FLUOROMONOMERS
MANUFACTURING PROCESS
DIVISION STACK EMISSIONS TEST REPORT
TEST DATES: 22 NOVEMBER AND
4 DECEMBER 2019

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FAYETTEVILLE, NORTH CAROLINA

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January 2020

W.O. No. 15418.002.018

THE CHEMOURS COMPANY

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Weston Solutions, Inc. (WESTON®) is a commercial laboratory operating within full accreditation of the Louisiana Environmental Laboratory Accreditation Program under Certificate Number 03024. The qualifications to provide defensible quality data as a certified commercial environmental testing firm as Agency Interest No. 30815 was granted by the Louisiana Department of Environmental Quality under the Louisiana Administrative Code of LAC 33.1 Chapter 45 et al.

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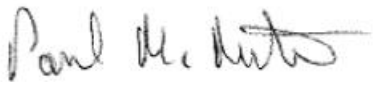

Paul M. Meeter
Weston Solutions, Inc.

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1. INTRODUCTION

1.1 FACILITY AND BACKGROUND INFORMATION

The Chemours Fayetteville Works (Chemours) is located in Bladen County, North Carolina, approximately 10 miles south of the city of Fayetteville. Chemours operating areas on the site include the Fluoromonomers, IXM and Polymers Processing Aid (PPA) manufacturing areas, Wastewater Treatment, and Powerhouse.

Chemours contracted Weston Solutions, Inc. (Weston) to perform HFPO Dimer Acid Fluoride, captured as HFPO Dimer Acid, and other target compound, emission testing on the Division stack at the facility. Testing was performed on 22 November and 4 December 2019 and generally followed the "Emission Test Protocol" reviewed and approved by the North Carolina Department of Environmental Quality (NCDEQ). This report provides the results from the emission test program.

1.2 TEST OBJECTIVES

The specific objectives for this test program were as follows:

- Measure the emissions concentrations and mass emissions rates of HFPO Dimer Acid Fluoride and other target compounds from the Division stack which is located in the Fluoromonomers process area.
- Monitor and record process and emissions control data in conjunction with the test program.
- Provide representative emissions data.

1.3 TEST PROGRAM OVERVIEW

During the emissions test program, the concentrations and mass emissions rates of HFPO Dimer Acid and other target compounds were measured at the Division stack.

Table 1-1 provides a summary of the test location and the parameters that were measured along with the sampling/analytical procedures that were followed.

Section 2 provides a summary of test results. A description of the processes is provided in Section 3. Section 4 provides a description of the test locations. The sampling and analytical procedures are provided in Section 5. Detailed test results and discussion are provided in Section 6.

Appendix C includes the summary reports for the laboratory analytical results. The full laboratory data packages are provided in electronic format.

Table 1-1
Sampling Plan for Division Stack

Sampling Point & Location	**Division Stack**						
Number of Tests:	5 (3 MM18 and 2 M0010)						
Parameters To Be Tested:	HFPO Dimer Acid (HFPO-DA)	HFPO Dimer Methyl Ester; HFPO Monomer; Fluoroether E-1; Carbonyl Difluoride	Total Fluorine; Hydrogen Fluoride	Volumetric Flow Rate and Gas Velocity	Carbon Dioxide	Oxygen	Water Content
Sampling or Monitoring Method	EPA M-0010	Modified EPA M-18	Modified EPA M-18	EPA M1 and M2 in conjunction with M-0010 tests	EPA M3/3A		EPA M4 in conjunction with M-0010 tests
Sample Extraction/ Analysis Method(s):	LC/MS/MS	GC/MS and LC/MS/MS	9056	NA	NA		NA
Sample Size	□1.5m^3	□1.5m^3	□1.5m^3	NA	NA	NA	NA
Total Number of Samples Collected[1]	2	3	3	3	3	3	3
Reagent Blanks (Solvents, Resins)[1]	1 set	1 set	1 set	0	0	0	0
Field Blank Trains[1]	1 per source	1 per source	0 per source	0	0	0	0
Proof Blanks[1]	1 per train	1 per train	0 per train	0	0	0	0
Trip Blanks[1,2]	0 sets	0 sets	0 sets	0	0	0	0
Lab Blanks	1 per fraction[3]	1 per fraction[3]	0 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Samples (LCS)	1 per fraction[3]	1 per fraction[3]	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Sample Duplicate (LCSD)	1 per fraction[3]	1 per fraction[3]	1 per fraction[3]	0	0	0	0
Media Blanks	1 set[4]	1 set[4]	1 set[4]	0	0	0	0
Isotope Dilution Internal Standard Spikes	Each sample	Each sample	Each sample	0	0	0	0
Total No. of Samples	5[5]	6[5]	4[5]	3	3	3	3

Key:

[1] Sample collected in field.

[2] Trip blanks include one XAD-2 resin module and one methanol sample per sample shipment.

[3] Lab blank and LCS/LCSD includes one set per analytical fraction (front half, back half and condensate).

[4] One set of media blank archived at laboratory at media preparation.

[5] Actual number of samples collected in field.

2. SUMMARY OF TEST RESULTS

A total of three MM18 and two M0010 test runs were performed on the Division stack. Table 2-1 provides a summary of the HFPO Dimer Acid emissions test results associated with M0010. Table 2-2 provides a summary of the target compound emissions test results associated with MM18. Detailed test results summaries are provided in Section 6.

It is important to note that emphasis is being placed on the characterization of the emissions based on the M0010 stack test results. Research conducted in developing the protocol for stack testing HFPO Dimer Acid Fluoride, HFPO Dimer Acid Ammonium Salt and HFPO Dimer Acid realized that the resulting testing, including collection of the air samples and extraction of the various fraction of the sampling train, would result in all three compounds being expressed as simply the HFPO Dimer Acid. However, it should be understood that the total M0010 HFPO Dimer Acid results provided in Table 2-1 and in this report include a percentage of each of the three compounds.

Table 2-1
Summary of M0010 HFPO Dimer Acid Division Stack Test Results

	Division Stack – M0010	
	g/sec	lb/hr
R1	1.94E-04	1.54E-03
R2	3.39E-04	2.69E-03
Average	2.66E-04	2.12E-03

Samples taken using MM18 were analyzed for the following volatile organic compounds ("target compounds"): HFPO Dimer, Methyl Ester as HFPO (HFPO Dimer Methyl Ester); 2-MTP as HFPO (HFPO Monomer); Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether (Fluoroether E-1); Carbonyl Difluoride; Total Fluorine and Hydrogen Fluoride. Results of MM18 target compound analysis are provided in Table 2-2.

Table 2-2
Summary of MM18 Target Compound Division Stack Test Results

Target Compound	Division Stack MM18 Run 1		Division Stack MM18 Run 2		Division Stack MM18 Run 3	
	g/sec	lb/hr	g/sec	lb/hr	g/sec	lb/hr
HFPO Dimer Methyl Ester	<4.38E-03	<3.48E-02	<2.60E-03	<2.07E-02	<2.63E-03	<2.09E-02
HFPO Monomer	3.74E-01	2.97E+00	3.15E-01	2.50E+00	1.92E+00	1.53E+01
Fluoroether E-1	2.91E-02	2.31E-01	6.67E-02	5.30E-01	2.41E-02	1.92E-01
Carbonyl Difluoride	<1.34E-02	<1.06E-01	<7.96E-03	<6.33E-02	<8.03E-03	<6.38E-02
Total Fluorine	7.27E+00	5.78E+01	5.94E+00	4.72E+01	1.40E+01	1.11E+02
Hydrogen Fluoride	<1.82E-01	<1.45E+00	<1.09-01	<8.63E-01	<1.10E-01	<8.70E-01

Note: All < values were below the laboratory analysis detection limits. Emission rates were calculated using the method detection limit (MDL) for the first analytical fraction of the target compound.

3. PROCESS DESCRIPTIONS

The Fluoromonomers area is included in the scope of this test program.

3.1 FLUOROMONOMERS

These facilities produce a family of fluorocarbon compounds used to produce Chemours products such as Nafion®, Krytox®, and Viton®, as well as sales to outside customers.

At the time of testing, process emissions were vented to the Division waste gas scrubber system (which included the secondary scrubber) and vented to the Carbon Bed and then into the Division stack. The VE North building air systems were vented to the Carbon Bed and then into the Division stack.

3.2 PROCESS OPERATIONS AND PARAMETERS

The following table is a summary of the operation and products from the specific areas tested.

Source	Operation/Product	Batch or Continuous
VE North	PPVE	Condensation is continuous. Agitated Bed Reactor and Refining are batch.

During the test program, the following parameters were monitored by Chemours and are included in Appendix A.

- Fluoromonomers Process
  - VEN Precurser Rate
  - VEN Condensation Rate
  - VEN ABR Rate

4. DESCRIPTION OF TEST LOCATIONS

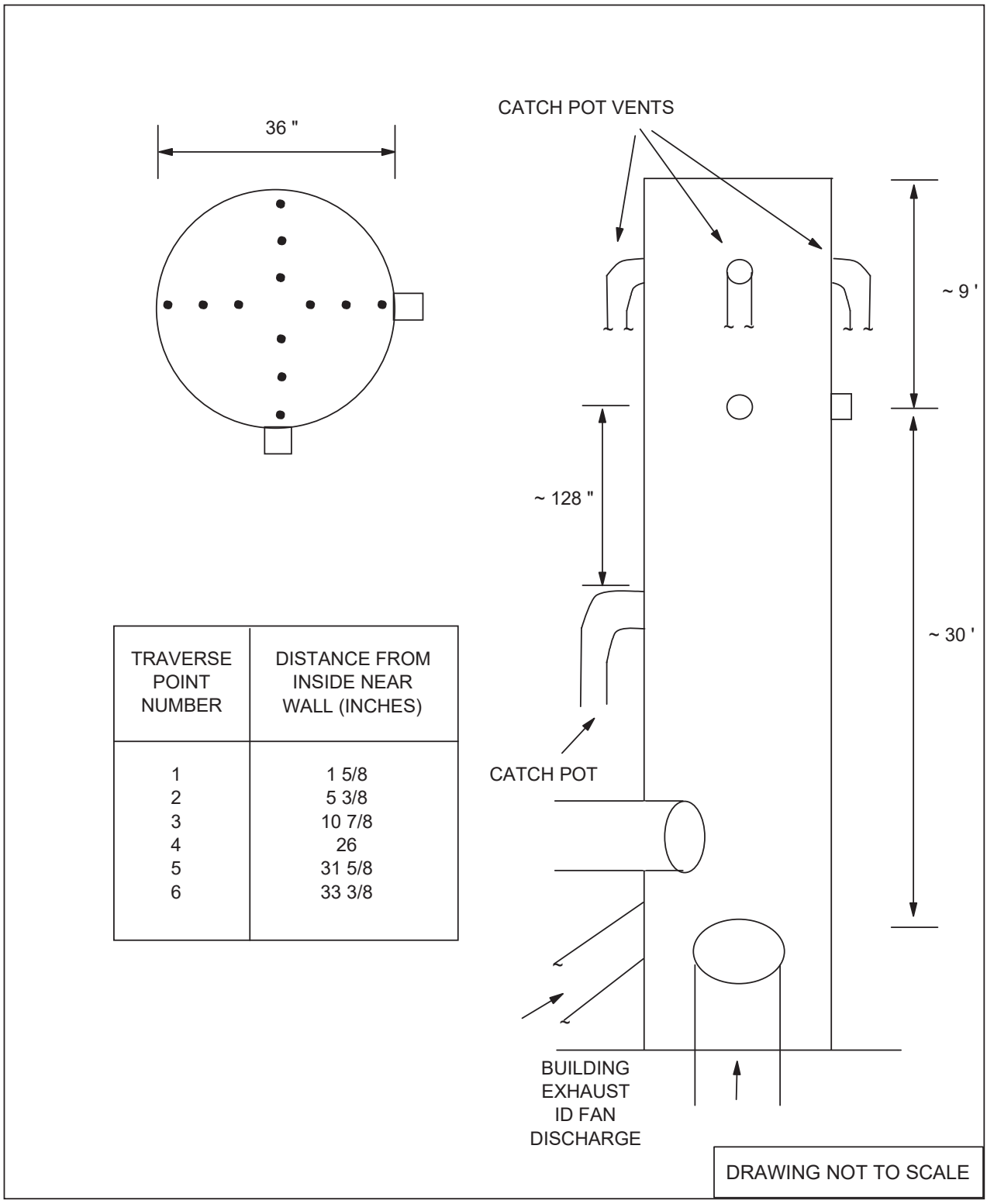
4.1 DIVISION STACK

Two 6-inch ID test ports were installed on the 36-inch ID fiberglass stack as shown below. The four vents that enter the top of the stack and the one vent ~11 feet below are catch pots which, under normal process operations, do not discharge to the stack. They are used to vent process gas to the stack in the event of a process upset and are not considered a flow contributor or a disturbance.

Per EPA Method 1, a total of 12 traverse points (six per axis) were used for M-0010 isokinetic sampling. Figure 4-1 provides a schematic of the test ports and traverse point locations.

Location	Distance from Flow Disturbance	
	Downstream (B)	Upstream (A)
Division Stack	30 feet > 10 duct diameters	9 feet > 3 diameters

The EPA Method 18 sample was collected at a constant rate at a single point at the approximate center of the stack.



TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	1 5/8
2	5 3/8
3	10 7/8
4	26
5	31 5/8
6	33 3/8

FIGURE 4-1
DIVISION STACK TEST PORT
AND TRAVERSE POINT LOCATIONS

IASDATA\CHEMOURS\15418.002.018\FIGURE 4-1 DIVISION STACK

5. SAMPLING AND ANALYTICAL METHODS

5.1 STACK GAS SAMPLING PROCEDURES

The purpose of this section is to describe the stack gas emissions sampling trains and to provide details of the stack sampling and analytical procedures utilized during the emissions test program.

5.1.1 Pre-Test Determinations

Preliminary test data were obtained at the test location. Stack geometry measurements were measured and recorded, and traverse point distances verified. A preliminary velocity traverse was performed utilizing a calibrated S-type pitot tube and an inclined manometer to determine velocity profiles. Flue gas temperatures were observed with a calibrated direct readout panel meter equipped with a chromel-alumel thermocouple. Preliminary water vapor content was estimated by wet bulb/dry bulb temperature measurements.

A check for the presence or absence of cyclonic flow was previously conducted at the test location. The cyclonic flow check was negative (< 20°) verifying that the test location was acceptable for testing.

Preliminary test data was used for nozzle sizing and sampling rate determinations for isokinetic sampling procedures.

Calibration of probe nozzles, pitot tubes, metering systems, and temperature measurement devices was performed as specified in Section 5 of EPA Method 5 test procedures.

5.2 STACK PARAMETERS

5.2.1 EPA Method 0010

The sampling train utilized to perform the HFPO Dimer Acid sampling at the location was an EPA Method 0010 train (see Figure 5-1). The Method 0010 consisted of a borosilicate nozzle that attached directly to a heated borosilicate probe. In order to minimize possible thermal degradation of the HFPO Dimer Acid, the probe and particulate filter were heated above stack temperature to minimize water vapor condensation before the filter. The probe was connected directly to a heated borosilicate filter holder containing a solvent extracted glass fiber filter.

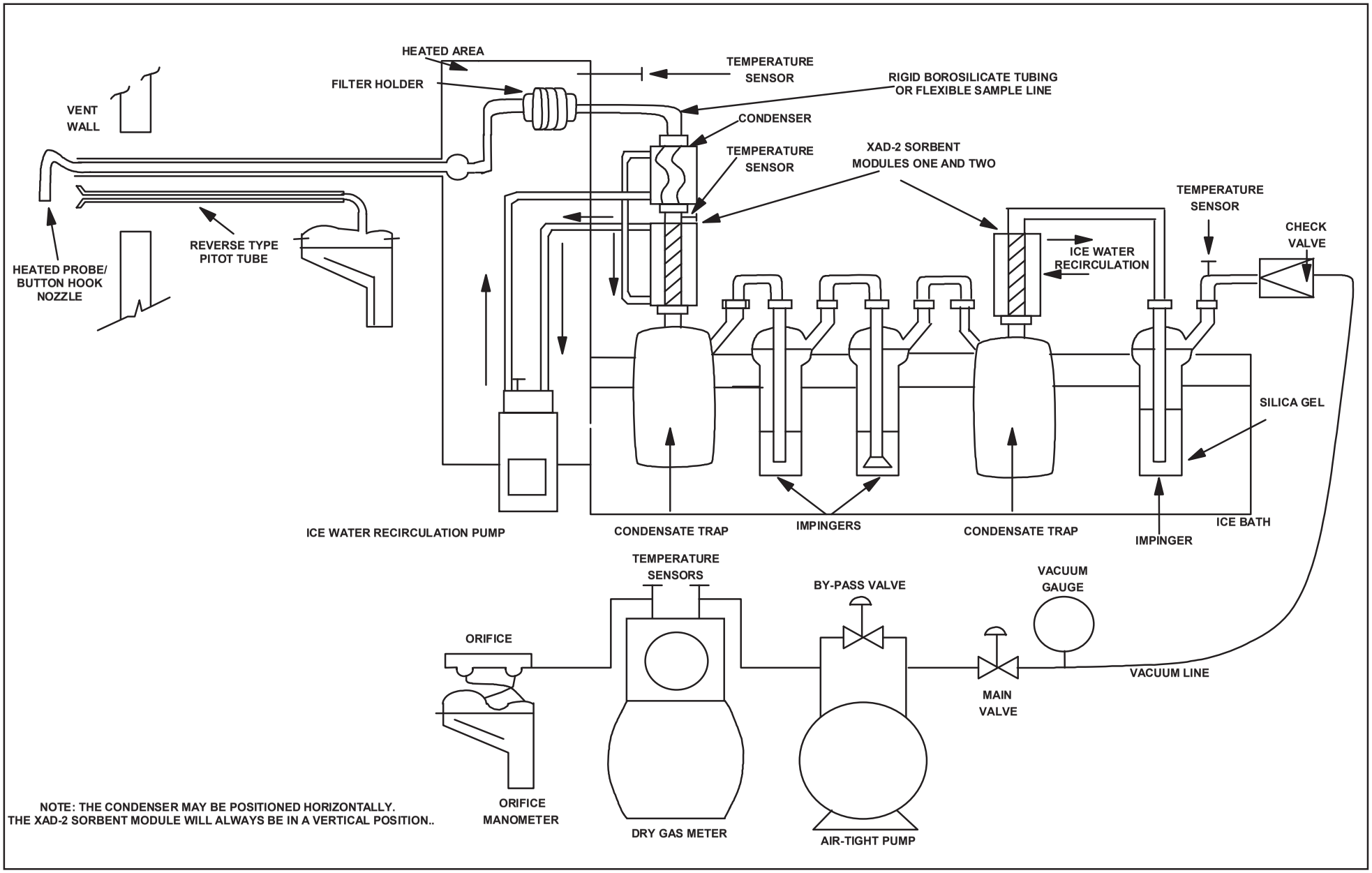


FIGURE 5-1
EPA METHOD 0010 SAMPLING TRAIN

IASDATA\CHEMOURS\15418.002.018\FIGURE 5-1 METHOD 0010

A section of borosilicate glass or flexible polyethylene tubing connected the filter holder exit to a Grahm (spiral) type ice water-cooled condenser, an ice water-jacketed sorbent module containing approximately 40 grams of XAD-2 resin. The XAD-2 resin tube was equipped with an inlet temperature sensor. The XAD-2 resin trap was followed by a condensate knockout impinger and a series of two impingers that contained 100 mL of high-purity distilled water. The train also included a second XAD-2 resin trap behind the impinger section to evaluate possible sampling train breakthrough. Each XAD-2 resin trap was connected to a 1-liter condensate knockout trap. The final impinger contained 300 grams of dry pre-weighed silica gel. All impingers and the condensate traps were maintained in an ice bath. Ice water was continuously circulated in the condenser and the XAD-2 module to maintain method-required temperature. A control console with a leakless vacuum pump, a calibrated orifice, and dual inclined manometers was connected to the final impinger via an umbilical cord to complete the sample train.

HFPO Dimer Acid Fluoride (CAS No. 2062-98-8) that is present in the stack gas is expected to be captured in the sampling train along with HFPO Dimer Acid (CAS No. 13252-13-6). HFPO Dimer Acid Fluoride underwent hydrolysis instantaneously in water in the sampling train and during the sample recovery step, and was converted to HFPO Dimer Acid such that the amount of HFPO Dimer Acid emissions represented a combination of both HFPO Dimer Acid Fluoride and HFPO Dimer Acid.

During sampling, gas stream velocities were measured by attaching a calibrated S-type pitot tube into the gas stream adjacent to the sampling nozzle. The velocity pressure differential was observed immediately after positioning the nozzle at each traverse point, and the sampling rate adjusted to maintain isokineticity at 100% ± 10. Flue gas temperature was monitored at each point with a calibrated panel meter and thermocouple. Isokinetic test data was recorded at each traverse point during all test periods, as appropriate. Leak checks were performed on the sampling apparatus according to reference method instructions, prior to and following each run, component change (if required) or during midpoint port changes.

5.2.2 EPA Method 0010 Sample Recovery

At the conclusion of each test, the sampling train was dismantled, the openings sealed, and the components transported to the field laboratory trailer for recovery.

A consistent procedure was employed for sample recovery:

1. The two XAD-2 covered (to minimize light degradation) sorbent modules (1 and 2) were sealed and labeled.

2. The glass fiber filter(s) were removed from the holder with tweezers and placed in a polyethylene container along with any loose particulate and filter fragments.

3. The particulate adhering to the internal surfaces of the nozzle, probe and front half of the filter holder were rinsed with a solution of methanol and ammonium hydroxide into a polyethylene container while brushing a minimum of three times until no visible particulate remained. Particulate adhering to the brush was rinsed with methanol/ ammonium hydroxide into the same container. The container was sealed.

4. The volume of liquid collected in the first condensate trap was measured, the value recorded, and the contents poured into a polyethylene container.

5. All train components between the filter exit and the first condensate trap were rinsed with methanol/ammonium hydroxide. The solvent rinse was placed in a separate polyethylene container and sealed.

6. The volume of liquid in impingers one and two, and the second condensate trap, were measured, the values recorded, and the sample was placed in the same container as Step 4 above, then sealed.

7. The two impingers, condensate trap, and connectors were rinsed with methanol/ ammonium hydroxide. The solvent sample was placed in a separate polyethylene container and sealed.

8. The silica gel in the final impinger was weighed and the weight gain value recorded.

9. Site (reagent) blank samples of the methanol/ammonium hydroxide, XAD resin, filter and distilled water were retained for analysis.

Each container was labeled to clearly identify its contents. All samples were maintained cool.

Following sample recovery, all samples were transported to Eurofins TestAmerica (TestAmerica) for sample extraction and analysis.

See Figure 5-2 for a schematic of the Method 0010 sample recovery process.

5.2.3 EPA Method 0010 Sample Analysis

Method 0010 sampling trains resulted in four separate analytical fractions for HFPO Dimer Acid analysis according to SW-846 Method 3542:

- Front-half Composite—comprised of the particulate filter, and the probe, nozzle, and front-half of the filter holder solvent rinses;
- Back-half Composite—comprised of the first XAD-2 resin material and the back-half of the filter holder with connecting glassware solvent rinses;
- Condensate Composite—comprised of the aqueous condensates and the contents of impingers one and two with solvent rinses;
- Breakthrough XAD-2 Resin Tube—comprised of the resin tube behind the series of impingers.

The second XAD-2 resin material was analyzed separately to evaluate any possible sampling train HFPO-DA breakthrough.

The front-half and back-half composites and the second XAD-2 resin material were placed in polypropylene wide-mouth bottles and tumbled with methanol containing 5% NH_4OH for 18 hours. Portions of the extracts were processed analytically for the HFPO dimer acid by liquid chromatography and duel mass spectroscopy (HPLC/MS/MS). The condensate composite was concentrated onto a solid phase extraction (SPE) cartridge followed by desorption from the cartridge using methanol. Portions of those extracts were also processed analytically by HPLC/MS/MS.

