PFAS & v-HAP EMISSIONS TEST
FUME ELIMINATOR 5
TACONIC
PETERSBURGH, NEW YORK
DECEMBER 2016

NYS DEC Air State Facility Permit
4-3834-00004/00028

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1.0 INTRODUCTION

Air Pollution Characterization and Control, Ltd. (APCC) was retained by Taconic to determine emissions of Perfluoro- and Polyfluoro- Alkyl Substances (PFAS) from Fume Eliminator 5 (FE-5) at their facility located at 136 Coonbrook Road, Petersburgh, NY. Taconic manufactures PTFE (PFOA free) coated fiberglass/fabric products for the food processing industry and other industrial applications, such as baking sheets.

A fume eliminator manufactured by CVM Corporation controls emissions from Emission Unit 2-OVEN5 (FE-5 - Buildings 4 and 5). This is a 2-stage pollution control device, whereby emissions are cooled to condense pollutants into liquid droplets, which are then collected by densely packed coalescing filters.

The facility currently operates under the following NYS DEC Air State Facility Permit:

4-3834-00004/00028

Testing was performed in response to a NYSDEC letter dated 8 September 2016 requesting this test program, followed by conference call/meeting with Taconic, DEC and APCC on 28 September. A pretest protocol was submitted to DEC on 8 November and subsequently approved prior to testing.

Some of the technical approach described herein is based on two PFAS sampling programs performed by the New Hampshire DES and Weston Solutions, Inc., in the Spring and Summer of 2016. Additional input in developing the sampling and analytical methodology was provided by ALS Life Sciences-Environmental, who also performed PFAS analyses.

APCC performed triplicate 120-minute (nominal) tests at the inlet and outlet (simultaneously) of FE-5 to determine emissions of PFAS as requested by DEC. Sampling was performed isokinetically in general accordance with EPA Methods 1-4 and 13B, modified to to utilize a a solution of 100 ml in each of the first three impingers:

- Impinger 1 - DI water,
- Impinger 2 – 0.1N NaOH
- Impinger 3 – 0.01N $Na_2B_4O_7$
- Back-up Glass Fiber Filter

Concurrent with each test performed, stack gas temperature, velocity, flow rate, dry molecular weight, and moisture content were determined in accordance with EPA Methods 1, 2, 3, and 4.

PFAS analyses were performed by ALS Life Sciences–Environmental in Kelso, WA; in accordance with EPA Method 537 (Modified), utilizing liquid chromatography with tandem mass spectrometers (LC-MS/MS). ALS analyzed for the PFAS listed in Table 1-1. The inclusion of PFOS analysis in the stack test was performed at the request of DEC, although these compounds have never been used by Taconic.

It should be noted that Method 537 has been validated for water analyses only, and that the sampling approach to determine concentrations and mass emission rates in a gaseous exhaust stream is experimental, has not been validated in accordance any regulatory standards, and that these tests should therefore be considered as screening analyses, as previously agreed to by DEC.

Table 1-1 PFAS Analytes

Perfluorobutanoic Acid	PFBA
Perfluorodecanoic Acid	PFDA
Perfluorododecanoic Acid	PFDoA
Perfluoroheptanoic Acid	PFHpA
Perfluorohexanoic Acid	PFHxA
Perfluorononanoic acid	PFNA
Perfluoro-n-tetradecanoic acid	PFTeDA
Perfluoro-n-tridecanoic acid	PFTrDA
Perfluorooctanoic Acid	PFOA
Perfluoropentanoic Acid	PFPeA
Perfluoroundecanoic Acid	PFUnA
Perfluorooctanesulfonate	PFOS
Hexafluoropropylene Oxide Dimer Acid	HFPO-DA

In addition to the above PFAS tests, APCC performed triplicate 60-minute (nominal) tests at the exhaust of FE-5 concurrent with PFAS testing described above to determine emissions of volatile Hazardous Air Pollutants (v-HAP), as defined by the Clean Air Act Amendments (CAAA) of 1990; in accordance with EPA Method TO-15 – *Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS)*.

TO-15 analyses were performed by Maxxam Analytics of Burlington, ON. In addition to the triplicate tests described above, a background blank sample was drawn to the west of the plant as a measure of upwind ambient air concentrations of these compounds not contributed by Taconic.

NYS DEC also provided two additional TO-15 sampling canisters to APCC. APCC assisted DEC in procuring two consecutive grab samples during Test 2 as performed by APCC. DEC performed their own analyses.

This test program was performed on 7 December 2016, following approval of the pretest protocol and schedule by the New York State DEC.

John H. Powell, Principal of APCC, was Program Manager for this field effort, and was assisted on-site by Brett T. Smith, Principal Engineer; and Derrek Schultz, Environmental Scientist; of APCC. Process operational and site coordination was by Karen Toth, Environmental Manager, and John Loomis, Safety Coordinator; of Taconic.

New York State DEC personnel on-site to witness testing included: Ben Potter, Rick Leone and Don Ford.

Section 2 of this report presents test results and a discussion thereof. Section 3 contains a brief description of the process, as well as a summary of operations during the test program. Section 4 details the test methods used. Section 5 contains APCC's quality assurance/quality control guidelines as implemented for this test program.

The Appendix of this report contains all field and analytical data, process operating data, analytical data, calibrations, and calculations.

Contact information for project personnel is presented below:

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2.0 RESULTS AND DISCUSSION

Air Pollution Characterization and Control, Ltd. performed testing to determine emissions of Perfluoro- and Polyfluoro-Alkyl Substances (PFAS) from Fume Eliminator 5 (FE-5) at the Taconic facility in Petersburgh, NY on 7 December 2016. Taconic manufactures PTFE (PFOA free) coated fiberglass/fabric products for the food processing industry and other industrial applications, such as baking sheets.

All 15 drying ovens were operational during testing. Process data are summarized in Section 3 and detailed in the Appendix of this report.

APCC performed triplicate 120-minute (nominal) tests at the inlet and outlet (simultaneously) of FE-5 to determine emissions of PFAS .Concurrent with this testing, stack gas temperature, velocity, flow rate, dry molecular weight, and moisture content were determined in accordance with EPA Methods 1, 2, 3, and 4.

In addition to the above PFAS testing, APCC performed triplicate 60-minute (nominal) tests at the exhaust of FE-5 concurrent with PFAS testing described above to determine emissions of volatile Hazardous Air Pollutants (v-HAP) in accordance with EPA Method TO-15. DEC also provided two additional TO-15 sampling canisters to APCC for procuring two consecutive grab samples during Test 2.

2.1 PFAS Analyses

Simultaneous 120-minute PFAS emission tests were performed at the inlet and outlet of FE-5 while all 15 drying ovens were operational. Results are presented in Table 2-1. Included in this Table are acronyms for each of the PFAS, which will be utilized for discussion purposes.

As can be seen from the afore-mentioned table, with a few exceptions, most measured PFAS emissions are in the range of or below the Estimated Train Reporting Limit (ETRL) of 20 ng per total of all 4 sample fractions (as described in Section 4). The ETRL is an estimate by the analytical laboratory (ALS) of a reasonable level at which to report the sum of the analyses for the multiple sample fractions, taking into account such factors as detection limits for individual sample fractions and matrix interferences. Actual detection limits (Ld) may be somewhat lower than the ETRL.

Results <ETRL in Table 2-1 are reported in *italics* for informational purposes only, with a J Qualifier. This means that the analyte was analyzed for and is considered not present above the level of the numerical value listed on the laboratory's data reporting form. The numerical value indicates that approximate concentration necessary to detect the analyte in this sample. The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the sample. The data should be seriously considered for decision-making and data may be usable for many purposes.

For the purposes of this report, all data reported by the analytical laboratory (ALS) as non-detect (ND) were treated as 0 for calculation of subsequent emissions.

Measured PFAS entering FE-5 did show some elevated concentrations, such as PFBA, PFOA, PFPeA, and HFPO-DA. The remaining analytes were either <ETRL or within 3 x ETRL, which may not be a statistically significant difference from actual ETRL. HFPO-DA exhibited the most statistically significant loading to FE-5, with an average mass loading to FE-5 of 0.010 g/hr. It should be noted that corresponding FE-5 Outlet measurements for HFPO-DA were non-detect (ND)

Measured PFAS exiting FE-5 were all <2.5 x ETRL. Most individual PFAS measured mass emissions from FE-5 were <0.0002 g/hr or ND.

Table 2-1

Summary of Measured PFAS Emissions
Fume Eliminator 5
Taconic
Petersburgh, NY
7-Dec-16

		Inlet				Outlet				Average
Test No.		1	2	3	Avg.	1	2	3	Avg.	**Control**
Time		0756-0957	1100-1300	1401-1601		0756-1000	1100-1305	1401-1601		**%E**
Sample Conditions										
Meter Volume	dscf	78.10	77.80	73.98	76.63	94.00	95.17	92.62		
	dscm	2.21	2.20	2.09		2.66	2.69	2.62		
Isokinesis	%	99.3	99.7	101.0	-	100.5	99.9	99.3		
Stack Conditions										
Stack Gas Flowrate	dscf/min	16,800	16,600	15,600	16,300	19,000	19,300	18,900	19,100	
	dscm/min	476	470	442	461	538	546	535	541	
Average Stack Temperature	°F	289	288	287	288	102	102	101	102	
Water Vapor in Stack Gas	%	1.5	2.1	3.1	2.2	6.9	7.3	5.2	6.5	
Sample Catch (ng)*										
Perfluorobutanoic Acid	PFBA	260	211	137		39.5	24.1	33.9		
Perfluorodecanoic Acid	PFDA	14	*14.3*	*9.3*		*4.8*	*2.2*	*3.8*		
Perfluorododecanoic Acid	PFDoA	*17.2*	*19.3*	*10.8*		*2.2*	*0.5*	*0.5*		
Perfluoroheptanoic Acid	PFHpA	41.9	32.2	23.4		*11.8*	*8.9*	*6.4*		
Perfluorohexanoic Acid	PFHxA	68.6	53.9	38.9		21.1	*17.8*	*11.8*		
Perfluorononanoic acid	PFNA	39.0	44.2	24.4		36.3	45.5	39.3		
Perfluoro-n-tetradecanoic acid	PFTeDA	*5.4*	*14.3*	*7.6*		ND	*0.3*	ND		
Perfluoro-n-tridecanoic acid	PFTrDA	*16.2*	35.7	21.1		*1.4*	*1.2*	*1.5*		
Perfluorooctanoic Acid	PFOA	325	148	155		50.4	56.2	41.5		
Perfluoropentanoic Acid	PFPeA	115	107	55.7		23.8	9.6	9.5		
Perfluoroundecanoic Acid	PFUnA	30.4	37.1	21.2		21.1	16.0	22.5		
Perfluorooctanesulfonate	PFOS	ND	ND	ND		ND	ND	*0.6*		
Hexafluoropropylene Oxide Dimer Acid	HFPO-DA	1472	583	179		ND	ND	ND		
Emission Concentration (ng/m^3)										
Perfluorobutanoic Acid	PFBA	117.4	96.0	65.5	93.0	14.9	8.9	12.9	12.2	
Perfluorodecanoic Acid	PFDA	*6.5*	*6.5*	*4.4*	*5.8*	*1.8*	*0.8*	*1.4*	*1.4*	
Perfluorododecanoic Acid	PFDoA	*7.8*	*8.8*	*5.2*	*7.2*	*0.8*	*0.2*	*0.2*	*0.4*	
Perfluoroheptanoic Acid	PFHpA	18.9	14.6	11.2	14.9	*4.5*	*3.3*	*2.5*	*3.4*	
Perfluorohexanoic Acid	PFHxA	31.0	24.5	18.6	24.7	7.9	*6.6*	*4.5*	*6.3*	
Perfluorononanoic acid	PFNA	17.7	20.1	11.6	16.5	13.7	16.9	15.0	15.2	
Perfluoro-n-tetradecanoic acid	PFTeDA	*2.4*	*6.5*	*3.6*	*4.2*	ND	<0.1	ND	<0.1	
Perfluoro-n-tridecanoic acid	PFTrDA	*7.3*	*16.2*	*10.1*	*11.2*	*0.5*	*0.4*	*0.6*	*0.5*	
Perfluorooctanoic Acid	PFOA	147.0	67.0	74.1	96.0	18.9	20.9	15.8	18.5	
Perfluoropentanoic Acid	PFPeA	51.8	48.6	26.6	42.4	8.9	3.6	3.6	5.4	
Perfluoroundecanoic Acid	PFUnA	13.7	16.9	10.1	13.6	7.9	5.9	8.6	7.5	
Perfluorooctanesulfonate	PFOS	ND	ND	ND	ND	ND	ND	*0.2*	*0.2*	
Hexafluoropropylene Oxide Dimer Acid	HFPO-DA	666	264	85	338	ND	ND	ND	ND	
Measured Mass Emissions (g/hr)										
Perfluorobutanoic Acid	PFBA	0.0034	0.0027	0.0017	0.0026	0.0005	0.0003	0.0004	0.0004	84.8%
Perfluorodecanoic Acid	PFDA	*0.0002*	*0.0002*	*0.0001*	*0.0002*	*0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	NA
Perfluorododecanoic Acid	PFDoA	*0.0002*	*0.0002*	*0.0001*	*0.0002*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	NA
Perfluoroheptanoic Acid	PFHpA	0.0005	0.0004	0.0003	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	>73.5%
Perfluorohexanoic Acid	PFHxA	0.0009	0.0007	0.0005	0.0007	0.0003	<0.0002	<0.0001	<0.0002	>70.2%
Perfluorononanoic acid	PFNA	0.0005	0.0006	0.0003	0.0005	0.0004	0.0006	0.0005	0.0005	NA
Perfluoro-n-tetradecanoic acid	PFTeDA	*0.0001*	*0.0002*	*0.0001*	*0.0001*	ND	*<0.0001*	ND	*<0.0001*	NA
Perfluoro-n-tridecanoic acid	PFTrDA	*0.0002*	0.0005	0.0003	*0.0003*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*	NA
Perfluorooctanoic Acid	PFOA	0.0042	0.0019	0.0020	0.0027	0.0006	0.0007	0.0005	0.0006	77.6%
Perfluoropentanoic Acid	PFPeA	0.0015	0.0014	0.0007	0.0012	0.0003	0.0001	0.0001	0.0002	85.3%
Perfluoroundecanoic Acid	PFUnA	0.0004	0.0005	0.0003	0.0004	0.0003	0.0002	0.0003	0.0002	36.1%
Perfluorooctanesulfonate	PFOS	ND	ND	ND	ND	ND	ND	<0.0001	<0.0001	NA
Hexafluoropropylene Oxide Dimer Acid	HFPO-DA	0.0190	0.0075	0.0023	0.0096	ND	ND	ND	ND	>99.0%
Total Measured PFAS (g/hr)	PFAS				0.0188				>0.0022	>88.2%

STP = 29.92 in. Hg @ 68°F

Numbers in *italics* are <ETRL and are reported for informational purposes with J Qualifier, see text for discussion

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For measured compounds with measured inlet loading at significant levels, calculated FE-5 control efficiency was also significant: at >88% for total PFAS, 85% for PFBA and PFPeA, and >99% for HFPO-DA, the only compound that exhibited significant FE-5 loading. These measured control efficiencies are likely representative of the control that would be exhibited for other PFAS at higher control inlet loadings.

There are no regulatory guidelines governing emissions of PFAS, nor does Taconic's DEC Air Permit referenced above limit emissions of PFAS.

All sampling and analyses were performed in accordance with the methodologies described in Section 4 of this report, and met all QA/QC requirements thereof. Isokinesis was acceptable at 100±10% for each test performed, with final sample train leak rates acceptable at ≤0.02 cfm.

2.2 Volatile HAP Analyses

In addition to the above PFAS testing, APCC performed triplicate 60-minute (nominal) tests at the exhaust of FE-5 concurrent with PFAS testing to determine emission concentrations of volatile Hazardous Air Pollutants (v-HAP) in accordance with EPA Method TO-15.

In addition, APCC drew a single ambient sample over a 60-minute (nominal) period at ground level due west (upwind) of the source and adjacent to the road. This test was performed concurrent with Test 2 as a measure of background ambient concentration.

Results are presented in Table 2-2. Emission concentrations are reported as ppb (v/v).(with the exception of acetone)

DEC also provided two additional TO-15 sampling canisters to APCC for procuring two consecutive grab samples during Test 2. Results are presented in the Appendix.

As can be seen from Table 2-2, measured emission concentrations were typically <1 ppm, in many cases ≤1 ppb. Statistically significant (based on method Ld) measured concentrations included the following:

- Ethanol (suspected contaminant)
- 2-Propanol (IPA)
- Propene (suspected contaminant)
- 2-Propanone (acetone – suspected contaminant)

Although these measured emission concentrations seem significant compared with the remaining analytes, it should be noted that the 3-test average concentration for each (except acetone) is still <1 ppm.

Acetone (2-Propanone) was detected in the samples at concentrations ranging from 1-4.5 ppm. Taconic uses no acetone in the oven processes, and as acetone is ubiquitous in the emission measurement world, it is therefore also a suspected contaminant.

A possible source of this contamination is the stainless steel ¼" sample probe used for this testing. Stainless was used in place of the usual Teflon tubing to avoid contamination of PFAS samples. This was a brand-new piece of tubing that was cleaned (with acetone) then dried and purged with clean hot air. This is also possible the source of other contaminants, although APCC does not routinely use any of them.

It should be noted that acetone is neither a VOC nor HAP.

In addition, while IPA is utilized at Taconic for cleaning rolls, none of the other compounds detected (typically <100 ppb) are utilized at this facility and are suspected contaminants.

Table 2-2

Summary of Measured v-HAP Emissions
Fume Eliminator 5
Taconic
Petersburgh, NY
7-Dec-16

Test No.	**1**		**2**		**3**		**Ambient**
Time	0900-1004		1207-1307		1504-1605		1204-1300
Exhaust Flowrate (scm/min)	577.2		589.8		565.0		
Compound	(ppb v/v)	(g/hr)	(ppb v/v)	(g/hr)	(ppb v/v)	(g/hr)	(ppb v/v)
Dichlorodifluoromethane (FREON 12)	<1.0	<0.17	<2.2	<0.39	<5.9	<1.01	0.56
1,2-Dichlorotetrafluoroethane	<0.9	<0.21	<1.9	<0.48	<5.0	<1.20	<0.34
Chloromethane	<1.5	<0.11	14.4	1.07	<8.8	<0.63	<0.60
Vinyl Chloride	<0.5	<0.04	<1.1	<0.10	<2.9	<0.26	<0.20
Chloroethane	<1.5	<0.14	<3.3	<0.31	<8.8	<0.80	<0.60
1,3-Butadiene	2.8	0.22	5.5	<0.44	15.0	<1.14	<1.0
Trichlorofluoromethane (FREON 11)	<1.0	<0.20	<2.2	<0.44	<5.9	<1.14	<0.40
*Ethanol (ethyl alcohol)**	*259*	*17.1*	*739*	*50.0*	*1230*	*79.7*	*<2.0*
Trichlorotrifluoroethane	<0.8	<0.20	<1.7	<0.47	<4.4	<1.16	<0.30
2-propanol (IPA)	568	49.1	1340	118.3	527	44.6	<2.0
*2-Propanone (acetone)**	*2280*	191	*4630*	*396*	*3710*	304	*10.6*
Methyl Ethyl Ketone (2-Butanone)	194	20.1	298	31.6	158	16.0	<2.0
Methyl Isobutyl Ketone	219	31.5	262	38.5	108	15.2	<2.0
Methyl Butyl Ketone (2-Hexanone)	7.9	1.1	12.0	1.8	<29.0	<4.09	<2.0
Methyl t-butyl ether (MTBE)	<1.0	<0.23	<2.2	<0.53	<5.9	<1.36	<0.40
Ethyl Acetate	<0.5	<0.05	<11.0	<1.16	<29.0	<2.94	<2.0
1,1-Dichloroethylene	<0.5	<0.07	<1.1	<0.16	<2.9	<0.40	<0.20
cis-1,2-Dichloroethylene	<0.5	<0.07	<1.1	<0.16	<2.9	<0.40	0.32
trans-1,2-Dichloroethylene	<0.5	<0.07	<1.1	<0.16	<2.9	<0.40	<0.20
Methylene Chloride(Dichloromethane)	<4.0	<0.48	<8.8	<1.09	<23.0	<2.72	<1.6
Chloroform	<0.5	<0.09	<1.1	<0.19	<2.9	<0.49	<0.20
Carbon Tetrachloride	<0.5	<0.11	<1.1	<0.25	<2.9	<0.63	<0.20
1,1-Dichloroethane	<0.5	<0.07	<1.1	<0.16	<2.9	<0.40	<0.20
1,2-Dichloroethane	<0.5	<0.07	<1.1	<0.16	<2.9	<0.40	<0.20
Ethylene Dibromide	<0.5	<0.14	<1.1	<0.30	<2.9	<0.77	<0.20
1,1,1-Trichloroethane	<0.5	<0.10	<1.1	<0.22	<2.9	<0.55	<0.20
1,1,2-Trichloroethane	<0.5	<0.10	<1.1	<0.22	<2.9	<0.55	<0.20
1,1,2,2-Tetrachloroethane	<0.5	<0.12	<1.1	<0.27	<2.9	<0.69	<0.20
cis-1,3-Dichloropropene	<0.5	<0.07	<1.1	<0.16	<2.9	<0.40	<0.20
trans-1,3-Dichloropropene	<0.5	<0.07	<1.1	<0.16	<2.9	<0.40	<0.20
1,2-Dichloropropane	<0.5	<0.08	<1.1	<0.18	<2.9	<0.46	<0.20
Bromomethane	<0.5	<0.07	2.6	0.4	<2.9	<0.39	<0.20
Bromoform	<1.0	<0.36	<2.2	<0.82	<5.9	<2.10	<0.40
Bromodichloromethane	<1.0	<0.24	<2.2	<0.53	<5.9	<1.36	<0.40
Dibromochloromethane	<1.0	<0.30	<2.2	<0.67	<5.9	<1.73	<0.40
Trichloroethylene	<0.5	<0.09	<1.1	<0.21	<2.9	<0.54	<0.20
Tetrachloroethylene	<0.5	<0.12	<1.1	<0.27	<2.9	<0.68	1.66
Benzene	2.54	0.29	5.2	0.60	<2.9	<0.32	<0.20
Toluene	1.29	0.17	1.6	0.22	168	21.8	<0.20
Ethylbenzene	<0.5	<0.08	<1.1	<0.17	2.9	<0.43	<0.20
p+m-Xylene	<1.0	<0.15	<2.2	<0.34	6.2	0.93	<0.40
o-Xylene	<0.5	<0.08	<1.1	<0.17	<2.9	<0.43	<0.20
Styrene	<0.5	<0.07	<1.1	<0.17	<2.9	<0.43	<0.20
4-ethyltoluene	<2.5	<0.43	<5.5	<0.97	<15.0	<2.54	<1.0
1,3,5-Trimethylbenzene	<2.5	<0.43	<5.5	<0.97	<15.0	<2.54	<1.0
1,2,4-Trimethylbenzene	<2.5	<0.43	<5.5	<0.97	<15.0	<2.54	<1.0
Chlorobenzene	<0.5	<0.08	<1.1	<0.18	<2.9	<0.46	<0.20
Benzyl chloride	<2.5	<0.46	<5.5	<1.02	<15.0	<2.68	<1.0
1,3-Dichlorobenzene	<2.0	<0.42	<4.4	<0.95	<12.0	<2.49	<0.80
1,4-Dichlorobenzene	<0.5	<0.11	<1.1	<0.24	<2.9	<0.60	<0.20
1,2-Dichlorobenzene	<0.5	<0.11	<1.1	<0.24	<2.9	<0.60	<0.20
1,2,4-Trichlorobenzene	<2.5	<0.65	<5.5	<1.47	<15.0	<3.84	<1.0
Hexachlorobutadiene	<2.5	<0.94	<5.5	<2.11	<15.0	<5.51	<1.0
Hexane	<22.0	<2.66	<7.5	<0.93	<8.8	<1.04	<0.60
Heptane	<1.5	<0.16	<3.3	<0.35	<8.8	<0.89	<0.60
Cyclohexane	<1.0	<0.12	<2.2	<0.27	<5.9	<0.70	<0.40
Tetrahydrofuran	<2.0	<0.21	6.0	<0.64	<12.0	<1.22	<0.80
1,4-Dioxane	12.0	1.52	87.0	11.3	78.0	9.67	<2.0
Naphthalene	<2.5	<0.46	<5.5	<1.04	<15.0	<2.71	<1.0
Total Xylenes	<1.5	<0.23	<3.3	<0.51	<8.8	<1.32	<0.60
1,1,1,2-Tetrachloroethane	<0.5	<0.12	<1.1	<0.27	<2.9	<0.69	<0.20
Vinyl Bromide	<1.0	<0.15	<2.2	<0.35	<5.9	<0.89	<0.40
Propene	833	50.5	704	43.6	158	9.4	2.5
2,2,4-Trimethylpentane	<1.0	<0.17	<2.2	<0.38	<5.9	<0.96	<0.40
Carbon Disulfide	<2.5	<0.27	<5.5	<0.62	24	<2.57	<1.0
Vinyl Acetate	10.4	1.3	7.9	1.0	<5.9	<0.72	<0.40

** Suspected contaminant, compound not used by Taconic*

Measured ambient concentrations were typically in the range of 1 ppb.

Sampling and analyses were performed in accordance with EPA Method TO-15, and met the QA/QC criteria thereof. Field and analytical data are presented the Appendix.

3.0 PROCESS AND OPERATIONS

Taconic manufactures PTFE (PFOA free) coated fiberglass/fabric products for the food processing industry and other industrial applications, such as baking sheets.

The process involves the use of woven fiberglass fabric dipped into PTFE dispersion mix liquids, where the coated fabric passes through ovens to be dried and baked. Oven temperature varies from 200°F to below 800°F to properly bond the PTFE to the fabric.

Emission Unit 2 Oven 5 processes emissions from 15 vertical drying ovens in Buildings 4 and 5.

Emissions are controlled by a Fume Eliminator System manufactured by CVM Corporation. This unit is a 2-stage pollution control device, whereby emissions are cooled to condense pollutants into liquid droplets which are then collected by densely packed coalescing filters. Collected liquids drop off into a sump.

3.1 Sample Locations

PFAS emissions outlet sampling was performed in the newly installed 39" diameter stainless steel stack of FE-5 at 2 sampling ports located 90° apart and >2 diameters downstream and 1.0 diameter upstream from the nearest respective flow disturbances. Twenty-four traverse points chosen in accordance with EPA Method 1 were sampled for 5-minutes each during each test for a total test time of 120-minutes for each test.

EPA Method TO-15 sampling was performed in the centroid of this stack concurrent with PFAS sampling at the outlet of FE-5 only.

Concurrent with the above, PFAS inlet sampling was performed at the 40" diameter fume eliminator inlet to determine PFAS loading and removal efficiency. Testing was performed at a single (horizontal) sample port located approximately 4 diameters downstream and 2.4 diameters upstream from the nearest respective flow disturbances. A total of 12 traverse points was sampled for 10 minutes each during each 120-minute test. This approach has been approved by DEC for this test as well as previous compliance emissions testing.

Figure 3-1 presents a photo of the FE-5 sampling locations. EPA Method 1 worksheets are presented in the Appendix.

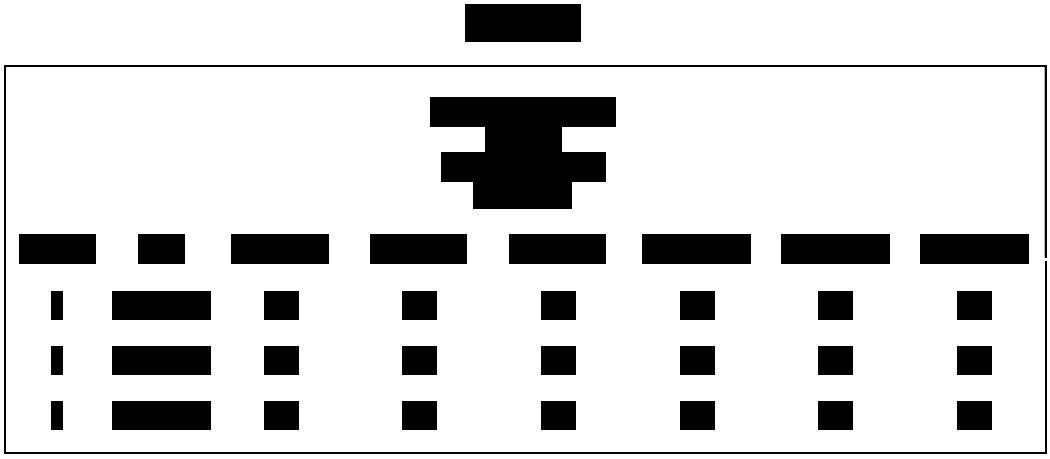
3.2 Process Operations

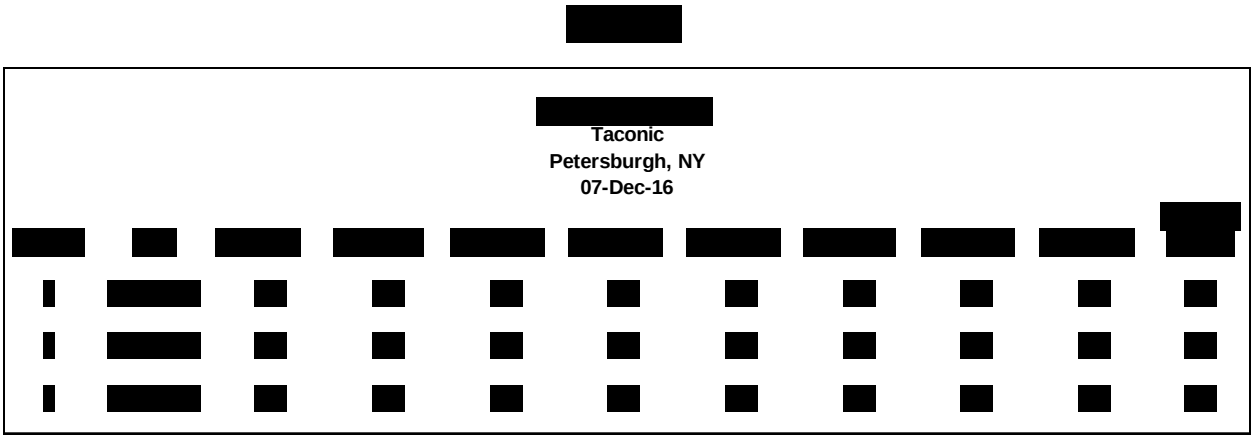
Testing was conducted under maximum normal operating conditions, with all 15 ovens operating during each test performed. Typical operations are 10-12 ovens operating at any given time. Taconic had 15 ovens operating during the entire test program.

