22 15:20
Sample Matrix	: WATER	**Date Extracted**	: 03/31/22
Analytical Method	: 134,LCMSMS-ID	**Dilution Factor**	: 1
Lab File ID	: M02945	**Analyst**	: SG
Sample Amount	: 250 g	**Instrument ID**	: LCMS02
Extraction Method	: ALPHA 23528	**GC Column**	: Acquity UPLC BEH C18
Extract Volume	: 1000 uL	**%Solids**	: N/A
GPC Cleanup	: N	**Injection Volume**	: 3 uL

		ng/l			
CAS NO.	**Parameter**	**Results**	**RL**	**MDL**	**Qualifier**
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND	2.00	0.580	U

Field Duplicate Calculation Section

EPA Method 537 PFC

Calculations for Field Duplicate Relative Percent Difference (RPD)
SDG No. L2214376

S1= AVS-EFF **S2=** DUP03182022

Analyte	S1	S2	RPD (%)	
Perfluorobutanoic Acid (PFBA)	5.23	5.30	1%	
Perfluoropentanoic Acid (PFPeA)	6.04	6.37	5%	
Perfluorobutanesulfonic Acid (PFBS)	2.10	2.07	1%	
Perfluorohexanoic Acid (PFHxA)	5.27	4.99	5%	
Perfluoroheptanoic Acid (PFHpA)	**1.80**	**1.76**	NC	
Perfluorohexanesulfonic Acid (PFHxS)	**1.44**	**0.998**	NC	
Perfluorooctanoic Acid (PFOA)	6.38	6.99	9%	
Perfluorononanoic Acid (PFNA)	**0.774**	**0.884**	NC	
Perfluorooctanesulfonic Acid (PFOS)	22.6	25.9	14%	
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	3.43	4.80	33%	*
PFOA/PFOS, Total	29.0	32.9	13%	

* RPD is above the allowable maximum (20%).

All results are in ng/L.
Bold numbers were values that are below the CRQL or above the high standard.
ND - Not detected.
NC - Not calculated, both results must be within the linear range for valid RPDs to be

Alpha Geoscience: Acronyms and Definitions

Data Validation Acronyms

AA	Atomic absorption, flame technique
BHC	Hexachlorocyclohexane
BFB	Bromofluorobenzene
CCB	Continuing calibration blank
CCC	Calibration check compound
CCV	Continuing calibration verification
CN	Cyanide
CRDL	Contract required detection limit
CRQL	Contract required quantitation limit
CVAA	Atomic adsorption, cold vapor technique
DCAA	2,4-Dichlophenylacetic acid
DCB	Decachlorobiphenyl
DFTPP	Decafluorotriphenyl phosphine
ECD	Electron capture detector
FAA	Atomic absorption, furnace technique
FID	Flame ionization detector
FNP	1-Fluoronaphthalene
GC	Gas chromatography
GC/MS	Gas chromatography/mass spectrometry
GPC	Gel permeation chromatography
ICB	Initial calibration blank
ICP	Inductively coupled plasma-atomic emission spectrometer
ICV	Initial calibration verification
IDL	Instrument detection limit
IS	Internal standard
LCS	Laboratory control sample
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate
MSA	Method of standard additions
MS/MSD	Matrix spike/matrix spike duplicate
PID	Photo ionization detector
PCB	Polychlorinated biphenyl
PCDD	Polychlorinated dibenzodioxins
PCDF	Polychlorinated dibenzofurans
QA	Quality assurance
QC	Quality control
RF	Response factor
RPD	Relative percent difference
RRF	Relative response factor
RRF(number)	Relative response factor at concentration of the number following
RT	Retention time
RRT	Relative retention time
SDG	Sample delivery group
SPCC	System performance check compound
TCX	Tetrachloro-m-xylene
%D	Percent difference
%R	Percent recovery
%RSD	Percent relative standard deviation