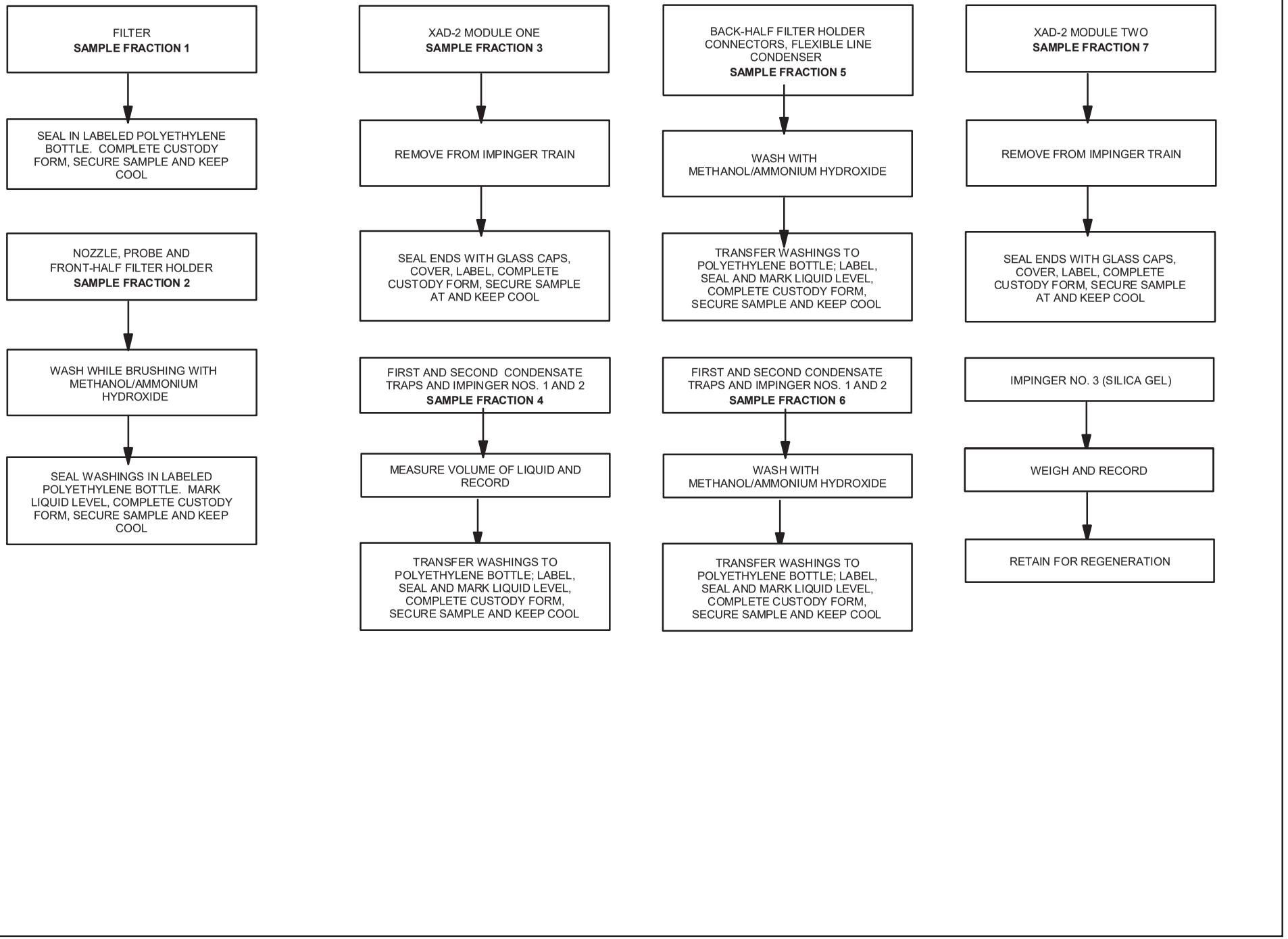


FIGURE 5-2
HFPO DIMER ACID SAMPLE RECOVERY PROCEDURES FOR METHOD 0010

IASDATA\CHEMOURS\15418.002.018\FIGURE 5-2 EPA 0010

Samples were spiked with isotope dilution internal standard (IDA) at the commencement of their preparation to provide accurate assessments of the analytical recoveries. Final data was corrected for IDA standard recoveries.

TestAmerica developed detailed procedures for the sample extraction and analysis for HFPO Dimer Acid. These procedures were incorporated into the test protocol.

5.3 MM18

The sampling train utilized to perform the target compound sampling at the Division stack was a modified EPA Method 18 train using full size Teflon® impingers. Impingers 1 through 6 each contained 100 mL of methanol. See Figure 5-3 for the modified EPA Method 18 sampling train.

The impingers were maintained in a dry ice/methanol bath. Each test run was approximately 90 minutes in duration collecting at a rate of approximately □1.5 liters per minute.

Each impinger was recovered and included a methanol rinse of each impinger and connector. The impinger contents and rinses were collected separately.

Each sample was analyzed by EPA SW-846 Method 8260B and 8231A procedures by Gas Chromatography (GC) Mass Spectrometry (MS).

During the Division stack test campaign, a blank train was set up near the test location, leak-checked and recovered along with the respective sample train. Following sample recovery, all samples were transported to TestAmerica for sample extraction and analysis.

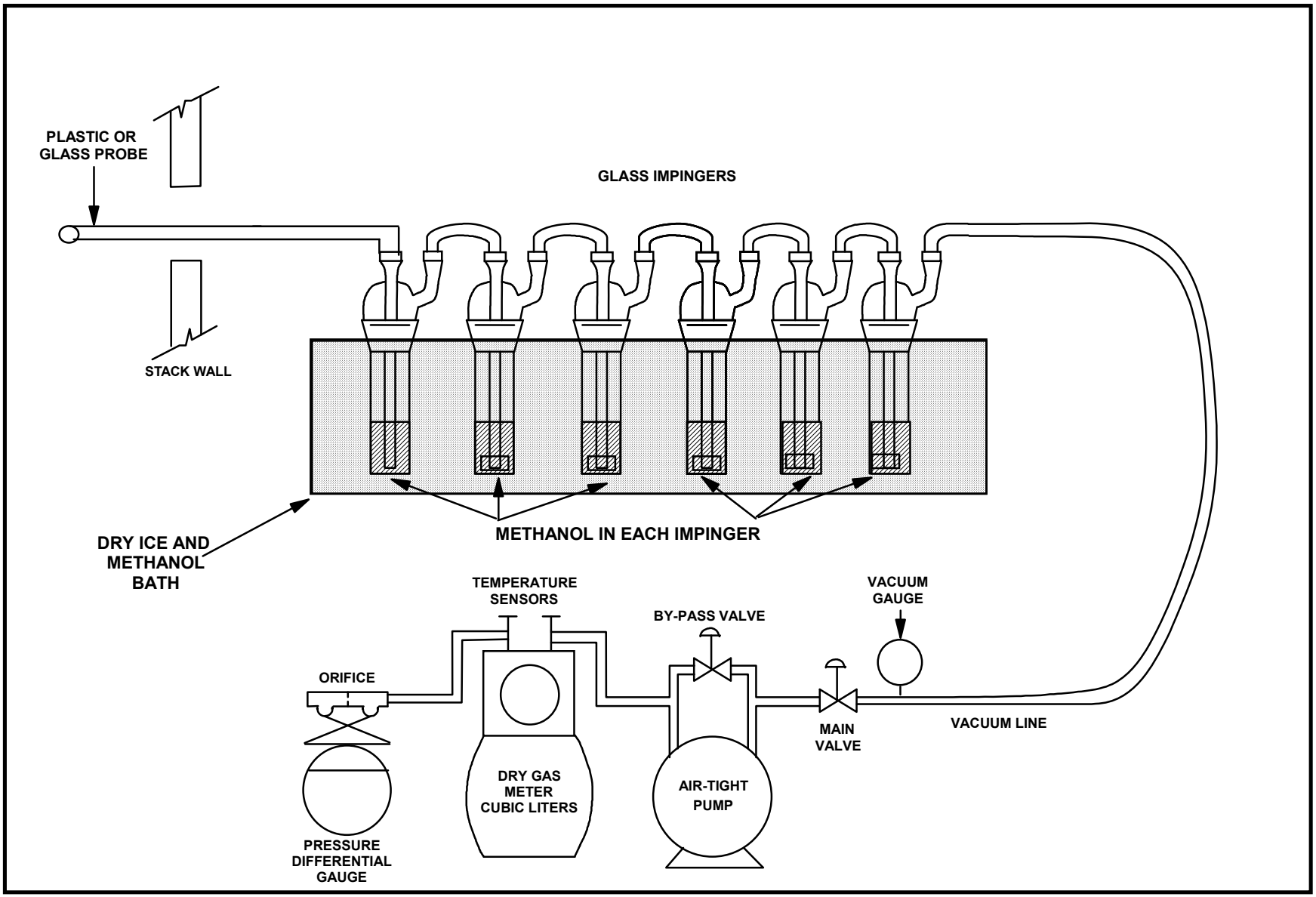


FIGURE 5-3
MODIFIED EPA METHOD 18 SAMPLING TRAIN FOR PFAS COMPOUNDS

5.4 GAS COMPOSITION

The Weston mobile laboratory equipped with instrumental analyzers was used to measure carbon dioxide (CO_2) and oxygen (O_2) concentrations. A diagram of the Weston sampling system is presented in Figure 5-4.

For the Division stack test campaign, the sample was collected at the exhaust of the Method 0010 sampling system. At the end of the line, a tee permitted the introduction of calibration gas. The sample was drawn through a heated Teflon® sample line to the sample conditioner. The output from the sampling system was recorded electronically, and one minute averages were recorded and displayed on a data logger.

Each analyzer was set up and calibrated internally by introduction of calibration gas standards directly to the analyzer from a calibration manifold. The calibration manifold is designed with an atmospheric vent to release excess calibration gas and maintained the calibration at ambient pressure. The direct calibration sequence consisted of alternate injections of zero and mid-range gases with appropriate adjustments until the desired responses were obtained. The high-range standards were then introduced in sequence without further adjustment.

The sample line integrity was verified by performing a bias test before and after each test period. The sampling system bias test consisted of introducing the zero gas and one up-range calibration standard in excess to the valve at the probe end when the system was sampling normally. The excess calibration gas flowed out through the probe to maintain ambient sampling system pressure. Calibration gas supply was regulated to maintain constant sampling rate and pressure. Instrument bias check response was compared to internal calibration responses to insure sample line integrity and to calculate a bias correction factor after each run using the ratio of the measured concentration of the bias gas certified by the calibration gas supplier.

The oxygen and carbon dioxide content of each stack gas was measured according to EPA Method 3A procedures which incorporate the latest updates of EPA Method 7E. A Servomex Model 4900 analyzer (or equivalent) was used to measure oxygen content. A Servomex Model 4900 analyzer (or equivalent) was used to measure carbon dioxide content of the stack gas. Both analyzers were calibrated with EPA Protocol gases prior to the start of the test program and performance was verified by sample bias checks before and after each test run.

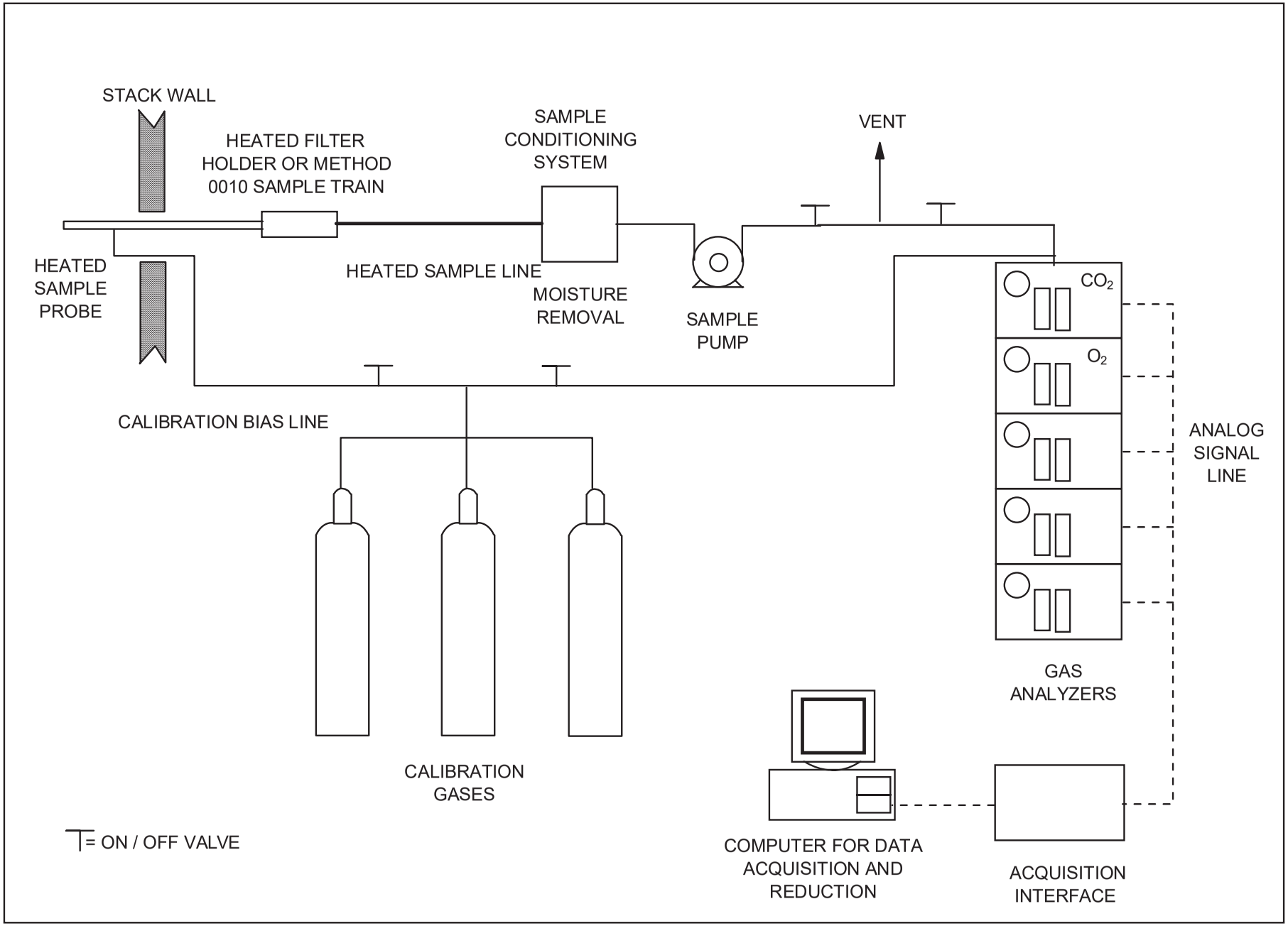


FIGURE 5-4
WESTON SAMPLING SYSTEM

I:\ASDATA\CHEMOURS\15418.002.018\FIGURE 5-4 WESTON SAMPLING SYSTEM

6. DETAILED TEST RESULTS AND DISCUSSION

M0010 test run number two was stopped prior to the full run time due to a process upset in the area. The run was considered complete and the sample was recovered and submitted for analysis. A total of two M0010 test runs were performed at the location. A total of three MM18 test runs were performed at the location.

Table 6-1 provides detailed M0010 test data and test results for Division stack. Table 6-2 provides detailed MM18 test data and test results for the Division stack.

The Method 3A sampling indicated that the O_2 and CO_2 concentrations were at ambient air levels (20.9% O_2, 0% CO_2), therefore, 20.9% O_2 and 0% CO_2 values were used in all calculations.

It should be noted that methylene chloride was identified in the MM18 analytical results. This detection was due to a special procedure done in the process area in which methylene chloride was used to unplug equipment that experienced plugging during testing. Methylene chloride would not typically be detected in this process area.

TABLE 6-1
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
DIVISION STACK

Test Data		
Run number	1	2
Location	Divison Stack	Divison Stack
Date	11/22/19	11/22/19
Time period	0826-1022	1139-1324
SAMPLING DATA:		
Sampling duration, min.	96.0	84.0
Nozzle diameter, in.	0.160	0.160
Cross sectional nozzle area, sq.ft.	0.000140	0.000140
Barometric pressure, in. Hg	30.02	30.02
Avg. orifice press. diff., in H_2O	1.40	1.00
Avg. dry gas meter temp., deg F	57.0	65.2
Avg. abs. dry gas meter temp., deg. R	517	525
Total liquid collected by train, ml	34.4	21.5
Std. vol. of H_2O vapor coll., cu.ft.	1.6	1.0
Dry gas meter calibration factor	0.9972	0.9972
Sample vol. at meter cond., dcf	63.136	47.088
Sample vol. at std. cond., dscf [(1)]	64.704	47.462
Percent of isokinetic sampling	101.0	100.5
GAS STREAM COMPOSITION DATA:		
CO_2, % by volume, dry basis	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.024	0.021
Mole fraction of dry gas	0.976	0.979
Molecular wt. of wet gas, lb/lb mole	28.57	28.61
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:		
Static pressure, in. H_2O	-0.35	-0.35
Absolute pressure, in. Hg	29.99	29.99
Avg. temperature, deg. F	72	79
Avg. absolute temperature, deg.R	532	539
Pitot tube coefficient	0.84	0.84
Total number of traverse points	12	12
Avg. gas stream velocity, ft./sec.	82.0	69.9
Stack/duct cross sectional area, sq.ft.	7.07	7.07
Avg. gas stream volumetric flow, wacf/min.	34799	29659
Avg. gas stream volumetric flow, dscf/min.	33787	28485

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-1 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
DIVISION STACK

TEST DATA		
Run number	1	2
Location	Divison Stack	Divison Stack
Date	11/22/19	11/22/19
Time period	0826-1022	1139-1324
LABORATORY REPORT DATA, ug.		
HFPO Dimer Acid	22.31	33.88
EMISSION RESULTS, ug/dscm.		
HFPO Dimer Acid	12.17	25.20
EMISSION RESULTS, lb/dscf.		
HFPO Dimer Acid	7.60E-10	1.57E-09
EMISSION RESULTS, lb/hr.		
HFPO Dimer Acid	1.54E-03	2.69E-03
EMISSION RESULTS, g/sec.		
HFPO Dimer Acid	1.94E-04	3.39E-04

TABLE 6-2
CHEMOURS-FAYETTEVILLE, NC
INPUTS FOR EPA MM18 TARGET COMPOUND CALCULATIONS
DIVISION STACK

TEST DATA			
Test run number	1	2	3
Location	Division Stack	Division Stack	Division Stack
Test date	11/22/19	11/22/19	12/4/19
Test time period	0826-1022	1139-1318	0955-1125
Operator	WF	WF	KS
SAMPLING DATA			
Duration, minutes	84	78	90
Average dry gas meter press. in. H2O	3.41	3.56	5.00
Average dry gas meter temp. deg. F	54.9	66.00	54.50
Average absolute meter temp. deg. R	514.9	526.0	514.5
Sample vol. at meter cond., dcl	143.580	147.394	159.313
Meter box calibration, Y	0.9996	0.9996	1.0140
Barometric pressure, in. Hg	30.02	30.02	30.12
Sample volume, dscl (1)	148.843	149.624	168.860
Sample volume, dscf (1)	5.256	5.283	5.963
VOLUMETRIC FLOW RATE			
Avg. gas stream volumetric flow, dscf/min.	33,787	28,485	31,136

(1) Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 inches Hg (760mm Hg).

TABLE 6-2 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF EPA MM18 TARGET COMPOUND TEST DATA AND TEST RESULTS

TEST DATA						
Run number		1		2		3
Location		Division Stack		Division Stack		Division Stack
Date		11/22/19		11/22/19		12/4/19
Time period		0826-1022		1139-1318		0955-1125
LABORATORY REPORT DATA, ug.						
HFPO Dimer Methyl Ester	<	40.9	<	29	<	30.2
HFPO Monomer		3497.4		3507		22080
Fluoroether E-1		272		743		277.7
Carbonyl Difluoride	<	125	<	88.7	<	92.3
Total Fluorine		67940		66200		160830
Hydrogen Fluoride	<	1700	<	1210	<	1260
EMISSION RESULTS, ug/dscm.						
HFPO Dimer Methyl Ester	<	2.75E+02	<	1.94E+02	<	1.79E+02
HFPO Monomer		2.35E+04		2.34E+04		1.31E+05
Fluoroether E-1		1.83E+03		4.97E+03		1.64E+03
Carbonyl Difluoride	<	8.40E+02	<	5.93E+02	<	5.47E+02
Total Fluorine		4.56E+05		4.42E+05		9.52E+05
Hydrogen Fluoride	<	1.14E+04	<	8.09E+03	<	7.46E+03
EMISSION RESULTS, lb/dscf.						
HFPO Dimer Methyl Ester	<	1.72E-08	<	1.21E-08	<	1.12E-08
HFPO Monomer		1.47E-06		1.46E-06		8.16E-06
Fluoroether E-1		1.14E-07		3.10E-07		1.03E-07
Carbonyl Difluoride	<	5.24E-08	<	3.70E-08	<	3.41E-08
Total Fluorine		2.85E-05		2.76E-05		5.95E-05
Hydrogen Fluoride	<	7.13E-07	<	5.05E-07	<	4.66E-07
EMISSION RESULTS, lb/hr.						
HFPO Dimer Methyl Ester	<	3.48E-02	<	2.07E-02	<	2.09E-02
HFPO Monomer		2.97E+00		2.50E+00		1.53E+01
Fluoroether E-1		2.31E-01		5.30E-01		1.92E-01
Carbonyl Difluoride	<	1.06E-01	<	6.33E-02	<	6.38E-02
Total Fluorine		5.78E+01		4.72E+01		1.11E+02
Hydrogen Fluoride	<	1.45E+00	<	8.63E-01	<	8.70E-01
EMISSION RESULTS, g/sec.						
HFPO Dimer Methyl Ester	<	4.38E-03	<	2.60E-03	<	2.63E-03
HFPO Monomer		3.74E-01		3.15E-01		1.92E+00
Fluoroether E-1		2.91E-02		6.67E-02		2.41E-02
Carbonyl Difluoride	<	1.34E-02	<	7.96E-03	<	8.03E-03
Total Fluorine		7.27E+00		5.94E+00		1.40E+01
Hydrogen Fluoride	<	1.82E-01	<	1.09E-01	<	1.10E-01

Note: All < values were below the laboratory analysis detection limits. The value shown is the method detection limit (MDL) for the first analytical fraction of the target compound in order to develop emission rates.