Production data for each oven were collected during the source testing, which includes the PTFE dispersion mix and oven temperatures. Data are summarized in Tables 3-1 and 3-2, and presented in full in the Appendix.

As requested by DEC, Taconic also obtained samples of the fume eliminator supply water and sump water to be analyzed for PFAS during each stack test performed. Data are presented in full in the Appendix.

Figure 3-1 FE-5 Sample Locations




Taconic
Petersburgh, NY
07-Dec-16

4.0 SAMPLING AND ANALYTICAL METHODOLOGY

APCC performed triplicate 120-minute (nominal) tests at the inlet and outlet (simultaneously) of FE- 5 to determine PFAS emissions and FE-5 control efficiency of PFAS. Sampling was performed isokinetically in general accordance with EPA Methods 1-4 and 13B, modified to to utilize a solution of 100 ml in each of:

- **Impinger 1 - DI water,**
- **Impinger 2 – 0.1N NaOH**
- **Impinger 3 – 0.01N $Na_2B_4O_7$**
- **Back-up glass-fiber filter**

Concurrent with this testing, stack gas temperature, velocity, flow rate, dry molecular weight, and moisture content will be determined in accordance with EPA Methods 1, 2, 3, and 4.

PFAS analyses were performed by ALS Life Sciences–Environmental in Kelso, WA; in accordance with EPA Method 537 (Modified), utilizing liquid chromatography with tandem mass spectrometers (LC-MS/MS).

APCC also performed triplicate 60-minute (nominal) tests at the exhaust of FE-5 concurrent with testing described above to determine emissions of volatile Hazardous Air Pollutants (v-HAP), as defined by the Clean Air Act Amendments (CAAA) of 1989; in accordance with EPA Method TO-15 - *Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS)*.

As these are not combustion sources, O_2 and CO_2 measurements need not be performed concurrent with testing for calculation stack gas molecular weight. Ambient levels of O_2 and CO_2 were utilized for these calculations.

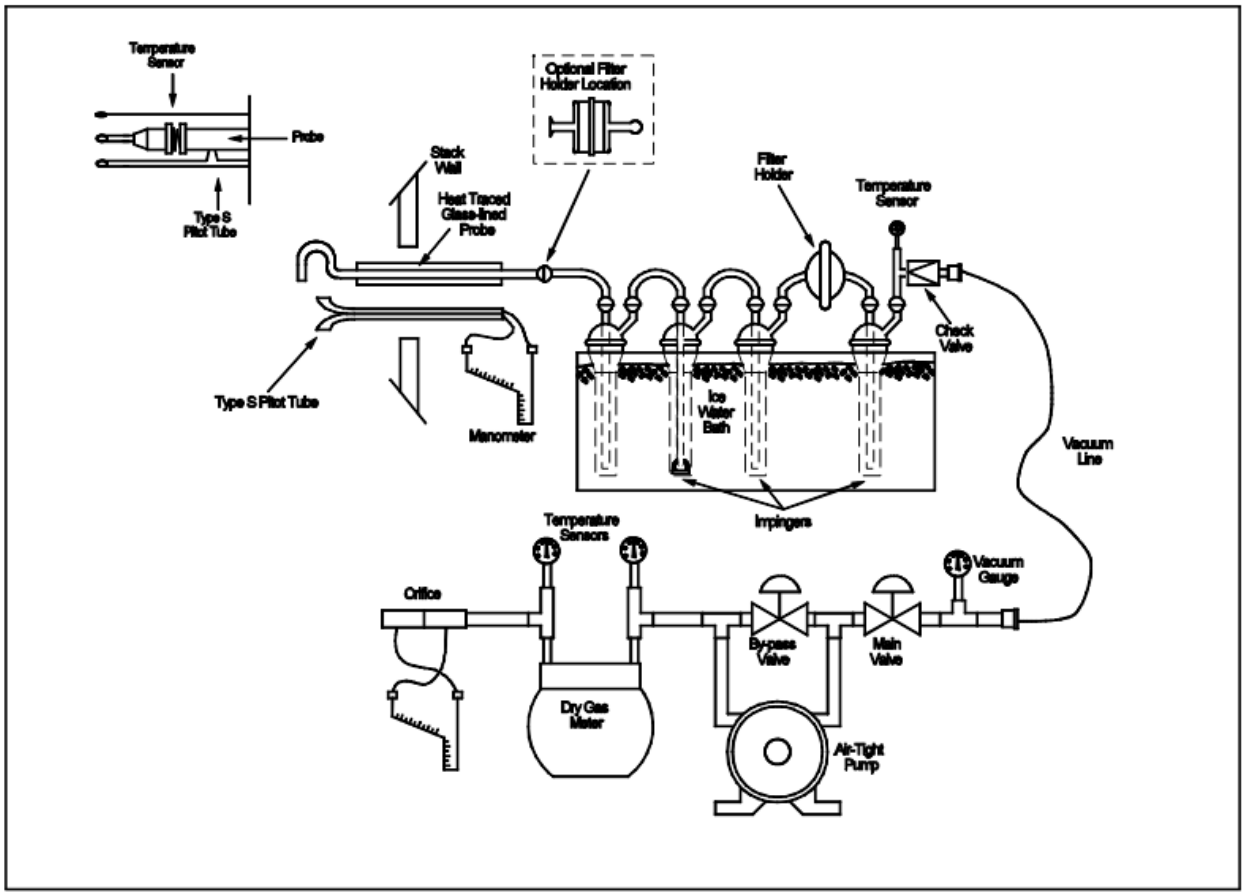
4.1 PFAS Sampling and Analyses

PFAS sampling was performed at the inlet and outlet (simultaneously) of the fume eliminator in accordance with EPA Methods 1-4 and 13B (modified), using a sample train similar to that displayed in Figure 4-1. It consists of a borosilicate glass nozzle, borosilicate glass-line probe, a short flexible HDPE sample line, three reagent impingers, Whatman EPM 2000 glass fiber filter, silica gel impinger, vacuum pump, dry gas meter, and an orifice flow meter. Complete sampling train calibrations are performed before and after the sampling program. Triplicate 120-minute tests were performed at each sample location.

Extreme care was taken to avoid contamination, as PFAS seem to be ubiquitous.

- **All reagents were prepared and/or prescreened for PFAS by ALS**
- **Sampling personnel wore Tyvek suits**
- **Prescreened HDPE sample bottles without Teflon lined caps were utilized.**
- **No blue ice was used for sample shipment. Samples were shipped on water-ice double sealed to prevent leakage**
- **Nitrile rubber gloves were used when recovering sample. New gloves were used for each test**
- **Samplers avoided contact with aluminum foil, pre-wrapped foods and snacks, sun-screen, Post-It® Notes, water-resistant papers, permanent markers (ie. Sharpie®), and avoided wearing water-resistant/proof clothing, jackets, gloves, shoes, etc. (ie. Gore-Tex®).**
- **Sample bottle labels, provided by ALS, were written with a regular ink pen. No permanent inks were used.**

Figure 4-1 – EPA Method 13B Schematic



The glass nozzle is attached to a glass-lined probe, which was heated to prevent condensation. An ice bath containing four impingers is attached to the back end of the filter via a short, flexible HDPE umbilical line, with stainless steel 28/12 sockets on each end. No Teflon components were utilized in this sample train.

The first, third, and fourth impingers are of modified Greenburg-Smith design, while the second is of standard Greenburg-Smith design. The first impinger contains 100 milliliters (ml) of distilled water, the second 100 ml of 0.1 N NaOH, third contains 100 ml 0.01N $Na_2B_4O_7$, and the fourth contains 200 grams (g) of indicating silica gel to remove any remaining moisture from the sample stream.

A pre-screened (by ALS) Whatman EPM 2000 glass fiber filter, supported in a 4-1/2 inch glass filter holder with a glass or stainless steel frit with silicone gasket, is used as the final collection media between the third and fourth impingers.

All impingers, connecting glassware and HDPE sample line were brand-new prior to the test program. The ground glass joints were sealed using silicone O-rings as well as ground glass closed socket and ball joints.

All glass and HDPE sample train components are pre-cleaned as described in Section 3A of the *Manual of Analytical Methods for Analyses of Pesticide Residues in Human and Environmental Samples*. All glassware was washed with Alconox detergent and tap water followed by a DI reagent water rinse. The nozzle, probe, impingers, connecting glassware and filter holder are then rinsed with methanol prior to use.

Prior to mobilization on-site, the sampling trains were assembled, and charged with reagents or filters. The ends of the sampling trains are capped with glass balls or caps that have been prepped in the same manner. The sampling trains are then recovered in a manner described below as a train blank.

Flexible tubing, vacuum gauge, needle valves, leakless vacuum pump, bypass valve, dry gas meter, calibration orifice, and inclined manometer complete the sampling train. The stack velocity pressure is measured using a pitot tube and inclined manometer in accordance with EPA Method 2. The stack temperature is monitored using a calibrated, unshielded K-type thermocouple connected to a potentiometer.

A calculator is used to quickly determine the orifice pressure drop required for a pitot velocity pressure and stack temperature to maintain isokinetic sampling conditions. Sample flow is adjusted by means of the bypass valve.

Before and after each sampling run, the sampling train is leak checked (using nitrile gloves), acceptable at less than 0.02 cfm. The moisture content of the exhaust gas is determined during each sampling run in accordance with EPA Method 4. Sampling data are recorded on standard field data sheets.

Sample Recovery

At the end of each sample run, five sample containers are used as follows. Sample recovery personnel wore Tyvek suits and new nitrile gloves for each recovery scenario.

Container No. 1 — The nozzle, probe, and HDPE sample line are each rinsed in triplicate with pre-screened DI water. The probe and nozzle are brushed concurrent with each rinse.

A stainless-steel based brush with nylon bristles and stainless steel handle is utilized for the probe.

The contents of the first impinger are quantified using a clean glass graduated cylinder used only for recovery and deposited into the same container

The impinger is then rinsed in triplicate with DI water. All water rinses then rinsed through the graduate and are then deposited in a 1000 ml HDPE sample jar. The sample jar is sealed, and labeled w/ F^--free labeling.

Container No. 2 — The contents of the second impinger are quantified using a clean glass graduated cylinder used only for recovery and deposited into the same container

The impinger is then rinsed in triplicate with DI water. All water rinses are then rinsed through the graduate and are then deposited in a 250 ml HDPE sample jar. The sample jar is sealed, and labeled w/ F^--free labeling.

Container No. 3 — The contents of the third impinger are quantified using a clean glass graduated cylinder used only for recovery and deposited into the same container

The impinger is then rinsed in triplicate with DI water. All water rinses are then rinsed through the graduate and are then deposited in a 250 ml HDPE sample jar. The sample jar is sealed, and labeled w/ F^--free labeling.

A total of $\leq$500 ml of DI water is used for all the above rinses.

Container No. 4 — The entire sample train is rinsed with <30 ml methanol (MeOH) into a 1000 ml HDPE sample jar.

The filter is removed from the filter holder and deposited into the same HDPE sample jar. The front half of the filter is rinsed with MeOH into the same. The sample jar is sealed, and labeled w/ F^--free labeling.

Container No. 5 — Silica gel from the fourth impinger is deposited into its original container.

APCC prepared one blank sample train per set of three samples (i.e. one inlet and one outlet) charging the sample train as if to test, and then recovering sample as per the above procedure. As noted above, all reagents were prepared and prescreened by the analytical laboratory.

The PFAS samples were shipped to ALS at 4^{o}C using water ice (no Blue Ice) in a new cooler; and the following analyses performed:

Container Nos. 1-3 — Sample were analyzed for PFAS as described below.

Container No. 4 — MeOH fraction was analyzed for PFAS as described below.

Container No. 5 — The silica gel is weighed to the nearest 0.5 g (on-site). The weight of the moisture entrapped in the silica gel, along with the

volume of moisture, which is condensed in the impingers, is used to calculate the moisture content of the flue gas.

PFAS analyses were performed by ALS Life Sciences–Environmental in Kelso, WA; in accordance with EPA Method 537 (Modified), utilizing liquid chromatography with tandem mass spectrometers (LC-MS/MS). ALS analyzed for the following PFAS:

PFAS Analytes

Perfluorobutanoic Acid	PFBA
Perfluorodecanoic Acid	PFDA
Perfluorododecanoic Acid	PFDoA
Perfluoroheptanoic Acid	PFHpA
Perfluorohexanoic Acid	PFHxA
Perfluorononanoic acid	PFNA
Perfluoro-n-tetradecanoic acid	PFTeDA
Perfluoro-n-tridecanoic acid	PFTrDA
Perfluorooctanoic Acid	PFOA
Perfluoropentanoic Acid	PFPeA
Perfluoroundecanoic Acid	PFUnA
Perfluorooctanesulfonate	PFOS
Hexafluoropropylene Oxide Dimer Acid	HFPO-DA

Analytes of interest in water are extracted using solid phase extraction for water, and solvent extraction for solids. Extracts are evaporated with gentle stream of nitrogen, and reconstituted in methanol prior to analysis. This procedure provides high performance liquid chromatographic (HPLC) reversed phase chromatographic conditions and tandem mass spectrometry conditions for the analysis of these compounds by ESI- conditions. The detection limit (Ld) is in the range of <20 ppt in air for each sample fraction for each individual constituent.

4.2 EPA TO-15 Sampling and Analyses

APCC also performed triplicate 60-minute (nominal) tests at the exhaust of FE-5 concurrent with testing described above to determine emissions of volatile Hazardous Air Pollutants (v-HAP), as defined by the Clean Air Act Amendments (CAAA) of 1990; in accordance with EPA Method TO-15 - *Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/ Mass Spectrometry (GC/MS)*. VOC are defined here as organic compounds having a vapor pressure greater than 10^{-1} Torr at 25°C and 760 mm Hg.

Sampling

Sample is collected by introduction of stack gases through a stainless-steel probe into a specially-prepared glass-lined 5 liter stainless steel canister. Sub-atmospheric pressure in an evacuated canister provides sampling motive force. A sample of gas is drawn through the sampling train comprised of components that regulate the rate and duration of sampling into the pre-evacuated and passivated Summa canister.

Sampling was performed at approximately 50 cc/min for 60-minutes using a 5 l Summa canister. Triplicate tests were performed only at the FE-5 outlet. An ambient sample was also drawn as a measure of background. Two additional grab samples were drawn for DEC analyses by APCC personnel.

It should be noted that FE-5 exhaust is at or near ambient conditions, and should have been close enough to ambient conditions to utilize this test method. Due to the exhaust moisture content (7%

v/v) and cold ambient temperatures, however, sample flow was reduced most likely by water droplets condensing in the flow regulator, which reduced sample volumes and elevated detection limits.

After the sample is collected, the canister valve is closed, an identification tag is attached to the canister, and the canister is transported to the laboratory for analysis.

In addition to the triplicate tests described above, a 60-minute background blank sample was drawn (west of the facility) as a measure of upwind ambient air concentrations of these compounds not contributed by Taconic.

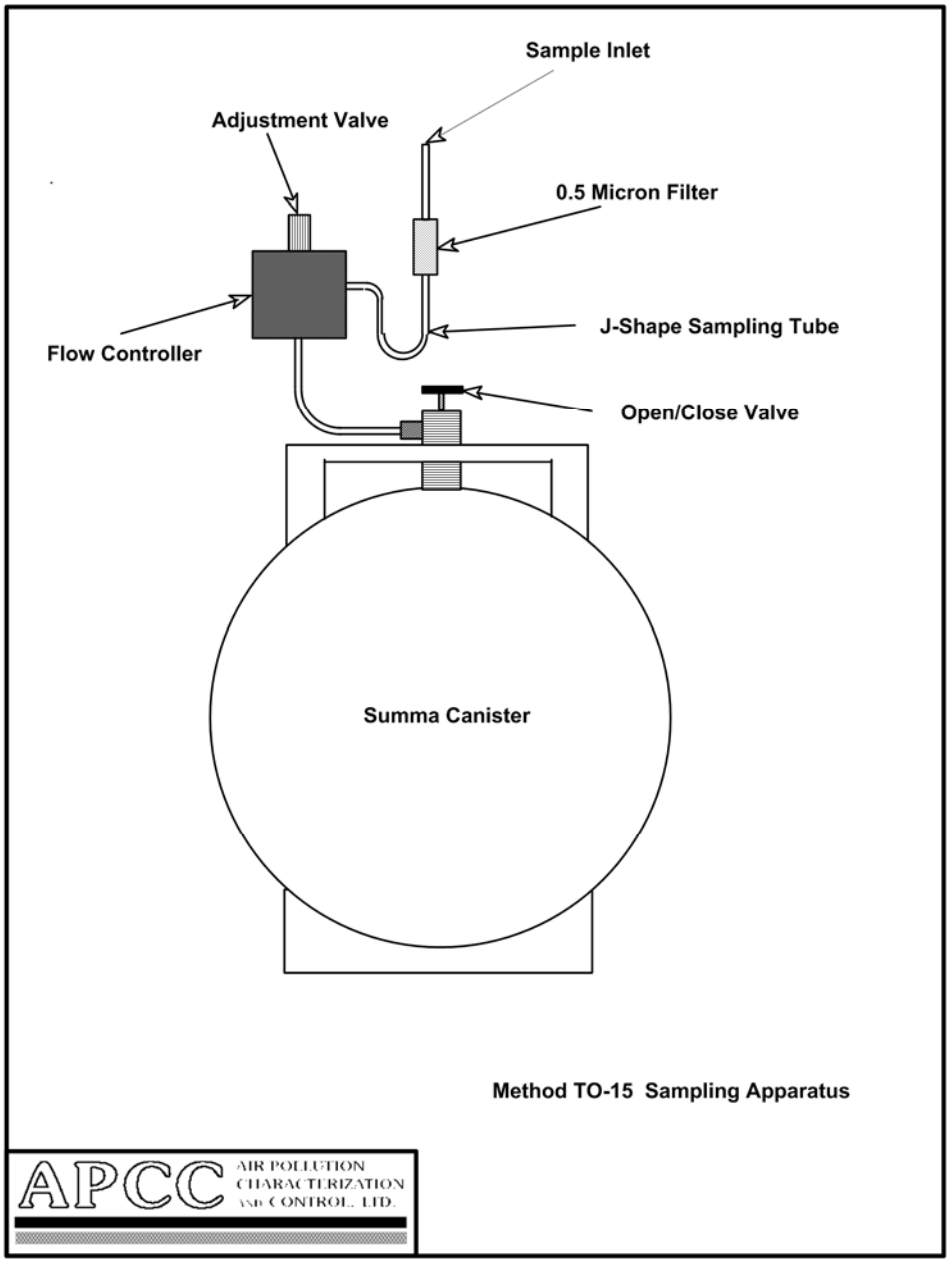
Analyses

Analyses were performed by Maxxam Analytics of Burlington, ON. Upon receipt at the laboratory, the canister tag data is recorded and the canister is stored until analysis. To analyze the sample, a known volume of sample is directed from the canister through a solid multi-sorbent concentrator. A portion of the water vapor in the sample breaks through the concentrator during sampling, to a degree depending on the multi-sorbent composition, duration of sampling, and other factors. Water content of the sample can be further reduced by dry purging the concentrator with helium while retaining target compounds.

After the concentration and drying steps are completed, the VOC are thermally desorbed, entrained in a carrier gas stream, and then focused in a small volume by trapping on a reduced temperature trap or small volume multi-sorbent trap. The sample is then released by thermal desorption and carried onto a gas chromatographic column for separation.

Analysis involves using a high-resolution gas chromatograph (GC) coupled to a mass spectrometer, operated either by continuously scanning a wide range of mass to charge ratios (SCAN mode) or by monitoring select ion monitoring mode (SIM) of compounds on the target list. Mass spectra for individual peaks in the total chromatogram are examined with respect to the fragmentation pattern corresponding to various VOC. The fragmentation pattern is compared with stored spectra taken under similar conditions in order to identify the compound. For any given compound, the intensity of the primary fragment is compared with the system response to the primary fragment for known amounts of the compound. This establishes the compound concentration that exists in the sample.

Figure 4-2 EPA Method TO-15 Sampling Train



5.0 QUALITY ASSURANCE

Quality Assurance (QA) and Quality Control (QC) guidelines are provided by the United States Environmental Protection Agency (US EPA) to ensure the sampling program activities and analyses are performed in a manner to achieve quality/accurate data. The QA/QC guideline summary presented in this section is detailed in the *Quality Assurance Handbook for Air Pollution Measurement Systems*, Volume III (EPA-600/4-7-027b). Detailed QA/QC procedures are found in each test method utilized in the specific test program.

5.1 Sampling Quality Assurance

Implementation of quality assurance procedures for source measurement programs is designed so that the work is done:

- By competent, trained individuals experienced in the specific methodologies being used.
- Using properly calibrated equipment.
- Using approved procedures for sample handling and documentation.

Measurement devices, pitot tubes, dry gas meters, thermocouples, etc. are uniquely identified and calibrated with documented procedures and acceptance criteria before and after each field effort. Records of all calibration data are maintained on file at APCC.

Data are recorded on standard field forms. Bound field notebooks are used to record observations and miscellaneous elements affecting data, calculations, or evaluation.

Prior to the performance of test programs, APCC provides the following:

- Calibrations of all probes, pitot tubes, dry gas meters, orifice meters, sampling nozzles, and thermocouples, etc. which will be used during the test program. All calibrations are performed within six months prior to the test date.

5.2 PFAS Sampling

Method specific QA/QC procedures for PFAS sampling and analyses are presented in Section 4 above.

5.3 Data Reduction and Reporting

The Project Engineer develops a data reduction system to conform to the collection of field data to be reduced and quantitative results for the final report. The methods for data reduction are specified and presented to the Program Manager before the field effort. Raw data are recorded on field data sheets presented in the Appendix of the final report, bound laboratory books, and data logger strip charts. Parts of the data capture are checked manually or with QC check programs.

5.4 Data Validation

Validation of data is performed by the Quality Assurance Manager against the QA/QC criteria of the specific methods. The data are assessed to the quality and accuracy as required to meet the objectives of the sampling program. Hand calculations are performed with raw data separate from the reported calculations and results. All documentation is checked for correctness, completeness and verified as checked. A data assessment of sampling results is also performed during scheduled time periods to ensure quality data is collected and processed. Corrective action is implemented if warranted.

APPENDIX

Sample Calculations

1.Duct Velocity (FPM)

$$Vs = 5129.4 \times Cp \times SQRT\Delta P \text{ avg.} \times SQRT(Ts / (Ps \times Mw)) \qquad (\Delta P \times \cos \text{Ø if applic.})$$

2.Duct Volumetric Flowrate (ACFM)

$$Qa = Vs \times As$$

3.Duct Volumetric Flowrate (DSCFM)

$$Qstd = Qa \times \frac{528}{(Ts + 460)} \times \frac{Ps}{29.92} \times [1 - (\%H_2O/100)]$$

4.Meter Volume corrected to Standard Conditions (DSCF)

$$Vm(std) = Vm \times \gamma \times \frac{528}{(Tm+460)} \times \frac{Pb + (\Delta H / 13.6)}{29.92}$$

5.Moisture Content of Stack Gas

$$\%H_2O = \frac{.04707\ (Vi + Vsg)}{Vm(std) + .04707\ (Vi + Vsg)}$$

6.Isokinetic Factor

$$\% \text{ Iso} = \frac{5.67\ (Ts +460)\ (Vm\ std)}{(Pb + (Ps/13.6)\ Vs\ T\ (1 - (\%H20) / 100)\ ((Dn^2 \times 0.7854) / 144)}$$

7.Module Sampling Rate

$$\Delta H = \Delta P \left[\frac{846.72\ D_n\ \Delta H\ @\ C_p\ (1-\%H_2O)^2\ Md\ Tm\ Ps}{Ms\ Ts\ Pb}\right]$$

8.Stack Concentration

$$ppm = \frac{mg}{m^3} * \frac{24.06}{Mw}$$

$$ppm = \frac{Lbs/DSCF * (385.1 * 10^6}{Mw}$$

9. Pollutant Emission Rate

$$Lbs/hr = ppm * SCFM * Mw * (15.58*10^{-8})$$

Lbs/hr = $\frac{\text{Lbs}}{\text{DSCF}}$ * DSCFM * 60

Lbs/DSCF = $\frac{\text{ppm* Mw}}{385.1 * 10^6}$

Lbs/MMBtu = Lb/DSCF * F_d * $\frac{20.9}{20.9 - O_2}$

10. Relative Accuracy Determination

$$S_d = \left[\frac{\sum_{i=1}^{n} d_i^2 - \frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}}{n-1} \right]^{1/2}$$

$$CC = t_{0.975} \frac{S_d}{\sqrt{n}}$$

$$RA = \frac{\left|\overline{d}\right| + \left|CC\right|}{\overline{RM}} \times 100$$

Where:

Cp = Pitot Coefficient, (0.84 S-Type, 0.99 Standard)
Ts = Stack Temp. (°F)
As = Stack Area, (sq. ft.)
Y = Module Calibration Factor
Vi = Volume H_2O Impingers, (ml.)
Vsg = Volume H_2O Silica Gel
T = Time, (minutes)
Dn = Nozzle Diameter, (inches)
Vm = Meter Volume, (cubic feet)
Mw = Molecular Weight of Stack Gas, (lb /lb mole)
Pb = Barometric Pressure, (in. Hg)
DSCF = Dry Standard Cubic Feet
mg = Milligrams
F_d = Fuel Factor (O_2 Dry)
Ps = Absolute Pressure in Stack (Pb + (P_{static} / 13.6))
n = Number of Data Points
$t_{0.975}$ = t-value from Table 2-1, 40 CFR 60 App. B, Spec. 2
|d| = Absolute Value of Mean of Difference Between CEMS and IRM System
|CC| = Absolute Value of Confidence Coefficient
RM = Reference Method Value
RA = Relative Accuracy of CEMS

Appendix A
Data Summaries

APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

PFAS Test Data Worksheet

Inlet

CLIENT:	Taconic					
SOURCE/LOCATION:	FE 5					
PROJECT NUMBER:	16036					
TEST NUMBER:			1	2	3	**AVERAGE**
DATE:			07-Dec-16			
TIME :			0756-0957	1100-1300	1401-1601	
SOOT BLOW:						
APPROXIMATE LOAD:						
PARTICULATE EMISSION LIMIT:						
TEST DATA INPUT	**SYMBOL**	**UNITS**				
Barometric Pressure	Pbar	in. Hg	29.12	29.12	29.12	
Stack Area	A	ft2	8.72	8.72	8.72	
Nozzle Diameter (in.)	Dn	in.	0.250	0.250	0.250	
Total Sampling Time	Ø	min.	120	120	120	
Calibration Factor	Y	-	1.08	1.08	1.08	
Pitot Coefficient	Cp	-	0.84	0.84	0.84	
Average Square Root of Velocity Head	√ΔPavg	in. H2O	0.701	0.698	0.661	
Average Orifice Pressure Drop	ΔH	in. H2O	1.48	1.47	1.31	
Average Meter Temperature	Tm	°F	62	70	70	
Average Stack Pressure	Pg	in. H2O	-3.5	-3.5	-3.5	
Average Stack Temperature	Ts	°F	289	288	287	
Meter Volume @ Meter Conditions	Vm	ft3	73.18	74.02	70.42	
Total Water Collected	Vlc	ml	25.0	35.0	51.0	
CO2 in Stack Gas	CO2	%	0.1	0.1	0.1	
O2 in Stack Gas	O2	%	20.9	20.9	20.9	
CO in Stack Gas	CO	%				
PFAS Catch		mg				
CALCULATED VALUES						
Meter Volume	Vmstd	dscf	78.10	77.80	73.98	76.63
		dscm	2.21	2.20	2.09	2.17
Water Vapor in Stack Gas	Bws	%	1.48	2.07	3.14	2.23
Molecular Weight of Stack Gas (dry)	Md	g/g-mole	28.85	28.85	28.85	28.85
Molecular Weight of Stack Gas (wet)	Ms	g/g-mole	28.69	28.63	28.51	28.61
Average Velocity of Stack Gas	Vs	ft/min	2,873	2,862	2,714	2,816
Actual Stack Gas Flowrate	Q	acf/min	25,055	24,959	23,668	24,561
Stack Gas Flowrate	Qsd	dscf/min	16,785	16,643	15,631	16,353
Isokinetics	I	%	99.3	99.7	101.0	-