Data Validation Qualifiers Used in the QA/QC Reviews for USEPA Region II

U	=	Not detected. The associated number indicates the approximate sample concentration necessary to be detected significantly greater than the level of the highest associated blank.
R	=	Unreliable result; data is rejected or unusable. Analyte may or may not be present in the sample. Supporting data or information is necessary to confirm the result.
N	=	Tentative identification. Analyte is considered present. Special methods may be needed to confirm its presence or absence during future sampling efforts.
J	=	Analyte is present. Reported value may be associated with a higher level of uncertainty than is normally expected with the analytical method.
J-	=	Analyte is present. Reported value may be biased low and associated with a higher level of uncertainty than is normally expected with the analytical method.
J+	=	Analyte is present. Reported value may be biased high andassociated with a higher level of uncertainty than is normally expected with the analytical method.
UJ	=	Not detected, quantitation limit may be inaccurate or imprecise.

Note: These qualifiers are used for data validation purposes. The data validation qualifiers may differ from the qualifiers that the laboratory assigns to the data. Refer to the laboratory analytical report for the definitions of the laboratory qualifiers.

Polyfluorinated Alkyl Substances (PFAS) Acronyms

PFBA	Perfluorobutanoic acid
PFPeA	Perfluoropentanoic acid
PFHxA	Perfluorohexanoic acid
PFHpA	Perfluoroheptanoic acid
PFOA	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFDA	Perfluorodecanoic acid
PFUnA	Perfluoroundecanoic acid
PFDoA	Perfluorododecanoic acid
PFTriA or PFTrDA	Perfluorotridecanoic acid
PFTeA or PFTA	Perfluorotetradecanoic acid
PFBS	Perfluorobutanesulfonic acid
PFPeS	Perfluoropentanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFHpS	Perfluoroheptanesulfonic acid
PFOS	Perfluorooctanesulfonic acid
PFNS	Perfluorononanesulfonic acid
PFDS	Perfluorodecanesulfonic acid
FOSA	Perfluorooctane Sulfonamide
NMeFOSAA	N-methyl perfluorooctane sulfonamidoacetic acid
NEtFOSAA	N-ethyl perfluorooctane sulfonamidoacetic acid
4:2 FTS or 4:2	1H, 1H, 2H, 2H-perfluorohexanesulfonic acid
6:2 FTS or 6:2	1H, 1H, 2H, 2H-perfluorooctanesulfonic acid or 6:2 Fluorotelomersulfonate
8:2 FTS or 8:2	1H, 1H, 2H, 2H-perfluorodecanesulfonic acid or 8:2 Fluorotelomersulfonate

LABORATORY ANALYTICAL REPORT

ANALYTICAL REPORT

Lab Number:	L2214376
Client:	Sterling Environmental Engineering 24 Wade Road Latham, NY 12110
ATTN:	Andrew Millspaugh
Phone:	(518) 456-4900
Project Name:	APPLE VALLEY
Project Number:	23008
Report Date:	04/06/22

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2214376-01	AVS-EFF	WATER	LAGRANGE, NY	03/18/22 11:00	03/18/22
L2214376-02	DUP03182022	WATER	LAGRANGE, NY	03/18/22 00:00	03/18/22

Project Name:	APPLE VALLEY	**Lab Number:**	L2214376
Project Number:	23008	**Report Date:**	04/06/22

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	APPLE VALLEY	**Lab Number:**	L2214376
Project Number:	23008	**Report Date:**	04/06/22

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Perfluorinated Alkyl Acids by Isotope Dilution

L2214376-01, -01RE, -02, and -02RE: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2214376-01RE and -02RE: The sample was re-extracted with the method required holding time exceeded due to QC failures in the original extraction. The results of the re-extraction are reported for 6:2FTS only.

L2214376-01 and -02: The MeOH fraction of the extraction is reported for perfluorooctanesulfonamide (fosa) due to better extraction efficiency of the perfluoro[13c8]octanesulfonamide (m8fosa) Extracted Internal Standard.