APPENDIX A
PROCESS OPERATIONS DATA

Division

Date: 11/22/2019

Time	800	900	1000	1100	1200	1300	1400	1500	1600
Stack Testing		RUN 1: 0826-1022			RUN 2 - 1139-1320				
HFPO									
VEN Product	PPVE								
VEN Precursor									
VEN Condensation (HFPO)									
VEN ABR								Burnout	
VEN Refining									
Stripper Column Vent									
Division WGS Recirculation Flow	15,000 kg/h								
Division WGS Inlet Flow	142 kg/h	145 kg/h	148 kg/h	150 kg/h		135 kg/h	128 kg/h	103 kg/h	74 kg/h

Date: 12/4/2019

Time	800	900	1000	1100
Stack Testing			RUN 3 0955-1125	
HFPO				
VEN Product	PPVE			
VEN Precursor				
VEN Condensation (HFPO)				
VEN ABR				
VEN Refining				
Stripper Column Vent				
Division WGS Recirculation Flow	15,000 kg/h			
Division WGS Inlet Flow	65 kg/h		73 kg/h	110 kg/h

APPENDIX B
RAW AND REDUCED TEST DATA

Sample and Velocity Traverse Point Data Sheet - Method 1

Client CHCMOUNS
Loaction/Plant Fayetteville, N.C.
Source Division Stack

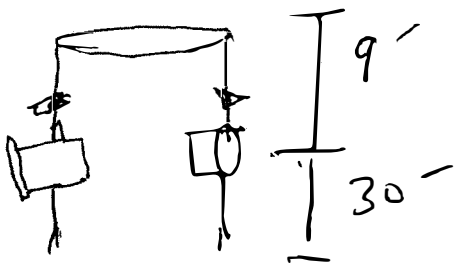
Operator MWKS
Date 11/22/12
W.O. Number 10418.00.002

Duct Type	☒	Circular	☐	Rectangular Duct	Indicate appropriate type
Traverse Type	☒	Particulate Traverse	☐	Velocity Traverse	☐ CEM Traverse

Distance from far wall to outside of port (in.) = C	5"
Port Depth (in.) = D	12.5
Depth of Duct, diameter (in.) = C-D	37
Area of Duct (ft^2) 3/07/13 7.07	7.66
Total Traverse Points MD	12
Total Traverse Points per Port	6
Port Diameter (in.) —(Flange-Threaded-Hole)	4"
Monorail Length	8'
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	
Equivalent Diameter = (2*L*W)/(L+W)	

Flow Disturbances	
Upstream - A (ft)	9' 12' 9'
Downstream - B (ft)	18' 30'
Upstream - A (duct diameters)	9.2
Downstream - B (duct diameters)	27.6

Diagram of Stack



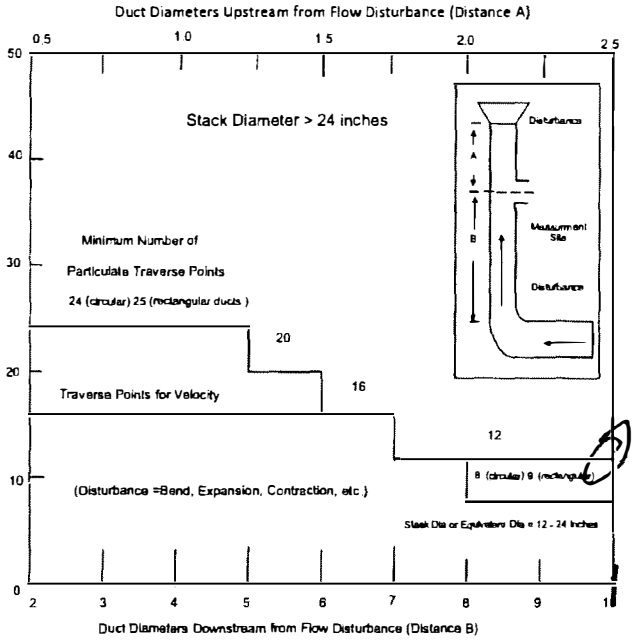
Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)	
1	4.4	1.62	19 3/4	20 1/8
2	14.6	5.40	23 1/4	24 3/8
3	29.6	10.95	23 7/8	24 7/8
4	70.4	26.04	44.0	45
5	95.4	31.59	49 3/4	50 5/8
6	95.6	35.37	53 1/4	54 3/8
7				
8				
9				
10				
11				
12				

CEM 3 Point(Long Measurment Line) Stratificaton Point Locations

1	0.167		
2	0.50		
3	0.833		

Note: If stack dia < 12 inch use EPA Method 1A
(Sample port upstream of pitot port)
Note: If stack dia >24" then adjust traverse point to 1 inch from wall
If stack dia <24" then adjust traverse point to 0.5 inch from wall



Traverse Point Location Percent of Stack -Circular

Traverse Point	Number of Traverse Points 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point	Number of Traverse Points 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
DIVISION STACK

Test Data		
Run number	1	2
Location	Divison Stack	Divison Stack
Date	11/22/19	11/22/19
Time period	0826-1022	1139-1324
Operator	BB	BB
Inputs For Calcs.		
Sq. rt. delta P	1.45039	1.22804
Delta H	1.4025	1.0010
Stack temp. (deg.F)	71.6	79.4
Meter temp. (deg.F)	57.0	65.2
Sample volume (act.)	63.136	47.088
Barometric press. (in.Hg)	30.02	30.02
Volume H_2O imp. (ml)	10.0	7.0
Weight change sil. gel (g)	24.4	14.5
% CO_2	0.0	0.0
% O_2	20.9	20.9
% N_2	79.1	79.1
Area of stack (sq.ft.)	7.070	7.070
Sample time (min.)	96.0	84.0
Static pressure (in.H_2O)	-0.35	-0.35
Nozzle dia. (in.)	0.160	0.160
Meter box cal.	0.9972	0.9972
Cp of pitot tube	0.84	0.84
Traverse points	12	12

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

		Stack Conditions	Assumed	Actual
Client	Chemours	% Moisture	~3	
W.O.#	15418.002.018	Impinger Vol (ml)		
Project ID	Chemours	Silica gel (g)		
Mode/Source ID	Division	CO2, % by Vol	0	
Samp. Loc. ID	STK	O2, % by Vol	20.9	
Run No.ID	1	Temperature (°F)	~~96~~ 75	
Test Method ID	M0010	Meter Temp (°F)	45	
Date ID	NOV2019	Static Press (in H_2O)	-.35	-.35 ✓
Source/Location	Division Stack	Ambient Temp (°F)	45	
Sample Date	11/22/19 ✓			
Baro. Press (in Hg)	30.02 ✓			
Operator	BB ✓			

Meter Box ID	30		
Meter Box Y	.9972 ✓		
Meter Box Del H	1.8715		
Probe ID / Length	694	6'	Sample Train (ft^3)
Probe Material	Boro		Leak Check @ (in Hg)
Pitot / Thermocouple ID			Pitot leak check good
Pitot Coefficient	0.84 ✓		Pitot Inspection good
Nozzle ID			Method 3 System good
Nozzle Measurements	.160	.160 .160	**Temp Check**
Avg Nozzle Dia (in)	.160 ✓		Meter Box Temp
Area of Stack (ft^2)	7.07 ✓		Reference Temp
Sample Time	96 ✓		Pass/Fail (+/- 2°)
Total Traverse Pts	12 ✓		Temp Change Response ?

K Factor 0.66

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.005	0.005	0.005
Leak Check @ (in Hg)	15"	15"	15"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	yes / no	yes / no	yes / no
	Pre-Test Set		Post-Test Set
Meter Box Temp			
Reference Temp			
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT	NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
		0	0826 ✓			897.696									
A	1	4		1.9	1.25	900.1	69	53	111	110	52	6.5	49		
	1	8		2.1	1.39	903.2	69	53	110	109	50	6.5	47		
	2	12		2.1	1.39	905.3	70	53	110	108	51	6.5	47		
	2	16		2.1	1.39	907.9	70	54	110	114	53	7	47		
	3	20		2.5	1.65	909.4	70	55	110	110	56	7.5	47		
	3	24		2.6	1.72	913.1	70	55	110	106	57	8	47		
	4	28		2.4	1.58	916.5	71	56	110	106	58	7.5	46	BB	
	4	32		2.5	1.65	919.6	71	56	110	111	58	7.5	44	BB	✓✓
	5	36		2.3	1.52	922.2	71	57	110	111	59	7.5	46		32.985
	5	40		2.4	1.58	925.1	71	56	110	111	59	7.5	46		
	6	44		2.4	1.58	927.5	71	57	110	108	59	7.5	46		
	6	48	0915	2.5	1.65	930.681	71	57	110	112	59	7.5	47		
						930.950									
B	1	4	0934	1.3	.86	932.9	72	58	111	115	56	5	48		
	1	8		1.3	.86	935.0	72	58	110	113	56	5	48		
	2	12		2.0	1.32	937.5	72	58	111	115	56	6.5	46		
	2	16		2.1	1.39	940.1	72	59	110	108	57	6.5	46		
	3	20		2.1	1.39	942.7	72	59	110	111	57	6.5	45		✓✓
	3	24		2.4	1.58	945.2	73	59	110	110	56	6.5	45		
	4	28		2.4	1.58	947.9	73	59	110	110	56	6.5	45		30.151
	4	32		2.4	1.58	950.1	73	59	110	112	56	6.5	45		
	5	36		2.3	1.52	953.2	74	59	110	113	55	7	45		
	5	40		2.2	1.45	955.8	74	59	110	106	55	7	45		
	6	44		BB ~~1.9~~ 1.3	.86	958.5	74	60	110	111	56	7	46		
	6	48	1022 ✓	1.4	.92	961.101	74	60	110	109	56	7	46		
				Avg Delta P ✓ 2.13 ✓	Avg Delta H 1.40 ✓	Total Volume ~~63.405~~ 63.136	Avg Ts ~~68.67~~ 71.6 ✓	Avg Tm ✓ 57.0	Min/Max 110/111	Min/Max 106/114	Max 59	Max Vac 8	Min/Max 44/49		
				Avg Sqrt Delta P ✓ 1.4504 ✓	Avg Sqrt Del H 1.18 ✓	Comments:									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

2.4 o/s n 101.2 for 33830 dscf omit

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

		Stack Conditions	Assumed	Actual						
Client	Chemours				Meter Box ID	30			K Factor	0.66
W.O.#	15418.002.018				Meter Box Y	.9972 ✓			Initial	Mid-Point / Final
Project ID	Chemours	% Moisture	3		Meter Box Del H	1.8715				
Mode/Source ID	Division	Impinger Vol (ml)			Probe ID / Length	694	6'	Sample Train (ft^3)	0.001	0.001 /
Samp. Loc. ID	STK	Silica gel (g)			Probe Material	Boro		Leak Check @ (in Hg)	15"	15" /
Run No.ID	2	CO2, % by Vol	0		Pitot / Thermocouple ID			Pitot leak check good	yes / no	yes / no / yes / no
Test Method ID	M0010	O2, % by Vol	20.9		Pitot Coefficient	0.84 ✓		Pitot Inspection good	yes / no	yes / no / yes / no
Date ID	NOV2019	Temperature (°F)	BB 50 75		Nozzle ID			Method 3 System good	yes / no	yes / no / yes / no
Source/Location	Division Stack	Meter Temp (°F)	60		Nozzle Measurements	.160	.160	.160	**Temp Check**	Pre-Test Set / Post-Test Set
Sample Date	11-22-19 ✓	Static Press (in H_2O)	-35	-.35 ✓	Avg Nozzle Dia (in)	.160 ✓			Meter Box Temp	/
Baro. Press (in Hg)	30.02 ✓				Area of Stack (ft^2)	7.07 ✓			Reference Temp	/
Operator	BB ✓	Ambient Temp (°F)	50		Sample Time	~~96~~ 84			Pass/Fail (+/- 2°)	Pass / Fail / Pass / Fail
					Total Traverse Pts	12 ✓			Temp Change Response ?	yes / no / yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1139 ✓			961.312									

[redacted]

CHEMOURS-FAYETTEVILLE, NC
INPUTS FOR EPA MM18 TARGET COMPOUND CALCULATIONS
DIVISION STACK

TEST DATA			
Test run number	1	2	3
Location	Division Stack	Division Stack	Division Stack
Test date	11/22/19	11/22/19	12/4/19
Test time period	0826-1022	1139-1318	0955-1125
Operator	WF	WF	KS
SAMPLING DATA			
Duration, minutes	84	78	90
Average dry gas meter press. in. H2O	3.41	3.56	5.00
Average dry gas meter temp. deg. F	54.9	66.00	54.50
Average absolute meter temp. deg. R	514.9	526.0	514.5
Sample vol. at meter cond., dcl	143.580	147.394	159.313
Meter box calibration, Y	0.9996	0.9996	1.0140
Barometric pressure, in. Hg	30.02	30.02	30.12
Sample volume, dscl (1)	148.843	149.624	168.860
Sample volume, dscf (1)	5.256	5.283	5.963
VOLUMETRIC FLOW RATE			
Avg. gas stream volumetric flow, dscf/min.	33,787	28,485	31,136

(1) Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 inches Hg (760mm Hg).

FIELD DATA SHEET

MM 18 - HFPO Dimer Acid

Client	Chemours	Run No.	1	Meter Box ID	VOST 5				
W.O.#	15418.002.018	Test Method	Modified M18	Meter Box Y	0.9996				
Project ID	CHEM-F	Date	22 Nov. 2019	Probe ID/Length		Leak Check @ (in Hg)	0.02 @ 2"		6.0 @ 5"
Mode/Source ID	Division	Baro. Press (in Hg)	30.02 ✓	Probe Material		Pitot leak check good	~~yes / no~~	yes / no	~~yes / no~~
Samp. Loc.	Stack	Ambient Temp (°F)	50						
Source	Division Stk	Operator	WJF						
		Sample Time	84/min		~1.7 lpm				

Comments: Initial Probe Leak check:

Final Probe Leak check:

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (start then)	ROTAMETER SETTING	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM OUTLET TEMP (°F)	PROBE TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)		COMMENTS
	0	0926			0.000						
B	5		2.0	3.5	7.5	50	NA	1.0	-98		
	10		2.0	3.1	13.9	50		1.0	-97		
	15		2.0	3.2	21.4	50		2.0	-98		
	20		2.0	3.0	29.8	51		6.0	-98		Vac went to 7.5
	25		2.0	3.2	38.4	52		1.0	-98		Back to Zero after adjustment
	30		2.0	3.2	46.6	53		1.0	-98		
	35		2.0	3.6	55.3	53		1.0	-97		
	40		2.0	3.4	63.9	54		1.0	-97		
	45		2.0	3.6	72.5	54		1.0	-97		
A 48	~~50~~	0914	2.0	3.3	77.607	55		1.0	-97		
53	~~55~~ MP9	0934	2.0	3.6	86.5	57		1.0	-98		
58	~~60~~		2.0	3.5	95.8	58		1.0	-101		
~~63~~	63		2.0	3.6	104.6	58		1.0	-102		
~~68~~ NP	68	0956/1002	2.0	3.6	113.7	58		1.0	-100		0950 Vac Shot up Restart @ 1002
	73		2.0	3.5	122.4	58		1.0	-102		Max Vac 20" Hg
	78		2.0	3.5	133.1	59		1.0	-99		
	83		2.0	3.5	141.7	59		1.0	-99		
84	~~88~~	1022	2.0	3.5	143.580	59		1.0	-99		
	~~93~~										
				Avg Delta H	Total Volume	Avg Tm	Max Temp	Max Vac	Max Temp		
				3.41 ✓	143.580 ✓	~~53.5~~ 54.9					

FIELD DATA SHEET

MM 18 - HFPO Dimer Acid

Client	Chemours	Run No.	2	Meter Box ID	VOST 5
W.O.#	15418.002.018	Test Method	Modified M18	Meter Box Y	0.9996
Project ID	CHEM-F	Date	22 Nov. 2019	Probe ID/Length	
Mode/Source ID	Division	Baro. Press (in Hg)	30.02	Probe Material	
Samp. Loc.	Stack	Ambient Temp (°F)	60		
Source	Division Stk	Operator	WF		
		Sample Time	78 min		

Leak Check @ (in Hg): 0.0 @ 3" | | |

Pitot leak check good: ~~yes / no~~ | yes / no | yes / no

Comments: Initial Probe Leak check:

Final Probe Leak check:

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (hhmm)	ROTAMETER SETTING	ORIFICE PRESSURE DIFF. H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°C)	PROBE TEMP (°C)	SAMPLE MAIN VAC (in Hg)	METHANOL BATH TEMP (°F)		COMMENTS
	0	1139			0.00							
A	5		2.0	3.6	9.0	NA	65	NA	1.0	-98		
	10		2.0	3.6	18.1		65		1.0	-98		
	15		2.0	3.7	27.3		65		1.0	-99		
	20		2.0	3.7	36.5		66		1.0	-99		
	25		2.0	3.6	45.8		66		1.0	-99		
	30		2.0	3.7	54.7		66		1.0	-100		
	35		2.0	3.6	63.9		66		1.0	-100		
	40		2.0	3.5	72.9		66		1.0	-100		
	45		2.0	3.6	82.1		66		1.0	-100		
	48	1227	2.0	3.7	87.364		66		1.0	-100		
	0	1248			87.364							
	5		2.0	3.4	96.3		67		1.0	-99		
	10		2.0	3.4	104.8		66		1.0	-99		
	15		2.0	3.4	113.5		67		1.0	-99		
	20		2.0	3.3	122.4		67		1.0	-99		
	25		2.0	3.6	132.1		66		1.0	-98		
	30	1318	2.0	3.5	147.394		66		1.0	-97		Step Test
	35											
	40											
	45											
				Avg Delta H	Total Volume	Avg Tm		Max Temp	Max Vac	Max Temp		
				3.56	147.394	66						

Div Stack

M18

SAMPLE RECOVERY FIELD DATA

Client: Chemours — W.O. #:
Location/Plant: Pompton Plains — Source & Location: Div Stack

Run No. — Sample Date 11-22-19 — Recovery Date 11-22-19
Sample I.D. M18 — Analyst JDO/SR — Filter Number NA

	Impinger 1	2	3	4	5	6	7	Imp.Total	8 Silica Gel	Total
Contents										
Final	654.2	663.8	541.2	597.5	597.2	609.5				
Initial	606.9	608.9	607.9	609.1	608.4	614.9*				
Gain	47.3	54.9	-66.7	-11.6	-11.2	-4.9		1.8		

Impinger Color: all clear — Labeled? ✓
Silica Gel Condition: NA — Sealed? ✓

Trip 1

Run No. 2 — Sample Date 11-22-19 — Recovery Date 11-22-19
Sample I.D. — Analyst JDO — Filter Number NA

	Impinger 1	2	3	4	5	6	7	Imp.Total	8 Silica Gel	Total
Contents										
Final	606.6	606.5	609.0	610.5	608.3	618.4				
Initial	~~610.4~~ 605.0	606.2	608.7	610.2	608.0	618.1				
Gain	~~4.2~~ 1.6	0.3	0.3	0.3	0.3	0.3		3.1		

Impinger Color: all clear — Labeled? ✓
Silica Gel Condition: NA — Sealed? ✓

~~602.0~~ 605.0
Trip 2
1 / 1.5 / 1.6 / 3.1

Run No. BT — Sample Date 11/22/19 — Recovery Date 11/22/19
Sample I.D. — Analyst JDO — Filter Number NA

	Impinger 1	2	3	4	5	6	7	Imp.Total	8 Silica Gel	Total
Contents										
Final	611.3	609.4	607.8	609.4	606.1	612.4				
Initial	611.3	609.3	607.7	609.4	606.1	612.4				
Gain	0	0.1	0.1	0	606.1	0		0.2		

Impinger Color: all clear — Labeled?
Silica Gel Condition: NA — Sealed?

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS

* stem adds ~ 6-12 grs.

Added 5 chips to each Impinger

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	1	Meter Box ID	8				
W.O.#	15418.002.018	Test Method	Modified M18	Meter Box Y	1.0140 ✓				
Project ID	CHEM-F	Date	4 Dec. 2019	Probe ID/Length			Leak Check @ (in Hg)	0.000810	0.000810
Mode/Source ID	VE North	Baro. Press (in Hg)	30.12	Probe Material			Pitot leak check good	yes / no	yes / no
Samp. Loc.	Stack	Ambient Temp (°F)	40						
Source	Division	Operator	KS ✓						
		Sample Time	90 min ✓						

Comments: Initial Probe Leak check: Good 0.000810

Final Probe Leak check: Good 0.000810

Traverse Point No.	Sample Time (min)	Clock Time (military time)	Orifice Meter Setting (ΔH)	Orifice Pressure Differential (ΔH@)	Dry Gas Meter Reading (ft³)	Dry Gas Meter Temp (°F)	Probe Temp (°C)	Sample Train Vac (in Hg)	Filter Box Temp (°F)		Comments
	0	0955 ✓	KS	KS	0.000						
A1	5		~~1.6~~ 1.8	~~4~~ 5	8.023	52	N/A	1.5	-101		
	10		2.0	5	16.2	52		2.5	-102		
	15		2.0	5	25.5	52		2.5	-102		
	20		2.0	5	34.1	52		2.5	-101		
	25		2.0	5	43.0	52		2.5	-100		
	30		2.0	5	51.7	53		2.5	-100		
	35		2.0	5	60.8	53		2.5	-100		
	40		2.0	5	69.5	53		2.5	-101		
	45		2.0	5	78.3	53		2.5	-101		
	50		2.0	5	87.2	54		2.5	-101		
	55		2.0	5	96.0	55		2.5	-100		
	60		2.0	5	104.8	55		2.5	-100		
	65		2.0	5	113.6	56		2.5	-101		
	70		2.0	5	122.3	57		2.5	-100		
	75		2.0	5	131.5	58		2.5	-100		
	80		2.0	5	141.2	57		2.0	-101		
	85		2.0	5	150.0	~~58~~ 58		2.0	-100		
	90	1125 ✓	2.0	5	159.313	~~58~~ 58		2.0	-101		
							N/A				
				Avg Delta H 5.0 ✓	Total Volume 159.313 ✓	Avg Tm 54.5 ✓	Max Temp	Max Vac 2.5	Max Temp -100/-102		

SAMPLE RECOVERY FIELD DATA

Client: Chemours
Location/Plant: Fayetteville NC
W.O. #: 15418.062.98.0001
Source & Location: VE North - Division South

Run No. 3 | Sample Date 12-4-19 | Recovery Date 12-4-19
Sample I.D. _____ | Analyst PM/CH | Filter Number n/a

	Impinger 1	2	3	4	5	6	7	Imp.Total	8 Silica Gel	Total
Contents										
Final	608.0	608.3	605.0	606.8	606.5	613.4				
Initial	607.7	608.2	604.8	606.7	606.5	613.3				
Gain	0.3	0.1	0.2	0.1	0	0.1		0.8		

Impinger Color: clear | Labeled? ✓
Silica Gel Condition: dry | Sealed? ✓

Run No. ___ | Sample Date _____ | Recovery Date _____
Sample I.D. _____ | Analyst _____ | Filter Number _____

	Impinger 1	2	3	4	5	6	7	Imp.Total	8 Silica Gel	Total
Contents										
Final										
Initial	603.6	602.0	607.7	603.2	606.8	613.3				
Gain										

Impinger Color _____ | Labeled? _____
Silica Gel Condition _____ | Sealed? _____

Run No. ___ | Sample Date _____ | Recovery Date _____
Sample I.D. _____ | Analyst _____ | Filter Number _____

	Impinger 1	2	3	4	5	6	7	Imp.Total	8 Silica Gel	Total
Contents										
Final										
Initial										
Gain										

Impinger Color _____ | Labeled? _____
Silica Gel Condition _____ | Sealed? _____

Check COC for Sample IDs of Media Blanks

APPENDIX C
LABORATORY ANALYTICAL REPORT

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Job Number: 140-17458-1

Job Description: VEN Stack - M0010

Contract Number: LBIO-67048

For:
Chemours Company FC, LLC The
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, DE 19713

Attention: Michael Aucoin

Approved for release.
Courtney M Adkins
Project Manager II
12/10/2019 3:07 PM

Courtney M Adkins, Project Manager II
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
12/10/2019

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Qualifiers

LCMS

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - M0010

Job ID: 140-17458-1

Method	Method Description	Protocol	Laboratory
8321A	HFPO-DA	SW846	TAL DEN
8321A	PFOA and PFOS	SW846	TAL DEN
None	Leaching Procedure	TAL SOP	TAL DEN
None	Leaching Procedure for Condensate	TAL SOP	TAL DEN
None	Leaching Procedure for XAD	TAL SOP	TAL DEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - M0010

Job ID: 140-17458-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-17458-1	G-2577,2578 DIV VEN STACK R1 M0010 FH	Air	11/22/19 00:00	11/25/19 08:00	
140-17458-2	G-2579,2580,2582 DIV VEN STACK R1 M0010 BH	Air	11/22/19 00:00	11/25/19 08:00	
140-17458-3	G-2581 DIV VEN STACK R1 M0010 IMPINGERS 1,2&3 COND	Air	11/22/19 00:00	11/25/19 08:00	
140-17458-4	G-2583 DIV VEN STACK R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	11/22/19 00:00	11/25/19 08:00	
140-17458-5	G-2584,2585 DIV VEN STACK R2 M0010 FH	Air	11/22/19 00:00	11/25/19 08:00	
140-17458-6	G-2586,2587,2589 DIV VEN STACK R2 M0010 BH	Air	11/22/19 00:00	11/25/19 08:00	
140-17458-7	G-2588 DIV VEN STACK R2 M0010 IMPINGERS 1,2&3 COND	Air	11/22/19 00:00	11/25/19 08:00	
140-17458-8	G-2590 DIV VEN STACK R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	11/22/19 00:00	11/25/19 08:00	

Job Narrative
140-17458-1

Sample Receipt

The samples were received on November 25, 2019 at 8:00 AM in good condition and properly preserved. The temperature of the cooler at receipt was 1.6º C.

Quality Control and Data Interpretation

Unless otherwise noted, all holding times, and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

Method 0010/Method 3542 Sampling Train Preparation

Train fractions were extracted and prepared for analysis in TestAmerica's Knoxville laboratory. Extracts and condensate samples were forwarded to the Denver laboratory for HFPO-DA analysis. All results are reported in "Total ug" per sample.

LCMS

Method 8321A: The following samples were inadvertently spiked with a native solution of HFPO-DA rather than the isotope dilution internal standard prior to extraction in the Knoxville Laboratory.