PFAS Test Data Worksheet

Outlet

CLIENT:	Taconic					
SOURCE/LOCATION:	FE 5					
PROJECT NUMBER:	16036					
TEST NUMBER:			1	2	3	**AVERAGE**
DATE:				07-Dec-16		
TIME :			0756-1000	1100-1305	1401-1601	
SOOT BLOW:						
APPROXIMATE LOAD:						
PARTICULATE EMISSION LIMIT:						
TEST DATA INPUT	**SYMBOL**	**UNITS**				
Barometric Pressure	Pbar	in. Hg	29.12	29.12	29.12	
Stack Area	A	ft2	8.29	8.29	8.29	
Nozzle Diameter (in.)	Dn	in.	0.250	0.250	0.250	
Total Sampling Time	Ø	min.	120	120	120	
Calibration Factor	Y	-	0.99	0.99	0.99	
Pitot Coefficient	Cp	-	0.84	0.84	0.84	
Average Square Root of Velocity Head	√ΔPavg	in. H2O	0.753	0.769	0.739	
Average Orifice Pressure Drop	ΔH	in. H2O	1.91	1.99	1.87	
Average Meter Temperature	Tm	°F	46	48	48	
Average Stack Pressure	Pg	in. H2O	-0.01	-0.08	-0.1	
Average Stack Temperature	Ts	°F	102	102	101	
Meter Volume @ Meter Conditions	Vm	ft3	93.04	94.56	92.05	
Total Water Collected	Vlc	ml	149.0	159.0	109.0	
CO2 in Stack Gas	CO2	%	0.1	0.1	0.1	
O2 in Stack Gas	O2	%	20.9	20.9	20.9	
CO in Stack Gas	CO	%				
PFAS Catch		mg				
CALCULATED VALUES						
Meter Volume	Vmstd	dscf	94.00	95.17	92.62	93.93
		dscm	2.66	2.69	2.62	2.66
Water Vapor in Stack Gas	Bws	%	6.94	7.29	5.25	6.49
Molecular Weight of Stack Gas (dry)	Md	g/g-mole	28.85	28.85	28.85	28.85
Molecular Weight of Stack Gas (wet)	Ms	g/g-mole	28.10	28.06	28.28	28.15
Average Velocity of Stack Gas	Vs	ft/min	2,689	2,748	2,628	2,688
Actual Stack Gas Flowrate	Q	acf/min	22,295	22,786	21,793	22,291
Stack Gas Flowrate	Qsd	dscf/min	18,970	19,313	18,910	19,064
Isokinetics	I	%	100.5	99.9	99.3	-

ALS-Kelso
PFAS Analytical Data Summary
Taconic - Petersburgh, NY
Dec-16

Test No.	I-B					O-B					I-1					O-1				
Sample Fraction	1	2	3	4	total	1	2	3	4	total	1	2	3	4	total	1	2	3	4	total
Analyte Name	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
Perfluorobutanesulfonate	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	2.07	ND	ND	ND	**2.07**
Perfluorobutanoic Acid	1.30	ND	ND	0.15	**1.45**	4.13	ND	ND	ND	**4.13**	117.25	99.00	28.60	14.70	**259.55**	29.89	7.35	1.54	0.75	**39.53**
Perfluorodecane Sulfonate	0.79	ND	ND	ND	**0.79**	ND	ND	ND	ND	**ND**	ND	ND	0.79	ND	**0.79**	ND	ND	ND	ND	**ND**
Perfluorodecanoic Acid	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	1.54	1.35	0.61	10.80	**14.30**	1.46	2.55	ND	0.81	**4.82**
Perfluorododecanoic Acid	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	0.73	ND	16.50	**17.23**	1.65	ND	ND	0.60	**2.25**
Perfluoroheptane sulfonate	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**
Perfluoroheptanoic Acid	0.44	ND	ND	ND	**0.44**	ND	ND	ND	ND	**ND**	19.25	8.37	1.98	12.30	**41.90**	3.36	6.75	1.26	0.48	**11.85**
Perfluorohexanesulfonate	1.07	0.60	0.65	0.22	**2.54**	0.70	0.80	0.53	0.13	**2.15**	ND	0.56	ND	ND	**0.56**	ND	ND	0.97	0.13	**1.10**
Perfluorohexanoic Acid	1.43	2.00	1.20	ND	**4.63**	1.15	1.37	1.10	0.37	**3.99**	35.00	17.10	4.51	12.00	**68.61**	10.98	7.20	2.24	0.63	**21.05**
Perfluorononanoic acid	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	5.25	5.13	1.07	27.60	**39.05**	ND	25.50	3.64	7.20	**36.34**
Perfluoro-n-tetradecanoic acid	ND	ND	ND	ND	**ND**	ND	ND	ND	0.2046	**0.2046**	ND	ND	ND	5.4	**5.4**	ND	ND	ND	ND	**ND**
Perfluoro-n-tridecanoic acid	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	16.2	**16.2**	ND	ND	ND	1.41	**1.41**
Perfluorooctanesulfonate	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**
Perfluorooctanoic Acid	1.183	0.46	0.38	0.1496	**2.1726**	0.875	0.5145	0.517	0.165	**2.0715**	26.25	14.4	4.29	280	**324.94**	24.095	15	5.6	5.7	**50.395**
Perfluorooctylsulfonamide	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**
Perfluoropentanoic Acid	ND	0.4	ND	ND	**0.4**	ND	ND	ND	ND	**ND**	52.5	32.4	9.02	20.7	**114.62**	14.03	9.6	ND	0.18	**23.81**
Perfluoroundecanoic Acid	1.027	0.67	0.62	0.187	**2.504**	0.8	0.7455	0.836	0.2134	**2.5949**	1.2775	2.25	1.034	25.8	**30.3615**	2.196	11.4	2.38	5.1	**21.076**
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	1.4875	7.02	1.54	ND	**10.0475**	ND	ND	ND	ND	**ND**
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	ND	ND	ND	0.238	**0.238**	ND	ND	ND	0.308	**0.308**	ND	9.9	ND	ND	**9.9**	ND	ND	ND	2.49	**2.49**
6:2 Fluorotelomer sulfonate	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	2.1	1.44	ND	3.6	**7.14**	ND	1.395	ND	ND	**1.395**
8:2 Fluorotelomer sulfonate	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**
N-ethylperfluoro-1-octanesulfonamide	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	10.065	ND	ND	ND	**10.065**
N-methylperfluoro-1-octanesulfonamide	0.845	ND	ND	0.867	**1.712**	3.25	ND	0.682	0.143	**4.075**	4.025	1.8	1.32	ND	**7.145**	5.49	ND	ND	ND	**5.49**
Hexafluoropropylene Oxide Dimer Acid	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	280	135	96.8	360	**871.8**	ND	ND	ND	ND	**ND**

ALS-Kelso
PFAS Analytical Data Summary
Taconic - Petersburgh, NY
Dec-16

Test No.	I-2					O-2					I-3					O-3					Estimated
Sample Fraction	1	2	3	4	total	1	2	3	4	total	1	2	3	4	total	1	2	3	4	total	Total Train RL
Analyte Name	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng
Perfluorobutanesulfonate	ND	ND	0.85	ND	**0.85**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	20
Perfluorobutanoic Acid	67.20	108.90	22.00	13.30	**211.40**	15.90	4.93	3.24	ND	**24.07**	57.00	62.70	17.60	ND	**137.30**	25.50	4.21	2.57	1.60	**33.87**	20
Perfluorodecane Sulfonate	ND	ND	ND	ND	**ND**	ND	1.12	ND	ND	**1.12**	ND	0.66	ND	ND	**0.66**	ND	ND	ND	ND	**ND**	20
Perfluorodecanoic Acid	1.18	1.21	1.06	10.85	**14.30**	ND	ND	1.56	0.66	**2.22**	1.37	0.75	ND	7.20	**9.32**	ND	ND	2.97	0.80	**3.77**	20
Perfluorododecanoic Acid	ND	0.83	0.63	17.85	**19.30**	ND	ND	ND	0.52	**0.52**	ND	ND	ND	10.80	**10.80**	ND	ND	ND	0.47	**0.47**	20
Perfluoroheptane sulfonate	2.88	ND	0.90	ND	**3.78**	ND	1.28	1.07	ND	**2.34**	2.66	0.79	0.76	ND	**4.21**	ND	1.04	ND	ND	**1.04**	20
Perfluoroheptanoic Acid	15.36	6.49	1.98	8.40	**32.23**	1.83	0.87	6.00	0.18	**8.88**	11.40	4.84	1.98	5.20	**23.42**	1.89	0.77	3.24	0.55	**6.45**	20
Perfluorohexanesulfonate	ND	ND	ND	ND	**ND**	ND	0.97	1.10	ND	**2.08**	3.42	0.61	1.10	ND	**5.13**	2.19	0.91	0.54	0.41	**4.05**	20
Perfluorohexanoic Acid	22.40	17.60	5.83	8.05	**53.88**	10.50	2.18	4.56	0.54	**17.78**	18.05	12.10	3.52	5.20	**38.87**	5.40	1.60	3.38	1.45	**11.82**	20
Perfluorononanoic acid	5.44	10.34	0.79	27.65	**44.22**	ND	0.88	39.60	5.00	**45.48**	7.60	3.30	0.69	12.80	**24.39**	ND	1.74	31.05	6.50	**39.29**	20
Perfluoro-n-tetradecanoic acid	0.992	ND	ND	13.3	**14.292**	ND	ND	ND	0.32	**0.32**	ND	ND	ND	7.6	**7.6**	ND	ND	ND	ND	**ND**	20
Perfluoro-n-tridecanoic acid	0.816	0.924	1.43	32.55	**35.72**	ND	ND	ND	1.18	**1.18**	1.235	0.286	ND	19.6	**21.121**	ND	ND	ND	1.5	**1.5**	20
Perfluorooctanesulfonate	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	0.32	**0.32**	20
Perfluorooctanoic Acid	35.2	14.3	7.15	91	**147.65**	30	10.005	13.2	3	**56.205**	45.6	9.46	4.18	96	**155.24**	22.2	7.25	7.29	4.75	**41.49**	10
Perfluorooctylsulfonamide	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	20
Perfluoropentanoic Acid	43.2	38.5	10.67	14.7	**107.07**	3.6	0.754	5.04	0.24	**9.634**	24.7	19.8	4.84	6.4	**55.74**	7.8	ND	1.35	0.39	**9.54**	20
Perfluoroundecanoic Acid	1.76	2.31	1.21	31.85	**37.13**	3.3	1.392	6.72	4.6	**16.012**	1.9	1.54	0.979	16.8	**21.219**	2.76	1.2905	12.42	6	**22.4705**	20
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	4.8	4.4	3.41	ND	**12.61**	ND	1.595	ND	0.54	**2.135**	ND	5.28	1.65	ND	**6.93**	ND	1.2325	1.0125	0.95	**3.195**	20
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	2.72	ND	3.08	ND	**5.8**	ND	ND	ND	2.8	**2.8**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	20
6:2 Fluorotelomer sulfonate	22.4	3.96	ND	ND	**26.36**	ND	1.1455	0.96	ND	**2.1055**	5.7	0.88	ND	ND	**6.58**	ND	1.3485	1.35	ND	**2.6985**	20
8:2 Fluorotelomer sulfonate	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	20
N-ethylperfluoro-1-octanesulfonamide	5.76	ND	ND	ND	**5.76**	ND	ND	ND	ND	**ND**	ND	ND	ND	ND	**ND**	ND	ND	1.89	ND	**1.89**	20
N-methylperfluoro-1-octanesulfonamide	2.4	ND	2.42	ND	**4.82**	6.6	0.841	1.092	ND	**8.533**	1.577	1.98	ND	ND	**3.557**	5.4	1.595	1.89	0.34	**9.225**	20
Hexafluoropropylene Oxide Dimer Acid	256	100.1	55	171.5	**582.6**	ND	ND	ND	ND	**ND**	95	28.6	16.5	38.4	**178.5**	ND	ND	ND	ND	**ND**	20

APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

Maxxam Job Number: B6Q9629
Report Date: 2017/01/04

APCC Ltd
Client Project #: 16036
Site Location: TACONIC

VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		DPL929			DPL930	DPL930		DPL931			DPL932		
Sampling Date		07-12-16			07-12-16	07-12-16		07-12-16			07-12-16		
COC Number		na			na	na		na			na		
	UNITS	**TEST 1**	**RDL**	**QC Batch**	**TEST 2**	**TEST 2 Lab-Dup**	**RDL**	**TEST 3**	**RDL**	**QC Batch**	**AMBIENT**	**RDL**	**QC Batch**
Dichlorodifluoromethane (FREON 12)	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	0.56	0.40	4795923
1,2-Dichlorotetrafluoroethane	ppbv	<0.85	0.85	4791982	<1.9	<1.9	1.9	<5.0	5.0	4809275	<0.34	0.34	4795923
Chloromethane	ppbv	<1.5	1.5	4791982	14.4	15.1	3.3	<8.8	8.8	4809275	<0.60	0.60	4795923
Vinyl Chloride	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Chloroethane	ppbv	<1.5	1.5	4791982	<3.3	<3.3	3.3	<8.8	8.8	4809275	<0.60	0.60	4795923
1,3-Butadiene	ppbv	2.8	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275	<1.0	1.0	4795923
Trichlorofluoromethane (FREON 11)	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Ethanol (ethyl alcohol)	ppbv	259	5.0	4791982	739	771	11	1230	29	4809275	<2.0	2.0	4795923
Trichlorotrifluoroethane	ppbv	<0.75	0.75	4791982	<1.7	<1.7	1.7	<4.4	4.4	4809275	<0.30	0.30	4795923
2-propanol	ppbv	568	5.0	4791982	1340	1390	11	527	29	4809275	<2.0	2.0	4795923
2-Propanone	ppbv	2280	14	4791982	4630	4780	35	3710	23	4809275	10.6	1.6	4795923
Methyl Ethyl Ketone (2-Butanone)	ppbv	194	5.0	4791982	298	309	11	158	29	4809275	<2.0	2.0	4795923
Methyl Isobutyl Ketone	ppbv	219	5.0	4791982	262	275	11	108	29	4809275	<2.0	2.0	4795923
Methyl Butyl Ketone (2-Hexanone)	ppbv	7.9	5.0	4791982	12	12	11	<29	29	4809275	<2.0	2.0	4795923
Methyl t-butyl ether (MTBE)	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Ethyl Acetate	ppbv	<5.0	5.0	4791982	<11	<11	11	<29	29	4809275	<2.0	2.0	4795923
1,1-Dichloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
cis-1,2-Dichloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	0.32	0.20	4795923
trans-1,2-Dichloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Methylene Chloride(Dichloromethane)	ppbv	<4.0	4.0	4791982	<8.8	<8.8	8.8	<23	23	4809275	<1.6	1.6	4795923
Chloroform	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Carbon Tetrachloride	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
1,1-Dichloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
1,2-Dichloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Ethylene Dibromide	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
1,1,1-Trichloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
1,1,2-Trichloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
1,1,2,2-Tetrachloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
cis-1,3-Dichloropropene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
trans-1,3-Dichloropropene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
1,2-Dichloropropane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Bromomethane	ppbv	<0.50	0.50	4791982	2.6	2.8	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Bromoform	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Bromodichloromethane	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Dibromochloromethane	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Trichloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Tetrachloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	1.66	0.20	4795923
Benzene	ppbv	2.54	0.50	4791982	5.2	5.7	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Toluene	ppbv	1.29	0.50	4791982	1.6	1.8	1.1	168	2.9	4809275	<0.20	0.20	4795923
Ethylbenzene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
p+m-Xylene	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	6.2	5.9	4809275	<0.40	0.40	4795923
o-Xylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Styrene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
4-ethyltoluene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275	<1.0	1.0	4795923
1,3,5-Trimethylbenzene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275	<1.0	1.0	4795923
1,2,4-Trimethylbenzene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275	<1.0	1.0	4795923
Chlorobenzene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Benzyl chloride	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275	<1.0	1.0	4795923
1,3-Dichlorobenzene	ppbv	<2.0	2.0	4791982	<4.4	<4.4	4.4	<12	12	4809275	<0.80	0.80	4795923
1,4-Dichlorobenzene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
1,2-Dichlorobenzene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
1,2,4-Trichlorobenzene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275	<1.0	1.0	4795923
Hexachlorobutadiene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275	<1.0	1.0	4795923
Hexane	ppbv	<22	22	4791982	<7.5	<7.5	7.5	<8.8	8.8	4809275	<0.60	0.60	4795923
Heptane	ppbv	<1.5	1.5	4791982	<3.3	<3.3	3.3	<8.8	8.8	4809275	<0.60	0.60	4795923
Cyclohexane	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Tetrahydrofuran	ppbv	<2.0	2.0	4791982	6.0	5.7	4.4	<12	12	4809275	<0.80	0.80	4795923
1,4-Dioxane	ppbv	12.0	5.0	4791982	87	93	11	78	29	4809275	<2.0	2.0	4795923
Naphthalene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275	<1.0	1.0	4795923
Total Xylenes	ppbv	<1.5	1.5	4791982	<3.3	<3.3	3.3	<8.8	8.8	4809275	<0.60	0.60	4795923
1,1,1,2-Tetrachloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275	<0.20	0.20	4795923
Vinyl Bromide	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Propene	ppbv	833	2.5	4791982	704	716	5.5	158	15	4809275	2.5	1.0	4795923
2,2,4-Trimethylpentane	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Carbon Disulfide	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	24	15	4809275	<1.0	1.0	4795923
Vinyl Acetate	ppbv	10.4	1.0	4791982	7.9	8.4	2.2	<5.9	5.9	4809275	<0.40	0.40	4795923
Surrogate Recovery (%)													
Bromochloromethane	%	77	N/A	4791982	81	82	N/A	87	N/A	4809275	91	N/A	4795923
D5-Chlorobenzene	%	63	N/A	4791982	76	75	N/A	83	N/A	4809275	86	N/A	4795923
Difluorobenzene	%	74	N/A	4791982	78	79	N/A	85	N/A	4809275	88	N/A	4795923

Appendix B
Field Data

CRITICAL ORIFICE METHOD 5 MODULE CALIBRATION

PUMP NUMBE 2 MODULE NUMBER : M-81 TECHNICIAN: DES

ROMETRIC PRESSURE: 30.03 DATE: 10/10/2016 STANDARD METER DGM-115 PRE-CAL. POST-CAL FOR

MODULE			ORIFICE		MODULE METER									CALIBRATIONS			
PUMP VACUUM (in. Hg)	ΔH SETTING in. H2O	TEMP. Tamb (°F)	NUMBER	K'	VOLUME Vmi (cubic ft.)	VOLUME Vmf (cubic ft.)	VOLUME Vm (cubic ft.)	TEMP. Tmi (°F)	TEMP. Tmf (°F)	TEMP. Tm (°F)	TIME t (min)	Vm (std)	Vcr (std)	Y	Y % ave.	ΔH@	ΔH@ % ave.
			AC47	0.3146													
16	1.10	62	AC 55	0.4378	113.60	116.29	2.69	62	62	62	5.00	2.74	2.88	1.05	0%	1.91	-6%
16	1.85	62	AC 63	0.5633	116.50	119.95	3.45	62	63	63	5.00	3.51	3.70	1.05	0%	1.94	-4%
16	3.85	60	AC 73	0.7647	104.00	108.64	4.64	60	61	61	5.00	4.77	5.04	1.06	0%	2.22	10%
			AC 81	0.9468													
														1.05	**0.00**	**2.02**	**0.00**

***NOTE**: Each orifice has a pre-calibrated critical vacuum of 14" Hg, set module vacuum at 1" to 2" above critical vacuum.

***NOTE**: Need to record Data in the Dark Gray Boxes, this data is taken off of the module during the Calibration

$$Vcr(std) = \frac{(K')*Pbar*t}{sqrt(Tamb)}$$

$$Vm(std) = \frac{17.64*Vm*(Pbar + \Delta H/13.6)}{(Tm + 460)}$$

$$Y = \frac{Vcr(std)}{Vm(std)}$$

$$\Delta H@ = \frac{0.0319*\Delta H*(Tm + 460)*(t^2)}{Pbar*(Y*Vm)^2}$$

Module Leak Check: X Probe Heat Control: X *T.C. Readout calibrated with: Hot / Cold Bath* X

Pitot Leak Check: X Heater Box Control: X Constant Voltage Source

CRITICAL ORIFICE METHOD 5 MODULE CALIBRATION

PUMP NUMBER: 3 **MODULE NUMBER :** M-98 **TECHNICIAN:** DES

BAROMETRIC PRESSURE: 30.03 **DATE:** 10/10/2016 **STANDARD METER** DGM-115 **PRE-CAL.** **POST-CAL FOR**

MODULE			ORIFICE		MODULE METER									CALIBRATIONS			
PUMP VACUUM (in. Hg)	ΔH SETTING (in. H2O)	TEMP. Tamb (°F)	NUMBER	K'	VOLUME Vmi (cubic ft.)	VOLUME Vmf (cubic ft.)	VOLUME Vm (cubic ft.)	TEMP. Tmi (°F)	TEMP. Tmf (°F)	TEMP. Tm (°F)	TIME t (min)	Vm (std)	Vcr (std)	Y	Y % ave.	ΔH@	ΔH@ % ave.
			AC47	0.3146													
16	1.05	61	AC 55	0.4378	558.70	561.55	2.85	61	61	61	5.00	2.91	2.88	0.99	0%	1.82	1%
16	1.70	60	AC 63	0.5633	562.00	565.64	3.64	60	60	60	5.00	3.72	3.71	1.00	0%	1.79	-1%
16	3.15	61	AC 73	0.7647	566.30	571.24	4.94	61	62	62	5.00	5.06	5.03	0.99	0%	1.81	0%
			AC 81	0.9468													
														0.99	**0.00**	**1.80**	**0.00**

***NOTE**: Each orifice has a pre-calibrated critical vacuum of 14" Hg, set module vacuum at 1" to 2" above critical vacuum.

***NOTE**: Need to record Data in the Dark Gray Boxes, this data is taken off of the module during the Calibration

$$Vcr(std) = \frac{(K')*Pbar*t}{\sqrt{Tamb}} \qquad Vm(std) = \frac{17.64*Vm*(Pbar + \Delta H/13.6)}{(Tm + 460)}$$

$$Y = \frac{Vcr(std)}{Vm(std)} \qquad \Delta H@ = \frac{0.0319*\Delta H*(Tm + 460)*(t^2)}{Pbar*(Y*Vm)^2}$$

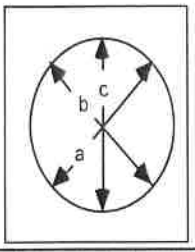
Module Leak Check: X
Pitot Leak Check: X
Probe Heat Control: X
Heater Box Control: X
T.C. Readout calibrated with: Hot / Cold Bath X
Constant Voltage Source

APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

Nozzle Calibration Worksheet

zzle Set Number **Glass Nozzles** Tech Specialist **BTS**

Date Calibrated **3/18/2015**



Nozzle Number	Diameter*	a	b	c	Average**
G85	0.250	0.255	0.253	0.256	0.255
G86	0.250	0.255	0.253	0.257	0.255
G87	0.250	0.248	0.250	0.247	0.248
G88	0.250	0.249	0.250	0.251	0.250
G89	0.250	0.248	0.250	0.249	0.249
G90	0.312	0.313	0.314	0.313	0.313
G91	0.312	0.310	0.311	0.309	0.310
G92	0.312	0.313	0.314	0.315	0.314
G93	0.312	0.315	0.316	0.315	0.315
G94	0.312	0.314	0.315	0.315	0.315

*NOTE: Measure to the nearest 0.001".

**NOTE: The three measurements must be within 0.004" of each other.

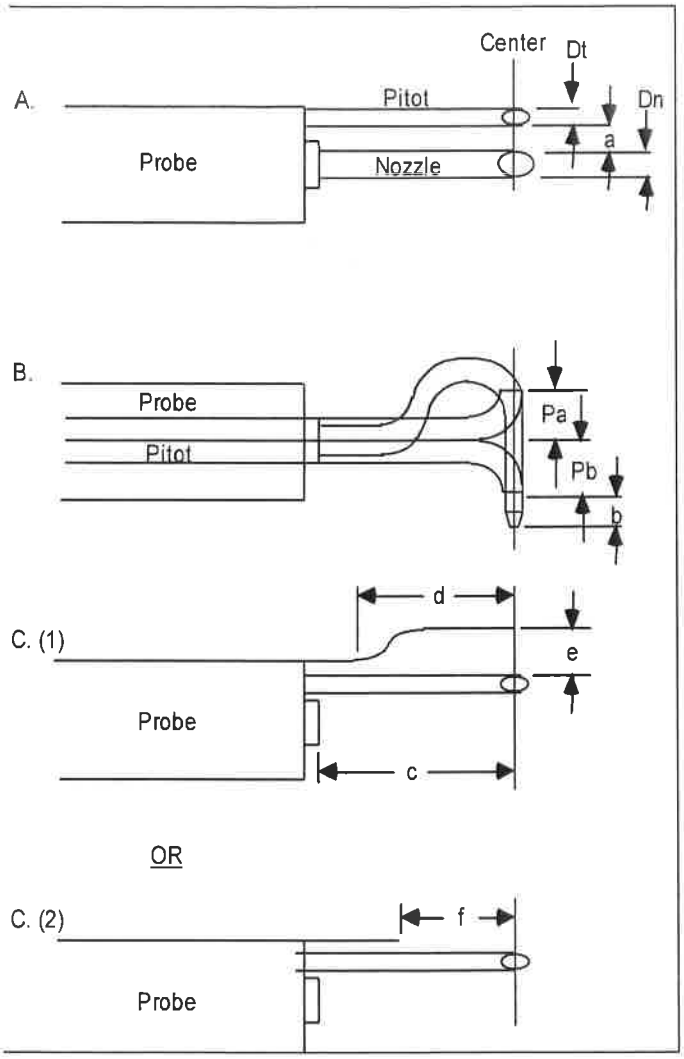
APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

S-Type Pitot Tube Geometric Calibration
Part 1 - Probe Configuration

Probe Identification 401 Pitot Identification 401

Technical Specialist TJC

Date 1/15/16



Dt 0.376
Dn 0.536
a 0.822

Pa 0.550
Pb 0.550
b 0.638

c 3.721
d 4.628
e 2.706

OR

c _____
f _____

Specifications (EPA Method 2)

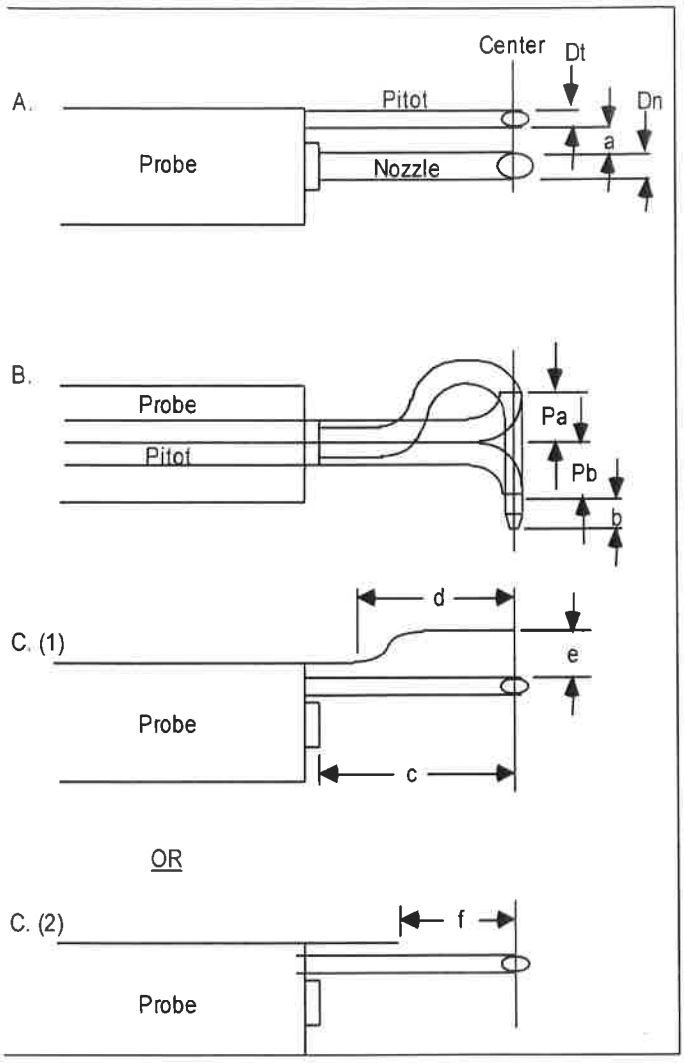
Dt = 3/16" to 3/8"	c≥ 3"	Pa = Pb
Dn = 1/2"	d≥ 3"	
a≥ 3/4"	e≥ 3/4"	1.05 Dt ≤ P ≤ 1.50 Dt
b≥ 0	f≥ 2"	

If these specifications are met, proceed with Part 2, Pitot alignment.

APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

S-Type Pitot Tube Geometric Calibration
Part 1 - Probe Configuration

Probe Identification 402 Pitot Identification 402
Technical Specialist TJC
Date 1/25/16



Dt	0.371
Dn	0.499
a	1.021
Pa	0.505
Pb	0.505
b	0.650
c	3.370
d	3.537
e	1.844

OR

c	
f	

Specifications (EPA Method 2)

Dt = 3/16" to 3/8"	c≥ 3"	Pa = Pb
Dn = 1/2"	d≥ 3"	
a≥ 3/4"	e≥ 3/4"	1.05 Dt ≤ P ≤ 1.50 Dt
b≥ 0	f≥ 2"	

If these specifications are met, proceed with Part 2, Pitot alignment.