The WG1622056-1 Method Blank, associated with L2214376-01 and -02, has concentrations above the reporting limits for 6:2FTS and 8:2FTS. Any associated sample with positive detects for these compounds was re-extracted with the method required holding time exceeded. The results of both extractions are reported; however, the original sample results are reported with a "B" qualifier.

WG1622850-1, WG1622850-2, WG1622850-3, WG1622850-4, and WG1622056-4: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

The WG1622056-2 LCS recovery, associated with L2214376-01 and -02, is above the acceptance criteria for 1h,1h,2h,2h-perfluorooctanesulfonic acid (6:2fts) (324%); however, the associated samples were re-extracxted for this compound.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Susan E O'Neil Susan O' Neil

Title: Technical Director/Representative Date: 04/06/22

ORGANICS

SEMIVOLATILES

Project Name: APPLE VALLEY
Project Number: 23008
Lab Number: L2214376
Report Date: 04/06/22

SAMPLE RESULTS

Lab ID: L2214376-01
Client ID: AVS-EFF
Sample Location: LAGRANGE, NY

Date Collected: 03/18/22 11:00
Date Received: 03/18/22
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/01/22 16:34
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 03/31/22 17:43

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	5.23		ng/l	1.84	0.376	1
Perfluoropentanoic Acid (PFPeA)	6.04		ng/l	1.84	0.365	1
Perfluorobutanesulfonic Acid (PFBS)	2.10		ng/l	1.84	0.219	1
Perfluorohexanoic Acid (PFHxA)	5.27		ng/l	1.84	0.302	1
Perfluoroheptanoic Acid (PFHpA)	1.80	J	ng/l	1.84	0.207	1
Perfluorohexanesulfonic Acid (PFHxS)	1.44	J	ng/l	1.84	0.346	1
Perfluorooctanoic Acid (PFOA)	6.38		ng/l	1.84	0.217	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	3.43	B	ng/l	1.84	1.23	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.84	0.634	1
Perfluorononanoic Acid (PFNA)	0.774	J	ng/l	1.84	0.287	1
Perfluorooctanesulfonic Acid (PFOS)	22.6		ng/l	1.84	0.464	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.84	0.280	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.84	1.12	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.84	0.597	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.84	0.240	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.84	0.903	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.84	0.741	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.84	0.343	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.84	0.301	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.84	0.228	1
PFOA/PFOS, Total	29.0		ng/l	1.84	0.217	1

Project Name: APPLE VALLEY
Project Number: 23008
Lab Number: L2214376
Report Date: 04/06/22

SAMPLE RESULTS

Lab ID: L2214376-01
Client ID: AVS-EFF
Sample Location: LAGRANGE, NY
Date Collected: 03/18/22 11:00
Date Received: 03/18/22
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	92		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	119		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	110		70-131
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	85		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	93		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	118		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	94		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**167**	Q	14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	95		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	106		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	93		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	110		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	100		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	93		55-137
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	93		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	93		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	73		22-136

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

SAMPLE RESULTS

Lab ID: L2214376-01
Client ID: AVS-EFF
Sample Location: LAGRANGE, NY

Date Collected: 03/18/22 11:00
Date Received: 03/18/22
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/03/22 15:42
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 03/31/22 17:43

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.84	0.534	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	78		10-112

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

SAMPLE RESULTS

Lab ID: L2214376-01 RE
Client ID: AVS-EFF
Sample Location: LAGRANGE, NY

Date Collected: 03/18/22 11:00
Date Received: 03/18/22
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/04/22 04:24
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 04/03/22 07:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.86	1.24	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**176**	Q	14-147

Project Name: APPLE VALLEY
Project Number: 23008
Lab Number: L2214376
Report Date: 04/06/22

SAMPLE RESULTS

Lab ID: L2214376-02
Client ID: DUP03182022
Sample Location: LAGRANGE, NY

Date Collected: 03/18/22 00:00
Date Received: 03/18/22
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/01/22 17:40
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 03/31/22 17:43