- DIV VEN Stack R1 FH
- DIV VEN Stack R1 BH
- DIV VEN R1 Breakthrough
- DIV VEN Stack R2 FH
- DIV VEN Stack R2 BH
- DIV VEN R2 Breakthrough

As a result, these samples received a relatively small fortification of the native HFPO-DA, and no labeled IDA as typically applied. Upon discovery of the processing issue, the IDAs were post spiked onto the extracted samples which were then re-analyzed to acquire the Total HFPO-DA content in the samples. The spiked amount of native HFPO-DA was subsequently subtracted from the Total HFPO-DA, and the corrected concentration is reported in with the data set below.
Please note that under these conditions, the affected samples are not corrected for extraction losses through isotope dilution internal standard data reduction. However, the HFPO-DA concentrations are accurate and useful for their intended purpose.
Method 8321A: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 280-478940 and analytical batch 280-479928 recovered outside control limits for the following analytes: HFPO. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

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

Organic Prep

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

Chemours VES Carbon Bed Outlet Test Analytical Report
TestAmerica Job No. 140-17458-1
December 10, 2019

The following samples were inadvertently spiked with a native solution of HFPO-DA prior to extraction in the Knoxville laboratory:

- **DIV VEN Stack R1 FH**
- **DIV VEN Stack R1 BH**
- **DIV VEN R1 Breakthrough**
- **DIV VEN Stack R2 FH**
- **DIV VEN Stack R2 BH**
- **DIV VEN R2 Breakthrough**

The HFPO-DA results presented below have been corrected to remove the laboratory contribution from the final result.

TALS ID	Client ID	HFPO-DA Result (ug/sample)	HFPO-DA Added in the lab (ug/sample)	HFPO-DA Corrected Result (ug/sample)
140-17458-1	**DIV VEN Stack R1 FH**	9.86	2	7.86
140-17458-2	**DIV VEN Stack R1 BH**	21.3	7	14.3
140-17458-4	**DIV VEN R1 Breakthrough**	2.30	4	ND
140-17458-5	**DIV VEN Stack R2 FH**	6.58	2.5	4.08
140-17458-6	**DIV VEN Stack R2 BH**	36.3	6.5	29.8
140-17458-8	**DIV VEN R2 Breakthrough**	2.19	4	ND

LCMS

Analysis Batch: 464589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-464589/13	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 478940

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17458-1	G-2577,2578 DIV VEN STACK R1 M0010 FH	Total/NA	Air	None	
140-17458-5	G-2584,2585 DIV VEN STACK R2 M0010 FH	Total/NA	Air	None	
MB 280-478940/14-A	Method Blank	Total/NA	Air	None	
MB 280-478940/1-A	Method Blank	Total/NA	Air	None	
LCS 280-478940/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-478940/3-A	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 478993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17458-3	G-2581 DIV VEN STACK R1 M0010 IMPINGERS	Total/NA	Air	None	
140-17458-7	G-2588 DIV VEN STACK R2 M0010 IMPINGERS	Total/NA	Air	None	
MB 280-478993/14-A	Method Blank	Total/NA	Air	None	
MB 280-478993/1-A	Method Blank	Total/NA	Air	None	
LCS 280-478993/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-478993/3-A	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 479245

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17458-2	G-2579,2580,2582 DIV VEN STACK R1 M0010 E	Total/NA	Air	None	
140-17458-4	G-2583 DIV VEN STACK R1 M0010 BREAKTHR	Total/NA	Air	None	
140-17458-6	G-2586,2587,2589 DIV VEN STACK R2 M0010 E	Total/NA	Air	None	
140-17458-8	G-2590 DIV VEN STACK R2 M0010 BREAKTHR	Total/NA	Air	None	
MB 280-479245/1-A	Method Blank	Total/NA	Air	None	
LCS 280-479245/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-479245/3-A	Lab Control Sample Dup	Total/NA	Air	None	

Analysis Batch: 479814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17458-3	G-2581 DIV VEN STACK R1 M0010 IMPINGERS	Total/NA	Air	8321A	478993
140-17458-7	G-2588 DIV VEN STACK R2 M0010 IMPINGERS	Total/NA	Air	8321A	478993
MB 280-478993/14-A	Method Blank	Total/NA	Air	8321A	478993
MB 280-478993/1-A	Method Blank	Total/NA	Air	8321A	478993
LCS 280-478993/2-A	Lab Control Sample	Total/NA	Air	8321A	478993
LCSD 280-478993/3-A	Lab Control Sample Dup	Total/NA	Air	8321A	478993

Analysis Batch: 479928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17458-1	G-2577,2578 DIV VEN STACK R1 M0010 FH	Total/NA	Air	8321A	478940
140-17458-5	G-2584,2585 DIV VEN STACK R2 M0010 FH	Total/NA	Air	8321A	478940
MB 280-478940/14-A	Method Blank	Total/NA	Air	8321A	478940
MB 280-478940/1-A	Method Blank	Total/NA	Air	8321A	478940
LCS 280-478940/2-A	Lab Control Sample	Total/NA	Air	8321A	478940
LCSD 280-478940/3-A	Lab Control Sample Dup	Total/NA	Air	8321A	478940

Analysis Batch: 479929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17458-2	G-2579,2580,2582 DIV VEN STACK R1 M0010 E	Total/NA	Air	8321A	479245

LCMS (Continued)

Analysis Batch: 479929 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17458-4	G-2583 DIV VEN STACK R1 M0010 BREAKTHR	Total/NA	Air	8321A	479245
140-17458-6	G-2586,2587,2589 DIV VEN STACK R2 M0010 E	Total/NA	Air	8321A	479245
140-17458-8	G-2590 DIV VEN STACK R2 M0010 BREAKTHR	Total/NA	Air	8321A	479245
MB 280-479245/1-A	Method Blank	Total/NA	Air	8321A	479245
LCS 280-479245/2-A	Lab Control Sample	Total/NA	Air	8321A	479245
LCSD 280-479245/3-A	Lab Control Sample Dup	Total/NA	Air	8321A	479245

Client Sample ID: G-2577,2578 DIV VEN STACK R1 M0010 FH

Lab Sample ID: 140-17458-1

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	9.86	B *	0.100	0.0108	ug/Sample		11/27/19 08:04	12/08/19 09:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*133*		*50 - 200*	*11/27/19 08:04*	*12/08/19 09:15*	*1*

Client Sample ID: G-2579,2580,2582 DIV VEN STACK R1 M0010 BH

Lab Sample ID: 140-17458-2

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	21.3	B	0.350	0.0700	ug/Sample		12/02/19 11:25	12/08/19 09:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*116*		*50 - 200*	*12/02/19 11:25*	*12/08/19 09:55*	*1*

Client Sample ID: G-2581 DIV VEN STACK R1 M0010 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-17458-3

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.145	J	0.212	0.0108	ug/Sample		11/27/19 12:36	12/06/19 12:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*116*		*50 - 200*	*11/27/19 12:36*	*12/06/19 12:41*	*1*

Client Sample ID: G-2583 DIV VEN STACK R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-17458-4

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	2.30	B	0.200	0.0400	ug/Sample		12/02/19 11:25	12/08/19 09:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*126*		*50 - 200*	*12/02/19 11:25*	*12/08/19 09:58*	*1*

Client Sample ID: G-2584,2585 DIV VEN STACK R2 M0010 FH

Lab Sample ID: 140-17458-5

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	6.58	B *	0.125	0.0135	ug/Sample		11/27/19 08:04	12/08/19 09:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*136*		*50 - 200*	*11/27/19 08:04*	*12/08/19 09:19*	*1*

Client Sample ID: G-2586,2587,2589 DIV VEN STACK R2 M0010 BH

Lab Sample ID: 140-17458-6

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	36.3	B	0.325	0.0650	ug/Sample		12/02/19 11:25	12/08/19 10:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*100*		*50 - 200*	*12/02/19 11:25*	*12/08/19 10:01*	*1*

Client Sample ID: G-2588 DIV VEN STACK R2 M0010 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-17458-7

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.196	0.00999	ug/Sample		11/27/19 12:36	12/06/19 12:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*121*		*50 - 200*	*11/27/19 12:36*	*12/06/19 12:44*	*1*

Client Sample ID: G-2590 DIV VEN STACK R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-17458-8

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	2.19	B	0.200	0.0400	ug/Sample		12/02/19 11:25	12/08/19 10:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*109*		*50 - 200*	*12/02/19 11:25*	*12/08/19 10:04*	*1*

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - M0010

Job ID: 140-17458-1

Method: 8321A - HFPO-DA

Prep: None

Analyte	RL	MDL	Units
HFPO-DA	0.00250	0.00128	ug/Sample

Method: 8321A - PFOA and PFOS

Prep: None

Analyte	RL	MDL	Units
HFPO-DA	0.0250	0.00270	ug/Sample
HFPO-DA	0.100	0.0200	ug/Sample

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ANALYTICAL REPORT

Job Number: 140-17461-1

Job Description: VEN Stack - MM-18

Contract Number: LBIO-67048

For:
Chemours Company FC, LLC The
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, DE 19713

Attention: Michael Aucoin

Approved for release.
Courtney M Adkins
Project Manager II
12/23/2019 3:00 PM

Courtney M Adkins, Project Manager II
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
12/23/2019

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
H	Sample was prepped or analyzed beyond the specified holding time

GC/MS VOA TICs

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

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

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - MM-18

Job ID: 140-17461-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL KNX
9056	Anions, Ion Chromatography	SW846	TAL KNX
9041A	pH	SW846	TAL KNX
5050	Bomb Preparation Method for Solid Waste	SW846	TAL KNX
MeOH Prep	Methanol Impinger Preparation	None	TAL KNX

Protocol References:

None = None

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

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - MM-18

Job ID: 140-17461-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-17461-1	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-2	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-3	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-4	Y-2967 R1 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-5	Y-2968 R1 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-6	Y-2969 R1 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-7	Y-2970 R2 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-8	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-9	Y-2972 R2 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-10	Y-2973 R2 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-11	Y-2974 R2 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	
140-17461-12	Y-2975 R2 VEN DIV STACK MM18 IMPINGER #	Air	11/22/19 00:00	11/25/19 08:00	

Job Narrative
140-17461-1

Sample Receipt

The samples were received on November 25, 2019 at 8:00 AM in good condition and properly preserved. The temperature of the cooler at receipt was 1.6º C.

GC/MS VOA

Impinger Sample Preparation and Analysis: Impinger samples were analyzed for the volatile organic target analytes by purge and trap GCMS using Eurofins TestAmerica Knoxville standard operating procedure KNOX-MS-0015, based on the following method:

· SW-846 8260B, "Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS)"

Each sample is prepared by adding a known amount of sample to the purge water in a purge and trap vessel and spiking with internal standards, surrogates, and matrix spike analytes (as needed). Volatile compounds are introduced into the gas chromatograph by the purge and trap method. The components are separated using the chromatograph and detected using a mass spectrometer, which provides both qualitative and quantitative information.

Impinger sample results were calculated using the following equation:

Concentration, µg/sample = (C × DF × W × Vt) / (Va)
Where:
C = On-column concentration, µg/L
DF = Dilution factor
W = Volume of water purged, L
Vt = Methanol extract final volume, µL
Va = Volume of extract analyzed, µL

Method 8260B: The LCS (LCS 140-35706/1-A) for analytical batch 140-35903 recovered below marginal exceedance limits for Trichlorofluoromethane. This is an ongoing instrument issue with LCS recoveries for this analyte. The project manager approved moving forward with analysis for the current job.

Method 8260B: The following samples were analyzed outside of analytical holding time due to ongoing instrumentation problems: Y-2972 R2 VEN DIV STACK MM18 IMPINGER #3 (140-17461-9), Y-2973 R2 VEN DIV STACK MM18 IMPINGER #4 (140-17461-10), Y-2974 R2 VEN DIV STACK MM18 IMPINGER #5 (140-17461-11) and Y-2975 R2 VEN DIV STACK MM18 IMPINGER #6 (140-17461-12).

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

Total Halogens: The samples were prepared for total fluorine, chlorine, bromine and/or iodine using SOP number KNOX-WC-0016 (based on ASTM Method E442 and SW-846 Method 5050). The sample is oxidized by combustion in an oxygen flask at atmospheric pressure or a bomb containing oxygen under pressure. The liberated halogen compounds are absorbed primarily as halides in a sodium carbonate/sodium bicarbonate buffer solution. The combustion products are collected by repeated rinsing of the combustion apparatus, and analyzed by ion chromatography in accordance with SOP KNOX-WC-0005 (based on SW-846 Method 9056). The results are calculated using the following equation:

C = [(Ccom × Vcom) / W] × 1000 g/Kg

Where:
C = Concentration of analyte in the sample, mg/Kg
Ccom = Concentration of analyte in the combustate, mg/L
Vcom = Total volume of combustate, L
W = Weight of sample combusted, g

Anions in Impinger Solutions: Anions are is determined in accordance to SOP KNOX-WC-0005 (based on methods 300.0A and 9056). The samples were diluted a minimum of 1/20 in ion chromatography solvent buffer solution to reduce the methanol concentration before injection. Buffer concentrate was added until the pH was 10. Samples are diluted with ion chromatography eluate solution to bring the concentrations within the calibration range when necessary. Higher dilutions are applied as necessary.

An aliquot of prepared sample is introduced into the ion chromatograph. Anions are identified based on their retention times as compared to those of known standards. Quantification is accomplished by measuring the peak response and comparing it to a calibration curve generated from known standards.

The pH of all samples were tested with pH paper. QC consisted of initial CCV and LCS which also serve as initial calibration, duplicate analysis for every 10 samples, and closing CCV. A certified thermometer was used to check the ambient temperature.

QC Association Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - MM-18

Job ID: 140-17461-1

GC/MS VOA

Prep Batch: 35706

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-1	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-2	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-3	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-4	Y-2967 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-5	Y-2968 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-6	Y-2969 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-7	Y-2970 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-8	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-9	Y-2972 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-10	Y-2973 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-11	Y-2974 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-12	Y-2975 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
MB 140-35706/2-A	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-35706/1-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
140-17461-8 MS	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-8 MSD	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	

Analysis Batch: 35903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-1	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-2	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-3	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-4	Y-2967 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-5	Y-2968 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-6	Y-2969 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-7	Y-2970 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-8	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-9	Y-2972 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-10	Y-2973 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-11	Y-2974 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-12	Y-2975 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
MB 140-35706/2-A	Method Blank	Total/NA	Air	8260B	35706
LCS 140-35706/1-A	Lab Control Sample	Total/NA	Air	8260B	35706
LCS 140-35706/1-A	Lab Control Sample	Total/NA	Air	8260B	35706
140-17461-8 MS	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706
140-17461-8 MSD	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35706

HPLC/IC

Prep Batch: 35705

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 140-35705/14-B	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-35705/15-B	Lab Control Sample	Total/NA	Air	MeOH Prep	
LCSD 140-35705/16-B	Lab Control Sample Dup	Total/NA	Air	MeOH Prep	

Prep Batch: 35706

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-1	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-2	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-3	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-4	Y-2967 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	

HPLC/IC (Continued)

Prep Batch: 35706 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-5	Y-2968 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-6	Y-2969 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-7	Y-2970 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-8	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-9	Y-2972 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-10	Y-2973 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-11	Y-2974 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-12	Y-2975 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
MB 140-35706/17-A	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-35706/18-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
LCSD 140-35706/19-A	Lab Control Sample Dup	Total/NA	Air	MeOH Prep	
140-17461-8 MS	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17461-8 MSD	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	

Prep Batch: 35707

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 140-35707/17-B	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-35707/18-B	Lab Control Sample	Total/NA	Air	MeOH Prep	
LCSD 140-35707/19-B	Lab Control Sample Dup	Total/NA	Air	MeOH Prep	

Prep Batch: 35761

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-1	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-2	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-3	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-4	Y-2967 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-5	Y-2968 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-6	Y-2969 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-7	Y-2970 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
MB 140-35707/17-B	Method Blank	Total/NA	Air	5050	35707
LCS 140-35707/18-B	Lab Control Sample	Total/NA	Air	5050	35707
LCSD 140-35707/19-B	Lab Control Sample Dup	Total/NA	Air	5050	35707

Prep Batch: 35762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-8	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-9	Y-2972 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-10	Y-2973 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-11	Y-2974 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-12	Y-2975 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
MB 140-35705/14-B	Method Blank	Total/NA	Air	5050	35705
LCS 140-35705/15-B	Lab Control Sample	Total/NA	Air	5050	35705
LCSD 140-35705/16-B	Lab Control Sample Dup	Total/NA	Air	5050	35705
140-17461-8 MS	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706
140-17461-8 MSD	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35706

Analysis Batch: 36005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-1	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35761
140-17461-2	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35761
140-17461-3	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35761

HPLC/IC (Continued)

Analysis Batch: 36005 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-4	Y-2967 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35761
140-17461-5	Y-2968 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35761
140-17461-6	Y-2969 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35761
140-17461-7	Y-2970 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35761
MB 140-35707/17-B	Method Blank	Total/NA	Air	9056	35761
LCS 140-35707/18-B	Lab Control Sample	Total/NA	Air	9056	35761
LCSD 140-35707/19-B	Lab Control Sample Dup	Total/NA	Air	9056	35761

Analysis Batch: 36121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-8	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17461-9	Y-2972 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17461-10	Y-2973 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17461-11	Y-2974 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17461-12	Y-2975 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
MB 140-35705/14-B	Method Blank	Total/NA	Air	9056	35762
LCS 140-35705/15-B	Lab Control Sample	Total/NA	Air	9056	35762
LCSD 140-35705/16-B	Lab Control Sample Dup	Total/NA	Air	9056	35762
140-17461-8 MS	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17461-8 MSD	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762

Analysis Batch: 36210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-1	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-2	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-3	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-4	Y-2967 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-5	Y-2968 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-6	Y-2969 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-7	Y-2970 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-8	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-9	Y-2972 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-10	Y-2973 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-11	Y-2974 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-12	Y-2975 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
MB 140-35706/17-A	Method Blank	Total/NA	Air	9056	35706
LCS 140-35706/18-A	Lab Control Sample	Total/NA	Air	9056	35706
LCSD 140-35706/19-A	Lab Control Sample Dup	Total/NA	Air	9056	35706
140-17461-8 MS	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706
140-17461-8 MSD	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35706

General Chemistry

Analysis Batch: 36086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-1	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-2	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-3	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-4	Y-2967 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-5	Y-2968 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-6	Y-2969 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	

General Chemistry (Continued)

Analysis Batch: 36086 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17461-7	Y-2970 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-8	Y-2971 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-9	Y-2972 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-10	Y-2973 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-11	Y-2974 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-12	Y-2975 R2 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
LCS 140-36086/2	Lab Control Sample	Total/NA	Air	9041A	
140-17461-1 DU	Y-2964 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-2 DU	Y-2965 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17461-3 DU	Y-2966 R1 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	

Client Sample ID: Y-2964 R1 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17461-1

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		42.6	5.62	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1,1,3,3-Pentafluorobutane	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1,1-Trichloroethane	ND		42.6	6.13	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		85.2	16.9	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1,1-Trifluoroethane	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1,2,2-Tetrachloroethane	ND		42.6	8.18	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		85.2	4.77	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1,2-trichloro-1-fluoroethane	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1,2-Trichloroethane	ND		42.6	4.43	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1-Dichloro-1-fluoroethane	ND		85.2	42.6	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1-dichloro-2,2-difluoroethane	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1-dichloro-2,2-difluoroethene	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1-Dichloroethane	ND		42.6	5.11	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1-Dichloroethene	ND		42.6	6.30	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1-Dichloropropene	ND		42.6	4.60	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,1-Difluoroethene	ND		852	852	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2,2-trichloro-1,1-difluoroethane	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2,3-Trichlorobenzene	ND		42.6	13.6	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2,3-Trichloropropane	ND		42.6	10.6	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2,4-Trichlorobenzene	ND		42.6	14.3	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2,4-Trimethylbenzene	ND		42.6	8.86	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2-Dibromo-3-Chloropropane	ND		85.2	15.0	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2-Dibromoethane (EDB)	ND		42.6	5.62	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2-dichloro-1,1-difluoroethane	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2-Dichlorobenzene	ND		42.6	7.49	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2-Dichloroethane	ND		42.6	7.15	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,2-Dichloropropane	ND		42.6	4.26	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,3,5-Trimethylbenzene	ND		42.6	8.86	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,3-Dichlorobenzene	ND		42.6	7.32	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,3-Dichloropropane	ND		42.6	4.77	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1,4-Dichlorobenzene	ND		42.6	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
1-Chloro-1,1-difluoroethane	ND		85.2	8.69	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
2,2-Dichloropropane	ND		42.6	12.4	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
2-Butanone (MEK)	ND		170	27.3	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		85.2	12.6	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
2-Chloro-1,1,1-Trifluoroethane	ND		85.2	8.52	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
2-Chlorotoluene	ND		42.6	8.01	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
2-Hexanone	ND		170	39.2	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
2-MTP as HFPO	**820**		37.2	37.2	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
4-Chlorotoluene	ND		42.6	8.86	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
4-Isopropyltoluene	ND		42.6	11.4	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
4-Methyl-2-pentanone (MIBK)	ND		170	27.3	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Acetone	ND		170	101	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Benzene	ND		42.6	8.18	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Bromobenzene	ND		42.6	5.96	ug/Sample		11/29/19 10:48	12/06/19 20:54	1

Client Sample ID: Y-2964 R1 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17461-1

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	ND		42.6	9.54	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Bromodichloromethane	ND		42.6	7.32	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Bromoform	ND		42.6	12.9	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Bromomethane	ND		85.2	49.4	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Carbon disulfide	ND		42.6	10.6	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Carbon tetrachloride	ND		42.6	5.62	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Carbonyl Difluoride	ND		125	125	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Chlorobenzene	ND		42.6	6.13	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Chlorodibromomethane	ND		42.6	9.20	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Chloroethane	ND		85.2	18.7	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Chloroform	ND		42.6	4.94	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Chloromethane	ND		85.2	35.4	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
cis-1,2-Dichloroethene	ND		42.6	3.41	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
cis-1,3-Dichloropropene	ND		42.6	7.32	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Dibromomethane	ND		42.6	4.09	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Dichlorodifluoromethane	ND		85.2	15.0	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Ethylbenzene	ND		42.6	6.98	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**111**		42.6	42.6	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Hexachlorobutadiene	ND		42.6	11.2	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
HFPO dimer, methyl ester as HFPO-DA	ND		40.9	40.9	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Isopropylbenzene	ND		42.6	5.96	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
m,p-Xylene	ND		85.2	6.98	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Methylene Chloride	**68.7**		42.6	27.3	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Naphthalene	ND		42.6	20.4	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
n-Butylbenzene	ND		42.6	10.9	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
n-Propylbenzene	ND		42.6	9.20	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
o-Xylene	ND		42.6	4.43	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
sec-Butylbenzene	ND		42.6	8.35	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Styrene	ND		42.6	9.20	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
tert-Butylbenzene	ND		42.6	7.49	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Tetrachloroethene	ND		42.6	5.62	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Toluene	ND		42.6	7.84	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
trans-1,2-Dichloroethene	ND		42.6	4.43	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
trans-1,3-Dichloropropene	ND		42.6	15.0	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Trichloroethene	ND		42.6	3.07	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Trichlorofluoromethane	ND	*	85.2	8.18	ug/Sample		11/29/19 10:48	12/06/19 20:54	1
Vinyl chloride	ND		85.2	20.4	ug/Sample		11/29/19 10:48	12/06/19 20:54	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Butanoic acid, heptafluoro-, sodium salt	*437*	*T J N*	*ug/Sample*		*1.13*	*2218-54-4*	*11/29/19 10:48*	*12/06/19 20:54*	*1*
Unknown	*489*	*T J*	*ug/Sample*		*1.18*		*11/29/19 10:48*	*12/06/19 20:54*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:48*	*12/06/19 20:54*	*1*
4-Bromofluorobenzene (Surr)	*110*		*57 - 152*	*11/29/19 10:48*	*12/06/19 20:54*	*1*

Client Sample ID: Y-2964 R1 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17461-1

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:48*	*12/06/19 20:54*	*1*
Toluene-d8 (Surr)	*97*		*71 - 139*	*11/29/19 10:48*	*12/06/19 20:54*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	ND		9080	4540	ug/Sample		11/29/19 10:48	12/11/19 21:21	1
Hydrogen Fluoride	ND		3750	1700	ug/Sample		11/29/19 10:48	12/17/19 19:02	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.00	HF			SU			12/13/19 15:01	1

Client Sample ID: Y-2965 R1 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17461-2