Appendix C
Analytical Data

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

January 31, 2017

Analytical Report for Service Request No: K1614856
Revised Service Request No: K1614856.01

Ron McLeod
ALS Environmental - Canada
1435 Norjohn Court #1
Burlington, ON L7L 0E6

RE: APCC Stack Testing 2016 / L1868106

Dear Ron,

Enclosed are the results of the sample(s) submitted to our laboratory December 08, 2016
For your reference, these analyses have been assigned our service request number **K1614856.**

This report is revised to include Total ng reporting for each sample.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3356. You may also contact me via email at Kurt.Clarkson@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kurt Clarkson
Client Services
Manager

REVISED
3:54 pm, Jan 31, 2017

ALS Environmental
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Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	ALS Environmental Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016	**Date Received:**	12/8/16
Sample Matrix:	Liquid		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Thirty two liquid samples were received for analysis at ALS Environmental on 12/8/16. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

Calibration Verification Exceptions:
The upper control criterion was exceeded for Perfluoro-n-tetradecanoic acid and Perfluoro-n-tridecanoic acid in Continuing Calibration Verification (CCV) 122116_185, 122116_209 and 122116_221. The associated field samples analyzed in this sequence did not contain the analytes in question above the method reporting limit (MRL) or were reanalyzed. Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.
The upper control criterion was exceeded for Perfluoro-n-tetradecanoic acid in Continuing Calibration Verification (CCV) 122116_197. The associated field samples analyzed in this sequence did not contain the analyte in question above the method reporting limit (MRL). Since the apparent problem indicated a potential high bias, the data quality was not affected. No further corrective action was required.

The control criteria were exceeded for Perfluoro-n-[1,2-13C2]dodecanoic acid, Perfluoro-n-[1,2-13C2]undecanoic acid, S_N-ethyl-d5-perfluoro-1-octanesulfonamide in Continuing Calibration Verification (CCV) 122116_221.D. The associated native analytes were in control, indicating the analysis was in control. No further corrective action was taken.

Surrogate Exceptions:
The upper control criterion was exceeded for several surrogates in multiple samples due to suspected matrix interferences. The associated analytes against this isotope were quantitated using the instrument internal standard, due to the enhancement on the isotope. No further corrective action was appropriate.

The control criterion was exceeded for one or more surrogates in several sample. The analytes in question were not detected in the associated field samples. Assuming the native analyte performed similar to the labeled analog, the effects on the reported results are minimal. No further corrective action was taken.

Approved by Kent Claussen

Lab Control Sample Exceptions:
The lower control criterion was exceeded in the Laboratory Control Sample (LCS) KWG1611166-1, KWG1611167-1, and Duplicate Laboratory Control Sample (DLCS) KWG1611167-2, KWG1611167-2 for a few analytes. The error associated with reduced recovery equates to a potential slight low bias. The results were flagged to indicate the issue. No further corrective action was taken.

Elevated Detection Limits:
The detection limit was elevated for all analytes in a few samples due to the presence of non-target background components. The matrix interference prevented adequate quantitation of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

Sample Notes and Discussion:
Samples I-2-1, I-2-2, and I-3-1 were quanititated by the instrument internal standard for 6:2 Fluorotelomer sulfonate, and 8:2 Fluorotelomer sulfonate due to high recovery of the associated isotope.

Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

No other anomalies associated with the analysis of these samples were observed.

Approved by 

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

PFAS Analyses
Modified M- 537

SAMPLE CHAIN OF CUSTODY

Non-HazMat

Project:	16036 Taconic	Lab:	ALS Env Kelso, WA by Fed Ex Attn:	Report to: John Powell 93 Breezemere Rd Brooksville, ME 04617
Date:	12/7/2016		Kurt Clarkson 360 501 3356	207 326 9556

Sample #	ID	Description	Analyses: PFAS / Mod M-537
1	I-B-1	Imp 1 - DI H2O	Perfluorobutanoic Acid - PFBA
2	I-B-2	Imp 2 - NaOH	Perfluoroheptanoic acid - PFHpA
3	I-B-3	Imp 3 - Na2B4O7	Perfluorooctanoic acid - PFOA
4	I-B-4	Filter & MeOH	Perfluoroundecanoic acid - PFUnA
5	O-B-1	Imp 1 - DI H2O	Perfluorododecanoic acid - PFDoA
6	O-B-2	Imp 2 - NaOH	Perfluoro-n-tridecanoic acid - PFTrDA
7	O-B-3	Imp 3 - Na2B4O7	Perfluoropentanoic acid - PFPeA
8	O-B-4	Filter & MeOH	Perfluorohexanoic acid - PFHxA
9	I-1-1	Imp 1 - DI H2O	Perfluorononanoic acid - PFNA
10	I-1-2	Imp 2 - NaOH	Perfluorodecanoic acid - PFDA
11	I-1-3	Imp 3 - Na2B4O7	Perfluorotetradecanoic acid - PFTeDA
12	I-1-4	Filter & MeOH	2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid
13	O-1-1	Imp 1 - DI H2O	(Undecafluoro-2-methyl-3-oxahexanoic acid) - HFPO-DA
14	O-1-2	Imp 2 - NaOH	Perfluorooctane sulfonate - PFOS
15	O-1-3	Imp 3 - Na2B4O7	
16	O-1-4	Filter & MeOH	
17	I-2-1	Imp 1 - DI H2O	
18	I-2-2	Imp 2 - NaOH	
19	I-2-3	Imp 3 - Na2B4O7	
20	I-2-4	Filter & MeOH	
21	O-2-1	Imp 1 - DI H2O	
22	O-2-2	Imp 2 - NaOH	
23	O-2-3	Imp 3 - Na2B4O7	
24	O-2-4	Filter & MeOH	
25	I-3-1	Imp 1 - DI H2O	
26	I-3-2	Imp 2 - NaOH	
27	I-3-3	Imp 3 - Na2B4O7	
28	I-3-4	Filter & MeOH	
29	O-3-1	Imp 1 - DI H2O	
30	O-3-2	Imp 2 - NaOH	
31	O-3-3	Imp 3 - Na2B4O7	
32	O-3-4	Filter & MeOH	

Sample Nomenclature:
Location - Test # - Sample #
I/O = Inlet/Outlet
B, 1, 2, 3 = Test #
1, 2, 3, 4 = Sample/Container #

	Name	Signature	Date	time
Relinquished By:	J.Powell		12/7/16	1642
Received By:	K. TODD		12/7/16	1642
Relinquished By:				
Received By:	C. Snyder	C. Snyder	12-8-16	09:30
Relinquished By:				
Received By:				

PC_____

Cooler Receipt and Preservation Form

Client APCC Service Request *K16*_____

Received: 12-8-16 Opened: 12-8-16 By: ES Unloaded: 12-8-16 By: ES

1. Samples were received via? *Mail* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where?_____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
3.8	3.7	4.6	4.5	-0.1	366		8574 1445 8247	

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA (Y) N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

*Notes, Discrepancies, & Resolutions:*_____

Page____of____

ALS Environmental

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA
1317 S. 13TH AVE
KELSO,WA 98626

NOTES: Please reference on final report and invoice: PO# *L1868106*
ALS requires QC data to be provided with your final results.

Please see enclosed 32 sample(s) in 32 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1868106-1 I-B-1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-2 I-B-2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-3 I-B-3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-4 I-B-4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-5 O-B-1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-6 O-B-2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-7 O-B-3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-8 O-B-4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-9 I-1-1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-10 I-1-2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA
1317 S. 13TH AVE
KELSO,WA 98626

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1868106-11 I-1-3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-12 I-1-4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-13 O-1-1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-14 O-1-2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-15 O-1-3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-16 O-1-4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-17 I-2-1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-18 I-2-2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-19 I-2-3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-20 I-2-4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-21 O-2-1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-22 O-2-2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA
1317 S. 13TH AVE
KELSO,WA 98626

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1868106-23 O-2-3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-24 O-2-4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-25 I-3-1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-26 I-3-2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-27 I-3-3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-28 I-3-4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-29 O-3-1	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-30 O-3-2	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-31 O-3-3	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	
L1868106-32 O-3-4	Special Request - Kelso (SPECIAL REQUEST-KL 14)	**12/7/2016** 1/5/2017	

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA
1317 S. 13TH AVE
KELSO,WA 98626

Subcontract Info Contact: Ron McLeod (905) 331-3111

Analysis and reporting info contact: Lynne Wrona, M.Sc.
1435 NORJOHN COURT
UNIT 1
BURLINGTON,ON L7L 0E6
Phone: (905) 331-3111 Email: lynne.wrona@alsglobal.com

Please email confirmation of receipt to: lynne.wrona@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: _____ Date Received: _____

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

PFAS Analyses
Modified M- 537

SAMPLE CHAIN OF CUSTODY

Non-HazMat

Project: 16036 Taconic
Date: 12/7/2016

Lab: ALS Env.
Kelso, WA
by Fed Ex
Attn:
Kurt Clarkson
360 501 3356

Report to:
John Powell
93 Breezemere Rd
Brooksville, ME 04617
207 326 9556
jpowell@apccltd.com

Sample #	ID	Description	Analyses: PFAS / Mod M-537
1	I-B-1	Imp 1 - DI H2O	
2	I-B-2	Imp 2 - NaOH	
3	I-B-3	Imp 3 - Na2B4O7	
4	I-B-4	Filter & MeOH	
5	O-B-1	Imp 1 - DI H2O	
6	O-B-2	Imp 2 - NaOH	
7	O-B-3	Imp 3 - Na2B4O7	
8	O-B-4	Filter & MeOH	
9	I-1-1	Imp 1 - DI H2O	
10	I-1-2	Imp 2 - NaOH	
11	I-1-3	Imp 3 - Na2B4O7	
12	I-1-4	Filter & MeOH	
13	O-1-1	Imp 1 - DI H2O	
14	O-1-2	Imp 2 - NaOH	
15	O-1-3	Imp 3 - Na2B4O7	
16	O-1-4	Filter & MeOH	
17	I-2-1	Imp 1 - DI H2O	
18	I-2-2	Imp 2 - NaOH	
19	I-2-3	Imp 3 - Na2B4O7	
20	I-2-4	Filter & MeOH	
21	O-2-1	Imp 1 - DI H2O	
22	O-2-2	Imp 2 - NaOH	
23	O-2-3	Imp 3 - Na2B4O7	
24	O-2-4	Filter & MeOH	
25	I-3-1	Imp 1 - DI H2O	
26	I-3-2	Imp 2 - NaOH	
27	I-3-3	Imp 3 - Na2B4O7	
28	I-3-4	Filter & MeOH	
29	O-3-1	Imp 1 - DI H2O	
30	O-3-2	Imp 2 - NaOH	
31	O-3-3	Imp 3 - Na2B4O7	
32	O-3-4	Filter & MeOH	

Sample Nomenclature:
Location - Test # - Sample #
I/O = Inlet/Outlet
B, 1, 2, 3 = Test #
1, 2, 3, 4 = Sample/Container #

	Name	Signature	Date
Relinquished By:	J.Powell		
Received By:			
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			

Perfluorobutanoic Acid - PFBA
Perfluoropentanoic acid - PFPeA
Perfluorobutane sulfonate - PFBS
Perfluorohexanoic acid - PFHxA
Perfluoroheptanoic acid - PFHpA
Perfluorohexane sulfonate - PFHxS
Perfluorooctanoic acid - PFOA
Perfluorononanoic acid - PFNA
Perfluorooctane sulfonate - PFOS
Perfluorodecanoic acid - PFDA
Perfluoroundecanoic acid - PFUnA
Perfluorodecane sulfonate - PFDS
Perfluorododecanoic acid - PFDoA
Perfluoroheptane sulfonate - PFHpS
Perfluorooctanesulfonamide - FOSA
Methylperfluoro-1-octanesulfonamide - N-MeFOSA
Ethylperfluoro-1-octanesulfonamide - N-EtFOSA
Perfluoro-n-tridecanoic acid - PFTrDA
Perfluorotetradecanoic acid - PFTeDA
2-(N-methylperfluoro-a-octanesulfonamido)-ethanol - N-MeFOSE
2-(N-ethylperfluoro-a-octanesulfonamido)-ethanol - N-EtFOSE
6:2 Fluorotelomersulfonate - 6:2 FTS
8:2 Fluorotelomersulfonate - 8:2 FTS

2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid
(Undecafluoro-2-methyl-3-oxahexanoic acid)

Poly and Perfluorinated Alkyl Substances by HPLCMSMS

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

Client: ALS Environmental - Burlington **Service Request:** K1614856
Project: APCC Stack Testing 2016/L1868106

Cover Page - Organic Analysis Data Package
Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name	Lab Code	Date Collected	Date Received
I-B-1	K1614856-001	12/07/2016	12/08/2016
I-B-2	K1614856-002	12/07/2016	12/08/2016
I-B-3	K1614856-003	12/07/2016	12/08/2016
I-B-4	K1614856-004	12/07/2016	12/08/2016
O-B-1	K1614856-005	12/07/2016	12/08/2016
O-B-2	K1614856-006	12/07/2016	12/08/2016
O-B-3	K1614856-007	12/07/2016	12/08/2016
O-B-4	K1614856-008	12/07/2016	12/08/2016
I-1-1	K1614856-009	12/07/2016	12/08/2016
I-1-2	K1614856-010	12/07/2016	12/08/2016
I-1-3	K1614856-011	12/07/2016	12/08/2016
I-1-4	K1614856-012	12/07/2016	12/08/2016
O-1-1	K1614856-013	12/07/2016	12/08/2016
O-1-2	K1614856-014	12/07/2016	12/08/2016
O-1-3	K1614856-015	12/07/2016	12/08/2016
0-1-4	K1614856-016	12/07/2016	12/08/2016
I-2-1	K1614856-017	12/07/2016	12/08/2016
I-2-2	K1614856-018	12/07/2016	12/08/2016
I-2-3	K1614856-019	12/07/2016	12/08/2016
I-2-4	K1614856-020	12/07/2016	12/08/2016
O-2-1	K1614856-021	12/07/2016	12/08/2016
O-2-2	K1614856-022	12/07/2016	12/08/2016
O-2-3	K1614856-023	12/07/2016	12/08/2016
O-2-4	K1614856-024	12/07/2016	12/08/2016
I-3-1	K1614856-025	12/07/2016	12/08/2016
I-3-2	K1614856-026	12/07/2016	12/08/2016
I-3-3	K1614856-027	12/07/2016	12/08/2016
I-3-4	K1614856-028	12/07/2016	12/08/2016
O-3-1	K1614856-029	12/07/2016	12/08/2016
O-3-2	K1614856-030	12/07/2016	12/08/2016
O-3-3	K1614856-031	12/07/2016	12/08/2016
O-3-4	K1614856-032	12/07/2016	12/08/2016