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	5.30		ng/l	1.92	0.392	1
Perfluoropentanoic Acid (PFPeA)	6.37		ng/l	1.92	0.380	1
Perfluorobutanesulfonic Acid (PFBS)	2.07		ng/l	1.92	0.228	1
Perfluorohexanoic Acid (PFHxA)	4.99		ng/l	1.92	0.315	1
Perfluoroheptanoic Acid (PFHpA)	1.76	J	ng/l	1.92	0.216	1
Perfluorohexanesulfonic Acid (PFHxS)	0.998	J	ng/l	1.92	0.361	1
Perfluorooctanoic Acid (PFOA)	6.99		ng/l	1.92	0.226	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	4.80	B	ng/l	1.92	1.28	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.92	0.660	1
Perfluorononanoic Acid (PFNA)	0.844	J	ng/l	1.92	0.299	1
Perfluorooctanesulfonic Acid (PFOS)	25.9		ng/l	1.92	0.484	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.92	0.292	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.92	1.16	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.92	0.622	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.92	0.250	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.92	0.940	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.92	0.772	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.92	0.357	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.92	0.314	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.92	0.238	1
PFOA/PFOS, Total	32.9		ng/l	1.92	0.226	1

Project Name: APPLE VALLEY
Project Number: 23008
Lab Number: L2214376
Report Date: 04/06/22

SAMPLE RESULTS

Lab ID: L2214376-02
Client ID: DUP03182022
Sample Location: LAGRANGE, NY
Date Collected: 03/18/22 00:00
Date Received: 03/18/22
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	85		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	111		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	111		70-131
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	81		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	88		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	119		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**158**	Q	14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	88		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	100		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	79		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	97		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	83		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	77		55-137
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	72		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	77		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	63		22-136

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

SAMPLE RESULTS

Lab ID: L2214376-02
Client ID: DUP03182022
Sample Location: LAGRANGE, NY

Date Collected: 03/18/22 00:00
Date Received: 03/18/22
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/03/22 16:03
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 03/31/22 17:43

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.92	0.556	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	67		10-112

Project Name: APPLE VALLEY
Project Number: 23008
Lab Number: L2214376
Report Date: 04/06/22

SAMPLE RESULTS

Lab ID: L2214376-02 RE
Client ID: DUP03182022
Sample Location: LAGRANGE, NY

Date Collected: 03/18/22 00:00
Date Received: 03/18/22
Field Prep: Not Specified

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/04/22 05:14
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 04/03/22 07:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.75	1.17	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**174**	Q	14-147

Project Name: APPLE VALLEY
Project Number: 23008
Lab Number: L2214376
Report Date: 04/06/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/01/22 15:11
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 03/31/22 17:43

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1622056-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.408
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.396
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.238
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.328
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.225
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.376
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.236
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	83.9		ng/l	2.00	1.33
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.688
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.312
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.504
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.304
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	3.80	F	ng/l	2.00	1.21
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.648
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.260
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	0.980
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	0.580
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.804
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.372
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	0.327
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.248
PFOA/PFOS, Total	ND		ng/l	2.00	0.236

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/01/22 15:11
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 03/31/22 17:43

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1622056-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	109		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	129		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	113		70-131
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	110		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	111		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	119		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	106		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	135		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	108		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	110		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	103		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	123		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	109		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	111		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	28		10-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	108		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	113		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	84		22-136

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/03/22 15:20
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 03/31/22 17:43

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1622056-1					
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	0.580

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	88		10-112

Project Name: APPLE VALLEY
Project Number: 23008
Lab Number: L2214376
Report Date: 04/06/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/03/22 23:59
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 04/03/22 07:05

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1622850-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.408
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.396
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.238
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.328
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.225
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.376
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.236
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	1.33
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.688
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.312
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.504
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.304
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	1.21
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.648
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.260
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	0.980
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	0.580
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.804
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.372
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	0.327
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.248
PFOA/PFOS, Total	ND		ng/l	2.00	0.236

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 04/03/22 23:59
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 04/03/22 07:05