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		46.1	6.08	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1,1,3,3-Pentafluorobutane	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1,1-Trichloroethane	ND		46.1	6.64	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		92.2	18.2	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1,1-Trifluoroethane	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1,2,2-Tetrachloroethane	ND		46.1	8.85	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		92.2	5.16	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1,2-trichloro-1-fluoroethane	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1,2-Trichloroethane	ND		46.1	4.79	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1-Dichloro-1-fluoroethane	ND		92.2	46.1	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1-dichloro-2,2-difluoroethane	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1-dichloro-2,2-difluoroethene	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1-Dichloroethane	ND		46.1	5.53	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1-Dichloroethene	ND		46.1	6.82	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1-Dichloropropene	ND		46.1	4.98	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,1-Difluoroethene	ND		922	922	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2,2-trichloro-1,1-difluoroethane	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2,3-Trichlorobenzene	ND		46.1	14.7	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2,3-Trichloropropane	ND		46.1	11.4	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2,4-Trichlorobenzene	ND		46.1	15.5	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2,4-Trimethylbenzene	ND		46.1	9.59	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2-Dibromo-3-Chloropropane	ND		92.2	16.2	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2-Dibromoethane (EDB)	ND		46.1	6.08	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2-dichloro-1,1-difluoroethane	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2-Dichlorobenzene	ND		46.1	8.11	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2-Dichloroethane	ND		46.1	7.74	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,2-Dichloropropane	ND		46.1	4.61	ug/Sample		11/29/19 10:48	12/06/19 21:19	1

Client Sample ID: Y-2965 R1 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17461-2

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	ND		46.1	9.59	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,3-Dichlorobenzene	ND		46.1	7.93	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,3-Dichloropropane	ND		46.1	5.16	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1,4-Dichlorobenzene	ND		46.1	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
1-Chloro-1,1-difluoroethane	ND		92.2	9.40	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
2,2-Dichloropropane	ND		46.1	13.5	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
2-Butanone (MEK)	ND		184	29.5	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		92.2	13.6	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
2-Chloro-1,1,1-Trifluoroethane	ND		92.2	9.22	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
2-Chlorotoluene	ND		46.1	8.66	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
2-Hexanone	ND		184	42.4	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
2-MTP as HFPO	**819**		40.3	40.3	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
4-Chlorotoluene	ND		46.1	9.59	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
4-Isopropyltoluene	ND		46.1	12.4	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
4-Methyl-2-pentanone (MIBK)	ND		184	29.5	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Acetone	ND		184	109	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Benzene	ND		46.1	8.85	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Bromobenzene	ND		46.1	6.45	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Bromochloromethane	ND		46.1	10.3	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Bromodichloromethane	ND		46.1	7.93	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Bromoform	ND		46.1	14.0	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Bromomethane	ND		92.2	53.5	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Carbon disulfide	ND		46.1	11.4	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Carbon tetrachloride	ND		46.1	6.08	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Carbonyl Difluoride	ND		135	135	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Chlorobenzene	ND		46.1	6.64	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Chlorodibromomethane	ND		46.1	9.95	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Chloroethane	ND		92.2	20.3	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Chloroform	ND		46.1	5.35	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Chloromethane	ND		92.2	38.3	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
cis-1,2-Dichloroethene	ND		46.1	3.69	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
cis-1,3-Dichloropropene	ND		46.1	7.93	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Dibromomethane	ND		46.1	4.42	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Dichlorodifluoromethane	ND		92.2	16.2	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Ethylbenzene	ND		46.1	7.56	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**161**		46.1	46.1	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Hexachlorobutadiene	ND		46.1	12.2	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
HFPO dimer, methyl ester as HFPO-DA	ND		44.2	44.2	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Isopropylbenzene	ND		46.1	6.45	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
m,p-Xylene	ND		92.2	7.56	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Methylene Chloride	**56.8**		46.1	29.5	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Naphthalene	ND		46.1	22.1	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
n-Butylbenzene	ND		46.1	11.8	ug/Sample		11/29/19 10:48	12/06/19 21:19	1

Client Sample ID: Y-2965 R1 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17461-2

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
n-Propylbenzene	ND		46.1	9.95	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
o-Xylene	ND		46.1	4.79	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
sec-Butylbenzene	ND		46.1	9.03	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Styrene	ND		46.1	9.95	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
tert-Butylbenzene	ND		46.1	8.11	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Tetrachloroethene	ND		46.1	6.08	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Toluene	ND		46.1	8.48	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
trans-1,2-Dichloroethene	ND		46.1	4.79	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
trans-1,3-Dichloropropene	ND		46.1	16.2	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Trichloroethene	ND		46.1	3.32	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Trichlorofluoromethane	ND	*	92.2	8.85	ug/Sample		11/29/19 10:48	12/06/19 21:19	1
Vinyl chloride	ND		92.2	22.1	ug/Sample		11/29/19 10:48	12/06/19 21:19	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*561*	*T J*	*ug/Sample*		*1.13*		*11/29/19 10:48*	*12/06/19 21:19*	*1*
Unknown	*1150*	*T J*	*ug/Sample*		*1.18*		*11/29/19 10:48*	*12/06/19 21:19*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:48*	*12/06/19 21:19*	*1*
4-Bromofluorobenzene (Surr)	*111*		*57 - 152*	*11/29/19 10:48*	*12/06/19 21:19*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:48*	*12/06/19 21:19*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:48*	*12/06/19 21:19*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**27900**		9830	4920	ug/Sample		11/29/19 10:48	12/11/19 21:42	1
Hydrogen Fluoride	ND		4060	1840	ug/Sample		11/29/19 10:48	12/17/19 20:06	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2966 R1 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17461-3

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		8.58	1.13	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1,1,3,3-Pentafluorobutane	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1,1-Trichloroethane	ND		8.58	1.24	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		17.2	3.40	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1,1-Trifluoroethane	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1,2,2-Tetrachloroethane	ND		8.58	1.65	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		17.2	0.961	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1,2-trichloro-1-fluoroethane	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1

Client Sample ID: Y-2966 R1 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17461-3

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloroethane	ND		8.58	0.892	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1-Dichloro-1-fluoroethane	ND		17.2	8.58	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1-dichloro-2,2-difluoroethane	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1-dichloro-2,2-difluoroethene	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1-Dichloroethane	ND		8.58	1.03	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1-Dichloroethene	ND		8.58	1.27	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1-Dichloropropene	ND		8.58	0.926	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,1-Difluoroethene	ND		172	172	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2,2-trichloro-1,1-difluoroethane	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2,3-Trichlorobenzene	ND		8.58	2.74	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2,3-Trichloropropane	ND		8.58	2.13	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2,4-Trichlorobenzene	ND		8.58	2.88	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2,4-Trimethylbenzene	ND		8.58	1.78	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2-Dibromo-3-Chloropropane	ND		17.2	3.02	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2-Dibromoethane (EDB)	ND		8.58	1.13	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2-dichloro-1,1-difluoroethane	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2-Dichlorobenzene	ND		8.58	1.51	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2-Dichloroethane	ND		8.58	1.44	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,2-Dichloropropane	ND		8.58	0.858	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,3,5-Trimethylbenzene	ND		8.58	1.78	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,3-Dichlorobenzene	ND		8.58	1.48	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,3-Dichloropropane	ND		8.58	0.961	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1,4-Dichlorobenzene	ND		8.58	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
1-Chloro-1,1-difluoroethane	ND		17.2	1.75	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
2,2-Dichloropropane	ND		8.58	2.50	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
2-Butanone (MEK)	ND		34.3	5.49	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		17.2	2.54	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
2-Chloro-1,1,1-Trifluoroethane	ND		17.2	1.72	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
2-Chlorotoluene	ND		8.58	1.61	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
2-Hexanone	ND		34.3	7.89	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
2-MTP as HFPO	**60.4**		7.49	7.49	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
4-Chlorotoluene	ND		8.58	1.78	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
4-Isopropyltoluene	ND		8.58	2.30	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
4-Methyl-2-pentanone (MIBK)	ND		34.3	5.49	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Acetone	ND		34.3	20.2	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Benzene	ND		8.58	1.65	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Bromobenzene	ND		8.58	1.20	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Bromochloromethane	ND		8.58	1.92	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Bromodichloromethane	ND		8.58	1.48	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Bromoform	ND		8.58	2.61	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Bromomethane	ND		17.2	9.95	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Carbon disulfide	ND		8.58	2.13	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Carbon tetrachloride	ND		8.58	1.13	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Carbonyl Difluoride	ND		25.1	25.1	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Chlorobenzene	ND		8.58	1.24	ug/Sample		11/29/19 10:48	12/06/19 21:43	1

Client Sample ID: Y-2966 R1 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17461-3

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorodibromomethane	ND		8.58	1.85	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Chloroethane	ND		17.2	3.77	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Chloroform	ND		8.58	0.995	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Chloromethane	ND		17.2	7.14	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
cis-1,2-Dichloroethene	ND		8.58	0.686	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
cis-1,3-Dichloropropene	ND		8.58	1.48	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Dibromomethane	ND		8.58	0.823	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Dichlorodifluoromethane	ND		17.2	3.02	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Ethylbenzene	ND		8.58	1.41	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		8.58	8.58	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Hexachlorobutadiene	ND		8.58	2.26	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
HFPO dimer, methyl ester as HFPO-DA	ND		8.23	8.23	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Isopropylbenzene	ND		8.58	1.20	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
m,p-Xylene	ND		17.2	1.41	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Methylene Chloride	ND		8.58	5.49	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Naphthalene	ND		8.58	4.12	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
n-Butylbenzene	ND		8.58	2.20	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
n-Propylbenzene	ND		8.58	1.85	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
o-Xylene	ND		8.58	0.892	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
sec-Butylbenzene	ND		8.58	1.68	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Styrene	ND		8.58	1.85	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
tert-Butylbenzene	ND		8.58	1.51	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Tetrachloroethene	ND		8.58	1.13	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Toluene	ND		8.58	1.58	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
trans-1,2-Dichloroethene	ND		8.58	0.892	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
trans-1,3-Dichloropropene	ND		8.58	3.02	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Trichloroethene	ND		8.58	0.618	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Trichlorofluoromethane	ND	*	17.2	1.65	ug/Sample		11/29/19 10:48	12/06/19 21:43	1
Vinyl chloride	ND		17.2	4.12	ug/Sample		11/29/19 10:48	12/06/19 21:43	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*20.1*	*T J*	*ug/Sample*		*1.13*		*11/29/19 10:48*	*12/06/19 21:43*	*1*
Unknown	*9.96*	*T J*	*ug/Sample*		*1.18*		*11/29/19 10:48*	*12/06/19 21:43*	*1*
Cyclohexane	*24.8*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:48*	*12/06/19 21:43*	*1*
1-Dodecene	*10.5*	*T J N*	*ug/Sample*		*12.07*	*112-41-4*	*11/29/19 10:48*	*12/06/19 21:43*	*1*
Cyclohexane, hexyl-	*12.9*	*T J N*	*ug/Sample*		*12.69*	*4292-75-5*	*11/29/19 10:48*	*12/06/19 21:43*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:48*	*12/06/19 21:43*	*1*
4-Bromofluorobenzene (Surr)	*111*		*57 - 152*	*11/29/19 10:48*	*12/06/19 21:43*	*1*
Dibromofluoromethane (Surr)	*102*		*62 - 134*	*11/29/19 10:48*	*12/06/19 21:43*	*1*
Toluene-d8 (Surr)	*97*		*71 - 139*	*11/29/19 10:48*	*12/06/19 21:43*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**9710**		1830	915	ug/Sample		11/29/19 10:48	12/11/19 22:03	1

Client Sample ID: Y-2966 R1 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17461-3

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 9056 - Anions, Ion Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hydrogen Fluoride	ND		755	343	ug/Sample		11/29/19 10:48	12/17/19 20:29	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.00	HF			SU			12/13/19 15:01	1

Client Sample ID: Y-2967 R1 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17461-4

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		26.4	3.49	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1,1,3,3-Pentafluorobutane	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1,1-Trichloroethane	ND		26.4	3.81	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		52.9	10.5	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1,1-Trifluoroethane	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1,2,2-Tetrachloroethane	ND		26.4	5.08	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		52.9	2.96	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1,2-trichloro-1-fluoroethane	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1,2-Trichloroethane	ND		26.4	2.75	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1-Dichloro-1-fluoroethane	ND		52.9	26.4	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1-dichloro-2,2-difluoroethane	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1-dichloro-2,2-difluoroethene	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1-Dichloroethane	ND		26.4	3.17	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1-Dichloroethene	ND		26.4	3.91	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1-Dichloropropene	ND		26.4	2.86	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,1-Difluoroethene	ND		529	529	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2,2-trichloro-1,1-difluoroethane	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2,3-Trichlorobenzene	ND		26.4	8.46	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2,3-Trichloropropane	ND		26.4	6.56	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2,4-Trichlorobenzene	ND		26.4	8.89	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2,4-Trimethylbenzene	ND		26.4	5.50	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2-Dibromo-3-Chloropropane	ND		52.9	9.31	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2-Dibromoethane (EDB)	ND		26.4	3.49	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2-dichloro-1,1-difluoroethane	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2-Dichlorobenzene	ND		26.4	4.65	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2-Dichloroethane	ND		26.4	4.44	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,2-Dichloropropane	ND		26.4	2.64	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,3,5-Trimethylbenzene	ND		26.4	5.50	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,3-Dichlorobenzene	ND		26.4	4.55	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,3-Dichloropropane	ND		26.4	2.96	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1,4-Dichlorobenzene	ND		26.4	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
1-Chloro-1,1-difluoroethane	ND		52.9	5.39	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1

Client Sample ID: Y-2967 R1 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17461-4

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,2-Dichloropropane	ND		26.4	7.72	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
2-Butanone (MEK)	ND		106	16.9	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		52.9	7.83	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
2-Chloro-1,1,1-Trifluoroethane	ND		52.9	5.29	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
2-Chlorotoluene	ND		26.4	4.97	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
2-Hexanone	ND		106	24.3	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
2-MTP as HFPO	**636**		23.1	23.1	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
4-Chlorotoluene	ND		26.4	5.50	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
4-Isopropyltoluene	ND		26.4	7.09	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
4-Methyl-2-pentanone (MIBK)	ND		106	16.9	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Acetone	ND		106	62.4	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Benzene	ND		26.4	5.08	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Bromobenzene	ND		26.4	3.70	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Bromochloromethane	ND		26.4	5.92	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Bromodichloromethane	ND		26.4	4.55	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Bromoform	ND		26.4	8.04	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Bromomethane	ND		52.9	30.7	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Carbon disulfide	ND		26.4	6.56	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Carbon tetrachloride	ND		26.4	3.49	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Carbonyl Difluoride	ND		77.7	77.7	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Chlorobenzene	ND		26.4	3.81	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Chlorodibromomethane	ND		26.4	5.71	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Chloroethane	ND		52.9	11.6	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Chloroform	ND		26.4	3.07	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Chloromethane	ND		52.9	22.0	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
cis-1,2-Dichloroethene	ND		26.4	2.12	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
cis-1,3-Dichloropropene	ND		26.4	4.55	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Dibromomethane	ND		26.4	2.54	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Dichlorodifluoromethane	ND		52.9	9.31	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Ethylbenzene	ND		26.4	4.34	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		26.4	26.4	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Hexachlorobutadiene	ND		26.4	6.98	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
HFPO dimer, methyl ester as HFPO-DA	ND		25.3	25.3	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Isopropylbenzene	ND		26.4	3.70	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
m,p-Xylene	ND		52.9	4.34	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Methylene Chloride	ND		26.4	16.9	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Naphthalene	ND		26.4	12.7	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
n-Butylbenzene	ND		26.4	6.77	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
n-Propylbenzene	ND		26.4	5.71	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
o-Xylene	ND		26.4	2.75	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
sec-Butylbenzene	ND		26.4	5.18	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Styrene	ND		26.4	5.71	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
tert-Butylbenzene	ND		26.4	4.65	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Tetrachloroethene	ND		26.4	3.49	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Toluene	ND		26.4	4.87	ug/Sample		11/29/19 10:48	12/06/19 22:08	1

Client Sample ID: Y-2967 R1 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17461-4

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,2-Dichloroethene	ND		26.4	2.75	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
trans-1,3-Dichloropropene	ND		26.4	9.31	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Trichloroethene	ND		26.4	1.90	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Trichlorofluoromethane	ND	*	52.9	5.08	ug/Sample		11/29/19 10:48	12/06/19 22:08	1
Vinyl chloride	ND		52.9	12.7	ug/Sample		11/29/19 10:48	12/06/19 22:08	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*365*	*T J*	*ug/Sample*		*1.13*		*11/29/19 10:48*	*12/06/19 22:08*	*1*
Unknown	*452*	*T J*	*ug/Sample*		*1.18*		*11/29/19 10:48*	*12/06/19 22:08*	*1*
Cyclohexane	*41.9*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:48*	*12/06/19 22:08*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*70 - 160*	*11/29/19 10:48*	*12/06/19 22:08*	*1*
4-Bromofluorobenzene (Surr)	*110*		*57 - 152*	*11/29/19 10:48*	*12/06/19 22:08*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:48*	*12/06/19 22:08*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:48*	*12/06/19 22:08*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**22000**		5640	2820	ug/Sample		11/29/19 10:48	12/12/19 15:10	1
Hydrogen Fluoride	ND		2330	1060	ug/Sample		11/29/19 10:48	12/17/19 20:51	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2968 R1 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17461-5

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		24.1	3.18	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1,1,3,3-Pentafluorobutane	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1,1-Trichloroethane	ND		24.1	3.47	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		48.2	9.54	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1,1-Trifluoroethane	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1,2,2-Tetrachloroethane	ND		24.1	4.62	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		48.2	2.70	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1,2-trichloro-1-fluoroethane	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1,2-Trichloroethane	ND		24.1	2.50	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1-Dichloro-1-fluoroethane	ND		48.2	24.1	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1-dichloro-2,2-difluoroethane	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1-dichloro-2,2-difluoroethene	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1-Dichloroethane	ND		24.1	2.89	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1-Dichloroethene	ND		24.1	3.56	ug/Sample		11/29/19 10:48	12/06/19 22:32	1

Client Sample ID: Y-2968 R1 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17461-5

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloropropene	ND		24.1	2.60	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,1-Difluoroethene	ND		482	482	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2,2-trichloro-1,1-difluoroethane	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2,3-Trichlorobenzene	ND		24.1	7.71	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2,3-Trichloropropane	ND		24.1	5.97	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2,4-Trichlorobenzene	ND		24.1	8.09	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2,4-Trimethylbenzene	ND		24.1	5.01	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2-Dibromo-3-Chloropropane	ND		48.2	8.48	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2-Dibromoethane (EDB)	ND		24.1	3.18	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2-dichloro-1,1-difluoroethane	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2-Dichlorobenzene	ND		24.1	4.24	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2-Dichloroethane	ND		24.1	4.05	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,2-Dichloropropane	ND		24.1	2.41	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,3,5-Trimethylbenzene	ND		24.1	5.01	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,3-Dichlorobenzene	ND		24.1	4.14	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,3-Dichloropropane	ND		24.1	2.70	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1,4-Dichlorobenzene	ND		24.1	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
1-Chloro-1,1-difluoroethane	ND		48.2	4.91	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
2,2-Dichloropropane	ND		24.1	7.03	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
2-Butanone (MEK)	ND		96.3	15.4	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		48.2	7.13	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
2-Chloro-1,1,1-Trifluoroethane	ND		48.2	4.82	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
2-Chlorotoluene	ND		24.1	4.53	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
2-Hexanone	ND		96.3	22.2	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
2-MTP as HFPO	**490**		21.0	21.0	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
4-Chlorotoluene	ND		24.1	5.01	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
4-Isopropyltoluene	ND		24.1	6.45	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
4-Methyl-2-pentanone (MIBK)	ND		96.3	15.4	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Acetone	ND		96.3	56.8	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Benzene	ND		24.1	4.62	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Bromobenzene	ND		24.1	3.37	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Bromochloromethane	ND		24.1	5.40	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Bromodichloromethane	ND		24.1	4.14	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Bromoform	ND		24.1	7.32	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Bromomethane	ND		48.2	27.9	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Carbon disulfide	ND		24.1	5.97	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Carbon tetrachloride	ND		24.1	3.18	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Carbonyl Difluoride	ND		70.6	70.6	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Chlorobenzene	ND		24.1	3.47	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Chlorodibromomethane	ND		24.1	5.20	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Chloroethane	ND		48.2	10.6	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Chloroform	ND		24.1	2.79	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Chloromethane	ND		48.2	20.0	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
cis-1,2-Dichloroethene	ND		24.1	1.93	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
cis-1,3-Dichloropropene	ND		24.1	4.14	ug/Sample		11/29/19 10:48	12/06/19 22:32	1

Client Sample ID: Y-2968 R1 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17461-5

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibromomethane	ND		24.1	2.31	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Dichlorodifluoromethane	ND		48.2	8.48	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Ethylbenzene	ND		24.1	3.95	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		24.1	24.1	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Hexachlorobutadiene	ND		24.1	6.36	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
HFPO dimer, methyl ester as HFPO-DA	ND		23.1	23.1	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Isopropylbenzene	ND		24.1	3.37	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
m,p-Xylene	ND		48.2	3.95	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Methylene Chloride	ND		24.1	15.4	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Naphthalene	ND		24.1	11.6	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
n-Butylbenzene	ND		24.1	6.17	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
n-Propylbenzene	ND		24.1	5.20	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
o-Xylene	ND		24.1	2.50	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
sec-Butylbenzene	ND		24.1	4.72	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Styrene	ND		24.1	5.20	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
tert-Butylbenzene	ND		24.1	4.24	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Tetrachloroethene	ND		24.1	3.18	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Toluene	ND		24.1	4.43	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
trans-1,2-Dichloroethene	ND		24.1	2.50	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
trans-1,3-Dichloropropene	ND		24.1	8.48	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Trichloroethene	ND		24.1	1.73	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Trichlorofluoromethane	ND	*	48.2	4.62	ug/Sample		11/29/19 10:48	12/06/19 22:32	1
Vinyl chloride	ND		48.2	11.6	ug/Sample		11/29/19 10:48	12/06/19 22:32	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*223*	*T J*	*ug/Sample*		*1.13*		*11/29/19 10:48*	*12/06/19 22:32*	*1*
Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(trifluoroethenyl)oxy]	*104*	*T J N*	*ug/Sample*		*1.18*	*1623-05-8*	*11/29/19 10:48*	*12/06/19 22:32*	*1*
Cyclohexane	*41.0*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:48*	*12/06/19 22:32*	*1*
Unknown	*30.9*	*T J*	*ug/Sample*		*13.17*		*11/29/19 10:48*	*12/06/19 22:32*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*70 - 160*	*11/29/19 10:48*	*12/06/19 22:32*	*1*
4-Bromofluorobenzene (Surr)	*109*		*57 - 152*	*11/29/19 10:48*	*12/06/19 22:32*	*1*
Dibromofluoromethane (Surr)	*106*		*62 - 134*	*11/29/19 10:48*	*12/06/19 22:32*	*1*
Toluene-d8 (Surr)	*95*		*71 - 139*	*11/29/19 10:48*	*12/06/19 22:32*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**4360**	**J**	5140	2570	ug/Sample		11/29/19 10:48	12/11/19 23:30	1
Hydrogen Fluoride	ND		2120	963	ug/Sample		11/29/19 10:48	12/17/19 21:14	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2969 R1 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17461-6

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		31.3	4.13	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1,1,3,3-Pentafluorobutane	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1,1-Trichloroethane	ND		31.3	4.51	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		62.7	12.4	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1,1-Trifluoroethane	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1,2,2-Tetrachloroethane	ND		31.3	6.01	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		62.7	3.51	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1,2-trichloro-1-fluoroethane	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1,2-Trichloroethane	ND		31.3	3.26	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1-Dichloro-1-fluoroethane	ND		62.7	31.3	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1-dichloro-2,2-difluoroethane	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1-dichloro-2,2-difluoroethene	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1-Dichloroethane	ND		31.3	3.76	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1-Dichloroethene	ND		31.3	4.64	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1-Dichloropropene	ND		31.3	3.38	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,1-Difluoroethene	ND		627	627	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2,2-trichloro-1,1-difluoroethane	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2,3-Trichlorobenzene	ND		31.3	10.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2,3-Trichloropropane	ND		31.3	7.77	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2,4-Trichlorobenzene	ND		31.3	10.5	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2,4-Trimethylbenzene	ND		31.3	6.52	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2-Dibromo-3-Chloropropane	ND		62.7	11.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2-Dibromoethane (EDB)	ND		31.3	4.13	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2-dichloro-1,1-difluoroethane	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2-Dichlorobenzene	ND		31.3	5.51	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2-Dichloroethane	ND		31.3	5.26	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,2-Dichloropropane	ND		31.3	3.13	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,3,5-Trimethylbenzene	ND		31.3	6.52	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,3-Dichlorobenzene	ND		31.3	5.39	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,3-Dichloropropane	ND		31.3	3.51	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1,4-Dichlorobenzene	ND		31.3	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
1-Chloro-1,1-difluoroethane	ND		62.7	6.39	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
2,2-Dichloropropane	ND		31.3	9.15	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
2-Butanone (MEK)	ND		125	20.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		62.7	9.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
2-Chloro-1,1,1-Trifluoroethane	ND		62.7	6.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
2-Chlorotoluene	ND		31.3	5.89	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
2-Hexanone	ND		125	28.8	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
2-MTP as HFPO	**672**		27.3	27.3	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
4-Chlorotoluene	ND		31.3	6.52	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
4-Isopropyltoluene	ND		31.3	8.40	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
4-Methyl-2-pentanone (MIBK)	ND		125	20.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Acetone	ND		125	73.9	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Benzene	ND		31.3	6.01	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Bromobenzene	ND		31.3	4.39	ug/Sample		11/29/19 10:48	12/06/19 22:57	1