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-1	**Units:**	ng/L
Lab Code:	K1614856-001	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**10**	J	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	**6.1**	J	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	**3.4**	J	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**8.2**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**11**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**9.1**	J	20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**7.9**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**6.5**	J	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-1	**Units:**	ng/L
Lab Code:	K1614856-001	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	118	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	93	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	93	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	103	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	96	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	79	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	84	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	136	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	81	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	85	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	106	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	92	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	93	20-113	12/22/16	Acceptable
HFPO-DA-13C3	120	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-2	**Units:**	ng/L
Lab Code:	K1614856-002	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	ND	U	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**6.0**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**20**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**4.6**	J	20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	**4.0**	J	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**6.7**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-2	**Units:**	ng/L
Lab Code:	K1614856-002	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	136	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	105	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	121	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	117	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	121	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	95	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	103	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	170	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	89	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	102	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	134	20-128	12/22/16	Outside Control Limits
d7-N-MeFOSE (Surr)	105	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	108	20-113	12/22/16	Acceptable
HFPO-DA-13C3	133	70-130	12/22/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-3	**Units:**	ng/L
Lab Code:	K1614856-003	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	ND	U	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**6.5**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**12**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**3.8**	J	20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**6.2**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-3	**Units:**	ng/L
Lab Code:	K1614856-003	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	122	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	99	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	111	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	107	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	117	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	91	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	94	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	137	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	89	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	94	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	115	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	93	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	94	20-113	12/22/16	Acceptable
HFPO-DA-13C3	116	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-4	**Units:**	ng/L
Lab Code:	K1614856-004	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	74	6.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**8.7**	J	150	8.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	74	8.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	74	6.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	74	7.8	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	74	7.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	ND	U	74	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**13**	J	74	5.2	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	ND	U	74	14	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	74	7.5	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	74	7.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	74	3.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	74	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**8.8**	J	30	4.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	74	11	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	74	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**11**	J	74	8.9	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	74	11	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	**14**	J	74	13	1	12/13/16	12/29/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	74	11	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	74	17	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	74	12	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**51**	J	74	8.3	1	12/13/16	12/29/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	74	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-4	**Units:**	ng/L
Lab Code:	K1614856-004	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	147	15-143	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	118	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	120	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	131	25-129	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	126	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	102	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	111	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	149	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	28	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	108	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	136	20-128	12/22/16	Outside Control Limits
d7-N-MeFOSE (Surr)	8	32-113	12/29/16	Outside Control Limits
d9-NEtFOSE (Surr)	26	20-113	12/22/16	Acceptable
HFPO-DA-13C3	138	70-130	12/22/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-1	**Units:**	ng/L
Lab Code:	K1614856-005	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**33**	J	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**5.6**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**9.2**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**7.0**	J	20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**6.4**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/29/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**26**	J	50	5.6	1	12/13/16	12/29/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-1	**Units:**	ng/L
Lab Code:	K1614856-005	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	142	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	104	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	111	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	124	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	112	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	92	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	100	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	146	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	30	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	95	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	119	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	9	32-113	12/29/16	Outside Control Limits
d9-NEtFOSE (Surr)	33	20-113	12/22/16	Acceptable
HFPO-DA-13C3	125	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-2	**Units:**	ng/L
Lab Code:	K1614856-006	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	ND	U	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**7.6**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**13**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**4.9**	J	20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**7.1**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-2	**Units:**	ng/L
Lab Code:	K1614856-006	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	104	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	78	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	87	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	91	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	82	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	73	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	80	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	113	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	67	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	68	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	97	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	72	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	74	20-113	12/22/16	Acceptable
HFPO-DA-13C3	86	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-3	**Units:**	ng/L
Lab Code:	K1614856-007	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	ND	U	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**4.8**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**10**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**4.7**	J	20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**7.6**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**6.2**	J	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-3	**Units:**	ng/L
Lab Code:	K1614856-007	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	110	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	84	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	89	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	93	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	84	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	73	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	80	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	101	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	84	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	71	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	96	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	87	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	88	20-113	12/22/16	Acceptable
HFPO-DA-13C3	93	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-4	**Units:**	ng/L
Lab Code:	K1614856-008	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	57	4.7	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	ND	U	120	6.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	57	6.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	57	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	57	6.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	57	5.6	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	ND	U	57	3.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**5.7**	J	57	4.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**17**	J	57	11	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	57	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	**9.3**	J	57	5.6	1	12/13/16	12/22/16	KWG1611166	*
Perfluoro-n-tridecanoic acid	ND	U	57	2.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	57	6.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**7.5**	J	23	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	57	8.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	57	3.6	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**9.7**	J	57	6.9	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	57	8.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	**14**	J	57	9.8	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	57	8.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	57	13	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	57	9.0	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**6.5**	J	57	6.4	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	57	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-4	**Units:**	ng/L
Lab Code:	K1614856-008	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	107	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	82	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	89	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	93	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	83	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	68	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	69	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	115	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	62	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	70	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	98	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	67	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	67	20-113	12/22/16	Acceptable
HFPO-DA-13C3	90	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-1	**Units:**	ng/L
Lab Code:	K1614856-009	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**670**		100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	**8.8**	J	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	**110**		50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**200**		50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	**30**	J	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**150**		20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	**300**		50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**7.3**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**8.5**	J	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/29/16	KWG1611166	
6:2 Fluorotelomer sulfonate	**12**	J	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**23**	J	50	5.6	1	12/13/16	12/29/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	**1600**		50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-1	**Units:**	ng/L
Lab Code:	K1614856-009	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	197	15-143	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	141	19-126	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	141	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	168	25-129	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	126	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	115	17-114	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2]undecanoic acid	124	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	500	10-187	12/22/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	28	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	100	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	102	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	9	32-113	12/29/16	Outside Control Limits
d9-NEtFOSE (Surr)	36	20-113	12/22/16	Acceptable
HFPO-DA-13C3	130	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-2	**Units:**	ng/L
Lab Code:	K1614856-010	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**1100**		100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	**15**	J	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	**8.1**	J	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	**93**		50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**6.2**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**190**		50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	**57**		50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**160**		20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	**360**		50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**25**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**78**		50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	**110**		50	8.6	1	12/13/16	12/29/16	KWG1611166	
6:2 Fluorotelomer sulfonate	**16**	J	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**20**	J	50	5.6	1	12/13/16	12/29/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	**1500**		50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-2	**Units:**	ng/L
Lab Code:	K1614856-010	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	215	15-143	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	140	19-126	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	137	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	186	25-129	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	146	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	130	17-114	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2]undecanoic acid	142	16-129	12/22/16	Outside Control Limits
S_6:2 Fluorotelomer sulfonate-13C2	255	10-187	12/22/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	30	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	117	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	126	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	8	32-113	12/29/16	Outside Control Limits
d9-NEtFOSE (Surr)	34	20-113	12/22/16	Acceptable
HFPO-DA-13C3	163	70-130	12/22/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-3	**Units:**	ng/L
Lab Code:	K1614856-011	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**260**		100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	**7.2**	J	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	**5.5**	J	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	**18**	J	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**41**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	**9.7**	J	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**39**		20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	**82**		50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**9.4**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**14**	J	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**12**	J	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	**880**		50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-3	**Units:**	ng/L
Lab Code:	K1614856-011	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	213	15-143	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	139	19-126	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	150	13-142	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] decanoic acid	167	25-129	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	154	10-151	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2]dodecanoic acid	116	17-114	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2]undecanoic acid	127	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	226	10-187	12/22/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	50	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	119	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	149	20-128	12/22/16	Outside Control Limits
d7-N-MeFOSE (Surr)	51	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	58	20-113	12/22/16	Acceptable
HFPO-DA-13C3	159	70-130	12/22/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-4	**Units:**	ng/L
Lab Code:	K1614856-012	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	500	41	10	12/13/16	12/28/16	KWG1611166	*
Perfluorobutanoic Acid	**490**	JD	1000	57	10	12/13/16	12/28/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	500	58	10	12/13/16	12/28/16	KWG1611166	
Perfluorodecanoic Acid	**360**	JD	500	46	10	12/13/16	12/28/16	KWG1611166	
Perfluorododecanoic Acid	**550**	D	500	53	10	12/13/16	12/28/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	500	49	10	12/13/16	12/28/16	KWG1611166	
Perfluoroheptanoic Acid	**410**	JD	500	31	10	12/13/16	12/28/16	KWG1611166	
Perfluorohexanesulfonate	ND	U	500	35	10	12/13/16	12/28/16	KWG1611166	
Perfluorohexanoic Acid	**400**	JD	500	89	10	12/13/16	12/28/16	KWG1611166	
Perfluorononanoic Acid	**920**	D	500	51	10	12/13/16	12/28/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	**180**	JD	500	49	10	12/13/16	12/28/16	KWG1611166	
Perfluoro-n-tridecanoic acid	**540**	D	500	24	10	12/13/16	12/28/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	500	60	10	12/13/16	12/28/16	KWG1611166	
Perfluorooctanoic Acid	**3500**	D	200	27	10	12/13/16	12/28/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	500	70	10	12/13/16	12/28/16	KWG1611166	
Perfluoropentanoic Acid	**690**	D	500	31	10	12/13/16	12/28/16	KWG1611166	
Perfluoroundecanoic Acid	**860**	D	500	60	10	12/13/16	12/28/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	500	70	10	12/13/16	12/28/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	500	86	10	12/13/16	12/28/16	KWG1611166	
6:2 Fluorotelomer sulfonate	**120**	JD	500	72	10	12/13/16	12/28/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	500	110	10	12/13/16	12/28/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	500	79	10	12/13/16	12/28/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	ND	U	500	56	10	12/13/16	12/28/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	**12000**	D	500	0	10	12/13/16	12/28/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-4	**Units:**	ng/L
Lab Code:	K1614856-012	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	149	15-143	12/28/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	115	19-126	12/28/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	100	13-142	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	125	25-129	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	132	10-151	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	69	17-114	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	84	16-129	12/28/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	663	10-187	12/28/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	48	19-103	12/28/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	88	11-131	12/28/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	129	20-128	12/28/16	Outside Control Limits
d7-N-MeFOSE (Surr)	45	32-113	12/28/16	Acceptable
d9-NEtFOSE (Surr)	66	20-113	12/28/16	Acceptable
HFPO-DA-13C3	113	70-130	12/28/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-1	**Units:**	ng/L
Lab Code:	K1614856-013	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	**6.8**	J	50	4.1	1	12/13/16	12/29/16	KWG1611166	*
Perfluorobutanoic Acid	**98**	J	100	5.7	1	12/13/16	12/29/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/29/16	KWG1611166	
Perfluorodecanoic Acid	**4.8**	J	50	4.6	1	12/13/16	12/29/16	KWG1611166	
Perfluorododecanoic Acid	**5.4**	J	50	5.3	1	12/13/16	12/29/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/29/16	KWG1611166	
Perfluoroheptanoic Acid	**11**	J	50	3.1	1	12/13/16	12/29/16	KWG1611166	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/29/16	KWG1611166	
Perfluorohexanoic Acid	**36**	J	50	8.9	1	12/13/16	12/29/16	KWG1611166	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/29/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/29/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/29/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/29/16	KWG1611166	
Perfluorooctanoic Acid	**79**		20	2.7	1	12/13/16	12/29/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/29/16	KWG1611166	
Perfluoropentanoic Acid	**46**	J	50	3.1	1	12/13/16	12/29/16	KWG1611166	
Perfluoroundecanoic Acid	**7.2**	J	50	6.0	1	12/13/16	12/29/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/29/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/29/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/29/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/29/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	**33**	J	50	7.9	1	12/13/16	12/29/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**18**	J	50	5.6	1	12/13/16	12/29/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/29/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-1	**Units:**	ng/L
Lab Code:	K1614856-013	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	29	15-143	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	20	19-126	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	23	13-142	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	24	25-129	12/29/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	22	10-151	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	18	17-114	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	20	16-129	12/29/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	33	10-187	12/29/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	18	19-103	12/29/16	Outside Control Limits
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	19	11-131	12/29/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	22	20-128	12/29/16	Acceptable
d7-N-MeFOSE (Surr)	20	32-113	12/29/16	Outside Control Limits
d9-NEtFOSE (Surr)	21	20-113	12/29/16	Acceptable
HFPO-DA-13C3	24	70-130	12/29/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-2	**Units:**	ng/L
Lab Code:	K1614856-014	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**49**	J	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	**17**	J	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	**45**	J	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**48**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	**170**		50	5.1	1	12/13/16	12/29/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**100**		20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	**64**		50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**76**		50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	**9.3**	J	50	7.2	1	12/13/16	12/29/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/29/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-2	**Units:**	ng/L
Lab Code:	K1614856-014	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	27	15-143	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	92	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	113	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	120	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	109	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	84	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	92	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	27	10-187	12/29/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	71	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	83	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	105	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	86	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	96	20-113	12/22/16	Acceptable
HFPO-DA-13C3	107	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-3	**Units:**	ng/L
Lab Code:	K1614856-015	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**11**	J	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	**9.0**	J	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**6.9**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**16**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	**26**	J	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**40**		20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**17**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-3	**Units:**	ng/L
Lab Code:	K1614856-015	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	116	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	81	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	88	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	97	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	87	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	74	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	76	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	118	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	64	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	75	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	94	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	74	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	82	20-113	12/22/16	Acceptable
HFPO-DA-13C3	98	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	0-1-4	**Units:**	ng/L
Lab Code:	K1614856-016	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	**25**	J	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	**27**	J	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	**20**	J	50	5.3	1	12/13/16	12/29/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	**16**	J	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**4.3**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	**21**	J	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	**240**		50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	**47**	J	50	2.4	1	12/13/16	12/29/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**190**		20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	**6.0**	J	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**170**		50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	**83**		50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	0-1-4	**Units:**	ng/L
Lab Code:	K1614856-016	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	139	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	97	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	99	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	120	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	99	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	92	17-114	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	88	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	143	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	42	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	84	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	106	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	45	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	52	20-113	12/22/16	Acceptable
HFPO-DA-13C3	110	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-1	**Units:**	ng/L
Lab Code:	K1614856-017	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/29/16	KWG1611167	*
Perfluorobutanoic Acid	**420**		100	5.7	1	12/13/16	12/29/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	**7.4**	J	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	**18**	J	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**96**		50	3.1	1	12/13/16	12/29/16	KWG1611167	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**140**		50	8.9	1	12/13/16	12/29/16	KWG1611167	
Perfluorononanoic Acid	**34**	J	50	5.1	1	12/13/16	12/29/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	**6.2**	J	50	4.9	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tridecanoic acid	**5.1**	J	50	2.4	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**220**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/29/16	KWG1611167	
Perfluoropentanoic Acid	**270**		50	3.1	1	12/13/16	12/29/16	KWG1611167	
Perfluoroundecanoic Acid	**11**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**30**	J	50	7.0	1	12/13/16	12/29/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	**17**	J	50	8.6	1	12/13/16	12/29/16	KWG1611167	
6:2 Fluorotelomer sulfonate	**140**		50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/29/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	**36**	J	50	7.9	1	12/13/16	12/29/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**15**	J	50	5.6	1	12/13/16	12/29/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	**1600**		50	0	1	12/13/16	12/29/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-1	**Units:**	ng/L
Lab Code:	K1614856-017	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	27	15-143	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	23	19-126	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	142	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	22	25-129	12/29/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	24	10-151	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	109	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	118	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	793	10-187	12/22/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	15	19-103	12/29/16	Outside Control Limits
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	101	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	110	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	112	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	19	20-113	12/29/16	Outside Control Limits
HFPO-DA-13C3	22	70-130	12/29/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-2	**Units:**	ng/L
Lab Code:	K1614856-018	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**990**		100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	**11**	J	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	**7.5**	J	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**59**		50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**160**		50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**94**		50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**8.4**	J	50	2.4	1	12/13/16	12/22/16	KWG1611167	*
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**130**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**350**		50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**21**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**40**	J	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	**36**	J	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	**910**		50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-2	**Units:**	ng/L
Lab Code:	K1614856-018	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	114	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	85	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	87	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	103	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	95	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	69	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	78	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	258	10-187	12/22/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	56	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	65	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	69	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	61	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	73	20-113	12/22/16	Acceptable
HFPO-DA-13C3	100	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-3	**Units:**	ng/L
Lab Code:	K1614856-019	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	**7.7**	J	50	4.1	1	12/13/16	12/29/16	KWG1611167	*
Perfluorobutanoic Acid	**200**		100	5.7	1	12/13/16	12/29/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/29/16	KWG1611167	
Perfluorodecanoic Acid	**9.6**	J	50	4.6	1	12/13/16	12/29/16	KWG1611167	
Perfluorododecanoic Acid	**5.7**	J	50	5.3	1	12/13/16	12/29/16	KWG1611167	
Perfluoroheptane sulfonate	**8.2**	J	50	4.9	1	12/13/16	12/29/16	KWG1611167	
Perfluoroheptanoic Acid	**18**	J	50	3.1	1	12/13/16	12/29/16	KWG1611167	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/29/16	KWG1611167	
Perfluorohexanoic Acid	**53**		50	8.9	1	12/13/16	12/29/16	KWG1611167	
Perfluorononanoic Acid	**7.2**	J	50	5.1	1	12/13/16	12/29/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/29/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**13**	J	50	2.4	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctanoic Acid	**65**		20	2.7	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/29/16	KWG1611167	
Perfluoropentanoic Acid	**97**		50	3.1	1	12/13/16	12/29/16	KWG1611167	
Perfluoroundecanoic Acid	**11**	J	50	6.0	1	12/13/16	12/29/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**31**	J	50	7.0	1	12/13/16	12/29/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	**28**	J	50	8.6	1	12/13/16	12/29/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/29/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/29/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/29/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**22**	J	50	5.6	1	12/13/16	12/29/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	**500**		50	0	1	12/13/16	12/29/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-3	**Units:**	ng/L
Lab Code:	K1614856-019	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	28	15-143	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	21	19-126	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	22	13-142	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	23	25-129	12/29/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	22	10-151	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	17	17-114	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	19	16-129	12/29/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	28	10-187	12/29/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	16	19-103	12/29/16	Outside Control Limits
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	19	11-131	12/29/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	23	20-128	12/29/16	Acceptable
d7-N-MeFOSE (Surr)	20	32-113	12/29/16	Outside Control Limits
d9-NEtFOSE (Surr)	20	20-113	12/29/16	Acceptable
HFPO-DA-13C3	26	70-130	12/29/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-4	**Units:**	ng/L
Lab Code:	K1614856-020	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	500	41	10	12/13/16	12/28/16	KWG1611167	*
Perfluorobutanoic Acid	**380**	JD	1000	57	10	12/13/16	12/28/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	500	58	10	12/13/16	12/28/16	KWG1611167	
Perfluorodecanoic Acid	**310**	JD	500	46	10	12/13/16	12/28/16	KWG1611167	
Perfluorododecanoic Acid	**510**	D	500	53	10	12/13/16	12/28/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	500	49	10	12/13/16	12/28/16	KWG1611167	
Perfluoroheptanoic Acid	**240**	JD	500	31	10	12/13/16	12/28/16	KWG1611167	
Perfluorohexanesulfonate	ND	U	500	35	10	12/13/16	12/28/16	KWG1611167	
Perfluorohexanoic Acid	**230**	JD	500	89	10	12/13/16	12/28/16	KWG1611167	
Perfluorononanoic Acid	**790**	D	500	51	10	12/13/16	12/28/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	**380**	JD	500	49	10	12/13/16	12/28/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**930**	D	500	24	10	12/13/16	12/28/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	500	60	10	12/13/16	12/28/16	KWG1611167	
Perfluorooctanoic Acid	**2600**	D	200	27	10	12/13/16	12/28/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	500	70	10	12/13/16	12/28/16	KWG1611167	
Perfluoropentanoic Acid	**420**	JD	500	31	10	12/13/16	12/28/16	KWG1611167	
Perfluoroundecanoic Acid	**910**	D	500	60	10	12/13/16	12/28/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	500	70	10	12/13/16	12/28/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	500	86	10	12/13/16	12/28/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	500	72	10	12/13/16	12/28/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	500	110	10	12/13/16	12/28/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	500	79	10	12/13/16	12/28/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	ND	U	500	56	10	12/13/16	12/28/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	**4900**	D	500	0	10	12/13/16	12/28/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-4	**Units:**	ng/L
Lab Code:	K1614856-020	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	144	15-143	12/28/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	95	19-126	12/28/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	95	13-142	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	108	25-129	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	120	10-151	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	54	17-114	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	72	16-129	12/28/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	444	10-187	12/28/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	48	19-103	12/28/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	77	11-131	12/28/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	111	20-128	12/28/16	Acceptable
d7-N-MeFOSE (Surr)	34	32-113	12/28/16	Acceptable
d9-NEtFOSE (Surr)	51	20-113	12/28/16	Acceptable
HFPO-DA-13C3	115	70-130	12/28/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-1	**Units:**	ng/L
Lab Code:	K1614856-021	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/29/16	KWG1611167	*
Perfluorobutanoic Acid	**53**	J	100	5.7	1	12/13/16	12/29/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/29/16	KWG1611167	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/29/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/29/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/29/16	KWG1611167	
Perfluoroheptanoic Acid	**6.1**	J	50	3.1	1	12/13/16	12/29/16	KWG1611167	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/29/16	KWG1611167	
Perfluorohexanoic Acid	**35**	J	50	8.9	1	12/13/16	12/29/16	KWG1611167	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/29/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/29/16	KWG1611167	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctanoic Acid	**100**		20	2.7	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/29/16	KWG1611167	
Perfluoropentanoic Acid	**12**	J	50	3.1	1	12/13/16	12/29/16	KWG1611167	
Perfluoroundecanoic Acid	**11**	J	50	6.0	1	12/13/16	12/29/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/29/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/29/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/29/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/29/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/29/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**22**	J	50	5.6	1	12/13/16	12/29/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/29/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-1	**Units:**	ng/L
Lab Code:	K1614856-021	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	28	15-143	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	21	19-126	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	25	13-142	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	25	25-129	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	24	10-151	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	18	17-114	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	19	16-129	12/29/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	36	10-187	12/29/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	19	19-103	12/29/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	20	11-131	12/29/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	21	20-128	12/29/16	Acceptable
d7-N-MeFOSE (Surr)	18	32-113	12/29/16	Outside Control Limits
d9-NEtFOSE (Surr)	18	20-113	12/29/16	Outside Control Limits
HFPO-DA-13C3	23	70-130	12/29/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-2	**Units:**	ng/L
Lab Code:	K1614856-022	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**34**	J	100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	**7.7**	J	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	**8.8**	J	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**6.0**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**6.7**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**15**	J	50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**6.1**	J	50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**69**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**5.2**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**9.6**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**11**	J	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	**7.9**	J	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**5.8**	J	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-2	**Units:**	ng/L
Lab Code:	K1614856-022	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	114	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	73	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	86	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	89	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	93	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	65	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	69	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	177	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	51	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	68	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	83	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	59	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	70	20-113	12/22/16	Acceptable
HFPO-DA-13C3	95	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-3	**Units:**	ng/L
Lab Code:	K1614856-023	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**27**	J	100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	**13**	J	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	**8.9**	J	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**50**		50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**9.2**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**38**	J	50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**330**		50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**110**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**42**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**56**		50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	**8.0**	J	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**9.1**	J	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-3	**Units:**	ng/L
Lab Code:	K1614856-023	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	105	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	70	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	84	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	87	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	79	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	61	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	67	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	173	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	57	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	63	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	82	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	67	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	77	20-113	12/22/16	Acceptable
HFPO-DA-13C3	90	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-4	**Units:**	ng/L
Lab Code:	K1614856-024	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	63	5.2	1	12/13/16	12/29/16	KWG1611167	*
Perfluorobutanoic Acid	ND	U	130	7.2	1	12/13/16	12/29/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	63	7.3	1	12/13/16	12/29/16	KWG1611167	
Perfluorodecanoic Acid	**33**	J	63	5.8	1	12/13/16	12/29/16	KWG1611167	
Perfluorododecanoic Acid	**26**	J	63	6.7	1	12/13/16	12/29/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	63	6.2	1	12/13/16	12/29/16	KWG1611167	
Perfluoroheptanoic Acid	**8.8**	J	63	3.9	1	12/13/16	12/29/16	KWG1611167	
Perfluorohexanesulfonate	ND	U	63	4.4	1	12/13/16	12/29/16	KWG1611167	
Perfluorohexanoic Acid	**27**	J	63	12	1	12/13/16	12/29/16	KWG1611167	
Perfluorononanoic Acid	**250**		63	6.4	1	12/13/16	12/29/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	**16**	J	63	6.2	1	12/13/16	12/29/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**59**	J	63	3.0	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	63	7.5	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctanoic Acid	**150**		25	3.4	1	12/13/16	12/29/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	63	8.8	1	12/13/16	12/29/16	KWG1611167	
Perfluoropentanoic Acid	**12**	J	63	3.9	1	12/13/16	12/29/16	KWG1611167	
Perfluoroundecanoic Acid	**230**		63	7.5	1	12/13/16	12/29/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**27**	J	63	8.8	1	12/13/16	12/29/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	**140**		63	11	1	12/13/16	12/29/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	63	9.0	1	12/13/16	12/29/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	63	14	1	12/13/16	12/29/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	63	9.9	1	12/13/16	12/29/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	ND	U	63	7.0	1	12/13/16	12/29/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	63	0	1	12/13/16	12/29/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-4	**Units:**	ng/L
Lab Code:	K1614856-024	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	123	15-143	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	85	19-126	12/29/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	91	13-142	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	98	25-129	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	88	10-151	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	69	17-114	12/29/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	76	16-129	12/29/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	154	10-187	12/29/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	69	19-103	12/29/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	69	11-131	12/29/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	84	20-128	12/29/16	Acceptable
d7-N-MeFOSE (Surr)	83	32-113	12/29/16	Acceptable
d9-NEtFOSE (Surr)	93	20-113	12/29/16	Acceptable
HFPO-DA-13C3	99	70-130	12/29/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-1	**Units:**	ng/L
Lab Code:	K1614856-025	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**300**		100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	**7.2**	J	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	**14**	J	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**60**		50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**18**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**95**		50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**40**	J	50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**6.5**	J	50	2.4	1	12/13/16	12/22/16	KWG1611167	*
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**240**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**130**		50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**10**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	**30**	J	50	7.2	1	12/13/16	12/31/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**8.3**	J	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	**500**		50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-1	**Units:**	ng/L
Lab Code:	K1614856-025	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	102	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	93	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	78	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	89	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	86	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	52	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	61	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	341	10-187	12/31/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	47	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	57	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	71	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	49	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	58	20-113	12/22/16	Acceptable
HFPO-DA-13C3	73	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-2	**Units:**	ng/L
Lab Code:	K1614856-026	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**570**		100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	**6.0**	J	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	**6.8**	J	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	**7.2**	J	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**44**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**5.5**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**110**		50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**30**	J	50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**2.6**	J	50	2.4	1	12/13/16	12/22/16	KWG1611167	*
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**86**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**180**		50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**14**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**48**	J	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	**8.0**	J	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**18**	J	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	**260**		50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-2	**Units:**	ng/L
Lab Code:	K1614856-026	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	113	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	85	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	91	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	99	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	102	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	70	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	80	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	169	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	51	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	73	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	90	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	56	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	61	20-113	12/22/16	Acceptable
HFPO-DA-13C3	88	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-3	**Units:**	ng/L
Lab Code:	K1614856-027	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**160**		100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	**6.9**	J	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**18**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**10**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**32**	J	50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**6.3**	J	50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**38**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**44**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**8.9**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**15**	J	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	**150**		50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-3	**Units:**	ng/L
Lab Code:	K1614856-027	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	163	15-143	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	118	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	126	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	138	25-129	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	127	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	97	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	106	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	165	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	59	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	102	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	133	20-128	12/22/16	Outside Control Limits
d7-N-MeFOSE (Surr)	64	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	73	20-113	12/22/16	Acceptable
HFPO-DA-13C3	128	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-4	**Units:**	ng/L
Lab Code:	K1614856-028	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	500	41	10	12/13/16	12/28/16	KWG1611167	*
Perfluorobutanoic Acid	ND	U	1000	57	10	12/13/16	12/28/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	500	58	10	12/13/16	12/28/16	KWG1611167	
Perfluorodecanoic Acid	**180**	JD	500	46	10	12/13/16	12/28/16	KWG1611167	
Perfluorododecanoic Acid	**270**	JD	500	53	10	12/13/16	12/28/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	500	49	10	12/13/16	12/28/16	KWG1611167	
Perfluoroheptanoic Acid	**130**	JD	500	31	10	12/13/16	12/28/16	KWG1611167	
Perfluorohexanesulfonate	ND	U	500	35	10	12/13/16	12/28/16	KWG1611167	
Perfluorohexanoic Acid	**130**	JD	500	89	10	12/13/16	12/28/16	KWG1611167	
Perfluorononanoic Acid	**320**	JD	500	51	10	12/13/16	12/28/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	**190**	JD	500	49	10	12/13/16	12/28/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**490**	JD	500	24	10	12/13/16	12/28/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	500	60	10	12/13/16	12/28/16	KWG1611167	
Perfluorooctanoic Acid	**2400**	D	200	27	10	12/13/16	12/28/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	500	70	10	12/13/16	12/28/16	KWG1611167	
Perfluoropentanoic Acid	**160**	JD	500	31	10	12/13/16	12/28/16	KWG1611167	
Perfluoroundecanoic Acid	**420**	JD	500	60	10	12/13/16	12/28/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	500	70	10	12/13/16	12/28/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	500	86	10	12/13/16	12/28/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	500	72	10	12/13/16	12/28/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	500	110	10	12/13/16	12/28/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	500	79	10	12/13/16	12/28/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	ND	U	500	56	10	12/13/16	12/28/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	**960**	D	500	0	10	12/13/16	12/28/16	KWG1611167	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-4	**Units:**	ng/L
Lab Code:	K1614856-028	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	137	15-143	12/28/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	102	19-126	12/28/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	89	13-142	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	101	25-129	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	115	10-151	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	45	17-114	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	63	16-129	12/28/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	377	10-187	12/28/16	Outside Control Limits
S_N-ethyl-d5-perfluoro-1-octanesulfonami	46	19-103	12/28/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	75	11-131	12/28/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	105	20-128	12/28/16	Acceptable
d7-N-MeFOSE (Surr)	28	32-113	12/28/16	Outside Control Limits
d9-NEtFOSE (Surr)	41	20-113	12/28/16	Acceptable
HFPO-DA-13C3	103	70-130	12/28/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-1	**Units:**	ng/L
Lab Code:	K1614856-029	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**85**	J	100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**6.3**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**7.3**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**18**	J	50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**74**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**26**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**9.2**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**18**	J	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-1	**Units:**	ng/L
Lab Code:	K1614856-029	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	181	15-143	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	125	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	136	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	155	25-129	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	156	10-151	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2]dodecanoic acid	109	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	109	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	181	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	18	19-103	12/22/16	Outside Control Limits
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	115	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	138	20-128	12/22/16	Outside Control Limits
d7-N-MeFOSE (Surr)	18	32-113	12/22/16	Outside Control Limits
d9-NEtFOSE (Surr)	20	20-113	12/22/16	Acceptable
HFPO-DA-13C3	139	70-130	12/22/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-2	**Units:**	ng/L
Lab Code:	K1614856-030	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**29**	J	100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	**7.2**	J	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**5.3**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**6.3**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**11**	J	50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**12**	J	50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**50**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**8.9**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**8.5**	J	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	**9.3**	J	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**11**	J	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-2	**Units:**	ng/L
Lab Code:	K1614856-030	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	103	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	64	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	76	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	84	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	73	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	60	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	63	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	118	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	51	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	58	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	72	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	62	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	69	20-113	12/22/16	Acceptable
HFPO-DA-13C3	70	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-3	**Units:**	ng/L
Lab Code:	K1614856-031	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**19**	J	100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	**22**	J	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**24**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**4.0**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**25**	J	50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**230**		50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**54**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**10**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**92**		50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**7.5**	J	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	**10**	J	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	**14**	J	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**14**	J	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-3	**Units:**	ng/L
Lab Code:	K1614856-031	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	88	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	67	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	80	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	75	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	83	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	57	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	62	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	108	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	61	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	62	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	77	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	70	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	76	20-113	12/22/16	Acceptable
HFPO-DA-13C3	75	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-4	**Units:**	ng/L
Lab Code:	K1614856-032	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluorobutanoic Acid	**32**	J	100	5.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611167	
Perfluorodecanoic Acid	**16**	J	50	4.6	1	12/13/16	12/22/16	KWG1611167	
Perfluorododecanoic Acid	**9.4**	J	50	5.3	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoroheptanoic Acid	**11**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanesulfonate	**8.2**	J	50	3.5	1	12/13/16	12/22/16	KWG1611167	
Perfluorohexanoic Acid	**29**	J	50	8.9	1	12/13/16	12/22/16	KWG1611167	
Perfluorononanoic Acid	**130**		50	5.1	1	12/13/16	12/22/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**30**	J	50	2.4	1	12/13/16	12/22/16	KWG1611167	*
Perfluorooctanesulfonate	**6.4**	J	50	6.0	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctanoic Acid	**95**		20	2.7	1	12/13/16	12/22/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611167	
Perfluoropentanoic Acid	**7.8**	J	50	3.1	1	12/13/16	12/22/16	KWG1611167	
Perfluoroundecanoic Acid	**120**		50	6.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	**19**	J	50	7.0	1	12/13/16	12/22/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	**6.8**	J	50	5.6	1	12/13/16	12/22/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611167	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/16
Sample Matrix:	Aqueous liquid	**Date Received:**	12/08/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-4	**Units:**	ng/L
Lab Code:	K1614856-032	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	184	15-143	12/22/16	Outside Control Limits
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	122	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	133	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	169	25-129	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2] hexanoic acid	135	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	122	17-114	12/22/16	Outside Control Limits
Perfluoro-n-[1,2-13C2]undecanoic acid	119	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	158	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	39	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	110	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	135	20-128	12/22/16	Outside Control Limits
d7-N-MeFOSE (Surr)	44	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	47	20-113	12/22/16	Acceptable
HFPO-DA-13C3	138	70-130	12/22/16	Outside Control Limits

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	NA
Sample Matrix:	Aqueous liquid	**Date Received:**	NA

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1611166-3	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/22/16	KWG1611166	*
Perfluorobutanoic Acid	ND	U	100	5.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/22/16	KWG1611166	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/22/16	KWG1611166	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoroheptanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanesulfonate	**4.0**	J	50	3.5	1	12/13/16	12/22/16	KWG1611166	
Perfluorohexanoic Acid	ND	U	50	8.9	1	12/13/16	12/22/16	KWG1611166	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/22/16	KWG1611166	
Perfluoro-n-tridecanoic acid	ND	U	50	2.4	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctanoic Acid	**4.3**	J	20	2.7	1	12/13/16	12/22/16	KWG1611166	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/22/16	KWG1611166	
Perfluoroundecanoic Acid	**7.7**	J	50	6.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/22/16	KWG1611166	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/22/16	KWG1611166	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/22/16	KWG1611166	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/22/16	KWG1611166	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/22/16	KWG1611166	
N-methylperfluoro-1-octanesulfonamide	**6.0**	J	50	5.6	1	12/13/16	12/22/16	KWG1611166	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/22/16	KWG1611166	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	NA
Sample Matrix:	Aqueous liquid	**Date Received:**	NA

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1611166-3	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	113	15-143	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	89	19-126	12/22/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	93	13-142	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	100	25-129	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	92	10-151	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	77	17-114	12/22/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	83	16-129	12/22/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	113	10-187	12/22/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	69	19-103	12/22/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	80	11-131	12/22/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	97	20-128	12/22/16	Acceptable
d7-N-MeFOSE (Surr)	79	32-113	12/22/16	Acceptable
d9-NEtFOSE (Surr)	82	20-113	12/22/16	Acceptable
HFPO-DA-13C3	107	70-130	12/22/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	NA
Sample Matrix:	Aqueous liquid	**Date Received:**	NA

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1611167-3	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	PFC/537M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Perfluorobutanesulfonate	ND	U	50	4.1	1	12/13/16	12/28/16	KWG1611167	*
Perfluorobutanoic Acid	ND	U	100	5.7	1	12/13/16	12/28/16	KWG1611167	
Perfluorodecane Sulfonate	ND	U	50	5.8	1	12/13/16	12/28/16	KWG1611167	
Perfluorodecanoic Acid	ND	U	50	4.6	1	12/13/16	12/28/16	KWG1611167	
Perfluorododecanoic Acid	ND	U	50	5.3	1	12/13/16	12/28/16	KWG1611167	
Perfluoroheptane sulfonate	ND	U	50	4.9	1	12/13/16	12/28/16	KWG1611167	
Perfluoroheptanoic Acid	ND	U	50	3.1	1	12/13/16	12/28/16	KWG1611167	
Perfluorohexanesulfonate	ND	U	50	3.5	1	12/13/16	12/28/16	KWG1611167	
Perfluorohexanoic Acid	ND	U	50	8.9	1	12/13/16	12/28/16	KWG1611167	
Perfluorononanoic Acid	ND	U	50	5.1	1	12/13/16	12/28/16	KWG1611167	*
Perfluoro-n-tetradecanoic acid	ND	U	50	4.9	1	12/13/16	12/28/16	KWG1611167	
Perfluoro-n-tridecanoic acid	**3.0**	J	50	2.4	1	12/13/16	12/28/16	KWG1611167	
Perfluorooctanesulfonate	ND	U	50	6.0	1	12/13/16	12/28/16	KWG1611167	
Perfluorooctanoic Acid	**5.2**	J	20	2.7	1	12/13/16	12/28/16	KWG1611167	
Perfluorooctylsulfonamide	ND	U	50	7.0	1	12/13/16	12/28/16	KWG1611167	
Perfluoropentanoic Acid	ND	U	50	3.1	1	12/13/16	12/28/16	KWG1611167	
Perfluoroundecanoic Acid	**11**	J	50	6.0	1	12/13/16	12/28/16	KWG1611167	
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	7.0	1	12/13/16	12/28/16	KWG1611167	
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND	U	50	8.6	1	12/13/16	12/28/16	KWG1611167	
6:2 Fluorotelomer sulfonate	ND	U	50	7.2	1	12/13/16	12/28/16	KWG1611167	*
8:2 Fluorotelomer sulfonate	ND	U	50	11	1	12/13/16	12/28/16	KWG1611167	
N-ethylperfluoro-1-octanesulfonamide	ND	U	50	7.9	1	12/13/16	12/28/16	KWG1611167	
N-methylperfluoro-1-octanesulfonamide	ND	U	50	5.6	1	12/13/16	12/28/16	KWG1611167	
Hexafluoropropylene Oxide Dimer Acid	ND	U	50	0	1	12/13/16	12/28/16	KWG1611167	

* See Case Narrative

Comments:

Analytical Results

Client:	ALS Environmental - Burlington	**Service Request:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	NA
Sample Matrix:	Aqueous liquid	**Date Received:**	NA

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	Method Blank	**Units:**	ng/L
Lab Code:	KWG1611167-3	**Basis:**	NA

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Perfluoro-n-[1,2,3,4,5-13C5] nonanoic acic	100	15-143	12/28/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] butanoic acid	77	19-126	12/28/16	Acceptable
Perfluoro-n-[1,2,3,4-13C4] octanoic acid	79	13-142	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2] decanoic acid	91	25-129	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2] hexanoic acid	84	10-151	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2]dodecanoic acid	67	17-114	12/28/16	Acceptable
Perfluoro-n-[1,2-13C2]undecanoic acid	63	16-129	12/28/16	Acceptable
S_6:2 Fluorotelomer sulfonate-13C2	131	10-187	12/28/16	Acceptable
S_N-ethyl-d5-perfluoro-1-octanesulfonami	62	19-103	12/28/16	Acceptable
Sodium perfluoro-1-[1,2,3,4-13C4] octanes	65	11-131	12/28/16	Acceptable
Sodium perfluoro-1-hexane[18O2]sulfonat	82	20-128	12/28/16	Acceptable
d7-N-MeFOSE (Surr)	62	32-113	12/28/16	Acceptable
d9-NEtFOSE (Surr)	76	20-113	12/28/16	Acceptable
HFPO-DA-13C3	90	70-130	12/28/16	Acceptable

Comments:

QA/QC Results

Client: ALS Environmental - Burlington
Project: APCC Stack Testing 2016/L1868106
Sample Matrix: Aqueous liquid

Service Request: K1614856
Date Extracted: 12/13/2016

Extraction Prep Log
Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Extraction Method: EPA 3535A
Analysis Method: PFC/537M

Extraction Lot: KWG1611166
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
I-B-1	K1614856-001	12/07/16	12/08/16	25ml	8ml	NA	
I-B-2	K1614856-002	12/07/16	12/08/16	25ml	8ml	NA	
I-B-3	K1614856-003	12/07/16	12/08/16	25ml	8ml	NA	
I-B-4RE	K1614856-004	12/07/16	12/08/16	17ml	8ml	NA	
I-B-4	K1614856-004	12/07/16	12/08/16	17ml	8ml	NA	
O-B-1RE	K1614856-005	12/07/16	12/08/16	25ml	8ml	NA	
O-B-1	K1614856-005	12/07/16	12/08/16	25ml	8ml	NA	
O-B-2	K1614856-006	12/07/16	12/08/16	25ml	8ml	NA	
O-B-3	K1614856-007	12/07/16	12/08/16	25ml	8ml	NA	
O-B-4	K1614856-008	12/07/16	12/08/16	22ml	8ml	NA	
I-1-1	K1614856-009	12/07/16	12/08/16	25ml	8ml	NA	
I-1-1RE	K1614856-009	12/07/16	12/08/16	25ml	8ml	NA	
I-1-2	K1614856-010	12/07/16	12/08/16	25ml	8ml	NA	
I-1-2RE	K1614856-010	12/07/16	12/08/16	25ml	8ml	NA	
I-1-3	K1614856-011	12/07/16	12/08/16	25ml	8ml	NA	
I-1-4	K1614856-012	12/07/16	12/08/16	25ml	8ml	NA	
O-1-1	K1614856-013	12/07/16	12/08/16	25ml	8ml	NA	
O-1-2RE	K1614856-014	12/07/16	12/08/16	25ml	8ml	NA	
O-1-2	K1614856-014	12/07/16	12/08/16	25ml	8ml	NA	
O-1-3	K1614856-015	12/07/16	12/08/16	25ml	8ml	NA	
0-1-4RE	K1614856-016	12/07/16	12/08/16	25ml	8ml	NA	
0-1-4	K1614856-016	12/07/16	12/08/16	25ml	8ml	NA	
Method Blank	KWG1611166-3	NA	NA	25ml	8ml	NA	
Lab Control Sample	KWG1611166-1	NA	NA	25ml	8ml	NA	
Duplicate Lab Control Sample	KWG1611166-2	NA	NA	25ml	8ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

QA/QC Results

Client: ALS Environmental - Burlington
Project: APCC Stack Testing 2016/L1868106
Sample Matrix: Aqueous liquid

Service Request: K1614856
Date Extracted: 12/13/2016

Extraction Prep Log
Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Extraction Method: EPA 3535A
Analysis Method: PFC/537M

Extraction Lot: KWG1611167
Level: Low

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
I-2-1	K1614856-017	12/07/16	12/08/16	25ml	8.0ml	NA	
I-2-1RE	K1614856-017	12/07/16	12/08/16	25ml	8.0ml	NA	
I-2-2	K1614856-018	12/07/16	12/08/16	25ml	8.0ml	NA	
I-2-3	K1614856-019	12/07/16	12/08/16	25ml	8.0ml	NA	
I-2-4	K1614856-020	12/07/16	12/08/16	25ml	8.0ml	NA	
O-2-1	K1614856-021	12/07/16	12/08/16	25ml	8.0ml	NA	
O-2-2	K1614856-022	12/07/16	12/08/16	25ml	8.0ml	NA	
O-2-3	K1614856-023	12/07/16	12/08/16	25ml	8.0ml	NA	
O-2-4	K1614856-024	12/07/16	12/08/16	20ml	8.0ml	NA	
I-3-1	K1614856-025	12/07/16	12/08/16	25ml	8.0ml	NA	
I-3-1RE	K1614856-025	12/07/16	12/08/16	25ml	8.0ml	NA	
I-3-2	K1614856-026	12/07/16	12/08/16	25ml	8.0ml	NA	
I-3-3	K1614856-027	12/07/16	12/08/16	25ml	8.0ml	NA	
I-3-4	K1614856-028	12/07/16	12/08/16	25ml	8.0ml	NA	
O-3-1	K1614856-029	12/07/16	12/08/16	25ml	8.0ml	NA	
O-3-2	K1614856-030	12/07/16	12/08/16	25ml	8.0ml	NA	
O-3-3	K1614856-031	12/07/16	12/08/16	25ml	8.0ml	NA	
O-3-4	K1614856-032	12/07/16	12/08/16	25ml	8.0ml	NA	
Method Blank	KWG1611167-3	NA	NA	25ml	8.0ml	NA	
Lab Control Sample	KWG1611167-1	NA	NA	25ml	8.0ml	NA	
Duplicate Lab Control Sample	KWG1611167-2	NA	NA	25ml	8.0ml	NA	