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1622850-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	100		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	112		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	104		70-131
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	97		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	98		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	105		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	99		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**160**	Q	14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	103		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	102		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	157		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	88		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	98		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	46		10-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	92		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	96		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	89		22-136

Lab Control Sample Analysis

Batch Quality Control

Project Name: APPLE VALLEY

Project Number: 23008

Lab Number: L2214376

Report Date: 04/06/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab	Associated sample(s): 01-02		Batch: WG1622056-2					
Perfluorobutanoic Acid (PFBA)	99		-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	99		-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	97		-		65-157	-		30
Perfluorohexanoic Acid (PFHxA)	103		-		69-168	-		30
Perfluoroheptanoic Acid (PFHpA)	100		-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	122		-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	103		-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	**324**	Q	-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	109		-		61-179	-		30
Perfluorononanoic Acid (PFNA)	107		-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	116		-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	107		-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	116		-		56-173	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	100		-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	102		-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	105		-		38-156	-		30
Perfluorooctanesulfonamide (FOSA)	92		-		46-170	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	111		-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	100		-		67-153	-		30
Perfluorotridecanoic Acid (PFTrDA)	120		-		48-158	-		30
Perfluorotetradecanoic Acid (PFTA)	117		-		59-182	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: APPLE VALLEY

Project Number: 23008

Lab Number: L2214376

Report Date: 04/06/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1622056-2								

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	102				58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	121				62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	106				70-131
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	105				57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	102				60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	110				71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	99				62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	130				14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	101				59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	100				69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	102				62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	128				10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	109				24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	108				55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	25				10-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	104				27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	115				48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	91				22-136

Lab Control Sample Analysis

Batch Quality Control

Project Name: APPLE VALLEY

Project Number: 23008

Lab Number: L2214376

Report Date: 04/06/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1622056-2								
Perfluorooctanesulfonamide (FOSA)	122		-		46-170	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	78				10-112

Lab Control Sample Analysis

Batch Quality Control

Project Name: APPLE VALLEY

Project Number: 23008

Lab Number: L2214376

Report Date: 04/06/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1622850-2								
Perfluorobutanoic Acid (PFBA)	106		-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	110		-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	104		-		65-157	-		30
Perfluorohexanoic Acid (PFHxA)	112		-		69-168	-		30
Perfluoroheptanoic Acid (PFHpA)	107		-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	128		-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	111		-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	134		-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	104		-		61-179	-		30
Perfluorononanoic Acid (PFNA)	110		-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	123		-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	113		-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	139		-		56-173	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	114		-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	112		-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	105		-		38-156	-		30
Perfluorooctanesulfonamide (FOSA)	105		-		46-170	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	110		-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	110		-		67-153	-		30
Perfluorotridecanoic Acid (PFTrDA)	114		-		48-158	-		30
Perfluorotetradecanoic Acid (PFTA)	114		-		59-182	-		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1622850-2								

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	100				58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	111				62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	105				70-131
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	100				57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	100				60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	102				71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	99				62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**163**	Q			14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	104				59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	104				69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	97				62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	154				10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	94				24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	103				55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	54				10-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	96				27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	97				48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	92				22-136