Client Sample ID: Y-2969 R1 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17461-6

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	ND		31.3	7.02	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Bromodichloromethane	ND		31.3	5.39	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Bromoform	ND		31.3	9.52	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Bromomethane	ND		62.7	36.3	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Carbon disulfide	ND		31.3	7.77	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Carbon tetrachloride	ND		31.3	4.13	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Carbonyl Difluoride	ND		91.6	91.6	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Chlorobenzene	ND		31.3	4.51	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Chlorodibromomethane	ND		31.3	6.77	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Chloroethane	ND		62.7	13.8	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Chloroform	ND		31.3	3.63	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Chloromethane	ND		62.7	26.1	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
cis-1,2-Dichloroethene	ND		31.3	2.51	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
cis-1,3-Dichloropropene	ND		31.3	5.39	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Dibromomethane	ND		31.3	3.01	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Dichlorodifluoromethane	ND		62.7	11.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Ethylbenzene	ND		31.3	5.14	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		31.3	31.3	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Hexachlorobutadiene	ND		31.3	8.27	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
HFPO dimer, methyl ester as HFPO-DA	ND		30.0	30.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Isopropylbenzene	ND		31.3	4.39	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
m,p-Xylene	ND		62.7	5.14	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Methylene Chloride	ND		31.3	20.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Naphthalene	ND		31.3	15.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
n-Butylbenzene	ND		31.3	8.02	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
n-Propylbenzene	ND		31.3	6.77	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
o-Xylene	ND		31.3	3.26	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
sec-Butylbenzene	ND		31.3	6.14	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Styrene	ND		31.3	6.77	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
tert-Butylbenzene	ND		31.3	5.51	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Tetrachloroethene	ND		31.3	4.13	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Toluene	ND		31.3	5.76	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
trans-1,2-Dichloroethene	ND		31.3	3.26	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
trans-1,3-Dichloropropene	ND		31.3	11.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Trichloroethene	ND		31.3	2.26	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Trichlorofluoromethane	ND	*	62.7	6.01	ug/Sample		11/29/19 10:48	12/06/19 22:57	1
Vinyl chloride	ND		62.7	15.0	ug/Sample		11/29/19 10:48	12/06/19 22:57	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*273*	*T J*	*ug/Sample*		*1.13*		*11/29/19 10:48*	*12/06/19 22:57*	*1*
Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(trifluoroethenyl)oxy]	*160*	*T J N*	*ug/Sample*		*1.18*	*1623-05-8*	*11/29/19 10:48*	*12/06/19 22:57*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*70 - 160*	*11/29/19 10:48*	*12/06/19 22:57*	*1*
4-Bromofluorobenzene (Surr)	*108*		*57 - 152*	*11/29/19 10:48*	*12/06/19 22:57*	*1*

Client Sample ID: Y-2969 R1 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17461-6

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*105*		*62 - 134*	*11/29/19 10:48*	*12/06/19 22:57*	*1*
Toluene-d8 (Surr)	*97*		*71 - 139*	*11/29/19 10:48*	*12/06/19 22:57*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**3970**	**J**	6680	3340	ug/Sample		11/29/19 10:48	12/11/19 23:50	1
Hydrogen Fluoride	ND		2760	1250	ug/Sample		11/29/19 10:48	12/17/19 21:37	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2970 R2 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17461-7

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		30.2	3.99	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1,1,3,3-Pentafluorobutane	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1,1-Trichloroethane	ND		30.2	4.35	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		60.4	12.0	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1,1-Trifluoroethane	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1,2,2-Tetrachloroethane	ND		30.2	5.80	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		60.4	3.38	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1,2-trichloro-1-fluoroethane	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1,2-Trichloroethane	ND		30.2	3.14	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1-Dichloro-1-fluoroethane	ND		60.4	30.2	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1-dichloro-2,2-difluoroethane	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1-dichloro-2,2-difluoroethene	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1-Dichloroethane	ND		30.2	3.62	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1-Dichloroethene	ND		30.2	4.47	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1-Dichloropropene	ND		30.2	3.26	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,1-Difluoroethene	ND		604	604	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2,2-trichloro-1,1-difluoroethane	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2,3-Trichlorobenzene	ND		30.2	9.67	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2,3-Trichloropropane	ND		30.2	7.49	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2,4-Trichlorobenzene	ND		30.2	10.1	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2,4-Trimethylbenzene	ND		30.2	6.28	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2-Dibromo-3-Chloropropane	ND		60.4	10.6	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2-Dibromoethane (EDB)	ND		30.2	3.99	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2-dichloro-1,1-difluoroethane	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2-Dichlorobenzene	ND		30.2	5.32	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2-Dichloroethane	ND		30.2	5.07	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,2-Dichloropropane	ND		30.2	3.02	ug/Sample		11/29/19 10:48	12/06/19 23:21	1

Client Sample ID: Y-2970 R2 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17461-7

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	ND		30.2	6.28	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,3-Dichlorobenzene	ND		30.2	5.20	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,3-Dichloropropane	ND		30.2	3.38	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1,4-Dichlorobenzene	ND		30.2	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
1-Chloro-1,1-difluoroethane	ND		60.4	6.16	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
2,2-Dichloropropane	ND		30.2	8.82	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
2-Butanone (MEK)	ND		121	19.3	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		60.4	8.94	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
2-Chloro-1,1,1-Trifluoroethane	ND		60.4	6.04	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
2-Chlorotoluene	ND		30.2	5.68	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
2-Hexanone	ND		121	27.8	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
2-MTP as HFPO	**467**		26.4	26.4	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
4-Chlorotoluene	ND		30.2	6.28	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
4-Isopropyltoluene	ND		30.2	8.09	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
4-Methyl-2-pentanone (MIBK)	ND		121	19.3	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Acetone	ND		121	71.3	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Benzene	ND		30.2	5.80	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Bromobenzene	ND		30.2	4.23	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Bromochloromethane	ND		30.2	6.77	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Bromodichloromethane	ND		30.2	5.20	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Bromoform	ND		30.2	9.18	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Bromomethane	ND		60.4	35.0	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Carbon disulfide	ND		30.2	7.49	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Carbon tetrachloride	ND		30.2	3.99	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Carbonyl Difluoride	ND		88.7	88.7	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Chlorobenzene	ND		30.2	4.35	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Chlorodibromomethane	ND		30.2	6.52	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Chloroethane	ND		60.4	13.3	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Chloroform	ND		30.2	3.50	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Chloromethane	ND		60.4	25.1	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
cis-1,2-Dichloroethene	ND		30.2	2.42	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
cis-1,3-Dichloropropene	ND		30.2	5.20	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Dibromomethane	ND		30.2	2.90	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Dichlorodifluoromethane	ND		60.4	10.6	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Ethylbenzene	ND		30.2	4.95	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**550**		30.2	30.2	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Hexachlorobutadiene	ND		30.2	7.97	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
HFPO dimer, methyl ester as HFPO-DA	ND		29.0	29.0	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Isopropylbenzene	ND		30.2	4.23	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
m,p-Xylene	ND		60.4	4.95	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Methylene Chloride	**116**		30.2	19.3	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Naphthalene	ND		30.2	14.5	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
n-Butylbenzene	ND		30.2	7.73	ug/Sample		11/29/19 10:48	12/06/19 23:21	1

Client Sample ID: Y-2970 R2 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17461-7

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
n-Propylbenzene	ND		30.2	6.52	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
o-Xylene	ND		30.2	3.14	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
sec-Butylbenzene	ND		30.2	5.92	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Styrene	ND		30.2	6.52	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
tert-Butylbenzene	ND		30.2	5.32	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Tetrachloroethene	ND		30.2	3.99	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Toluene	ND		30.2	5.56	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
trans-1,2-Dichloroethene	ND		30.2	3.14	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
trans-1,3-Dichloropropene	ND		30.2	10.6	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Trichloroethene	ND		30.2	2.17	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Trichlorofluoromethane	ND	*	60.4	5.80	ug/Sample		11/29/19 10:48	12/06/19 23:21	1
Vinyl chloride	ND		60.4	14.5	ug/Sample		11/29/19 10:48	12/06/19 23:21	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*275*	*T J*	*ug/Sample*		*1.13*		*11/29/19 10:48*	*12/06/19 23:21*	*1*
Unknown	*2960*	*T J*	*ug/Sample*		*1.18*		*11/29/19 10:48*	*12/06/19 23:21*	*1*
Unknown	*57.2*	*T J*	*ug/Sample*		*1.22*		*11/29/19 10:48*	*12/06/19 23:21*	*1*
Unknown	*229*	*T J*	*ug/Sample*		*2.12*		*11/29/19 10:48*	*12/06/19 23:21*	*1*
Unknown	*104*	*T J*	*ug/Sample*		*2.50*		*11/29/19 10:48*	*12/06/19 23:21*	*1*
Cyclohexane	*36.3*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:48*	*12/06/19 23:21*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*70 - 160*	*11/29/19 10:48*	*12/06/19 23:21*	*1*
4-Bromofluorobenzene (Surr)	*109*		*57 - 152*	*11/29/19 10:48*	*12/06/19 23:21*	*1*
Dibromofluoromethane (Surr)	*105*		*62 - 134*	*11/29/19 10:48*	*12/06/19 23:21*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:48*	*12/06/19 23:21*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**6490**		6440	3220	ug/Sample		11/29/19 10:48	12/12/19 00:11	1
Hydrogen Fluoride	ND		2660	1210	ug/Sample		11/29/19 10:48	12/18/19 09:46	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2971 R2 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17461-8

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		29.6	3.90	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1,1,3,3-Pentafluorobutane	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1,1-Trichloroethane	ND		29.6	4.26	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		59.1	11.7	ug/Sample		11/29/19 10:48	12/06/19 23:46	1

Client Sample ID: Y-2971 R2 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17461-8

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1,2,2-Tetrachloroethane	ND		29.6	5.67	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		59.1	3.31	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1,2-trichloro-1-fluoroethane	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1,2-Trichloroethane	ND		29.6	3.07	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1-Dichloro-1-fluoroethane	ND		59.1	29.6	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1-dichloro-2,2-difluoroethane	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1-dichloro-2,2-difluoroethene	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1-Dichloroethane	ND		29.6	3.55	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1-Dichloroethene	ND		29.6	4.37	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1-Dichloropropene	ND		29.6	3.19	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,1-Difluoroethene	ND		591	591	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2,2-trichloro-1,1-difluoroethane	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2,3-Trichlorobenzene	ND		29.6	9.46	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2,3-Trichloropropane	ND		29.6	7.33	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2,4-Trichlorobenzene	ND		29.6	9.93	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2,4-Trimethylbenzene	ND		29.6	6.15	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2-Dibromo-3-Chloropropane	ND		59.1	10.4	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2-Dibromoethane (EDB)	ND		29.6	3.90	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2-dichloro-1,1-difluoroethane	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2-Dichlorobenzene	ND		29.6	5.20	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2-Dichloroethane	ND		29.6	4.96	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,2-Dichloropropane	ND		29.6	2.96	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,3,5-Trimethylbenzene	ND		29.6	6.15	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,3-Dichlorobenzene	ND		29.6	5.08	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,3-Dichloropropane	ND		29.6	3.31	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1,4-Dichlorobenzene	ND		29.6	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
1-Chloro-1,1-difluoroethane	ND		59.1	6.03	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
2,2-Dichloropropane	ND		29.6	8.63	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
2-Butanone (MEK)	ND		118	18.9	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		59.1	8.75	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
2-Chloro-1,1,1-Trifluoroethane	ND		59.1	5.91	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
2-Chlorotoluene	ND		29.6	5.56	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
2-Hexanone	ND		118	27.2	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
2-MTP as HFPO	**610**		25.9	25.9	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
4-Chlorotoluene	ND		29.6	6.15	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
4-Isopropyltoluene	ND		29.6	7.92	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
4-Methyl-2-pentanone (MIBK)	ND		118	18.9	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Acetone	ND		118	69.7	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Benzene	ND		29.6	5.67	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Bromobenzene	ND		29.6	4.14	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Bromochloromethane	ND		29.6	6.62	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Bromodichloromethane	ND		29.6	5.08	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Bromoform	ND		29.6	8.98	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Bromomethane	ND		59.1	34.3	ug/Sample		11/29/19 10:48	12/06/19 23:46	1

Client Sample ID: Y-2971 R2 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17461-8

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon disulfide	ND		29.6	7.33	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Carbon tetrachloride	ND		29.6	3.90	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Carbonyl Difluoride	ND		86.5	86.5	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Chlorobenzene	ND		29.6	4.26	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Chlorodibromomethane	ND		29.6	6.38	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Chloroethane	ND		59.1	13.0	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Chloroform	ND		29.6	3.43	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Chloromethane	ND		59.1	24.6	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
cis-1,2-Dichloroethene	ND		29.6	2.36	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
cis-1,3-Dichloropropene	ND		29.6	5.08	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Dibromomethane	ND		29.6	2.84	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Dichlorodifluoromethane	ND		59.1	10.4	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Ethylbenzene	ND		29.6	4.85	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**193**		29.6	29.6	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Hexachlorobutadiene	ND		29.6	7.80	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
HFPO dimer, methyl ester as HFPO-DA	ND		28.4	28.4	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Isopropylbenzene	ND		29.6	4.14	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
m,p-Xylene	ND		59.1	4.85	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Methylene Chloride	ND		29.6	18.9	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Naphthalene	ND		29.6	14.2	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
n-Butylbenzene	ND		29.6	7.57	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
n-Propylbenzene	ND		29.6	6.38	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
o-Xylene	ND		29.6	3.07	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
sec-Butylbenzene	ND		29.6	5.79	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Styrene	ND		29.6	6.38	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
tert-Butylbenzene	ND		29.6	5.20	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Tetrachloroethene	ND		29.6	3.90	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Toluene	ND		29.6	5.44	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
trans-1,2-Dichloroethene	ND		29.6	3.07	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
trans-1,3-Dichloropropene	ND		29.6	10.4	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Trichloroethene	ND		29.6	2.13	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Trichlorofluoromethane	ND	*	59.1	5.67	ug/Sample		11/29/19 10:48	12/06/19 23:46	1
Vinyl chloride	ND		59.1	14.2	ug/Sample		11/29/19 10:48	12/06/19 23:46	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*341*	*T J*	*ug/Sample*		*1.13*		*11/29/19 10:48*	*12/06/19 23:46*	*1*
Unknown	*2160*	*T J*	*ug/Sample*		*1.19*		*11/29/19 10:48*	*12/06/19 23:46*	*1*
Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(trifluoroethenyl)oxy]	*49.7*	*T J N*	*ug/Sample*		*1.22*	*1623-05-8*	*11/29/19 10:48*	*12/06/19 23:46*	*1*
Cyclohexane	*39.7*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:48*	*12/06/19 23:46*	*1*
Cyclotetrasiloxane, octamethyl-	*31.6*	*T J N*	*ug/Sample*		*8.78*	*556-67-2*	*11/29/19 10:48*	*12/06/19 23:46*	*1*
Salicylic acid, 2TMS derivative	*30.7*	*T J N*	*ug/Sample*		*11.36*	*3789-85-3*	*11/29/19 10:48*	*12/06/19 23:46*	*1*
Unknown	*56.3*	*T J*	*ug/Sample*		*13.17*		*11/29/19 10:48*	*12/06/19 23:46*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*70 - 160*	*11/29/19 10:48*	*12/06/19 23:46*	*1*

Client Sample ID: Y-2971 R2 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17461-8

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*110*		*57 - 152*	*11/29/19 10:48*	*12/06/19 23:46*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:48*	*12/06/19 23:46*	*1*
Toluene-d8 (Surr)	*97*		*71 - 139*	*11/29/19 10:48*	*12/06/19 23:46*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**24300**		6380	3190	ug/Sample		11/29/19 10:48	12/13/19 18:43	1
Hydrogen Fluoride	ND		2600	1180	ug/Sample		11/29/19 10:48	12/18/19 10:09	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2972 R2 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17461-9

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND	H	30.8	4.06	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1,1,3,3-Pentafluorobutane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1,1-Trichloroethane	ND	H	30.8	4.43	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1,1-Trifluoro-2,2-dichloroethane	ND	H	61.5	12.2	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1,1-Trifluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1,2,2-Tetrachloroethane	ND	H	30.8	5.91	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	H	61.5	3.45	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1,2-trichloro-1-fluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1,2-Trichloroethane	ND	H	30.8	3.20	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1-Dichloro-1-fluoroethane	ND	H	61.5	30.8	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1-dichloro-2,2-difluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1-dichloro-2,2-difluoroethene	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1-Dichloroethane	ND	H	30.8	3.69	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1-Dichloroethene	ND	H	30.8	4.55	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1-Dichloropropene	ND	H	30.8	3.32	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,1-Difluoroethene	ND	H	615	615	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2,2-trichloro-1,1-difluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2,3-Trichlorobenzene	ND	H	30.8	9.85	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2,3-Trichloropropane	ND	H	30.8	7.63	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2,4-Trichlorobenzene	ND	H	30.8	10.3	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2,4-Trimethylbenzene	ND	H	30.8	6.40	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2-Dibromo-3-Chloropropane	ND	H	61.5	10.8	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2-Dibromoethane (EDB)	ND	H	30.8	4.06	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2-dichloro-1,1-difluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2-Dichlorobenzene	ND	H	30.8	5.42	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,2-Dichloroethane	ND	H	30.8	5.17	ug/Sample		11/29/19 10:48	12/07/19 00:10	1

Client Sample ID: Y-2972 R2 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17461-9

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND	H	30.8	3.08	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,3,5-Trimethylbenzene	ND	H	30.8	6.40	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,3-Dichlorobenzene	ND	H	30.8	5.29	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,3-Dichloropropane	ND	H	30.8	3.45	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1,4-Dichlorobenzene	ND	H	30.8	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
1-Chloro-1,1-difluoroethane	ND	H	61.5	6.28	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
2,2-Dichloropropane	ND	H	30.8	8.98	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
2-Butanone (MEK)	ND	H	123	19.7	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND	H	61.5	9.11	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
2-Chloro-1,1,1-Trifluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
2-Chlorotoluene	ND	H	30.8	5.78	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
2-Hexanone	ND	H	123	28.3	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
2-MTP as HFPO	**609**	**H**	26.9	26.9	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
4-Chlorotoluene	ND	H	30.8	6.40	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
4-Isopropyltoluene	ND	H	30.8	8.25	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
4-Methyl-2-pentanone (MIBK)	ND	H	123	19.7	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Acetone	ND	H	123	72.6	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Benzene	ND	H	30.8	5.91	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Bromobenzene	ND	H	30.8	4.31	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Bromochloromethane	ND	H	30.8	6.89	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Bromodichloromethane	ND	H	30.8	5.29	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Bromoform	ND	H	30.8	9.35	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Bromomethane	ND	H	61.5	35.7	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Carbon disulfide	ND	H	30.8	7.63	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Carbon tetrachloride	ND	H	30.8	4.06	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Carbonyl Difluoride	ND	H	90.1	90.1	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Chlorobenzene	ND	H	30.8	4.43	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Chlorodibromomethane	ND	H	30.8	6.65	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Chloroethane	ND	H	61.5	13.5	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Chloroform	ND	H	30.8	3.57	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Chloromethane	ND	H	61.5	25.6	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
cis-1,2-Dichloroethene	ND	H	30.8	2.46	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
cis-1,3-Dichloropropene	ND	H	30.8	5.29	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Dibromomethane	ND	H	30.8	2.95	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Dichlorodifluoromethane	ND	H	61.5	10.8	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Ethylbenzene	ND	H	30.8	5.05	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND	H	30.8	30.8	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Hexachlorobutadiene	ND	H	30.8	8.12	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
HFPO dimer, methyl ester as HFPO-DA	ND	H	29.5	29.5	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Isopropylbenzene	ND	H	30.8	4.31	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
m,p-Xylene	ND	H	61.5	5.05	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Methylene Chloride	ND	H	30.8	19.7	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Naphthalene	ND	H	30.8	14.8	ug/Sample		11/29/19 10:48	12/07/19 00:10	1

Client Sample ID: Y-2972 R2 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17461-9

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
n-Butylbenzene	ND	H	30.8	7.88	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
n-Propylbenzene	ND	H	30.8	6.65	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
o-Xylene	ND	H	30.8	3.20	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
sec-Butylbenzene	ND	H	30.8	6.03	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Styrene	ND	H	30.8	6.65	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
tert-Butylbenzene	ND	H	30.8	5.42	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Tetrachloroethene	ND	H	30.8	4.06	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Toluene	ND	H	30.8	5.66	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
trans-1,2-Dichloroethene	ND	H	30.8	3.20	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
trans-1,3-Dichloropropene	ND	H	30.8	10.8	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Trichloroethene	ND	H	30.8	2.22	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Trichlorofluoromethane	ND	H *	61.5	5.91	ug/Sample		11/29/19 10:48	12/07/19 00:10	1
Vinyl chloride	ND	H	61.5	14.8	ug/Sample		11/29/19 10:48	12/07/19 00:10	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*490*	*T H J*	*ug/Sample*		*1.13*		*11/29/19 10:48*	*12/07/19 00:10*	*1*
Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(trifluoroethenyl)oxy]	*2290*	*T H J N*	*ug/Sample*		*1.18*	*1623-05-8*	*11/29/19 10:48*	*12/07/19 00:10*	*1*
Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(trifluoroethenyl)oxy]	*41.0*	*T H J N*	*ug/Sample*		*1.22*	*1623-05-8*	*11/29/19 10:48*	*12/07/19 00:10*	*1*
Cyclohexane	*42.6*	*T H J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:48*	*12/07/19 00:10*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*70 - 160*	*11/29/19 10:48*	*12/07/19 00:10*	*1*
4-Bromofluorobenzene (Surr)	*109*		*57 - 152*	*11/29/19 10:48*	*12/07/19 00:10*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:48*	*12/07/19 00:10*	*1*
Toluene-d8 (Surr)	*97*		*71 - 139*	*11/29/19 10:48*	*12/07/19 00:10*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**3770**	**J**	6560	3280	ug/Sample		11/29/19 10:48	12/13/19 19:45	1
Hydrogen Fluoride	ND		2710	1230	ug/Sample		11/29/19 10:48	12/18/19 11:11	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2973 R2 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17461-10

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND	H	30.4	4.01	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1,1,3,3-Pentafluorobutane	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1,1-Trichloroethane	ND	H	30.4	4.38	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1,1-Trifluoro-2,2-dichloroethane	ND	H	60.8	12.0	ug/Sample		11/29/19 10:48	12/07/19 00:35	1

Client Sample ID: Y-2973 R2 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17461-10