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

Total ng per sample - Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by HPLC/MS

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REVISED
3:54 pm, Jan 31, 2017

Client: ALS Environmental - Burlington **Service Request:** K1614856
Project: APCC Stack Testing 2016/L1868106

Cover Page - Organic Analysis Data Package
Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name	Lab Code	Total Sample Volume Received
I-B-1	K1614856-001	130ml
I-B-2	K1614856-002	100ml
I-B-3	K1614856-003	100ml
I-B-4	K1614856-004	17ml
O-B-1	K1614856-005	125ml
O-B-2	K1614856-006	105ml
O-B-3	K1614856-007	110ml
O-B-4	K1614856-008	22ml
I-1-1	K1614856-009	175ml
I-1-2	K1614856-010	90ml
I-1-3	K1614856-011	110ml
I-1-4	K1614856-012	80ml
O-1-1	K1614856-013	305ml
O-1-2	K1614856-014	150ml
O-1-3	K1614856-015	140ml
0-1-4	K1614856-016	30ml
I-2-1	K1614856-017	160ml
I-2-2	K1614856-018	110ml
I-2-3	K1614856-019	110ml
I-2-4	K1614856-020	35ml
O-2-1	K1614856-021	300ml
O-2-2	K1614856-022	145ml
O-2-3	K1614856-023	120ml
O-2-4	K1614856-024	20ml
I-3-1	K1614856-025	190ml
I-3-2	K1614856-026	110ml
I-3-3	K1614856-027	110ml
I-3-4	K1614856-028	40ml
O-3-1	K1614856-029	300ml
O-3-2	K1614856-030	145ml
O-3-3	K1614856-031	135ml
O-3-4	K1614856-032	50ml

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-1
Lab Code:	K1614856-001

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	1.3
Perfluorodecane Sulfonate	0.793
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	0.442
Perfluorohexanesulfonate	1.066
Perfluorohexanoic Acid	1.43
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	1.183
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	1.027
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	0.845
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-2
Lab Code:	K1614856-002

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	ND
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	ND
Perfluorohexanesulfonate	0.6
Perfluorohexanoic Acid	2
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	0.46
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	0.4
Perfluoroundecanoic Acid	0.67
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-3
Lab Code:	K1614856-003

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	ND
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	ND
Perfluorohexanesulfonate	0.65
Perfluorohexanoic Acid	1.2
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	0.38
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	0.62
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-B-4
Lab Code:	K1614856-004

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	ND
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	ND
Perfluorohexanesulfonate	0.65
Perfluorohexanoic Acid	1.2
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	0.38
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	0.62
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-1
Lab Code:	K1614856-005

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	4.125
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	ND
Perfluorohexanesulfonate	0.7
Perfluorohexanoic Acid	1.15
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	0.875
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	0.8
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	3.25
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name: O-B-2
Lab Code: K1614856-006

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	ND
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	ND
Perfluorohexanesulfonate	0.798
Perfluorohexanoic Acid	1.365
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	0.5145
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	0.7455
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-3
Lab Code:	K1614856-007

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	ND
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	ND
Perfluorohexanesulfonate	0.528
Perfluorohexanoic Acid	1.1
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	0.517
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	0.836
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	0.682
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-B-4
Lab Code:	K1614856-008

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	ND
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	ND
Perfluorohexanesulfonate	0.1254
Perfluorohexanoic Acid	0.374
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	0.2046
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	0.165
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	0.2134
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	0.308
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	0.143
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-1
Lab Code:	K1614856-009

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	117.25
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	1.54
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	19.25
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	35
Perfluorononanoic Acid	5.25
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	26.25
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	52.5
Perfluoroundecanoic Acid	1.2775
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	1.4875
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	2.1
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	4.025
Hexafluoropropylene Oxide Dimer Acid	280

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-2
Lab Code:	K1614856-010

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	99
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	1.35
Perfluorododecanoic Acid	0.729
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	8.37
Perfluorohexanesulfonate	0.558
Perfluorohexanoic Acid	17.1
Perfluorononanoic Acid	5.13
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	14.4
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	32.4
Perfluoroundecanoic Acid	2.25
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	7.02
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	9.9
6:2 Fluorotelomer sulfonate	1.44
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	1.8
Hexafluoropropylene Oxide Dimer Acid	135

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-3
Lab Code:	K1614856-011

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	28.6
Perfluorodecane Sulfonate	0.792
Perfluorodecanoic Acid	0.605
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	1.98
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	4.51
Perfluorononanoic Acid	1.067
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	4.29
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	9.02
Perfluoroundecanoic Acid	1.034
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	1.54
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	1.32
Hexafluoropropylene Oxide Dimer Acid	96.8

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Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-1-4
Lab Code:	K1614856-012

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	39.2
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	28.8
Perfluorododecanoic Acid	44
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	32.8
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	32
Perfluorononanoic Acid	73.6
Perfluoro-n-tetradecanoic acid	14.4
Perfluoro-n-tridecanoic acid	43.2
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	280
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	55.2
Perfluoroundecanoic Acid	68.8
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	9.6
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	960

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-1
Lab Code:	K1614856-013

Analyte Name	Total ng
Perfluorobutanesulfonate	2.074
Perfluorobutanoic Acid	29.89
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	1.464
Perfluorododecanoic Acid	1.647
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	3.355
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	10.98
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	24.095
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	14.03
Perfluoroundecanoic Acid	2.196
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	10.065
N-methylperfluoro-1-octanesulfonamide	5.49
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-2
Lab Code:	K1614856-014

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	7.35
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	2.55
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	6.75
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	7.2
Perfluorononanoic Acid	25.5
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	15
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	9.6
Perfluoroundecanoic Acid	11.4
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	1.395
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	ND

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Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-3
Lab Code:	K1614856-015

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	1.54
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	1.26
Perfluorohexanesulfonate	0.966
Perfluorohexanoic Acid	2.24
Perfluorononanoic Acid	3.64
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	5.6
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	2.38
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-1-4
Lab Code:	K1614856-016

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	0.75
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	0.81
Perfluorododecanoic Acid	0.6
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	0.48
Perfluorohexanesulfonate	0.129
Perfluorohexanoic Acid	0.63
Perfluorononanoic Acid	7.2
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	1.41
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	5.7
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	0.18
Perfluoroundecanoic Acid	5.1
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	2.49
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-1
Lab Code:	K1614856-017

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	67.2
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	1.184
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	2.88
Perfluoroheptanoic Acid	15.36
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	22.4
Perfluorononanoic Acid	5.44
Perfluoro-n-tetradecanoic acid	0.992
Perfluoro-n-tridecanoic acid	0.816
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	35.2
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	43.2
Perfluoroundecanoic Acid	1.76
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	4.8
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	2.72
6:2 Fluorotelomer sulfonate	22.4
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	5.76
N-methylperfluoro-1-octanesulfonamide	2.4
Hexafluoropropylene Oxide Dimer Acid	256

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Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name: I-2-2
Lab Code: K1614856-018

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	108.9
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	1.21
Perfluorododecanoic Acid	0.825
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	6.49
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	17.6
Perfluorononanoic Acid	10.34
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	0.924
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	14.3
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	38.5
Perfluoroundecanoic Acid	2.31
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	4.4
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	3.96
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	100.1

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Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-3
Lab Code:	K1614856-019

Analyte Name	Total ng
Perfluorobutanesulfonate	0.847
Perfluorobutanoic Acid	22
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	1.056
Perfluorododecanoic Acid	0.627
Perfluoroheptane sulfonate	0.902
Perfluoroheptanoic Acid	1.98
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	5.83
Perfluorononanoic Acid	0.792
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	1.43
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	7.15
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	10.67
Perfluoroundecanoic Acid	1.21
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	3.41
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	3.08
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	2.42
Hexafluoropropylene Oxide Dimer Acid	55

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-2-4
Lab Code:	K1614856-020

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	13.3
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	10.85
Perfluorododecanoic Acid	17.85
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	8.4
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	8.05
Perfluorononanoic Acid	27.65
Perfluoro-n-tetradecanoic acid	13.3
Perfluoro-n-tridecanoic acid	32.55
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	91
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	14.7
Perfluoroundecanoic Acid	31.85
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	171.5

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-1
Lab Code:	K1614856-021

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	15.9
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	1.83
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	10.5
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	30
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	3.6
Perfluoroundecanoic Acid	3.3
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	6.6
Hexafluoropropylene Oxide Dimer Acid	ND

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Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-2-2
Lab Code:	K1614856-022

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	4.93
Perfluorodecane Sulfonate	1.1165
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	1.276
Perfluoroheptanoic Acid	0.87
Perfluorohexanesulfonate	0.9715
Perfluorohexanoic Acid	2.175
Perfluorononanoic Acid	0.8845
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	10.005
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	0.754
Perfluoroundecanoic Acid	1.392
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	1.595
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	1.1455
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	0.841
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name: O-2-3
Lab Code: K1614856-023

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	3.24
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	1.56
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	1.068
Perfluoroheptanoic Acid	6
Perfluorohexanesulfonate	1.104
Perfluorohexanoic Acid	4.56
Perfluorononanoic Acid	39.6
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	13.2
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	5.04
Perfluoroundecanoic Acid	6.72
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	0.96
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	1.092
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name: O-2-4
Lab Code: K1614856-024

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	ND
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	0.66
Perfluorododecanoic Acid	0.52
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	0.176
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	0.54
Perfluorononanoic Acid	5
Perfluoro-n-tetradecanoic acid	0.32
Perfluoro-n-tridecanoic acid	1.18
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	3
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	0.24
Perfluoroundecanoic Acid	4.6
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	0.54
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	2.8
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-1
Lab Code:	K1614856-025

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	57
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	1.368
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	2.66
Perfluoroheptanoic Acid	11.4
Perfluorohexanesulfonate	3.42
Perfluorohexanoic Acid	18.05
Perfluorononanoic Acid	7.6
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	1.235
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	45.6
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	24.7
Perfluoroundecanoic Acid	1.9
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	5.7
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	1.577
Hexafluoropropylene Oxide Dimer Acid	95

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-2
Lab Code:	K1614856-026

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	62.7
Perfluorodecane Sulfonate	0.66
Perfluorodecanoic Acid	0.748
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	0.792
Perfluoroheptanoic Acid	4.84
Perfluorohexanesulfonate	0.605
Perfluorohexanoic Acid	12.1
Perfluorononanoic Acid	3.3
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	0.286
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	9.46
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	19.8
Perfluoroundecanoic Acid	1.54
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	5.28
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	0.88
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	1.98
Hexafluoropropylene Oxide Dimer Acid	28.6

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-3
Lab Code:	K1614856-027

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	17.6
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	0.759
Perfluoroheptanoic Acid	1.98
Perfluorohexanesulfonate	1.1
Perfluorohexanoic Acid	3.52
Perfluorononanoic Acid	0.693
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	4.18
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	4.84
Perfluoroundecanoic Acid	0.979
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	1.65
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	16.5

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	I-3-4
Lab Code:	K1614856-028

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	ND
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	7.2
Perfluorododecanoic Acid	10.8
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	5.2
Perfluorohexanesulfonate	ND
Perfluorohexanoic Acid	5.2
Perfluorononanoic Acid	12.8
Perfluoro-n-tetradecanoic acid	7.6
Perfluoro-n-tridecanoic acid	19.6
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	96
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	6.4
Perfluoroundecanoic Acid	16.8
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	ND
Hexafluoropropylene Oxide Dimer Acid	38.4

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-1
Lab Code:	K1614856-029

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	25.5
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	1.89
Perfluorohexanesulfonate	2.19
Perfluorohexanoic Acid	5.4
Perfluorononanoic Acid	ND
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	22.2
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	7.8
Perfluoroundecanoic Acid	2.76
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	5.4
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-2
Lab Code:	K1614856-030

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	4.205
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	ND
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	1.044
Perfluoroheptanoic Acid	0.7685
Perfluorohexanesulfonate	0.9135
Perfluorohexanoic Acid	1.595
Perfluorononanoic Acid	1.74
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	7.25
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	ND
Perfluoroundecanoic Acid	1.2905
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	1.2325
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	1.3485
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	1.595
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-3
Lab Code:	K1614856-031

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	2.565
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	2.97
Perfluorododecanoic Acid	ND
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	3.24
Perfluorohexanesulfonate	0.54
Perfluorohexanoic Acid	3.375
Perfluorononanoic Acid	31.05
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	ND
Perfluorooctanesulfonate	ND
Perfluorooctanoic Acid	7.29
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	1.35
Perfluoroundecanoic Acid	12.42
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	1.0125
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	1.35
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	1.89
N-methylperfluoro-1-octanesulfonamide	1.89
Hexafluoropropylene Oxide Dimer Acid	ND

ALS ENVIRONMENTAL

Client:	ALS Environmental - Burlington	**Service Request No.:**	K1614856
Project:	APCC Stack Testing 2016/L1868106	**Date Collected:**	12/7/2016
Sample Matrix:	Aqueous liquid	**Date Received:**	12/8/2016

Poly and Perfluorinated Alkyl Substances by HPLC/MS/MS

Sample Name:	O-3-4
Lab Code:	K1614856-032

Analyte Name	Total ng
Perfluorobutanesulfonate	ND
Perfluorobutanoic Acid	1.6
Perfluorodecane Sulfonate	ND
Perfluorodecanoic Acid	0.8
Perfluorododecanoic Acid	0.47
Perfluoroheptane sulfonate	ND
Perfluoroheptanoic Acid	0.55
Perfluorohexanesulfonate	0.41
Perfluorohexanoic Acid	1.45
Perfluorononanoic Acid	6.5
Perfluoro-n-tetradecanoic acid	ND
Perfluoro-n-tridecanoic acid	1.5
Perfluorooctanesulfonate	0.32
Perfluorooctanoic Acid	4.75
Perfluorooctylsulfonamide	ND
Perfluoropentanoic Acid	0.39
Perfluoroundecanoic Acid	6
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol	0.95
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol	ND
6:2 Fluorotelomer sulfonate	ND
8:2 Fluorotelomer sulfonate	ND
N-ethylperfluoro-1-octanesulfonamide	ND
N-methylperfluoro-1-octanesulfonamide	0.34
Hexafluoropropylene Oxide Dimer Acid	ND

Your Project #: 16036
Site Location: TACONIC
Your C.O.C. #: na

Attention:John Powell

APCC Ltd
93 Breezemere Rd
Brooksville, ME
USA 04617

Report Date: 2017/01/04
Report #: R4309837
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B6Q9629
Received: 2016/12/09, 21:00

Sample Matrix: AIR
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Canister Pressure (TO-15)	2	N/A	2016/12/14	BRL SOP-00304	EPA TO-15 m
Canister Pressure (TO-15)	2	N/A	2016/12/23	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (1)	2	N/A	2016/12/14	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (1)	2	N/A	2016/12/23	BRL SOP-00304	EPA TO-15 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods. Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO14A. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO14A on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Maxxam for a period of 5 calendar days or as contractually agreed from the date of this report, after which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Your Project #: 16036
Site Location: TACONIC
Your C.O.C. #: na

Attention:John Powell

APCC Ltd
93 Breezemere Rd
Brooksville, ME
USA 04617

Report Date: 2017/01/04
Report #: R4309837
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B6Q9629
Received: 2016/12/09, 21:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Tarifur Rahman, Project Manager - Air Toxics, Source Evaluation
Email: TRahman@maxxam.ca
Phone# (905) 817-5700
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B6Q9629
Report Date: 2017/01/04

APCC Ltd
Client Project #: 16036
Site Location: TACONIC

RESULTS OF ANALYSES OF AIR

Maxxam ID		DPL929		DPL930	DPL931		DPL932	
Sampling Date		2016/12/07		2016/12/07	2016/12/07		2016/12/07	
COC Number		na		na	na		na	
	UNITS	**TEST 1**	**QC Batch**	**TEST 2**	**TEST 3**	**QC Batch**	**AMBIENT**	**QC Batch**
Pressure on Receipt	psig	(-5.0)	4792105	(-13.3)	(-14.2)	4809307	(-6.8)	4796074
QC Batch = Quality Control Batch								

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B6Q9629
Report Date: 2017/01/04

APCC Ltd
Client Project #: 16036
Site Location: TACONIC

VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		DPL929			DPL930	DPL930		DPL931		
Sampling Date		2016/12/07			2016/12/07	2016/12/07		2016/12/07		
COC Number		na			na	na		na		
	UNITS	TEST 1	RDL	QC Batch	TEST 2	TEST 2 Lab-Dup	RDL	TEST 3	RDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275
1,2-Dichlorotetrafluoroethane	ppbv	<0.85	0.85	4791982	<1.9	<1.9	1.9	<5.0	5.0	4809275
Chloromethane	ppbv	<1.5	1.5	4791982	14.4	15.1	3.3	<8.8	8.8	4809275
Vinyl Chloride	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Chloroethane	ppbv	<1.5	1.5	4791982	<3.3	<3.3	3.3	<8.8	8.8	4809275
1,3-Butadiene	ppbv	2.8	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275
Trichlorofluoromethane (FREON 11)	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275
Ethanol (ethyl alcohol)	ppbv	259	5.0	4791982	739	771	11	1230	29	4809275
Trichlorotrifluoroethane	ppbv	<0.75	0.75	4791982	<1.7	<1.7	1.7	<4.4	4.4	4809275
2-propanol	ppbv	568	5.0	4791982	1340	1390	11	527	29	4809275
2-Propanone	ppbv	2280	14	4791982	4630	4780	35	3710	23	4809275
Methyl Ethyl Ketone (2-Butanone)	ppbv	194	5.0	4791982	298	309	11	158	29	4809275
Methyl Isobutyl Ketone	ppbv	219	5.0	4791982	262	275	11	108	29	4809275
Methyl Butyl Ketone (2-Hexanone)	ppbv	7.9	5.0	4791982	12	12	11	<29	29	4809275
Methyl t-butyl ether (MTBE)	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275
Ethyl Acetate	ppbv	<5.0	5.0	4791982	<11	<11	11	<29	29	4809275
1,1-Dichloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
cis-1,2-Dichloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
trans-1,2-Dichloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Methylene Chloride(Dichloromethane)	ppbv	<4.0	4.0	4791982	<8.8	<8.8	8.8	<23	23	4809275
Chloroform	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Carbon Tetrachloride	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
1,1-Dichloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
1,2-Dichloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Ethylene Dibromide	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
1,1,1-Trichloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
1,1,2-Trichloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
1,1,2,2-Tetrachloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
cis-1,3-Dichloropropene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
trans-1,3-Dichloropropene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
1,2-Dichloropropane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Bromomethane	ppbv	<0.50	0.50	4791982	2.6	2.8	1.1	<2.9	2.9	4809275
Bromoform	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275
Bromodichloromethane	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6Q9629
Report Date: 2017/01/04

APCC Ltd
Client Project #: 16036
Site Location: TACONIC

VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		DPL929			DPL930	DPL930		DPL931		
Sampling Date		2016/12/07			2016/12/07	2016/12/07		2016/12/07		
COC Number		na			na	na		na		
	UNITS	TEST 1	RDL	QC Batch	TEST 2	TEST 2 Lab-Dup	RDL	TEST 3	RDL	QC Batch
Dibromochloromethane	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275
Trichloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Tetrachloroethylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Benzene	ppbv	2.54	0.50	4791982	5.2	5.7	1.1	<2.9	2.9	4809275
Toluene	ppbv	1.29	0.50	4791982	1.6	1.8	1.1	168	2.9	4809275
Ethylbenzene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
p+m-Xylene	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	6.2	5.9	4809275
o-Xylene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Styrene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
4-ethyltoluene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275
1,3,5-Trimethylbenzene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275
1,2,4-Trimethylbenzene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275
Chlorobenzene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Benzyl chloride	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275
1,3-Dichlorobenzene	ppbv	<2.0	2.0	4791982	<4.4	<4.4	4.4	<12	12	4809275
1,4-Dichlorobenzene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
1,2-Dichlorobenzene	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
1,2,4-Trichlorobenzene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275
Hexachlorobutadiene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275
Hexane	ppbv	<22	22	4791982	<7.5	<7.5	7.5	<8.8	8.8	4809275
Heptane	ppbv	<1.5	1.5	4791982	<3.3	<3.3	3.3	<8.8	8.8	4809275
Cyclohexane	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275
Tetrahydrofuran	ppbv	<2.0	2.0	4791982	6.0	5.7	4.4	<12	12	4809275
1,4-Dioxane	ppbv	12.0	5.0	4791982	87	93	11	78	29	4809275
Naphthalene	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	<15	15	4809275
Total Xylenes	ppbv	<1.5	1.5	4791982	<3.3	<3.3	3.3	<8.8	8.8	4809275
1,1,1,2-Tetrachloroethane	ppbv	<0.50	0.50	4791982	<1.1	<1.1	1.1	<2.9	2.9	4809275
Vinyl Bromide	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275
Propene	ppbv	833	2.5	4791982	704	716	5.5	158	15	4809275
2,2,4-Trimethylpentane	ppbv	<1.0	1.0	4791982	<2.2	<2.2	2.2	<5.9	5.9	4809275
Carbon Disulfide	ppbv	<2.5	2.5	4791982	<5.5	<5.5	5.5	24	15	4809275
Vinyl Acetate	ppbv	10.4	1.0	4791982	7.9	8.4	2.2	<5.9	5.9	4809275

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B6Q9629
Report Date: 2017/01/04

APCC Ltd
Client Project #: 16036
Site Location: TACONIC

VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		DPL929			DPL930	DPL930		DPL931		
Sampling Date		2016/12/07			2016/12/07	2016/12/07		2016/12/07		
COC Number		na			na	na		na		
	UNITS	TEST 1	RDL	QC Batch	TEST 2	TEST 2 Lab-Dup	RDL	TEST 3	RDL	QC Batch
Surrogate Recovery (%)										
Bromochloromethane	%	77	N/A	4791982	81	82	N/A	87	N/A	4809275
D5-Chlorobenzene	%	63	N/A	4791982	76	75	N/A	83	N/A	4809275
Difluorobenzene	%	74	N/A	4791982	78	79	N/A	85	N/A	4809275

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N/A = Not Applicable

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VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		DPL932		
Sampling Date		2016/12/07		
COC Number		na		
	UNITS	AMBIENT	RDL	QC Batch
Dichlorodifluoromethane (FREON 12)	ppbv	0.56	0.40	4795923
1,2-Dichlorotetrafluoroethane	ppbv	<0.34	0.34	4795923
Chloromethane	ppbv	<0.60	0.60	4795923
Vinyl Chloride	ppbv	<0.20	0.20	4795923
Chloroethane	ppbv	<0.60	0.60	4795923
1,3-Butadiene	ppbv	<1.0	1.0	4795923
Trichlorofluoromethane (FREON 11)	ppbv	<0.40	0.40	4795923
Ethanol (ethyl alcohol)	ppbv	<2.0	2.0	4795923
Trichlorotrifluoroethane	ppbv	<0.30	0.30	4795923
2-propanol	ppbv	<2.0	2.0	4795923
2-Propanone	ppbv	10.6	1.6	4795923
Methyl Ethyl Ketone (2-Butanone)	ppbv	<2.0	2.0	4795923
Methyl Isobutyl Ketone	ppbv	<2.0	2.0	4795923
Methyl Butyl Ketone (2-Hexanone)	ppbv	<2.0	2.0	4795923
Methyl t-butyl ether (MTBE)	ppbv	<0.40	0.40	4795923
Ethyl Acetate	ppbv	<2.0	2.0	4795923
1,1-Dichloroethylene	ppbv	<0.20	0.20	4795923
cis-1,2-Dichloroethylene	ppbv	0.32	0.20	4795923
trans-1,2-Dichloroethylene	ppbv	<0.20	0.20	4795923
Methylene Chloride(Dichloromethane)	ppbv	<1.6	1.6	4795923
Chloroform	ppbv	<0.20	0.20	4795923
Carbon Tetrachloride	ppbv	<0.20	0.20	4795923
1,1-Dichloroethane	ppbv	<0.20	0.20	4795923
1,2-Dichloroethane	ppbv	<0.20	0.20	4795923
Ethylene Dibromide	ppbv	<0.20	0.20	4795923
1,1,1-Trichloroethane	ppbv	<0.20	0.20	4795923
1,1,2-Trichloroethane	ppbv	<0.20	0.20	4795923
1,1,2,2-Tetrachloroethane	ppbv	<0.20	0.20	4795923
cis-1,3-Dichloropropene	ppbv	<0.20	0.20	4795923
trans-1,3-Dichloropropene	ppbv	<0.20	0.20	4795923
1,2-Dichloropropane	ppbv	<0.20	0.20	4795923
Bromomethane	ppbv	<0.20	0.20	4795923
Bromoform	ppbv	<0.40	0.40	4795923
Bromodichloromethane	ppbv	<0.40	0.40	4795923
Dibromochloromethane	ppbv	<0.40	0.40	4795923

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam ID		DPL932		
Sampling Date		2016/12/07		
COC Number		na		
	UNITS	AMBIENT	RDL	QC Batch
Trichloroethylene	ppbv	<0.20	0.20	4795923
Tetrachloroethylene	ppbv	1.66	0.20	4795923
Benzene	ppbv	<0.20	0.20	4795923
Toluene	ppbv	<0.20	0.20	4795923
Ethylbenzene	ppbv	<0.20	0.20	4795923
p+m-Xylene	ppbv	<0.40	0.40	4795923
o-Xylene	ppbv	<0.20	0.20	4795923
Styrene	ppbv	<0.20	0.20	4795923
4-ethyltoluene	ppbv	<1.0	1.0	4795923
1,3,5-Trimethylbenzene	ppbv	<1.0	1.0	4795923
1,2,4-Trimethylbenzene	ppbv	<1.0	1.0	4795923
Chlorobenzene	ppbv	<0.20	0.20	4795923
Benzyl chloride	ppbv	<1.0	1.0	4795923
1,3-Dichlorobenzene	ppbv	<0.80	0.80	4795923
1,4-Dichlorobenzene	ppbv	<0.20	0.20	4795923
1,2-Dichlorobenzene	ppbv	<0.20	0.20	4795923
1,2,4-Trichlorobenzene	ppbv	<1.0	1.0	4795923
Hexachlorobutadiene	ppbv	<1.0	1.0	4795923
Hexane	ppbv	<0.60	0.60	4795923
Heptane	ppbv	<0.60	0.60	4795923
Cyclohexane	ppbv	<0.40	0.40	4795923
Tetrahydrofuran	ppbv	<0.80	0.80	4795923
1,4-Dioxane	ppbv	<2.0	2.0	4795923
Naphthalene	ppbv	<1.0	1.0	4795923
Total Xylenes	ppbv	<0.60	0.60	4795923
1,1,1,2-Tetrachloroethane	ppbv	<0.20	0.20	4795923
Vinyl Bromide	ppbv	<0.40	0.40	4795923
Propene	ppbv	2.5	1.0	4795923
2,2,4-Trimethylpentane	ppbv	<0.40	0.40	4795923
Carbon Disulfide	ppbv	<1.0	1.0	4795923
Vinyl Acetate	ppbv	<0.40	0.40	4795923
Surrogate Recovery (%)				
Bromochloromethane	%	91	N/A	4795923
D5-Chlorobenzene	%	86	N/A	4795923

RDL = Reportable Detection Limit
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N/A = Not Applicable

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VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		DPL932		
Sampling Date		2016/12/07		
COC Number		na		
	UNITS	**AMBIENT**	**RDL**	**QC Batch**
Difluorobenzene	%	88	N/A	4795923

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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GENERAL COMMENTS

Sample DPL929 [TEST 1] : Sample was analyzed at a 5X dilution. 2-propanone was analyzed at a 17X dilution The DL's were adjusted accordingly.
Propene is a mixture of both propene and propane and this represents the highest possible concentration of propene.
Increased DL for hexane due to interference.

Sample DPL930 [TEST 2] : Sample was pressurized to a 11X dilution due to high vacuum in can. 2-propanone was analyzed at a 44X dilution. The DL's were adjusted accordingly.
Propene is a mixture of both propene and propane and this represents the highest possible concentration of propene.
Increased DL for hexane due to matrix interference.

Sample DPL931 [TEST 3] : Sample was pressurized to a 29.3X dilution due to high vacuum in can. The DL's were adjusted accordingly.