Matrix Spike Analysis

Batch Quality Control

Project Name: APPLE VALLEY

Project Number: 23008

Lab Number: L2214376

Report Date: 04/06/22

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1622056-3 WG1622056-4 QC Sample: L2214376-01 Client ID: AVS-EFF												
Perfluorobutanoic Acid (PFBA)	5.23	35.8	41.6	101		44.6	103		67-148	7		30
Perfluoropentanoic Acid (PFPeA)	6.04	35.8	41.2	98		45.5	103		63-161	10		30
Perfluorobutanesulfonic Acid (PFBS)	2.10	31.8	34.7	102		36.7	102		65-157	6		30
Perfluorohexanoic Acid (PFHxA)	5.27	35.8	44.0	108		46.6	108		69-168	6		30
Perfluoroheptanoic Acid (PFHpA)	1.80J	35.8	38.2	102		40.4	101		58-159	6		30
Perfluorohexanesulfonic Acid (PFHxS)	1.44J	32.8	42.5	125		45.9	127		69-177	8		30
Perfluorooctanoic Acid (PFOA)	6.38	35.8	44.6	107		48.4	110		63-159	8		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	3.43B	34.1	48.4	132		49.5	127		49-187	2		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	34.2	39.8	116		43.7	120		61-179	9		30
Perfluorononanoic Acid (PFNA)	0.774J	35.8	38.5	105		40.8	105		68-171	6		30
Perfluorooctanesulfonic Acid (PFOS)	22.6	33.3	63.2	122		71.7	138		52-151	13		30
Perfluorodecanoic Acid (PFDA)	ND	35.8	37.3	104		40.5	106		63-171	8		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	34.4	37.2	108		41.3	113		56-173	10		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	35.8	33.4	93		38.0	99		60-166	13		30
Perfluoroundecanoic Acid (PFUnA)	ND	35.8	34.8	97		37.6	98		60-153	8		30
Perfluorodecanesulfonic Acid (PFDS)	ND	34.6	30.9	89		29.6	80		38-156	4		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	35.8	37.7	105		45.0	118		45-170	18		30
Perfluorododecanoic Acid (PFDoA)	ND	35.8	33.5	93		36.4	95		67-153	8		30
Perfluorotridecanoic Acid (PFTrDA)	ND	35.8	40.7	114		43.4	114		48-158	6		30
Perfluorotetradecanoic Acid (PFTA)	ND	35.8	40.1	112		46.7	122		59-182	15		30

Matrix Spike Analysis

Batch Quality Control

Project Name: APPLE VALLEY

Project Number: 23008

Lab Number: L2214376

Report Date: 04/06/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1622056-3 WG1622056-4 QC Sample: L2214376-01 Client ID: AVS-EFF												

Surrogate (Extracted Internal Standard)	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	100		96		10-162
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	147		**164**	Q	14-147
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	64		79		27-126
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	80		91		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	74		78		55-137
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	75		80		62-124
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	71		81		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	77		88		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	105		112		71-134
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	75		75		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	62		61		22-136
Perfluoro[13C4]Butanoic Acid (MPFBA)	78		88		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	105		119		62-163
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91		96		69-131
Perfluoro[13C8]Octanoic Acid (M8PFOA)	78		89		62-129
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		89		59-139
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	100		107		70-131

Matrix Spike Analysis

Batch Quality Control

Project Name: APPLE VALLEY
Project Number: 23008
Lab Number: L2214376
Report Date: 04/06/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1622056-3 WG1622056-4 QC Sample: L2214376-01 Client ID: AVS-EFF												
Perfluorooctanesulfonamide (FOSA)	ND	35.8	39.8	111		43.4F	114		46-170	30		30

Surrogate (Extracted Internal Standard)	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	71		72		10-112

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1622850-3 WG1622850-4 QC Sample: L2214376-01 Client ID: AVS-EFF												
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	34.7	42.7	123		44.0	127		49-187	3		30

Surrogate (Extracted Internal Standard)	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**176**	Q	**184**	Q	14-147

Project Name: APPLE VALLEY
Project Number: 23008

Lab Number: L2214376
Report Date: 04/06/22

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2214376-01A	Plastic 250ml unpreserved	A	NA		3.3	Y	Absent		A2-NY-537-ISOTOPE(14)
L2214376-01A1	Plastic 250ml unpreserved	A	NA		3.3	Y	Absent		A2-NY-537-ISOTOPE(14)
L2214376-01A2	Plastic 250ml unpreserved	A	NA		3.3	Y	Absent		A2-NY-537-ISOTOPE(14)
L2214376-01B	Plastic 250ml unpreserved	A	NA		3.3	Y	Absent		A2-NY-537-ISOTOPE(14)
L2214376-01B1	Plastic 250ml unpreserved	A	NA		3.3	Y	Absent		A2-NY-537-ISOTOPE(14)
L2214376-01B2	Plastic 250ml unpreserved	A	NA		3.3	Y	Absent		A2-NY-537-ISOTOPE(14)
L2214376-02A	Plastic 250ml unpreserved	A	NA		3.3	Y	Absent		A2-NY-537-ISOTOPE(14)
L2214376-02B	Plastic 250ml unpreserved	A	NA		3.3	Y	Absent		A2-NY-537-ISOTOPE(14)