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoroethane	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1,2,2-Tetrachloroethane	ND	H	30.4	5.84	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	H	60.8	3.41	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1,2-trichloro-1-fluoroethane	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1,2-Trichloroethane	ND	H	30.4	3.16	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1-Dichloro-1-fluoroethane	ND	H	60.8	30.4	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1-dichloro-2,2-difluoroethane	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1-dichloro-2,2-difluoroethene	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1-Dichloroethane	ND	H	30.4	3.65	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1-Dichloroethene	ND	H	30.4	4.50	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1-Dichloropropene	ND	H	30.4	3.28	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,1-Difluoroethene	ND	H	608	608	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2,2-trichloro-1,1-difluoroethane	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2,3-Trichlorobenzene	ND	H	30.4	9.73	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2,3-Trichloropropane	ND	H	30.4	7.54	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2,4-Trichlorobenzene	ND	H	30.4	10.2	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2,4-Trimethylbenzene	ND	H	30.4	6.32	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2-Dibromo-3-Chloropropane	ND	H	60.8	10.7	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2-Dibromoethane (EDB)	ND	H	30.4	4.01	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2-dichloro-1,1-difluoroethane	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2-Dichlorobenzene	ND	H	30.4	5.35	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2-Dichloroethane	ND	H	30.4	5.11	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,2-Dichloropropane	ND	H	30.4	3.04	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,3,5-Trimethylbenzene	ND	H	30.4	6.32	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,3-Dichlorobenzene	ND	H	30.4	5.23	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,3-Dichloropropane	ND	H	30.4	3.41	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1,4-Dichlorobenzene	ND	H	30.4	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
1-Chloro-1,1-difluoroethane	ND	H	60.8	6.20	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
2,2-Dichloropropane	ND	H	30.4	8.88	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
2-Butanone (MEK)	ND	H	122	19.5	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND	H	60.8	9.00	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
2-Chloro-1,1,1-Trifluoroethane	ND	H	60.8	6.08	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
2-Chlorotoluene	ND	H	30.4	5.72	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
2-Hexanone	ND	H	122	28.0	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
2-MTP as HFPO	**629**	**H**	26.6	26.6	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
4-Chlorotoluene	ND	H	30.4	6.32	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
4-Isopropyltoluene	ND	H	30.4	8.15	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
4-Methyl-2-pentanone (MIBK)	ND	H	122	19.5	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Acetone	ND	H	122	71.8	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Benzene	ND	H	30.4	5.84	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Bromobenzene	ND	H	30.4	4.26	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Bromochloromethane	ND	H	30.4	6.81	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Bromodichloromethane	ND	H	30.4	5.23	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Bromoform	ND	H	30.4	9.24	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Bromomethane	ND	H	60.8	35.3	ug/Sample		11/29/19 10:48	12/07/19 00:35	1

Client Sample ID: Y-2973 R2 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17461-10

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon disulfide	ND	H	30.4	7.54	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Carbon tetrachloride	ND	H	30.4	4.01	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Carbonyl Difluoride	ND	H	89.4	89.4	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Chlorobenzene	ND	H	30.4	4.38	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Chlorodibromomethane	ND	H	30.4	6.57	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Chloroethane	ND	H	60.8	13.4	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Chloroform	ND	H	30.4	3.53	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Chloromethane	ND	H	60.8	25.3	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
cis-1,2-Dichloroethene	ND	H	30.4	2.43	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
cis-1,3-Dichloropropene	ND	H	30.4	5.23	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Dibromomethane	ND	H	30.4	2.92	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Dichlorodifluoromethane	ND	H	60.8	10.7	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Ethylbenzene	ND	H	30.4	4.99	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND	H	30.4	30.4	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Hexachlorobutadiene	ND	H	30.4	8.03	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
HFPO dimer, methyl ester as HFPO-DA	ND	H	29.2	29.2	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Isopropylbenzene	ND	H	30.4	4.26	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
m,p-Xylene	ND	H	60.8	4.99	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Methylene Chloride	ND	H	30.4	19.5	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Naphthalene	ND	H	30.4	14.6	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
n-Butylbenzene	ND	H	30.4	7.78	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
n-Propylbenzene	ND	H	30.4	6.57	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
o-Xylene	ND	H	30.4	3.16	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
sec-Butylbenzene	ND	H	30.4	5.96	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Styrene	ND	H	30.4	6.57	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
tert-Butylbenzene	ND	H	30.4	5.35	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Tetrachloroethene	ND	H	30.4	4.01	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Toluene	ND	H	30.4	5.59	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
trans-1,2-Dichloroethene	ND	H	30.4	3.16	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
trans-1,3-Dichloropropene	ND	H	30.4	10.7	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Trichloroethene	ND	H	30.4	2.19	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Trichlorofluoromethane	ND	H *	60.8	5.84	ug/Sample		11/29/19 10:48	12/07/19 00:35	1
Vinyl chloride	ND	H	60.8	14.6	ug/Sample		11/29/19 10:48	12/07/19 00:35	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Butanoic acid, heptafluoro-, sodium salt	*484*	*T H J N*	*ug/Sample*		*1.13*	*2218-54-4*	*11/29/19 10:48*	*12/07/19 00:35*	*1*
Unknown	*1700*	*T H J*	*ug/Sample*		*1.18*		*11/29/19 10:48*	*12/07/19 00:35*	*1*
Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(trifluoroethenyl)oxy]	*31.6*	*T H J N*	*ug/Sample*		*1.22*	*1623-05-8*	*11/29/19 10:48*	*12/07/19 00:35*	*1*
Cyclohexane	*43.2*	*T H J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:48*	*12/07/19 00:35*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:48*	*12/07/19 00:35*	*1*
4-Bromofluorobenzene (Surr)	*110*		*57 - 152*	*11/29/19 10:48*	*12/07/19 00:35*	*1*
Dibromofluoromethane (Surr)	*103*		*62 - 134*	*11/29/19 10:48*	*12/07/19 00:35*	*1*
Toluene-d8 (Surr)	*97*		*71 - 139*	*11/29/19 10:48*	*12/07/19 00:35*	*1*

Client Sample ID: Y-2973 R2 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17461-10

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**3540**	**J**	6490	3240	ug/Sample		11/29/19 10:48	12/13/19 20:06	1
Hydrogen Fluoride	ND		2680	1220	ug/Sample		11/29/19 10:48	12/18/19 12:15	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2974 R2 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17461-11

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND	H	31.4	4.14	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1,1,3,3-Pentafluorobutane	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1,1-Trichloroethane	ND	H	31.4	4.52	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1,1-Trifluoro-2,2-dichloroethane	ND	H	62.7	12.4	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1,1-Trifluoroethane	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1,2,2-Tetrachloroethane	ND	H	31.4	6.02	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	H	62.7	3.51	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1,2-trichloro-1-fluoroethane	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1,2-Trichloroethane	ND	H	31.4	3.26	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1-Dichloro-1-fluoroethane	ND	H	62.7	31.4	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1-dichloro-2,2-difluoroethane	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1-dichloro-2,2-difluoroethene	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1-Dichloroethane	ND	H	31.4	3.76	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1-Dichloroethene	ND	H	31.4	4.64	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1-Dichloropropene	ND	H	31.4	3.39	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,1-Difluoroethene	ND	H	627	627	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2,2-trichloro-1,1-difluoroethane	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2,3-Trichlorobenzene	ND	H	31.4	10.0	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2,3-Trichloropropane	ND	H	31.4	7.78	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2,4-Trichlorobenzene	ND	H	31.4	10.5	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2,4-Trimethylbenzene	ND	H	31.4	6.53	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2-Dibromo-3-Chloropropane	ND	H	62.7	11.0	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2-Dibromoethane (EDB)	ND	H	31.4	4.14	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2-dichloro-1,1-difluoroethane	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2-Dichlorobenzene	ND	H	31.4	5.52	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2-Dichloroethane	ND	H	31.4	5.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,2-Dichloropropane	ND	H	31.4	3.14	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,3,5-Trimethylbenzene	ND	H	31.4	6.53	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,3-Dichlorobenzene	ND	H	31.4	5.40	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,3-Dichloropropane	ND	H	31.4	3.51	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1,4-Dichlorobenzene	ND	H	31.4	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
1-Chloro-1,1-difluoroethane	ND	H	62.7	6.40	ug/Sample		11/29/19 10:48	12/07/19 00:59	1

Client Sample ID: Y-2974 R2 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17461-11

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,2-dichloro-1,1-difluoroethylmethyl ether	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
2,2-Dichloropropane	ND	H	31.4	9.16	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
2-Butanone (MEK)	ND	H	125	20.1	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND	H	62.7	9.29	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
2-Chloro-1,1,1-Trifluoroethane	ND	H	62.7	6.27	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
2-Chlorotoluene	ND	H	31.4	5.90	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
2-Hexanone	ND	H	125	28.9	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
2-MTP as HFPO	**609**	**H**	27.4	27.4	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
4-Chlorotoluene	ND	H	31.4	6.53	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
4-Isopropyltoluene	ND	H	31.4	8.41	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
4-Methyl-2-pentanone (MIBK)	ND	H	125	20.1	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Acetone	ND	H	125	74.0	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Benzene	ND	H	31.4	6.02	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Bromobenzene	ND	H	31.4	4.39	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Bromochloromethane	ND	H	31.4	7.03	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Bromodichloromethane	ND	H	31.4	5.40	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Bromoform	ND	H	31.4	9.54	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Bromomethane	ND	H	62.7	36.4	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Carbon disulfide	ND	H	31.4	7.78	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Carbon tetrachloride	ND	H	31.4	4.14	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Carbonyl Difluoride	ND	H	91.6	91.6	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Chlorobenzene	ND	H	31.4	4.52	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Chlorodibromomethane	ND	H	31.4	6.78	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Chloroethane	ND	H	62.7	13.8	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Chloroform	ND	H	31.4	3.64	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Chloromethane	ND	H	62.7	26.1	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
cis-1,2-Dichloroethene	ND	H	31.4	2.51	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
cis-1,3-Dichloropropene	ND	H	31.4	5.40	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Dibromomethane	ND	H	31.4	3.01	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Dichlorodifluoromethane	ND	H	62.7	11.0	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Ethylbenzene	ND	H	31.4	5.15	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND	H	31.4	31.4	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Hexachlorobutadiene	ND	H	31.4	8.28	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
HFPO dimer, methyl ester as HFPO-DA	ND	H	30.1	30.1	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Isopropylbenzene	ND	H	31.4	4.39	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
m,p-Xylene	ND	H	62.7	5.15	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Methylene Chloride	ND	H	31.4	20.1	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Naphthalene	ND	H	31.4	15.1	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
n-Butylbenzene	ND	H	31.4	8.03	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
n-Propylbenzene	ND	H	31.4	6.78	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
o-Xylene	ND	H	31.4	3.26	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
sec-Butylbenzene	ND	H	31.4	6.15	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Styrene	ND	H	31.4	6.78	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
tert-Butylbenzene	ND	H	31.4	5.52	ug/Sample		11/29/19 10:48	12/07/19 00:59	1

Client Sample ID: Y-2974 R2 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17461-11

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	ND	H	31.4	4.14	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Toluene	ND	H	31.4	5.77	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
trans-1,2-Dichloroethene	ND	H	31.4	3.26	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
trans-1,3-Dichloropropene	ND	H	31.4	11.0	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Trichloroethene	ND	H	31.4	2.26	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Trichlorofluoromethane	ND	H *	62.7	6.02	ug/Sample		11/29/19 10:48	12/07/19 00:59	1
Vinyl chloride	ND	H	62.7	15.1	ug/Sample		11/29/19 10:48	12/07/19 00:59	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Propene, hexafluoro-	*421*	*T H J N*	*ug/Sample*		*1.13*	*116-15-4*	*11/29/19 10:48*	*12/07/19 00:59*	*1*
Unknown	*882*	*T H J*	*ug/Sample*		*1.18*		*11/29/19 10:48*	*12/07/19 00:59*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*70 - 160*	*11/29/19 10:48*	*12/07/19 00:59*	*1*
4-Bromofluorobenzene (Surr)	*109*		*57 - 152*	*11/29/19 10:48*	*12/07/19 00:59*	*1*
Dibromofluoromethane (Surr)	*105*		*62 - 134*	*11/29/19 10:48*	*12/07/19 00:59*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:48*	*12/07/19 00:59*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	ND		6690	3350	ug/Sample		11/29/19 10:48	12/13/19 20:27	1
Hydrogen Fluoride	ND		2760	1250	ug/Sample		11/29/19 10:48	12/18/19 12:38	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: Y-2975 R2 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17461-12

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND	H	30.7	4.06	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1,1,3,3-Pentafluorobutane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1,1-Trichloroethane	ND	H	30.7	4.43	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1,1-Trifluoro-2,2-dichloroethane	ND	H	61.5	12.2	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1,1-Trifluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1,2,2-Tetrachloroethane	ND	H	30.7	5.90	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	H	61.5	3.44	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1,2-trichloro-1-fluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1,2-Trichloroethane	ND	H	30.7	3.20	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1-Dichloro-1-fluoroethane	ND	H	61.5	30.7	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1-dichloro-2,2-difluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1-dichloro-2,2-difluoroethene	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1-Dichloroethane	ND	H	30.7	3.69	ug/Sample		11/29/19 10:48	12/07/19 01:24	1

Client Sample ID: Y-2975 R2 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17461-12

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND	H	30.7	4.55	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1-Dichloropropene	ND	H	30.7	3.32	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,1-Difluoroethene	ND	H	615	615	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2,2-trichloro-1,1-difluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2,3-Trichlorobenzene	ND	H	30.7	9.83	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2,3-Trichloropropane	ND	H	30.7	7.62	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2,4-Trichlorobenzene	ND	H	30.7	10.3	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2,4-Trimethylbenzene	ND	H	30.7	6.39	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2-Dibromo-3-Chloropropane	ND	H	61.5	10.8	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2-Dibromoethane (EDB)	ND	H	30.7	4.06	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2-dichloro-1,1-difluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2-Dichlorobenzene	ND	H	30.7	5.41	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2-Dichloroethane	ND	H	30.7	5.16	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,2-Dichloropropane	ND	H	30.7	3.07	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,3,5-Trimethylbenzene	ND	H	30.7	6.39	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,3-Dichlorobenzene	ND	H	30.7	5.29	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,3-Dichloropropane	ND	H	30.7	3.44	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1,4-Dichlorobenzene	ND	H	30.7	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
1-Chloro-1,1-difluoroethane	ND	H	61.5	6.27	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
2,2-Dichloropropane	ND	H	30.7	8.97	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
2-Butanone (MEK)	ND	H	123	19.7	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND	H	61.5	9.10	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
2-Chloro-1,1,1-Trifluoroethane	ND	H	61.5	6.15	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
2-Chlorotoluene	ND	H	30.7	5.78	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
2-Hexanone	ND	H	123	28.3	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
2-MTP as HFPO	**583**	**H**	26.8	26.8	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
4-Chlorotoluene	ND	H	30.7	6.39	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
4-Isopropyltoluene	ND	H	30.7	8.24	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
4-Methyl-2-pentanone (MIBK)	ND	H	123	19.7	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Acetone	ND	H	123	72.5	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Benzene	ND	H	30.7	5.90	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Bromobenzene	ND	H	30.7	4.30	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Bromochloromethane	ND	H	30.7	6.88	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Bromodichloromethane	ND	H	30.7	5.29	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Bromoform	ND	H	30.7	9.34	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Bromomethane	ND	H	61.5	35.6	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Carbon disulfide	ND	H	30.7	7.62	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Carbon tetrachloride	ND	H	30.7	4.06	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Carbonyl Difluoride	ND	H	90.1	90.1	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Chlorobenzene	ND	H	30.7	4.43	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Chlorodibromomethane	ND	H	30.7	6.64	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Chloroethane	ND	H	61.5	13.5	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Chloroform	ND	H	30.7	3.56	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Chloromethane	ND	H	61.5	25.6	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
cis-1,2-Dichloroethene	ND	H	30.7	2.46	ug/Sample		11/29/19 10:48	12/07/19 01:24	1

Client Sample ID: Y-2975 R2 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17461-12

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,3-Dichloropropene	ND	H	30.7	5.29	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Dibromomethane	ND	H	30.7	2.95	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Dichlorodifluoromethane	ND	H	61.5	10.8	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Ethylbenzene	ND	H	30.7	5.04	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND	H	30.7	30.7	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Hexachlorobutadiene	ND	H	30.7	8.11	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
HFPO dimer, methyl ester as HFPO-DA	ND	H	29.4	29.4	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Isopropylbenzene	ND	H	30.7	4.30	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
m,p-Xylene	ND	H	61.5	5.04	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Methylene Chloride	ND	H	30.7	19.7	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Naphthalene	ND	H	30.7	14.8	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
n-Butylbenzene	ND	H	30.7	7.87	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
n-Propylbenzene	ND	H	30.7	6.64	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
o-Xylene	ND	H	30.7	3.20	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
sec-Butylbenzene	ND	H	30.7	6.02	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Styrene	ND	H	30.7	6.64	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
tert-Butylbenzene	ND	H	30.7	5.41	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Tetrachloroethene	ND	H	30.7	4.06	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Toluene	ND	H	30.7	5.65	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
trans-1,2-Dichloroethene	ND	H	30.7	3.20	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
trans-1,3-Dichloropropene	ND	H	30.7	10.8	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Trichloroethene	ND	H	30.7	2.21	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Trichlorofluoromethane	ND	H *	61.5	5.90	ug/Sample		11/29/19 10:48	12/07/19 01:24	1
Vinyl chloride	ND	H	61.5	14.8	ug/Sample		11/29/19 10:48	12/07/19 01:24	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Propene, hexafluoro-	*333*	*T H J N*	*ug/Sample*		*1.13*	*116-15-4*	*11/29/19 10:48*	*12/07/19 01:24*	*1*
Unknown	*498*	*T H J*	*ug/Sample*		*1.18*		*11/29/19 10:48*	*12/07/19 01:24*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:48*	*12/07/19 01:24*	*1*
4-Bromofluorobenzene (Surr)	*111*		*57 - 152*	*11/29/19 10:48*	*12/07/19 01:24*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:48*	*12/07/19 01:24*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:48*	*12/07/19 01:24*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**28100**		6560	3280	ug/Sample		11/29/19 10:48	12/13/19 20:47	1
Hydrogen Fluoride	ND		2700	1230	ug/Sample		11/29/19 10:48	12/18/19 12:59	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - MM-18

Job ID: 140-17461-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Prep: MeOH Prep

Analyte	RL	MDL	Units
1,1,1,2-Tetrachloroethane	2.50	0.330	ug/Sample
1,1,1,3,3-Pentafluorobutane	5.00	0.500	ug/Sample
1,1,1-Trichloroethane	2.50	0.360	ug/Sample
1,1,1-Trifluoro-2,2-dichloroethane	5.00	0.990	ug/Sample
1,1,1-Trifluoroethane	5.00	0.500	ug/Sample
1,1,2,2-Tetrachloroethane	2.50	0.480	ug/Sample
1,1,2-Trichloro-1,2,2-trifluoroethane	5.00	0.280	ug/Sample
1,1,2-trichloro-1-fluoroethane	5.00	0.500	ug/Sample
1,1,2-Trichloroethane	2.50	0.260	ug/Sample
1,1-Dichloro-1-fluoroethane	5.00	2.50	ug/Sample
1,1-dichloro-2,2-difluoroethane	5.00	0.500	ug/Sample
1,1-dichloro-2,2-difluoroethene	5.00	0.500	ug/Sample
1,1-Dichloroethane	2.50	0.300	ug/Sample
1,1-Dichloroethene	2.50	0.370	ug/Sample
1,1-Dichloropropene	2.50	0.270	ug/Sample
1,1-Difluoroethene	50.0	50.0	ug/Sample
1,2,2-trichloro-1,1-difluoroethane	5.00	0.500	ug/Sample
1,2,3-Trichlorobenzene	2.50	0.800	ug/Sample
1,2,3-Trichloropropane	2.50	0.620	ug/Sample
1,2,4-Trichlorobenzene	2.50	0.840	ug/Sample
1,2,4-Trimethylbenzene	2.50	0.520	ug/Sample
1,2-Dibromo-3-Chloropropane	5.00	0.880	ug/Sample
1,2-Dibromoethane (EDB)	2.50	0.330	ug/Sample
1,2-dichloro-1,1-difluoroethane	5.00	0.500	ug/Sample
1,2-Dichlorobenzene	2.50	0.440	ug/Sample
1,2-Dichloroethane	2.50	0.420	ug/Sample
1,2-Dichloropropane	2.50	0.250	ug/Sample
1,3,5-Trimethylbenzene	2.50	0.520	ug/Sample
1,3-Dichlorobenzene	2.50	0.430	ug/Sample
1,3-Dichloropropane	2.50	0.280	ug/Sample
1,4-Dichlorobenzene	2.50	0.500	ug/Sample
1-Chloro-1,1-difluoroethane	5.00	0.510	ug/Sample
2,2-dichloro-1,1-difluoroethylmethyl ether	5.00	0.500	ug/Sample
2,2-Dichloropropane	2.50	0.730	ug/Sample
2-Butanone (MEK)	10.0	1.60	ug/Sample
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	5.00	0.740	ug/Sample
2-Chloro-1,1,1-Trifluoroethane	5.00	0.500	ug/Sample
2-Chlorotoluene	2.50	0.470	ug/Sample
2-Hexanone	10.0	2.30	ug/Sample
2-MTP as HFPO	2.50	2.50	ug/Sample
4-Chlorotoluene	2.50	0.520	ug/Sample
4-Isopropyltoluene	2.50	0.670	ug/Sample
4-Methyl-2-pentanone (MIBK)	10.0	1.60	ug/Sample
Acetone	10.0	5.90	ug/Sample
Benzene	2.50	0.480	ug/Sample
Bromobenzene	2.50	0.350	ug/Sample
Bromochloromethane	2.50	0.560	ug/Sample
Bromodichloromethane	2.50	0.430	ug/Sample
Bromoform	2.50	0.760	ug/Sample
Bromomethane	5.00	2.90	ug/Sample
Carbon disulfide	2.50	0.620	ug/Sample
Carbon tetrachloride	2.50	0.330	ug/Sample

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

Prep: MeOH Prep

Analyte	RL	MDL	Units
Carbonyl Difluoride	10.0	10.0	ug/Sample
Chlorobenzene	2.50	0.360	ug/Sample
Chlorodibromomethane	2.50	0.540	ug/Sample
Chloroethane	5.00	1.10	ug/Sample
Chloroform	2.50	0.290	ug/Sample
Chloromethane	5.00	2.08	ug/Sample
cis-1,2-Dichloroethene	2.50	0.200	ug/Sample
cis-1,3-Dichloropropene	2.50	0.430	ug/Sample
Dibromomethane	2.50	0.240	ug/Sample
Dichlorodifluoromethane	5.00	0.880	ug/Sample
Ethylbenzene	2.50	0.410	ug/Sample
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	2.50	2.50	ug/Sample
Hexachlorobutadiene	2.50	0.660	ug/Sample
HFPO dimer, methyl ester as HFPO-DA	2.50	2.50	ug/Sample
Isopropylbenzene	2.50	0.350	ug/Sample
m,p-Xylene	5.00	0.410	ug/Sample
Methylene Chloride	2.50	1.60	ug/Sample
Naphthalene	2.50	1.20	ug/Sample
n-Butylbenzene	2.50	0.640	ug/Sample
n-Propylbenzene	2.50	0.540	ug/Sample
o-Xylene	2.50	0.260	ug/Sample
sec-Butylbenzene	2.50	0.490	ug/Sample
Styrene	2.50	0.540	ug/Sample
tert-Butylbenzene	2.50	0.440	ug/Sample
Tetrachloroethene	2.50	0.330	ug/Sample
Toluene	2.50	0.460	ug/Sample
trans-1,2-Dichloroethene	2.50	0.260	ug/Sample
trans-1,3-Dichloropropene	2.50	0.880	ug/Sample
Trichloroethene	2.50	0.180	ug/Sample
Trichlorofluoromethane	5.00	0.480	ug/Sample
Vinyl chloride	5.00	1.20	ug/Sample

Method: 9056 - Anions, Ion Chromatography

Prep: MeOH Prep

Analyte	RL	MDL	Units
Hydrogen Fluoride	11.0	5.00	ug/Sample
Total Fluorine	1000	500	ug/Sample

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ANALYTICAL REPORT

Job Number: 140-17557-1

Job Description: VEN Stack - MM-18

Contract Number: LBIO-67048

For:
Chemours Company FC, LLC The
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, DE 19713

Attention: Michael Aucoin

Approved for release.
Courtney M Adkins
Project Manager II
12/30/2019 6:39 AM

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12/30/2019

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

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

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - MM-18

Job ID: 140-17557-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL KNX
9056	Anions, Ion Chromatography	SW846	TAL KNX
9041A	pH	SW846	TAL KNX
5050	Bomb Preparation Method for Solid Waste	SW846	TAL KNX
MeOH Prep	Methanol Impinger Preparation	None	TAL KNX

Protocol References:

None = None

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

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - MM-18

Job ID: 140-17557-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-17557-1	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Air	12/04/19 00:00	12/07/19 08:00	
140-17557-2	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Air	12/04/19 00:00	12/07/19 08:00	
140-17557-3	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Air	12/04/19 00:00	12/07/19 08:00	
140-17557-4	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Air	12/04/19 00:00	12/07/19 08:00	
140-17557-5	Y-2980 R3 VEN DIV STACK MM18 IMPINGER #	Air	12/04/19 00:00	12/07/19 08:00	
140-17557-6	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Air	12/04/19 00:00	12/07/19 08:00	

Job Narrative
140-17557-1

Receipt

The samples were received on December 7, 2019 at 8:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.9º C and 1.4º C.