Sample DPL932 [AMBIENT] : Sample was pressurized due to high vacuum in can. The DL's were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4791982	KM2	Spiked Blank	Bromochloromethane	2016/12/14		99	%	60 - 140
			D5-Chlorobenzene	2016/12/14		95	%	60 - 140
			Difluorobenzene	2016/12/14		98	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2016/12/14		109	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2016/12/14		96	%	70 - 130
			Chloromethane	2016/12/14		116	%	70 - 130
			Vinyl Chloride	2016/12/14		108	%	70 - 130
			Chloroethane	2016/12/14		117	%	70 - 130
			1,3-Butadiene	2016/12/14		127	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2016/12/14		93	%	70 - 130
			Ethanol (ethyl alcohol)	2016/12/14		120	%	70 - 130
			Trichlorotrifluoroethane	2016/12/14		95	%	70 - 130
			2-propanol	2016/12/14		123	%	70 - 130
			2-Propanone	2016/12/14		128	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2016/12/14		123	%	70 - 130
			Methyl Isobutyl Ketone	2016/12/14		115	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2016/12/14		109	%	70 - 130
			Methyl t-butyl ether (MTBE)	2016/12/14		117	%	70 - 130
			Ethyl Acetate	2016/12/14		125	%	70 - 130
			1,1-Dichloroethylene	2016/12/14		109	%	70 - 130
			cis-1,2-Dichloroethylene	2016/12/14		105	%	70 - 130
			trans-1,2-Dichloroethylene	2016/12/14		115	%	70 - 130
			Methylene Chloride(Dichloromethane)	2016/12/14		103	%	70 - 130
			Chloroform	2016/12/14		97	%	70 - 130
			Carbon Tetrachloride	2016/12/14		93	%	70 - 130
			1,1-Dichloroethane	2016/12/14		107	%	70 - 130
			1,2-Dichloroethane	2016/12/14		108	%	70 - 130
			Ethylene Dibromide	2016/12/14		96	%	70 - 130
			1,1,1-Trichloroethane	2016/12/14		95	%	70 - 130
			1,1,2-Trichloroethane	2016/12/14		105	%	70 - 130
			1,1,2,2-Tetrachloroethane	2016/12/14		104	%	70 - 130
			cis-1,3-Dichloropropene	2016/12/14		118	%	70 - 130
			trans-1,3-Dichloropropene	2016/12/14		118	%	70 - 130
			1,2-Dichloropropane	2016/12/14		107	%	70 - 130
			Bromomethane	2016/12/14		112	%	70 - 130
			Bromoform	2016/12/14		99	%	70 - 130
			Bromodichloromethane	2016/12/14		110	%	70 - 130
			Dibromochloromethane	2016/12/14		101	%	70 - 130
			Trichloroethylene	2016/12/14		97	%	70 - 130
			Tetrachloroethylene	2016/12/14		94	%	70 - 130
			Benzene	2016/12/14		104	%	70 - 130
			Toluene	2016/12/14		112	%	70 - 130
			Ethylbenzene	2016/12/14		101	%	70 - 130
			p+m-Xylene	2016/12/14		101	%	70 - 130
			o-Xylene	2016/12/14		102	%	70 - 130
			Styrene	2016/12/14		104	%	70 - 130
			4-ethyltoluene	2016/12/14		106	%	70 - 130
			1,3,5-Trimethylbenzene	2016/12/14		95	%	70 - 130
			1,2,4-Trimethylbenzene	2016/12/14		97	%	70 - 130
			Chlorobenzene	2016/12/14		95	%	70 - 130
			Benzyl chloride	2016/12/14		110	%	70 - 130
			1,3-Dichlorobenzene	2016/12/14		94	%	70 - 130
			1,4-Dichlorobenzene	2016/12/14		89	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichlorobenzene	2016/12/14		92	%	70 - 130
			1,2,4-Trichlorobenzene	2016/12/14		90	%	70 - 130
			Hexachlorobutadiene	2016/12/14		86	%	70 - 130
			Hexane	2016/12/14		107	%	70 - 130
			Heptane	2016/12/14		121	%	70 - 130
			Cyclohexane	2016/12/14		113	%	70 - 130
			Tetrahydrofuran	2016/12/14		125	%	70 - 130
			1,4-Dioxane	2016/12/14		70	%	70 - 130
			Naphthalene	2016/12/14		91	%	70 - 130
			Total Xylenes	2016/12/14		101	%	70 - 130
			Vinyl Bromide	2016/12/14		117	%	70 - 130
			Propene	2016/12/14		135 (1)	%	70 - 130
			2,2,4-Trimethylpentane	2016/12/14		118	%	70 - 130
			Carbon Disulfide	2016/12/14		118	%	70 - 130
			Vinyl Acetate	2016/12/14		128	%	70 - 130
4791982	KM2	Method Blank	Bromochloromethane	2016/12/14		105	%	60 - 140
			D5-Chlorobenzene	2016/12/14		92	%	60 - 140
			Difluorobenzene	2016/12/14		101	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2016/12/14	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2016/12/14	<0.17		ppbv	
			Chloromethane	2016/12/14	<0.30		ppbv	
			Vinyl Chloride	2016/12/14	<0.10		ppbv	
			Chloroethane	2016/12/14	<0.30		ppbv	
			1,3-Butadiene	2016/12/14	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2016/12/14	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2016/12/14	<1.0		ppbv	
			Trichlorotrifluoroethane	2016/12/14	<0.15		ppbv	
			2-propanol	2016/12/14	<1.0		ppbv	
			2-Propanone	2016/12/14	<0.80		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2016/12/14	<1.0		ppbv	
			Methyl Isobutyl Ketone	2016/12/14	<1.0		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2016/12/14	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2016/12/14	<0.20		ppbv	
			Ethyl Acetate	2016/12/14	<1.0		ppbv	
			1,1-Dichloroethylene	2016/12/14	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2016/12/14	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2016/12/14	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2016/12/14	<0.80		ppbv	
			Chloroform	2016/12/14	<0.10		ppbv	
			Carbon Tetrachloride	2016/12/14	<0.10		ppbv	
			1,1-Dichloroethane	2016/12/14	<0.10		ppbv	
			1,2-Dichloroethane	2016/12/14	<0.10		ppbv	
			Ethylene Dibromide	2016/12/14	<0.10		ppbv	
			1,1,1-Trichloroethane	2016/12/14	<0.10		ppbv	
			1,1,2-Trichloroethane	2016/12/14	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2016/12/14	<0.10		ppbv	
			cis-1,3-Dichloropropene	2016/12/14	<0.10		ppbv	
			trans-1,3-Dichloropropene	2016/12/14	<0.10		ppbv	
			1,2-Dichloropropane	2016/12/14	<0.10		ppbv	
			Bromomethane	2016/12/14	<0.10		ppbv	
			Bromoform	2016/12/14	<0.20		ppbv	
			Bromodichloromethane	2016/12/14	<0.20		ppbv	
			Dibromochloromethane	2016/12/14	<0.20		ppbv	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Trichloroethylene	2016/12/14	<0.10		ppbv	
			Tetrachloroethylene	2016/12/14	<0.10		ppbv	
			Benzene	2016/12/14	<0.10		ppbv	
			Toluene	2016/12/14	<0.10		ppbv	
			Ethylbenzene	2016/12/14	<0.10		ppbv	
			p+m-Xylene	2016/12/14	<0.20		ppbv	
			o-Xylene	2016/12/14	<0.10		ppbv	
			Styrene	2016/12/14	<0.10		ppbv	
			4-ethyltoluene	2016/12/14	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2016/12/14	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2016/12/14	<0.50		ppbv	
			Chlorobenzene	2016/12/14	<0.10		ppbv	
			Benzyl chloride	2016/12/14	<0.50		ppbv	
			1,3-Dichlorobenzene	2016/12/14	<0.40		ppbv	
			1,4-Dichlorobenzene	2016/12/14	<0.10		ppbv	
			1,2-Dichlorobenzene	2016/12/14	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2016/12/14	<0.50		ppbv	
			Hexachlorobutadiene	2016/12/14	<0.50		ppbv	
			Hexane	2016/12/14	<0.30		ppbv	
			Heptane	2016/12/14	<0.30		ppbv	
			Cyclohexane	2016/12/14	<0.20		ppbv	
			Tetrahydrofuran	2016/12/14	<0.40		ppbv	
			1,4-Dioxane	2016/12/14	<1.0		ppbv	
			Naphthalene	2016/12/14	<0.50		ppbv	
			Total Xylenes	2016/12/14	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2016/12/14	<0.10		ppbv	
			Vinyl Bromide	2016/12/14	<0.20		ppbv	
			Propene	2016/12/14	<0.50		ppbv	
			2,2,4-Trimethylpentane	2016/12/14	<0.20		ppbv	
			Carbon Disulfide	2016/12/14	<0.50		ppbv	
			Vinyl Acetate	2016/12/14	<0.20		ppbv	
4795923	KM2	Spiked Blank	Bromochloromethane	2016/12/16		102	%	60 - 140
			D5-Chlorobenzene	2016/12/16		101	%	60 - 140
			Difluorobenzene	2016/12/16		101	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2016/12/16		98	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2016/12/16		85	%	70 - 130
			Chloromethane	2016/12/16		105	%	70 - 130
			Vinyl Chloride	2016/12/16		100	%	70 - 130
			Chloroethane	2016/12/16		97	%	70 - 130
			1,3-Butadiene	2016/12/16		115	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2016/12/16		87	%	70 - 130
			Ethanol (ethyl alcohol)	2016/12/16		112	%	70 - 130
			Trichlorotrifluoroethane	2016/12/16		93	%	70 - 130
			2-propanol	2016/12/16		118	%	70 - 130
			2-Propanone	2016/12/16		120	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2016/12/16		118	%	70 - 130
			Methyl Isobutyl Ketone	2016/12/16		111	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2016/12/16		104	%	70 - 130
			Methyl t-butyl ether (MTBE)	2016/12/16		112	%	70 - 130
			Ethyl Acetate	2016/12/16		123	%	70 - 130
			1,1-Dichloroethylene	2016/12/16		107	%	70 - 130
			cis-1,2-Dichloroethylene	2016/12/16		104	%	70 - 130
			trans-1,2-Dichloroethylene	2016/12/16		109	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methylene Chloride(Dichloromethane)	2016/12/16		102	%	70 - 130
			Chloroform	2016/12/16		95	%	70 - 130
			Carbon Tetrachloride	2016/12/16		91	%	70 - 130
			1,1-Dichloroethane	2016/12/16		105	%	70 - 130
			1,2-Dichloroethane	2016/12/16		106	%	70 - 130
			Ethylene Dibromide	2016/12/16		96	%	70 - 130
			1,1,1-Trichloroethane	2016/12/16		92	%	70 - 130
			1,1,2-Trichloroethane	2016/12/16		97	%	70 - 130
			1,1,2,2-Tetrachloroethane	2016/12/16		99	%	70 - 130
			cis-1,3-Dichloropropene	2016/12/16		116	%	70 - 130
			trans-1,3-Dichloropropene	2016/12/16		114	%	70 - 130
			1,2-Dichloropropane	2016/12/16		105	%	70 - 130
			Bromomethane	2016/12/16		95	%	70 - 130
			Bromoform	2016/12/16		95	%	70 - 130
			Bromodichloromethane	2016/12/16		107	%	70 - 130
			Dibromochloromethane	2016/12/16		100	%	70 - 130
			Trichloroethylene	2016/12/16		95	%	70 - 130
			Tetrachloroethylene	2016/12/16		94	%	70 - 130
			Benzene	2016/12/16		102	%	70 - 130
			Toluene	2016/12/16		105	%	70 - 130
			Ethylbenzene	2016/12/16		98	%	70 - 130
			p+m-Xylene	2016/12/16		96	%	70 - 130
			o-Xylene	2016/12/16		98	%	70 - 130
			Styrene	2016/12/16		101	%	70 - 130
			4-ethyltoluene	2016/12/16		103	%	70 - 130
			1,3,5-Trimethylbenzene	2016/12/16		91	%	70 - 130
			1,2,4-Trimethylbenzene	2016/12/16		92	%	70 - 130
			Chlorobenzene	2016/12/16		93	%	70 - 130
			Benzyl chloride	2016/12/16		105	%	70 - 130
			1,3-Dichlorobenzene	2016/12/16		89	%	70 - 130
			1,4-Dichlorobenzene	2016/12/16		85	%	70 - 130
			1,2-Dichlorobenzene	2016/12/16		85	%	70 - 130
			1,2,4-Trichlorobenzene	2016/12/16		85	%	70 - 130
			Hexachlorobutadiene	2016/12/16		79	%	70 - 130
			Hexane	2016/12/16		107	%	70 - 130
			Heptane	2016/12/16		118	%	70 - 130
			Cyclohexane	2016/12/16		110	%	70 - 130
			Tetrahydrofuran	2016/12/16		122	%	70 - 130
			1,4-Dioxane	2016/12/16		69 (1)	%	70 - 130
			Naphthalene	2016/12/16		84	%	70 - 130
			Total Xylenes	2016/12/16		96	%	70 - 130
			Vinyl Bromide	2016/12/16		100	%	70 - 130
			Propene	2016/12/16		124	%	70 - 130
			2,2,4-Trimethylpentane	2016/12/16		115	%	70 - 130
			Carbon Disulfide	2016/12/16		116	%	70 - 130
			Vinyl Acetate	2016/12/16		126	%	70 - 130
4795923	KM2	Method Blank	Bromochloromethane	2016/12/16		104	%	60 - 140
			D5-Chlorobenzene	2016/12/16		95	%	60 - 140
			Difluorobenzene	2016/12/16		103	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2016/12/16	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2016/12/16	<0.17		ppbv	
			Chloromethane	2016/12/16	<0.30		ppbv	
			Vinyl Chloride	2016/12/16	<0.10		ppbv	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chloroethane	2016/12/16	<0.30		ppbv	
			1,3-Butadiene	2016/12/16	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2016/12/16	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2016/12/16	<1.0		ppbv	
			Trichlorotrifluoroethane	2016/12/16	<0.15		ppbv	
			2-propanol	2016/12/16	<1.0		ppbv	
			2-Propanone	2016/12/16	<0.80		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2016/12/16	<1.0		ppbv	
			Methyl Isobutyl Ketone	2016/12/16	<1.0		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2016/12/16	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2016/12/16	<0.20		ppbv	
			Ethyl Acetate	2016/12/16	<1.0		ppbv	
			1,1-Dichloroethylene	2016/12/16	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2016/12/16	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2016/12/16	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2016/12/16	<0.80		ppbv	
			Chloroform	2016/12/16	<0.10		ppbv	
			Carbon Tetrachloride	2016/12/16	<0.10		ppbv	
			1,1-Dichloroethane	2016/12/16	<0.10		ppbv	
			1,2-Dichloroethane	2016/12/16	<0.10		ppbv	
			Ethylene Dibromide	2016/12/16	<0.10		ppbv	
			1,1,1-Trichloroethane	2016/12/16	<0.10		ppbv	
			1,1,2-Trichloroethane	2016/12/16	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2016/12/16	<0.10		ppbv	
			cis-1,3-Dichloropropene	2016/12/16	<0.10		ppbv	
			trans-1,3-Dichloropropene	2016/12/16	<0.10		ppbv	
			1,2-Dichloropropane	2016/12/16	<0.10		ppbv	
			Bromomethane	2016/12/16	<0.10		ppbv	
			Bromoform	2016/12/16	<0.20		ppbv	
			Bromodichloromethane	2016/12/16	<0.20		ppbv	
			Dibromochloromethane	2016/12/16	<0.20		ppbv	
			Trichloroethylene	2016/12/16	<0.10		ppbv	
			Tetrachloroethylene	2016/12/16	<0.10		ppbv	
			Benzene	2016/12/16	<0.10		ppbv	
			Toluene	2016/12/16	<0.10		ppbv	
			Ethylbenzene	2016/12/16	<0.10		ppbv	
			p+m-Xylene	2016/12/16	<0.20		ppbv	
			o-Xylene	2016/12/16	<0.10		ppbv	
			Styrene	2016/12/16	<0.10		ppbv	
			4-ethyltoluene	2016/12/16	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2016/12/16	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2016/12/16	<0.50		ppbv	
			Chlorobenzene	2016/12/16	<0.10		ppbv	
			Benzyl chloride	2016/12/16	<0.50		ppbv	
			1,3-Dichlorobenzene	2016/12/16	<0.40		ppbv	
			1,4-Dichlorobenzene	2016/12/16	<0.10		ppbv	
			1,2-Dichlorobenzene	2016/12/16	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2016/12/16	<0.50		ppbv	
			Hexachlorobutadiene	2016/12/16	<0.50		ppbv	
			Hexane	2016/12/16	<0.30		ppbv	
			Heptane	2016/12/16	<0.30		ppbv	
			Cyclohexane	2016/12/16	<0.20		ppbv	
			Tetrahydrofuran	2016/12/16	<0.40		ppbv	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,4-Dioxane	2016/12/16	<1.0		ppbv	
			Naphthalene	2016/12/16	<0.50		ppbv	
			Total Xylenes	2016/12/16	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2016/12/16	<0.10		ppbv	
			Vinyl Bromide	2016/12/16	<0.20		ppbv	
			Propene	2016/12/16	<0.50		ppbv	
			2,2,4-Trimethylpentane	2016/12/16	<0.20		ppbv	
			Carbon Disulfide	2016/12/16	<0.50		ppbv	
			Vinyl Acetate	2016/12/16	<0.20		ppbv	
4795923	KM2	RPD	Dichlorodifluoromethane (FREON 12)	2016/12/16	NC		%	25
			1,2-Dichlorotetrafluoroethane	2016/12/16	NC		%	25
			Chloromethane	2016/12/16	NC		%	25
			Vinyl Chloride	2016/12/16	NC		%	25
			Chloroethane	2016/12/16	NC		%	25
			1,3-Butadiene	2016/12/16	NC		%	25
			Trichlorofluoromethane (FREON 11)	2016/12/16	NC		%	25
			Ethanol (ethyl alcohol)	2016/12/16	NC		%	25
			Trichlorotrifluoroethane	2016/12/16	NC		%	25
			2-propanol	2016/12/16	NC		%	25
			2-Propanone	2016/12/16	0.24		%	25
			Methyl Ethyl Ketone (2-Butanone)	2016/12/16	NC		%	25
			Methyl Isobutyl Ketone	2016/12/16	NC		%	25
			Methyl Butyl Ketone (2-Hexanone)	2016/12/16	NC		%	25
			Methyl t-butyl ether (MTBE)	2016/12/16	NC		%	25
			Ethyl Acetate	2016/12/16	NC		%	25
			1,1-Dichloroethylene	2016/12/16	NC		%	25
			cis-1,2-Dichloroethylene	2016/12/16	NC		%	25
			trans-1,2-Dichloroethylene	2016/12/16	4.7		%	25
			Methylene Chloride(Dichloromethane)	2016/12/16	NC		%	25
			Chloroform	2016/12/16	0.87		%	25
			Carbon Tetrachloride	2016/12/16	NC		%	25
			1,1-Dichloroethane	2016/12/16	NC		%	25
			1,2-Dichloroethane	2016/12/16	NC		%	25
			Ethylene Dibromide	2016/12/16	NC		%	25
			1,1,1-Trichloroethane	2016/12/16	NC		%	25
			1,1,2-Trichloroethane	2016/12/16	NC		%	25
			1,1,2,2-Tetrachloroethane	2016/12/16	NC		%	25
			cis-1,3-Dichloropropene	2016/12/16	NC		%	25
			trans-1,3-Dichloropropene	2016/12/16	NC		%	25
			1,2-Dichloropropane	2016/12/16	NC		%	25
			Bromomethane	2016/12/16	NC		%	25
			Bromoform	2016/12/16	NC		%	25
			Bromodichloromethane	2016/12/16	NC		%	25
			Dibromochloromethane	2016/12/16	NC		%	25
			Trichloroethylene	2016/12/16	NC		%	25
			Tetrachloroethylene	2016/12/16	0.36		%	25
			Benzene	2016/12/16	5.9		%	25
			Toluene	2016/12/16	4.4		%	25
			Ethylbenzene	2016/12/16	4.7		%	25
			p+m-Xylene	2016/12/16	7.2		%	25
			o-Xylene	2016/12/16	7.9		%	25
			Styrene	2016/12/16	NC		%	25
			4-ethyltoluene	2016/12/16	NC		%	25

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,3,5-Trimethylbenzene	2016/12/16	NC		%	25
			1,2,4-Trimethylbenzene	2016/12/16	NC		%	25
			Chlorobenzene	2016/12/16	NC		%	25
			Benzyl chloride	2016/12/16	NC		%	25
			1,3-Dichlorobenzene	2016/12/16	NC		%	25
			1,4-Dichlorobenzene	2016/12/16	NC		%	25
			1,2-Dichlorobenzene	2016/12/16	NC		%	25
			1,2,4-Trichlorobenzene	2016/12/16	NC		%	25
			Hexachlorobutadiene	2016/12/16	NC		%	25
			Hexane	2016/12/16	2.2		%	25
			Heptane	2016/12/16	NC		%	25
			Cyclohexane	2016/12/16	NC		%	25
			Tetrahydrofuran	2016/12/16	NC		%	25
			1,4-Dioxane	2016/12/16	NC		%	25
			Naphthalene	2016/12/16	NC		%	25
			Total Xylenes	2016/12/16	7.4		%	25
			1,1,1,2-Tetrachloroethane	2016/12/16	NC		%	25
			Vinyl Bromide	2016/12/16	NC		%	25
			Propene	2016/12/16	NC		%	25
			2,2,4-Trimethylpentane	2016/12/16	NC		%	25
			Carbon Disulfide	2016/12/16	4.5		%	25
			Vinyl Acetate	2016/12/16	NC		%	25
4809275	LSY	Spiked Blank	Bromochloromethane	2016/12/23		97	%	60 - 140
			D5-Chlorobenzene	2016/12/23		96	%	60 - 140
			Difluorobenzene	2016/12/23		97	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2016/12/23		92	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2016/12/23		81	%	70 - 130
			Chloromethane	2016/12/23		83	%	70 - 130
			Vinyl Chloride	2016/12/23		85	%	70 - 130
			Chloroethane	2016/12/23		82	%	70 - 130
			1,3-Butadiene	2016/12/23		85	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2016/12/23		86	%	70 - 130
			Ethanol (ethyl alcohol)	2016/12/23		77	%	70 - 130
			Trichlorotrifluoroethane	2016/12/23		96	%	70 - 130
			2-propanol	2016/12/23		84	%	70 - 130
			2-Propanone	2016/12/23		92	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2016/12/23		94	%	70 - 130
			Methyl Isobutyl Ketone	2016/12/23		95	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2016/12/23		95	%	70 - 130
			Methyl t-butyl ether (MTBE)	2016/12/23		95	%	70 - 130
			Ethyl Acetate	2016/12/23		98	%	70 - 130
			1,1-Dichloroethylene	2016/12/23		99	%	70 - 130
			cis-1,2-Dichloroethylene	2016/12/23		92	%	70 - 130
			trans-1,2-Dichloroethylene	2016/12/23		95	%	70 - 130
			Methylene Chloride(Dichloromethane)	2016/12/23		87	%	70 - 130
			Chloroform	2016/12/23		93	%	70 - 130
			Carbon Tetrachloride	2016/12/23		90	%	70 - 130
			1,1-Dichloroethane	2016/12/23		93	%	70 - 130
			1,2-Dichloroethane	2016/12/23		98	%	70 - 130
			Ethylene Dibromide	2016/12/23		101	%	70 - 130
			1,1,1-Trichloroethane	2016/12/23		94	%	70 - 130
			1,1,2-Trichloroethane	2016/12/23		100	%	70 - 130
			1,1,2,2-Tetrachloroethane	2016/12/23		106	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			cis-1,3-Dichloropropene	2016/12/23		109	%	70 - 130
			trans-1,3-Dichloropropene	2016/12/23		101	%	70 - 130
			1,2-Dichloropropane	2016/12/23		97	%	70 - 130
			Bromomethane	2016/12/23		92	%	70 - 130
			Bromoform	2016/12/23		106	%	70 - 130
			Bromodichloromethane	2016/12/23		106	%	70 - 130
			Dibromochloromethane	2016/12/23		104	%	70 - 130
			Trichloroethylene	2016/12/23		107	%	70 - 130
			Tetrachloroethylene	2016/12/23		105	%	70 - 130
			Benzene	2016/12/23		97	%	70 - 130
			Toluene	2016/12/23		104	%	70 - 130
			Ethylbenzene	2016/12/23		100	%	70 - 130
			p+m-Xylene	2016/12/23		96	%	70 - 130
			o-Xylene	2016/12/23		99	%	70 - 130
			Styrene	2016/12/23		98	%	70 - 130
			4-ethyltoluene	2016/12/23		104	%	70 - 130
			1,3,5-Trimethylbenzene	2016/12/23		96	%	70 - 130
			1,2,4-Trimethylbenzene	2016/12/23		96	%	70 - 130
			Chlorobenzene	2016/12/23		103	%	70 - 130
			Benzyl chloride	2016/12/23		91	%	70 - 130
			1,3-Dichlorobenzene	2016/12/23		103	%	70 - 130
			1,4-Dichlorobenzene	2016/12/23		99	%	70 - 130
			1,2-Dichlorobenzene	2016/12/23		100	%	70 - 130
			1,2,4-Trichlorobenzene	2016/12/23		93	%	70 - 130
			Hexachlorobutadiene	2016/12/23		94	%	70 - 130
			Hexane	2016/12/23		89	%	70 - 130
			Heptane	2016/12/23		91	%	70 - 130
			Cyclohexane	2016/12/23		92	%	70 - 130
			Tetrahydrofuran	2016/12/23		91	%	70 - 130
			1,4-Dioxane	2016/12/23		81	%	70 - 130
			Naphthalene	2016/12/23		88	%	70 - 130
			Total Xylenes	2016/12/23		97	%	70 - 130
			Vinyl Bromide	2016/12/23		93	%	70 - 130
			Propene	2016/12/23		91	%	70 - 130
			2,2,4-Trimethylpentane	2016/12/23		96	%	70 - 130
			Carbon Disulfide	2016/12/23		105	%	70 - 130
			Vinyl Acetate	2016/12/23		88	%	70 - 130
4809275	LSY	Method Blank	Bromochloromethane	2016/12/23		91	%	60 - 140
			D5-Chlorobenzene	2016/12/23		90	%	60 - 140
			Difluorobenzene	2016/12/23		91	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2016/12/23	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2016/12/23	<0.17		ppbv	
			Chloromethane	2016/12/23	<0.30		ppbv	
			Vinyl Chloride	2016/12/23	<0.10		ppbv	
			Chloroethane	2016/12/23	<0.30		ppbv	
			1,3-Butadiene	2016/12/23	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2016/12/23	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2016/12/23	<1.0		ppbv	
			Trichlorotrifluoroethane	2016/12/23	<0.15		ppbv	
			2-propanol	2016/12/23	<1.0		ppbv	
			2-Propanone	2016/12/23	<0.80		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2016/12/23	<1.0		ppbv	
			Methyl Isobutyl Ketone	2016/12/23	<1.0		ppbv	

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Maxxam Job #: B6Q9629
Report Date: 2017/01/04