*Values in parentheses indicate holding time in days

Project Name: APPLE VALLEY
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PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA	376-06-7
Perfluorotridecanoic Acid	PFTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1
PERFLUOROETHER SULFONIC ACIDS (PFESAs)		
Perfluoro(2-Ethoxyethane)Sulfonic Acid	PFEESA	113507-82-7
PERFLUOROETHER/POLYETHER CARBOXYLIC ACIDS (PFPCAs)		
Perfluoro-3-Methoxypropanoic Acid	PFMPA	377-73-1
Perfluoro-4-Methoxybutanoic Acid	PFMBA	863090-89-5
Nonafluoro-3,6-Dioxaheptanoic Acid	NFDHA	151772-58-6

Project Name:	APPLE VALLEY	**Lab Number:**	L2214376
Project Number:	23008	**Report Date:**	04/06/22

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: DU Report with 'J' Qualifiers

Project Name:	APPLE VALLEY	**Lab Number:**	L2214376
Project Number:	23008	**Report Date:**	04/06/22

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers

Project Name:	APPLE VALLEY	**Lab Number:**	L2214376
Project Number:	23008	**Report Date:**	04/06/22

Data Qualifiers

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: DU Report with 'J' Qualifiers

Project Name:	APPLE VALLEY	**Lab Number:**	L2214376
Project Number:	23008	**Report Date:**	04/06/22

REFERENCES

134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625/625.1: alpha-Terpineol
EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D/8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

NEW YORK CHAIN OF CUSTODY

ALPHA ANALYTICAL

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TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page 1 of 1

Date Rec'd in Lab: 3/19/22

ALPHA Job #: L2214370

Client Information

Client: Sterling Env.
Address: 24 Wade Rd
Latham NY, 12110
Phone: 518 456-4900
Fax:
Email:

Project Information

Project Name: Apple Valley
Project Location: LaGrange, NY
Project # ~~LaGrange, NY~~ 23008
(Use Project name as Project #) ☐
Project Manager: Andrew Millspaugh
ALPHAQuote #:

Turn-Around Time

Standard ☒ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables

☒ ASP-A ☒ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other Cat B = PFAS only

Billing Information

☒ Same as Client Info
PO #

Regulatory Requirement

☒ NY TOGS ☐ NY Part 375
☐ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☐ Other
☐ NY Unrestricted Use
☐ NYC Sewer Discharge

Disposal Site Information

Please identify below location of applicable disposal facilities.
Disposal Facility:
☐ NJ ☐ NY
☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:
andrew.millspaugh@sterlingenvironmental.com
paul.scholar@sterlingenvironmental.com

Please specify Metals or TAL. * Report only: PCE, TCE, cis,1,2-DCE, and Vinyl Chloride

ANALYSIS

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	* VOCs 8260	LC MS/MS PFAS ISOTOPE 537	Total Bottle
14376-01	AVS-EFF	3-18-22	1100	GW	PWS	X	X	5
01	AVS-EFF MS		1105				X	2
01	AVS-EFF MSD		1110				X	2
	RW-2		1130			X		3
	RW-3		1140			X		3
	AV-2		1150			X		3
	TB03182022		—	LW		X		2
02	DUP 03182022		—	GW			X	2

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

Sample Specific Comments

Container Type	V	P											
Preservative	B	A											

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
	3-18-22 14:58		3/18/22 14:58
	3-18-22 1500		3/19/22 0900

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)