APCC Ltd
Client Project #: 16036
Site Location: TACONIC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl Butyl Ketone (2-Hexanone)	2016/12/23	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2016/12/23	<0.20		ppbv	
			Ethyl Acetate	2016/12/23	<1.0		ppbv	
			1,1-Dichloroethylene	2016/12/23	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2016/12/23	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2016/12/23	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2016/12/23	<0.80		ppbv	
			Chloroform	2016/12/23	<0.10		ppbv	
			Carbon Tetrachloride	2016/12/23	<0.10		ppbv	
			1,1-Dichloroethane	2016/12/23	<0.10		ppbv	
			1,2-Dichloroethane	2016/12/23	<0.10		ppbv	
			Ethylene Dibromide	2016/12/23	<0.10		ppbv	
			1,1,1-Trichloroethane	2016/12/23	<0.10		ppbv	
			1,1,2-Trichloroethane	2016/12/23	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2016/12/23	<0.10		ppbv	
			cis-1,3-Dichloropropene	2016/12/23	<0.10		ppbv	
			trans-1,3-Dichloropropene	2016/12/23	<0.10		ppbv	
			1,2-Dichloropropane	2016/12/23	<0.10		ppbv	
			Bromomethane	2016/12/23	<0.10		ppbv	
			Bromoform	2016/12/23	<0.20		ppbv	
			Bromodichloromethane	2016/12/23	<0.20		ppbv	
			Dibromochloromethane	2016/12/23	<0.20		ppbv	
			Trichloroethylene	2016/12/23	<0.10		ppbv	
			Tetrachloroethylene	2016/12/23	<0.10		ppbv	
			Benzene	2016/12/23	<0.10		ppbv	
			Toluene	2016/12/23	<0.10		ppbv	
			Ethylbenzene	2016/12/23	<0.10		ppbv	
			p+m-Xylene	2016/12/23	<0.20		ppbv	
			o-Xylene	2016/12/23	<0.10		ppbv	
			Styrene	2016/12/23	<0.10		ppbv	
			4-ethyltoluene	2016/12/23	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2016/12/23	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2016/12/23	<0.50		ppbv	
			Chlorobenzene	2016/12/23	<0.10		ppbv	
			Benzyl chloride	2016/12/23	<0.50		ppbv	
			1,3-Dichlorobenzene	2016/12/23	<0.40		ppbv	
			1,4-Dichlorobenzene	2016/12/23	<0.10		ppbv	
			1,2-Dichlorobenzene	2016/12/23	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2016/12/23	<0.50		ppbv	
			Hexachlorobutadiene	2016/12/23	<0.50		ppbv	
			Hexane	2016/12/23	<0.30		ppbv	
			Heptane	2016/12/23	<0.30		ppbv	
			Cyclohexane	2016/12/23	<0.20		ppbv	
			Tetrahydrofuran	2016/12/23	<0.40		ppbv	
			1,4-Dioxane	2016/12/23	<1.0		ppbv	
			Naphthalene	2016/12/23	<0.50		ppbv	
			Total Xylenes	2016/12/23	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2016/12/23	<0.10		ppbv	
			Vinyl Bromide	2016/12/23	<0.20		ppbv	
			Propene	2016/12/23	<0.50		ppbv	
			2,2,4-Trimethylpentane	2016/12/23	<0.20		ppbv	
			Carbon Disulfide	2016/12/23	<0.50		ppbv	
			Vinyl Acetate	2016/12/23	<0.20		ppbv	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4809275	LSY	RPD [DPL930-01]	Dichlorodifluoromethane (FREON 12)	2016/12/23	NC		%	25
			1,2-Dichlorotetrafluoroethane	2016/12/23	NC		%	25
			Chloromethane	2016/12/23	NC		%	25
			Vinyl Chloride	2016/12/23	NC		%	25
			Chloroethane	2016/12/23	NC		%	25
			1,3-Butadiene	2016/12/23	NC		%	25
			Trichlorofluoromethane (FREON 11)	2016/12/23	NC		%	25
			Ethanol (ethyl alcohol)	2016/12/23	4.2		%	25
			Trichlorotrifluoroethane	2016/12/23	NC		%	25
			2-propanol	2016/12/23	3.5		%	25
			2-Propanone	2016/12/23	3.3		%	25
			Methyl Ethyl Ketone (2-Butanone)	2016/12/23	3.9		%	25
			Methyl Isobutyl Ketone	2016/12/23	5.0		%	25
			Methyl Butyl Ketone (2-Hexanone)	2016/12/23	NC		%	25
			Methyl t-butyl ether (MTBE)	2016/12/23	NC		%	25
			Ethyl Acetate	2016/12/23	NC		%	25
			1,1-Dichloroethylene	2016/12/23	NC		%	25
			cis-1,2-Dichloroethylene	2016/12/23	NC		%	25
			trans-1,2-Dichloroethylene	2016/12/23	NC		%	25
			Methylene Chloride(Dichloromethane)	2016/12/23	NC		%	25
			Chloroform	2016/12/23	NC		%	25
			Carbon Tetrachloride	2016/12/23	NC		%	25
			1,1-Dichloroethane	2016/12/23	NC		%	25
			1,2-Dichloroethane	2016/12/23	NC		%	25
			Ethylene Dibromide	2016/12/23	NC		%	25
			1,1,1-Trichloroethane	2016/12/23	NC		%	25
			1,1,2-Trichloroethane	2016/12/23	NC		%	25
			1,1,2,2-Tetrachloroethane	2016/12/23	NC		%	25
			cis-1,3-Dichloropropene	2016/12/23	NC		%	25
			trans-1,3-Dichloropropene	2016/12/23	NC		%	25
			1,2-Dichloropropane	2016/12/23	NC		%	25
			Bromomethane	2016/12/23	NC		%	25
			Bromoform	2016/12/23	NC		%	25
			Bromodichloromethane	2016/12/23	NC		%	25
			Dibromochloromethane	2016/12/23	NC		%	25
			Trichloroethylene	2016/12/23	NC		%	25
			Tetrachloroethylene	2016/12/23	NC		%	25
			Benzene	2016/12/23	NC		%	25
			Toluene	2016/12/23	NC		%	25
			Ethylbenzene	2016/12/23	NC		%	25
			p+m-Xylene	2016/12/23	NC		%	25
			o-Xylene	2016/12/23	NC		%	25
			Styrene	2016/12/23	NC		%	25
			4-ethyltoluene	2016/12/23	NC		%	25
			1,3,5-Trimethylbenzene	2016/12/23	NC		%	25
			1,2,4-Trimethylbenzene	2016/12/23	NC		%	25
			Chlorobenzene	2016/12/23	NC		%	25
			Benzyl chloride	2016/12/23	NC		%	25
			1,3-Dichlorobenzene	2016/12/23	NC		%	25
			1,4-Dichlorobenzene	2016/12/23	NC		%	25
			1,2-Dichlorobenzene	2016/12/23	NC		%	25
			1,2,4-Trichlorobenzene	2016/12/23	NC		%	25
			Hexachlorobutadiene	2016/12/23	NC		%	25

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Maxxam Job #: B6Q9629
Report Date: 2017/01/04

APCC Ltd
Client Project #: 16036
Site Location: TACONIC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Hexane	2016/12/23	NC		%	25
			Heptane	2016/12/23	NC		%	25
			Cyclohexane	2016/12/23	NC		%	25
			Tetrahydrofuran	2016/12/23	NC		%	25
			1,4-Dioxane	2016/12/23	6.9		%	25
			Naphthalene	2016/12/23	NC		%	25
			Total Xylenes	2016/12/23	NC		%	25
			1,1,1,2-Tetrachloroethane	2016/12/23	NC		%	25
			Vinyl Bromide	2016/12/23	NC		%	25
			Propene	2016/12/23	1.7		%	25
			2,2,4-Trimethylpentane	2016/12/23	NC		%	25
			Carbon Disulfide	2016/12/23	NC		%	25
			Vinyl Acetate	2016/12/23	NC		%	25

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B6Q9629
Report Date: 2017/01/04

APCC Ltd
Client Project #: 16036
Site Location: TACONIC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Angel Guerrero, Team Leader, VOC Air

Maureen Smith, Supervisor, Volatiles

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Client Sample Results

Client: Tonoga Inc dba Taconic
Project/Site: Petersburgh, NY

TestAmerica Job ID: 320-24159-1

Client Sample ID: FE5 Supply Water 1
Date Collected: 12/07/16 08:10
Date Received: 12/08/16 10:00

Lab Sample ID: 320-24159-9
Matrix: Water

Method: PFAS - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		12/12/16 09:34	12/13/16 08:01	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		12/12/16 09:34	12/13/16 08:01	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		12/12/16 09:34	12/13/16 08:01	1
Perfluorooctanoic acid (PFOA)	**32**		2.0	0.75	ng/L		12/12/16 09:34	12/13/16 08:01	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		12/12/16 09:34	12/13/16 08:01	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		12/12/16 09:34	12/13/16 08:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*103*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:01*	*1*
13C4-PFHpA	*115*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:01*	*1*
13C4 PFOA	*101*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:01*	*1*
13C4 PFOS	*100*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:01*	*1*
13C5 PFNA	*106*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:01*	*1*

Client Sample Results

Client: Tonoga Inc dba Taconic
Project/Site: Petersburgh, NY

TestAmerica Job ID: 320-24159-1

Client Sample ID: FE5 Supply Water 2
Date Collected: 12/07/16 11:15
Date Received: 12/08/16 10:00

Lab Sample ID: 320-24159-11
Matrix: Water

Method: PFAS - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		12/12/16 09:34	12/13/16 08:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		12/12/16 09:34	12/13/16 08:37	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		12/12/16 09:34	12/13/16 08:37	1
Perfluorooctanoic acid (PFOA)	**18**		2.0	0.75	ng/L		12/12/16 09:34	12/13/16 08:37	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		12/12/16 09:34	12/13/16 08:37	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		12/12/16 09:34	12/13/16 08:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*92*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:37*	*1*
13C4-PFHpA	*102*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:37*	*1*
13C4 PFOA	*91*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:37*	*1*
13C4 PFOS	*89*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:37*	*1*
13C5 PFNA	*104*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:37*	*1*

Client Sample Results

Client: Tonoga Inc dba Taconic
Project/Site: Petersburgh, NY

TestAmerica Job ID: 320-24159-1

Client Sample ID: FE5 Supply Water 3
Date Collected: 12/07/16 14:08
Date Received: 12/08/16 10:00

Lab Sample ID: 320-24159-13
Matrix: Water

Method: PFAS - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.92	ng/L		12/12/16 12:13	12/13/16 09:14	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.87	ng/L		12/12/16 12:13	12/13/16 09:14	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.80	ng/L		12/12/16 12:13	12/13/16 09:14	1
Perfluorooctanoic acid (PFOA)	17		2.0	0.75	ng/L		12/12/16 12:13	12/13/16 09:14	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	1.3	ng/L		12/12/16 12:13	12/13/16 09:14	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.65	ng/L		12/12/16 12:13	12/13/16 09:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*90*		*25 - 150*	*12/12/16 12:13*	*12/13/16 09:14*	*1*
13C4-PFHpA	*103*		*25 - 150*	*12/12/16 12:13*	*12/13/16 09:14*	*1*
13C4 PFOA	*90*		*25 - 150*	*12/12/16 12:13*	*12/13/16 09:14*	*1*
13C4 PFOS	*91*		*25 - 150*	*12/12/16 12:13*	*12/13/16 09:14*	*1*
13C5 PFNA	*92*		*25 - 150*	*12/12/16 12:13*	*12/13/16 09:14*	*1*

Client Sample Results

Client: Tonoga Inc dba Taconic
Project/Site: Petersburgh, NY

TestAmerica Job ID: 320-24159-1

Client Sample ID: FE5 Sump Water 1
Date Collected: 12/07/16 08:20
Date Received: 12/08/16 10:00

Lab Sample ID: 320-24159-10
Matrix: Water

Method: PFAS - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	92	J	200	92	ng/L		12/12/16 09:34	12/13/16 08:19	100
Perfluorohexanesulfonic acid (PFHxS)	ND		200	87	ng/L		12/12/16 09:34	12/13/16 08:19	100
Perfluoroheptanoic acid (PFHpA)	6300		200	80	ng/L		12/12/16 09:34	12/13/16 08:19	100
Perfluorooctanesulfonic acid (PFOS)	ND		200	130	ng/L		12/12/16 09:34	12/13/16 08:19	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*97*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:19*	*100*
13C4-PFHpA	*105*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:19*	*100*
13C4 PFOS	*99*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:19*	*100*

Method: PFAS - Perfluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	58000		400	150	ng/L		12/12/16 09:34	12/16/16 21:08	200
Perfluorononanoic acid (PFNA)	5000		400	130	ng/L		12/12/16 09:34	12/16/16 21:08	200

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*84*		*25 - 150*	*12/12/16 09:34*	*12/16/16 21:08*	*200*
13C5 PFNA	*122*		*25 - 150*	*12/12/16 09:34*	*12/16/16 21:08*	*200*

Client Sample Results

Client: Tonoga Inc dba Taconic
Project/Site: Petersburgh, NY

TestAmerica Job ID: 320-24159-1

Client Sample ID: FE5 Sump Water 2
Date Collected: 12/07/16 11:45
Date Received: 12/08/16 10:00

Lab Sample ID: 320-24159-12
Matrix: Water

Method: PFAS - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	120	J	200	92	ng/L		12/12/16 09:34	12/13/16 08:56	100
Perfluorohexanesulfonic acid (PFHxS)	ND		200	87	ng/L		12/12/16 09:34	12/13/16 08:56	100
Perfluoroheptanoic acid (PFHpA)	6500		200	80	ng/L		12/12/16 09:34	12/13/16 08:56	100
Perfluorooctanesulfonic acid (PFOS)	ND		200	130	ng/L		12/12/16 09:34	12/13/16 08:56	100
Perfluorononanoic acid (PFNA)	5200		200	65	ng/L		12/12/16 09:34	12/13/16 08:56	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*79*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:56*	*100*
13C4-PFHpA	*86*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:56*	*100*
13C4 PFOS	*80*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:56*	*100*
13C5 PFNA	*123*		*25 - 150*	*12/12/16 09:34*	*12/13/16 08:56*	*100*

Method: PFAS - Perfluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	56000		400	150	ng/L		12/12/16 09:34	12/16/16 21:27	200

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*87*		*25 - 150*	*12/12/16 09:34*	*12/16/16 21:27*	*200*
13C4-PFHpA	*108*		*25 - 150*	*12/12/16 09:34*	*12/16/16 21:27*	*200*
13C4 PFOA	*91*		*25 - 150*	*12/12/16 09:34*	*12/16/16 21:27*	*200*
13C4 PFOS	*71*		*25 - 150*	*12/12/16 09:34*	*12/16/16 21:27*	*200*
13C5 PFNA	*119*		*25 - 150*	*12/12/16 09:34*	*12/16/16 21:27*	*200*

Client Sample Results

Client: Tonoga Inc dba Taconic
Project/Site: Petersburgh, NY

TestAmerica Job ID: 320-24159-1

Client Sample ID: FE5 Sump Water 3
Date Collected: 12/07/16 14:30
Date Received: 12/08/16 10:00

Lab Sample ID: 320-24159-14
Matrix: Water

Method: PFAS - Perfluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	150	J	200	92	ng/L		12/12/16 09:34	12/13/16 09:32	100
Perfluorohexanesulfonic acid (PFHxS)	ND		200	87	ng/L		12/12/16 09:34	12/13/16 09:32	100
Perfluoroheptanoic acid (PFHpA)	12000		200	80	ng/L		12/12/16 09:34	12/13/16 09:32	100
Perfluorooctanesulfonic acid (PFOS)	ND		200	130	ng/L		12/12/16 09:34	12/13/16 09:32	100
Perfluorononanoic acid (PFNA)	11000		200	65	ng/L		12/12/16 09:34	12/13/16 09:32	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*79*		*25 - 150*	*12/12/16 09:34*	*12/13/16 09:32*	*100*
13C4-PFHpA	*93*		*25 - 150*	*12/12/16 09:34*	*12/13/16 09:32*	*100*
13C4 PFOS	*81*		*25 - 150*	*12/12/16 09:34*	*12/13/16 09:32*	*100*
13C5 PFNA	*104*		*25 - 150*	*12/12/16 09:34*	*12/13/16 09:32*	*100*

Method: PFAS - Perfluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	120000		1000	370	ng/L		12/12/16 09:34	12/16/16 20:50	500

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOA	*69*		*25 - 150*	*12/12/16 09:34*	*12/16/16 20:50*	*500*

Appendix E
Calibrations

CRITICAL ORIFICE METHOD 5 MODULE CALIBRATION

PUMP NUMBE 2 MODULE NUMBER : M-81 TECHNICIAN: DES

ROMETRIC PRESSURE: 30.03 DATE: 10/10/2016 STANDARD METER DGM-115 PRE-CAL. POST-CAL FOR

MODULE			ORIFICE		MODULE METER									CALIBRATIONS			
PUMP VACUUM (in. Hg)	ΔH SETTING in. H2O	TEMP. Tamb (°F)	NUMBER	K'	VOLUME Vmi (cubic ft.)	VOLUME Vmf (cubic ft.)	VOLUME Vm (cubic ft.)	TEMP. Tmi (°F)	TEMP. Tmf (°F)	TEMP. Tm (°F)	TIME t (min)	Vm (std)	Vcr (std)	Y	Y % ave.	ΔH@	ΔH@ % ave.
			AC47	0.3146													
16	1.10	62	AC 55	0.4378	113.60	116.29	2.69	62	62	62	5.00	2.74	2.88	1.05	0%	1.91	-6%
16	1.85	62	AC 63	0.5633	116.50	119.95	3.45	62	63	63	5.00	3.51	3.70	1.05	0%	1.94	-4%
16	3.85	60	AC 73	0.7647	104.00	108.64	4.64	60	61	61	5.00	4.77	5.04	1.06	0%	2.22	10%
			AC 81	0.9468													
														1.05	**0.00**	**2.02**	**0.00**

***NOTE**: Each orifice has a pre-calibrated critical vacuum of 14" Hg, set module vacuum at 1" to 2" above critical vacuum.

***NOTE**: Need to record Data in the Dark Gray Boxes, this data is taken off of the module during the Calibration

$$Vcr(std) = \frac{(K')*Pbar*t}{sqrt(Tamb)}$$

$$Vm(std) = \frac{17.64*Vm*(Pbar + \Delta H/13.6)}{(Tm + 460)}$$

$$Y = \frac{Vcr(std)}{Vm(std)}$$

$$\Delta H@ = \frac{0.0319*\Delta H*(Tm + 460)*(t^2)}{Pbar*(Y*Vm)^2}$$

Module Leak Check: X Probe Heat Control: X *T.C. Readout calibrated with: Hot / Cold Bath* X

Pitot Leak Check: X Heater Box Control: X Constant Voltage Source

CRITICAL ORIFICE METHOD 5 MODULE CALIBRATION

PUMP NUMBER: 3 **MODULE NUMBER :** M-98 **TECHNICIAN:** DES

BAROMETRIC PRESSURE: 30.03 **DATE:** 10/10/2016 **STANDARD METER** DGM-115 **PRE-CAL.** **POST-CAL FOR**

MODULE			ORIFICE		MODULE METER									CALIBRATIONS			
PUMP VACUUM (in. Hg)	ΔH SETTING (in. H2O)	TEMP. Tamb (°F)	NUMBER	K'	VOLUME Vmi (cubic ft.)	VOLUME Vmf (cubic ft.)	VOLUME Vm (cubic ft.)	TEMP. Tmi (°F)	TEMP. Tmf (°F)	TEMP. Tm (°F)	TIME t (min)	Vm (std)	Vcr (std)	Y	Y % ave.	ΔH@	ΔH@ % ave.
			AC47	0.3146													
16	1.05	61	AC 55	0.4378	558.70	561.55	2.85	61	61	61	5.00	2.91	2.88	0.99	0%	1.82	1%
16	1.70	60	AC 63	0.5633	562.00	565.64	3.64	60	60	60	5.00	3.72	3.71	1.00	0%	1.79	-1%
16	3.15	61	AC 73	0.7647	566.30	571.24	4.94	61	62	62	5.00	5.06	5.03	0.99	0%	1.81	0%
			AC 81	0.9468													
														0.99	**0.00**	**1.80**	**0.00**

***NOTE**: Each orifice has a pre-calibrated critical vacuum of 14" Hg, set module vacuum at 1" to 2" above critical vacuum.

***NOTE**: Need to record Data in the Dark Gray Boxes, this data is taken off of the module during the Calibration

$$Vcr(std) = \frac{(K')*Pbar*t}{\sqrt{Tamb}} \qquad Vm(std) = \frac{17.64*Vm*(Pbar + \Delta H/13.6)}{(Tm + 460)}$$

$$Y = \frac{Vcr(std)}{Vm(std)} \qquad \Delta H@ = \frac{0.0319*\Delta H*(Tm + 460)*(t^2)}{Pbar*(Y*Vm)^2}$$

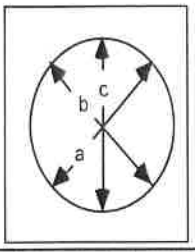
Module Leak Check: X
Pitot Leak Check: X
Probe Heat Control: X
Heater Box Control: X
T.C. Readout calibrated with: Hot / Cold Bath X
Constant Voltage Source

APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

Nozzle Calibration Worksheet

zzle Set Number **Glass Nozzles** Tech Specialist **BTS**

Date Calibrated **3/18/2015**



Nozzle Number	Diameter*	a	b	c	Average**
G85	0.250	0.255	0.253	0.256	0.255
G86	0.250	0.255	0.253	0.257	0.255
G87	0.250	0.248	0.250	0.247	0.248
G88	0.250	0.249	0.250	0.251	0.250
G89	0.250	0.248	0.250	0.249	0.249
G90	0.312	0.313	0.314	0.313	0.313
G91	0.312	0.310	0.311	0.309	0.310
G92	0.312	0.313	0.314	0.315	0.314
G93	0.312	0.315	0.316	0.315	0.315
G94	0.312	0.314	0.315	0.315	0.315

*NOTE: Measure to the nearest 0.001".

**NOTE: The three measurements must be within 0.004" of each other.

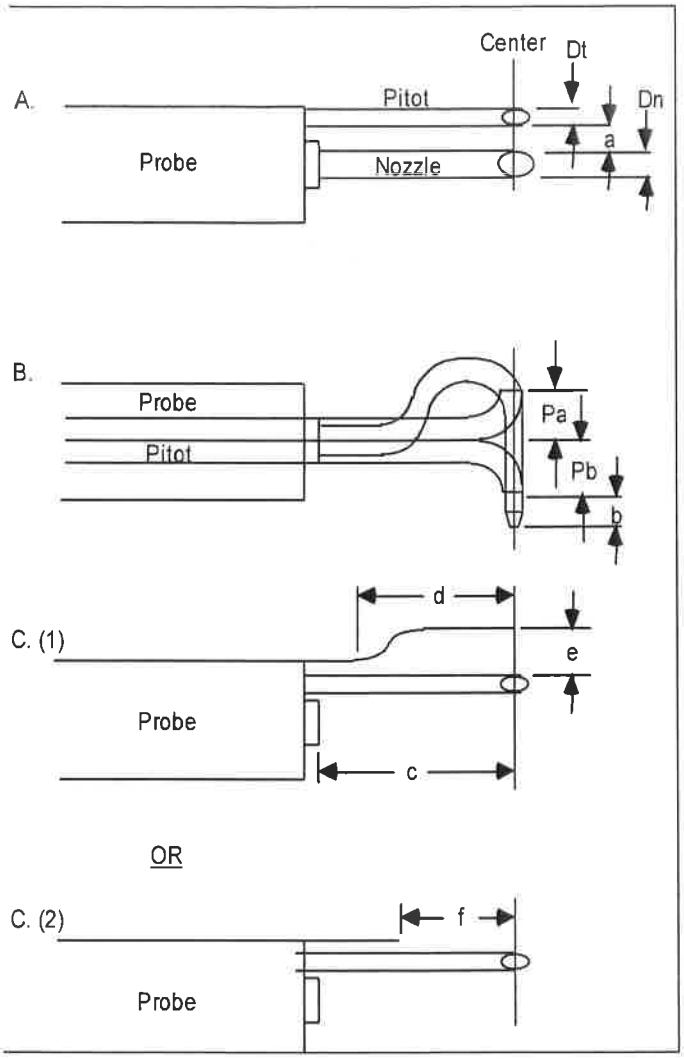
APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

S-Type Pitot Tube Geometric Calibration
Part 1 - Probe Configuration

Probe Identification 401 Pitot Identification 401

Technical Specialist TJC

Date 1/15/16



Dt 0.376
Dn 0.536
a 0.822

Pa 0.550
Pb 0.550
b 0.638

c 3.721
d 4.628
e 2.706

OR

c _____
f _____

Specifications (EPA Method 2)

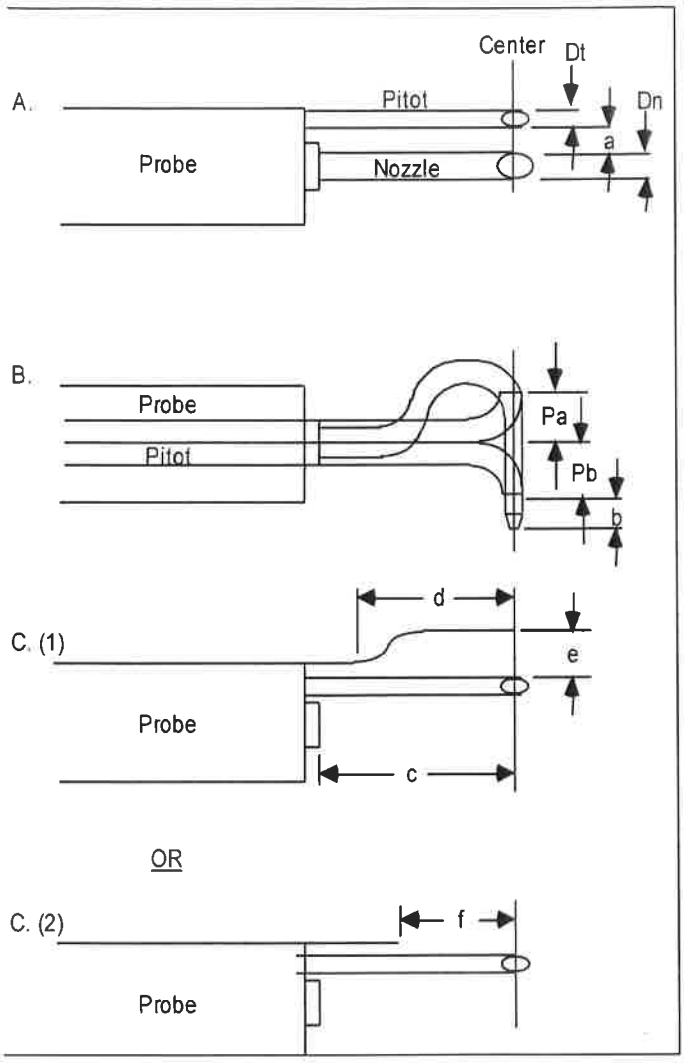
Dt = 3/16" to 3/8"	c≥ 3"	Pa = Pb
Dn = 1/2"	d≥ 3"	
a≥ 3/4"	e≥ 3/4"	1.05 Dt ≤ P ≤ 1.50 Dt
b≥ 0	f≥ 2"	

If these specifications are met, proceed with Part 2, Pitot alignment.

APCC AIR POLLUTION CHARACTERIZATION AND CONTROL, LTD.

S-Type Pitot Tube Geometric Calibration
Part 1 - Probe Configuration

Probe Identification 402 Pitot Identification 402
Technical Specialist TJC
Date 1/25/16



Dt	0.371
Dn	0.499
a	1.021
Pa	0.505
Pb	0.505
b	0.650
c	3.370
d	3.537
e	1.844

OR

c	
f	

Specifications (EPA Method 2)

Dt = 3/16" to 3/8"	c≥ 3"	Pa = Pb
Dn = 1/2"	d≥ 3"	
a≥ 3/4"	e≥ 3/4"	1.05 Dt ≤ P ≤ 1.50 Dt
b≥ 0	f≥ 2"	

If these specifications are met, proceed with Part 2, Pitot alignment.

CRITICAL ORIFICE METHOD 5 MODULE CALIBRATION

PUMP NUMBE 5 **MODULE NUMBER :** M-81 **TECHNICIAN:** DES

PRE-CAL.

ROMETRIC PRESSURE: 30.74 **DATE:** 12/19/2016 **STANDARD METER** DGM-115 **POST-CAL FOR**

MODULE			ORIFICE		MODULE METER										CALIBRATIONS			
PUMP VACUUM (in. Hg)	ΔH SETTING (in. H2O)	TEMP. Tamb (°F)	NUMBER	K'	VOLUME Vmi (cubic ft.)	VOLUME Vmf (cubic ft.)	VOLUME Vm (cubic ft.)	TEMP. Tmi (°F)	TEMP. Tmf (°F)	TEMP. Tm (°F)	TIME t (min)	Vm (std)	Vcr (std)	Y	Y % ave.	ΔH@	ΔH@ % ave.
			AC47	0.3146													
16	1.05	58	AC 55	0.4378	454.20	456.80	2.60	58	58	58	5.00	2.73	2.96	1.08	0%	1.78	-5%
16	1.90	57	AC 63	0.5633	450.50	453.83	3.33	57	58	58	5.00	3.51	3.81	1.09	0%	1.95	4%
16	3.35	56	AC 73	0.7647	445.80	450.32	4.52	56	57	57	5.00	4.78	5.17	1.08	0%	1.88	1%
			AC 81	0.9468													
														1.08	**0.00**	**1.87**	**0.00**

***NOTE**: Each orifice has a pre-calibrated critical vacuum of 14" Hg, set module vacuum at 1" to 2" above critical vacuum.

***NOTE**: Need to record Data in the Dark Gray Boxes, this data is taken off of the module during the Calibration

$$Vcr(std) = \frac{(K')*Pbar*t}{\sqrt{Tamb}}$$

$$Vm(std) = \frac{17.64*Vm*(Pbar + \Delta H/13.6)}{(Tm + 460)}$$

$$Y = \frac{Vcr(std)}{Vm(std)}$$

$$\Delta H@ = \frac{0.0319*\Delta H*(Tm + 460)*(t^2)}{Pbar*(Y*Vm)^2}$$

Module Leak Check: X Probe Heat Control: X T.C. Readout calibrated with: Hot / Cold Bath X

Pitot Leak Check: X Heater Box Control: X Constant Voltage Source

CRITICAL ORIFICE METHOD 5 MODULE CALIBRATION

PUMP NUMBER: 5 **MODULE NUMBER :** M-98 **TECHNICIAN:** DES

PRE-CAL.

ARROMETRIC PRESSURE: 30.74 **DATE:** 12/19/2016 **STANDARD METER** DGM-115 **POST-CAL FOR**

MODULE			ORIFICE		MODULE METER									CALIBRATIONS			
PUMP VACUUM (in. Hg)	ΔH SETTING (in. H2O)	TEMP. Tamb (°F)	NUMBER	K'	VOLUME Vmi (cubic ft.)	VOLUME Vmf (cubic ft.)	VOLUME Vm (cubic ft.)	TEMP. Tmi (°F)	TEMP. Tmf (°F)	TEMP. Tm (°F)	TIME t (min)	Vm (std)	Vcr (std)	Y	Y % ave.	ΔH@	ΔH@ % ave.
			AC47	0.3146													
16	1.05	56	AC 55	0.4378	143.80	146.63	2.83	56	57	57	5.00	2.98	2.96	0.99	-3%	1.78	3%
16	1.75	58	AC 63	0.5633	146.90	150.41	3.51	58	59	59	5.00	3.69	3.80	1.03	1%	1.79	4%
16	2.90	59	AC 73	0.7647	150.70	155.41	4.71	59	61	60	5.00	4.95	5.16	1.04	2%	1.62	-6%
			AC 81	0.9468													
														1.02	**0.00**	**1.73**	**0.00**

***NOTE:** Each orifice has a pre-calibrated critical vacuum of 14" Hg, set module vacuum at 1" to 2" above critical vacuum.

***NOTE**: Need to record Data in the Dark Gray Boxes, this data is taken off of the module during the Calibration

$$Vcr(std) = \frac{(K')*Pbar*t}{sqrt(Tamb)}$$

$$Vm(std) = \frac{17.64*Vm*(Pbar + \Delta H/13.6)}{(Tm + 460)}$$

$$Y = \frac{Vcr(std)}{Vm(std)}$$

$$\Delta H@ = \frac{0.0319*\Delta H*(Tm + 460)*(t^2)}{Pbar*(Y*Vm)^2}$$

Module Leak Check: X Probe Heat Control: X T.C. Readout calibrated with: Hot / Cold Bath X

Pitot Leak Check: X Heater Box Control: X Constant Voltage Source