GC/MS VOA
Impinger Sample Preparation and Analysis: Impinger samples were analyzed for the volatile organic target analytes by purge and trap GCMS using Eurofins TestAmerica Knoxville standard operating procedure KNOX-MS-0015, based on the following method:

· SW-846 8260B, "Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS)"

Each sample is prepared by adding a known amount of sample to the purge water in a purge and trap vessel and spiking with internal standards, surrogates, and matrix spike analytes (as needed). Volatile compounds are introduced into the gas chromatograph by the purge and trap method. The components are separated using the chromatograph and detected using a mass spectrometer, which provides both qualitative and quantitative information.

Impinger sample results were calculated using the following equation:

Concentration, µg/sample = (C × DF × W × Vt) / (Va)
Where:
C = On-column concentration, µg/L
DF = Dilution factor
W = Volume of water purged, L
Vt = Methanol extract final volume, µL
Va = Volume of extract analyzed, µL

Method 8260B: (LCS 140-35956/1-A) for analytical batch 140-35964 recovered below marginal exceedance limits for Trichlorofluoromethane. This is an ongoing instrument issue with LCS recoveries for this analyte. The project manager approved moving forward with analysis for the current job.

Method 8260B: The following samples were diluted to bring the concentration of target analytes within the calibration range: Y-2976 R3 VEN DIV STACK MM18 IMPINGER #1 (140-17557-1), Y-2977 R3 VEN DIV STACK MM18 IMPINGER #2 (140-17557-2), Y-2978 R3 VEN DIV STACK MM18 IMPINGER #3 (140-17557-3), Y-2979 R3 VEN DIV STACK MM18 IMPINGER #4 (140-17557-4), Y-2980 R3 VEN DIV STACK MM18 IMPINGER #5 (140-17557-5) and Y-2981 R3 VEN DIV STACK MM18 IMPINGER #6 (140-17557-6). Elevated reporting limits (RLs) are provided.

Method 8260B: The continuing calibration verification (CCV) associated with batch 140-35990 recovered above the upper control limit for Chloroethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

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

General Chemistry
Total Halogens: The samples were prepared for total fluorine, chlorine, bromine and/or iodine using SOP number KNOX-WC-0016 (based on ASTM Method E442 and SW-846 Method 5050). The sample is oxidized by combustion in an oxygen flask at atmospheric pressure or a bomb containing oxygen under pressure. The liberated halogen compounds are absorbed primarily as halides in a sodium carbonate/sodium bicarbonate buffer solution. The combustion products are collected by repeated rinsing of the combustion apparatus, and analyzed by ion chromatography in accordance with SOP KNOX-WC-0005 (based on SW-846 Method 9056). The results are calculated using the following equation:

C = [(Ccom × Vcom) / W] × 1000 g/Kg

Where:
C = Concentration of analyte in the sample, mg/Kg
Ccom = Concentration of analyte in the combustate, mg/L
Vcom = Total volume of combustate, L
W = Weight of sample combusted, g

Anions in Impinger Solutions: Anions are is determined in accordance to SOP KNOX-WC-0005 (based on methods 300.0A and 9056). The samples were diluted a minimum of 1/20 in ion chromatography solvent buffer solution to reduce the methanol concentration before injection. Buffer concentrate was added until the pH was 10. Samples are diluted with ion chromatography eluate solution to bring the

concentrations within the calibration range when necessary. Higher dilutions are applied as necessary.

An aliquot of prepared sample is introduced into the ion chromatograph. Anions are identified based on their retention times as compared to those of known standards. Quantification is accomplished by measuring the peak response and comparing it to a calibration curve generated from known standards.

The pH of all samples were tested with pH paper. QC consisted of initial CCV and LCS which also serve as initial calibration, duplicate analysis for every 10 samples, and closing CCV. A certified thermometer was used to check the ambient temperature.

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

GC/MS VOA

Prep Batch: 35956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-1	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-2	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-2 - DL	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-3	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-3 - DL	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-4	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-4 - DL	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-5	Y-2980 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-6 - DL	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-6	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
MB 140-35956/2-A	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-35956/1-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
140-17557-2 MS	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-2 MSD	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	

Analysis Batch: 35964

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-1	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-2	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-3	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-4	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-5	Y-2980 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-6	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
MB 140-35956/2-A	Method Blank	Total/NA	Air	8260B	35956
LCS 140-35956/1-A	Lab Control Sample	Total/NA	Air	8260B	35956
LCS 140-35956/1-A	Lab Control Sample	Total/NA	Air	8260B	35956

Analysis Batch: 35990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-2 - DL	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-3 - DL	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-4 - DL	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-6 - DL	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-2 MS	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956
140-17557-2 MSD	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35956

HPLC/IC

Prep Batch: 35956

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-1	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-2	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-3	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-4	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-5	Y-2980 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-6	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
MB 140-35956/19-A	Method Blank	Total/NA	Air	MeOH Prep	
MB 140-35956/19-B	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-35956/20-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
LCS 140-35956/20-B	Lab Control Sample	Total/NA	Air	MeOH Prep	
LCSD 140-35956/21-A	Lab Control Sample Dup	Total/NA	Air	MeOH Prep	

HPLC/IC (Continued)

Prep Batch: 35956 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 140-35956/21-B	Lab Control Sample Dup	Total/NA	Air	MeOH Prep	
140-17557-2 MS	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17557-2 MSD	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	

Prep Batch: 35976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-1	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35956
140-17557-2	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35956
140-17557-3	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35956
140-17557-4	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35956
140-17557-5	Y-2980 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35956
140-17557-6	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35956
MB 140-35956/19-B	Method Blank	Total/NA	Air	5050	35956
LCS 140-35956/20-B	Lab Control Sample	Total/NA	Air	5050	35956
LCSD 140-35956/21-B	Lab Control Sample Dup	Total/NA	Air	5050	35956
140-17557-2 MS	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35956
140-17557-2 MSD	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35956

Analysis Batch: 36294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-1	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35976
140-17557-2	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35976
140-17557-3	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35976
140-17557-4	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35976
140-17557-5	Y-2980 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35976
140-17557-6	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35976
MB 140-35956/19-B	Method Blank	Total/NA	Air	9056	35976
LCS 140-35956/20-B	Lab Control Sample	Total/NA	Air	9056	35976
LCSD 140-35956/21-B	Lab Control Sample Dup	Total/NA	Air	9056	35976
140-17557-2 MS	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35976
140-17557-2 MSD	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35976

Analysis Batch: 36325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-1	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35956
140-17557-2	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35956
140-17557-3	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35956
140-17557-4	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35956
140-17557-5	Y-2980 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35956
140-17557-6	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35956
MB 140-35956/19-A	Method Blank	Total/NA	Air	9056	35956
LCS 140-35956/20-A	Lab Control Sample	Total/NA	Air	9056	35956
LCSD 140-35956/21-A	Lab Control Sample Dup	Total/NA	Air	9056	35956
140-17557-2 MS	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35956
140-17557-2 MSD	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35956

General Chemistry

Analysis Batch: 36156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-1	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	

General Chemistry (Continued)

Analysis Batch: 36156 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17557-2	Y-2977 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17557-3	Y-2978 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17557-4	Y-2979 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17557-5	Y-2980 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17557-6	Y-2981 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
LCS 140-36156/2	Lab Control Sample	Total/NA	Air	9041A	
140-17557-1 DU	Y-2976 R3 VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	

Client Sample ID: Y-2976 R3 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17557-1

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		31.5	4.15	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1,1,3,3-Pentafluorobutane	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1,1-Trichloroethane	ND		31.5	4.53	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		62.9	12.5	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1,1-Trifluoroethane	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1,2,2-Tetrachloroethane	ND		31.5	6.04	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		62.9	3.52	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1,2-trichloro-1-fluoroethane	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1,2-Trichloroethane	ND		31.5	3.27	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1-Dichloro-1-fluoroethane	ND		62.9	31.5	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1-dichloro-2,2-difluoroethane	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1-dichloro-2,2-difluoroethene	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1-Dichloroethane	ND		31.5	3.78	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1-Dichloroethene	ND		31.5	4.66	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1-Dichloropropene	ND		31.5	3.40	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,1-Difluoroethene	ND		629	629	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2,2-trichloro-1,1-difluoroethane	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2,3-Trichlorobenzene	ND		31.5	10.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2,3-Trichloropropane	ND		31.5	7.80	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2,4-Trichlorobenzene	ND		31.5	10.6	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2,4-Trimethylbenzene	ND		31.5	6.54	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2-Dibromo-3-Chloropropane	ND		62.9	11.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2-Dibromoethane (EDB)	ND		31.5	4.15	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2-dichloro-1,1-difluoroethane	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2-Dichlorobenzene	ND		31.5	5.54	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2-Dichloroethane	ND		31.5	5.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,2-Dichloropropane	ND		31.5	3.15	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,3,5-Trimethylbenzene	ND		31.5	6.54	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,3-Dichlorobenzene	ND		31.5	5.41	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,3-Dichloropropane	ND		31.5	3.52	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1,4-Dichlorobenzene	ND		31.5	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
1-Chloro-1,1-difluoroethane	ND		62.9	6.42	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
2,2-Dichloropropane	ND		31.5	9.19	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
2-Butanone (MEK)	ND		126	20.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		62.9	9.31	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
2-Chloro-1,1,1-Trifluoroethane	ND		62.9	6.29	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
2-Chlorotoluene	ND		31.5	5.92	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
2-Hexanone	ND		126	28.9	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
2-MTP as HFPO	**1460**		27.5	27.5	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
4-Chlorotoluene	ND		31.5	6.54	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
4-Isopropyltoluene	ND		31.5	8.43	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
4-Methyl-2-pentanone (MIBK)	ND		126	20.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Acetone	ND		126	74.3	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Benzene	ND		31.5	6.04	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Bromobenzene	ND		31.5	4.41	ug/Sample		12/10/19 09:47	12/10/19 22:58	1

Client Sample ID: Y-2976 R3 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17557-1

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	ND		31.5	7.05	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Bromodichloromethane	ND		31.5	5.41	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Bromoform	ND		31.5	9.57	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Bromomethane	ND		62.9	36.5	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Carbon disulfide	ND		31.5	7.80	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Carbon tetrachloride	ND		31.5	4.15	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Carbonyl Difluoride	ND		92.3	92.3	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Chlorobenzene	ND		31.5	4.53	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Chlorodibromomethane	ND		31.5	6.80	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Chloroethane	ND		62.9	13.8	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Chloroform	ND		31.5	3.65	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Chloromethane	ND		62.9	26.2	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
cis-1,2-Dichloroethene	ND		31.5	2.52	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
cis-1,3-Dichloropropene	ND		31.5	5.41	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Dibromomethane	ND		31.5	3.02	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Dichlorodifluoromethane	ND		62.9	11.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Ethylbenzene	ND		31.5	5.16	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**149**		31.5	31.5	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Hexachlorobutadiene	ND		31.5	8.31	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
HFPO dimer, methyl ester as HFPO-DA	ND		30.2	30.2	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Isopropylbenzene	ND		31.5	4.41	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
m,p-Xylene	ND		62.9	5.16	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Methylene Chloride	**37.3**		31.5	20.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Naphthalene	ND		31.5	15.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
n-Butylbenzene	ND		31.5	8.06	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
n-Propylbenzene	ND		31.5	6.80	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
o-Xylene	ND		31.5	3.27	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
sec-Butylbenzene	ND		31.5	6.17	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Styrene	ND		31.5	6.80	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
tert-Butylbenzene	ND		31.5	5.54	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Tetrachloroethene	ND		31.5	4.15	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Toluene	ND		31.5	5.79	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
trans-1,2-Dichloroethene	ND		31.5	3.27	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
trans-1,3-Dichloropropene	ND		31.5	11.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Trichloroethene	ND		31.5	2.27	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Trichlorofluoromethane	ND	*	62.9	6.04	ug/Sample		12/10/19 09:47	12/10/19 22:58	1
Vinyl chloride	ND		62.9	15.1	ug/Sample		12/10/19 09:47	12/10/19 22:58	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*318*	*T J*	*ug/Sample*		*1.13*		*12/10/19 09:47*	*12/10/19 22:58*	*1*
Unknown	*626*	*T J*	*ug/Sample*		*1.18*		*12/10/19 09:47*	*12/10/19 22:58*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*70 - 160*	*12/10/19 09:47*	*12/10/19 22:58*	*1*
4-Bromofluorobenzene (Surr)	*106*		*57 - 152*	*12/10/19 09:47*	*12/10/19 22:58*	*1*
Dibromofluoromethane (Surr)	*109*		*62 - 134*	*12/10/19 09:47*	*12/10/19 22:58*	*1*

Client Sample ID: Y-2976 R3 VEN DIV STACK MM18 IMPINGER #1

Lab Sample ID: 140-17557-1

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*89*		*71 - 139*	*12/10/19 09:47*	*12/10/19 22:58*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**98200**		13400	6710	ug/Sample		12/10/19 09:47	12/23/19 12:01	2
Hydrogen Fluoride	ND		2770	1260	ug/Sample		12/10/19 09:47	12/24/19 01:17	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.0**	**HF**			SU			12/17/19 13:37	1

Client Sample ID: Y-2977 R3 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17557-2

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		30.5	4.02	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1,1,3,3-Pentafluorobutane	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1,1-Trichloroethane	ND		30.5	4.39	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		61.0	12.1	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1,1-Trifluoroethane	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1,2,2-Tetrachloroethane	ND		30.5	5.85	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		61.0	3.41	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1,2-trichloro-1-fluoroethane	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1,2-Trichloroethane	ND		30.5	3.17	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1-Dichloro-1-fluoroethane	ND		61.0	30.5	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1-dichloro-2,2-difluoroethane	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1-dichloro-2,2-difluoroethene	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1-Dichloroethane	ND		30.5	3.66	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1-Dichloroethene	ND		30.5	4.51	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1-Dichloropropene	ND		30.5	3.29	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,1-Difluoroethene	ND		610	610	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2,2-trichloro-1,1-difluoroethane	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2,3-Trichlorobenzene	ND		30.5	9.76	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2,3-Trichloropropane	ND		30.5	7.56	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2,4-Trichlorobenzene	ND		30.5	10.2	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2,4-Trimethylbenzene	ND		30.5	6.34	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2-Dibromo-3-Chloropropane	ND		61.0	10.7	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2-Dibromoethane (EDB)	ND		30.5	4.02	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2-dichloro-1,1-difluoroethane	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2-Dichlorobenzene	ND		30.5	5.37	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2-Dichloroethane	ND		30.5	5.12	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,2-Dichloropropane	ND		30.5	3.05	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,3,5-Trimethylbenzene	ND		30.5	6.34	ug/Sample		12/10/19 09:47	12/10/19 22:34	1

Client Sample ID: Y-2977 R3 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17557-2

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	ND		30.5	5.24	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,3-Dichloropropane	ND		30.5	3.41	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1,4-Dichlorobenzene	ND		30.5	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
1-Chloro-1,1-difluoroethane	ND		61.0	6.22	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
2,2-Dichloropropane	ND		30.5	8.90	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
2-Butanone (MEK)	ND		122	19.5	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		61.0	9.03	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
2-Chloro-1,1,1-Trifluoroethane	ND		61.0	6.10	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
2-Chlorotoluene	ND		30.5	5.73	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
2-Hexanone	ND		122	28.1	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
2-MTP as HFPO	**2430**	**E**	26.6	26.6	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
4-Chlorotoluene	ND		30.5	6.34	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
4-Isopropyltoluene	ND		30.5	8.17	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
4-Methyl-2-pentanone (MIBK)	ND		122	19.5	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Acetone	ND		122	72.0	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Benzene	ND		30.5	5.85	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Bromobenzene	ND		30.5	4.27	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Bromochloromethane	ND		30.5	6.83	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Bromodichloromethane	ND		30.5	5.24	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Bromoform	ND		30.5	9.27	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Bromomethane	ND		61.0	35.4	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Carbon disulfide	ND		30.5	7.56	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Carbon tetrachloride	ND		30.5	4.02	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Carbonyl Difluoride	ND		89.4	89.4	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Chlorobenzene	ND		30.5	4.39	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Chlorodibromomethane	ND		30.5	6.59	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Chloroethane	ND		61.0	13.4	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Chloroform	ND		30.5	3.54	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Chloromethane	ND		61.0	25.4	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
cis-1,2-Dichloroethene	ND		30.5	2.44	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
cis-1,3-Dichloropropene	ND		30.5	5.24	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Dibromomethane	ND		30.5	2.93	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Dichlorodifluoromethane	ND		61.0	10.7	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Ethylbenzene	ND		30.5	5.00	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**95.3**		30.5	30.5	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Hexachlorobutadiene	ND		30.5	8.05	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
HFPO dimer, methyl ester as HFPO-DA	ND		29.3	29.3	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Isopropylbenzene	ND		30.5	4.27	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
m,p-Xylene	ND		61.0	5.00	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Methylene Chloride	**21.1**	**J**	30.5	19.5	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Naphthalene	ND		30.5	14.6	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
n-Butylbenzene	ND		30.5	7.81	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
n-Propylbenzene	ND		30.5	6.59	ug/Sample		12/10/19 09:47	12/10/19 22:34	1

Client Sample ID: Y-2977 R3 VEN DIV STACK MM18 IMPINGER #2

Lab Sample ID: 140-17557-2

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND		30.5	3.17	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
sec-Butylbenzene	ND		30.5	5.98	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Styrene	ND		30.5	6.59	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
tert-Butylbenzene	ND		30.5	5.37	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Tetrachloroethene	ND		30.5	4.02	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Toluene	ND		30.5	5.61	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
trans-1,2-Dichloroethene	ND		30.5	3.17	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
trans-1,3-Dichloropropene	ND		30.5	10.7	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Trichloroethene	ND		30.5	2.20	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Trichlorofluoromethane	ND	*	61.0	5.85	ug/Sample		12/10/19 09:47	12/10/19 22:34	1
Vinyl chloride	ND		61.0	14.6	ug/Sample		12/10/19 09:47	12/10/19 22:34	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*596*	*T J*	*ug/Sample*		*1.13*		*12/10/19 09:47*	*12/10/19 22:34*	*1*
Unknown	*1110*	*T J*	*ug/Sample*		*1.18*		*12/10/19 09:47*	*12/10/19 22:34*	*1*
Unknown	*35.1*	*T J*	*ug/Sample*		*1.22*		*12/10/19 09:47*	*12/10/19 22:34*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*70 - 160*	*12/10/19 09:47*	*12/10/19 22:34*	*1*
4-Bromofluorobenzene (Surr)	*107*		*57 - 152*	*12/10/19 09:47*	*12/10/19 22:34*	*1*
Dibromofluoromethane (Surr)	*106*		*62 - 134*	*12/10/19 09:47*	*12/10/19 22:34*	*1*
Toluene-d8 (Surr)	*89*		*71 - 139*	*12/10/19 09:47*	*12/10/19 22:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-MTP as HFPO	**2230**		53.3	53.3	ug/Sample		12/10/19 09:47	12/11/19 16:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*70 - 160*	*12/10/19 09:47*	*12/11/19 16:29*	*1*
4-Bromofluorobenzene (Surr)	*108*		*57 - 152*	*12/10/19 09:47*	*12/11/19 16:29*	*1*
Dibromofluoromethane (Surr)	*97*		*62 - 134*	*12/10/19 09:47*	*12/11/19 16:29*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*12/10/19 09:47*	*12/11/19 16:29*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**32600**		6500	3250	ug/Sample		12/10/19 09:47	12/19/19 23:22	1
Hydrogen Fluoride	ND		2680	1220	ug/Sample		12/10/19 09:47	12/24/19 01:40	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.0**	**HF**			SU			12/17/19 13:37	1

Client Sample ID: Y-2978 R3 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17557-3

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		30.4	4.01	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1,1,3,3-Pentafluorobutane	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1,1-Trichloroethane	ND		30.4	4.38	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		60.8	12.0	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1,1-Trifluoroethane	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1,2,2-Tetrachloroethane	ND		30.4	5.83	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		60.8	3.40	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1,2-trichloro-1-fluoroethane	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1,2-Trichloroethane	ND		30.4	3.16	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1-Dichloro-1-fluoroethane	ND		60.8	30.4	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1-dichloro-2,2-difluoroethane	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1-dichloro-2,2-difluoroethene	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1-Dichloroethane	ND		30.4	3.65	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1-Dichloroethene	ND		30.4	4.50	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1-Dichloropropene	ND		30.4	3.28	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,1-Difluoroethene	ND		608	608	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2,2-trichloro-1,1-difluoroethane	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2,3-Trichlorobenzene	ND		30.4	9.72	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2,3-Trichloropropane	ND		30.4	7.53	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2,4-Trichlorobenzene	ND		30.4	10.2	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2,4-Trimethylbenzene	ND		30.4	6.32	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2-Dibromo-3-Chloropropane	ND		60.8	10.7	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2-Dibromoethane (EDB)	ND		30.4	4.01	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2-dichloro-1,1-difluoroethane	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2-Dichlorobenzene	ND		30.4	5.35	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2-Dichloroethane	ND		30.4	5.10	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,2-Dichloropropane	ND		30.4	3.04	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,3,5-Trimethylbenzene	ND		30.4	6.32	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,3-Dichlorobenzene	ND		30.4	5.23	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,3-Dichloropropane	ND		30.4	3.40	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1,4-Dichlorobenzene	ND		30.4	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
1-Chloro-1,1-difluoroethane	ND		60.8	6.20	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
2,2-Dichloropropane	ND		30.4	8.87	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
2-Butanone (MEK)	ND		122	19.4	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		60.8	8.99	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
2-Chloro-1,1,1-Trifluoroethane	ND		60.8	6.08	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
2-Chlorotoluene	ND		30.4	5.71	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
2-Hexanone	ND		122	28.0	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
2-MTP as HFPO	**2130**	**E**	26.6	26.6	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
4-Chlorotoluene	ND		30.4	6.32	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
4-Isopropyltoluene	ND		30.4	8.14	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
4-Methyl-2-pentanone (MIBK)	ND		122	19.4	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Acetone	ND		122	71.7	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Benzene	ND		30.4	5.83	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Bromobenzene	ND		30.4	4.25	ug/Sample		12/10/19 09:47	12/10/19 22:09	1

Client Sample ID: Y-2978 R3 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17557-3

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	ND		30.4	6.81	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Bromodichloromethane	ND		30.4	5.23	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Bromoform	ND		30.4	9.24	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Bromomethane	ND		60.8	35.2	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Carbon disulfide	ND		30.4	7.53	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Carbon tetrachloride	ND		30.4	4.01	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Carbonyl Difluoride	ND		89.4	89.4	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Chlorobenzene	ND		30.4	4.38	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Chlorodibromomethane	ND		30.4	6.56	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Chloroethane	ND		60.8	13.4	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Chloroform	ND		30.4	3.52	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Chloromethane	ND		60.8	25.3	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
cis-1,2-Dichloroethene	ND		30.4	2.43	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
cis-1,3-Dichloropropene	ND		30.4	5.23	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Dibromomethane	ND		30.4	2.92	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Dichlorodifluoromethane	ND		60.8	10.7	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Ethylbenzene	ND		30.4	4.98	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**33.4**		30.4	30.4	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Hexachlorobutadiene	ND		30.4	8.02	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
HFPO dimer, methyl ester as HFPO-DA	ND		29.2	29.2	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Isopropylbenzene	ND		30.4	4.25	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
m,p-Xylene	ND		60.8	4.98	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Methylene Chloride	**20.2**	**J**	30.4	19.4	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Naphthalene	ND		30.4	14.6	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
n-Butylbenzene	ND		30.4	7.78	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
n-Propylbenzene	ND		30.4	6.56	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
o-Xylene	ND		30.4	3.16	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
sec-Butylbenzene	ND		30.4	5.95	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Styrene	ND		30.4	6.56	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
tert-Butylbenzene	ND		30.4	5.35	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Tetrachloroethene	ND		30.4	4.01	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Toluene	ND		30.4	5.59	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
trans-1,2-Dichloroethene	ND		30.4	3.16	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
trans-1,3-Dichloropropene	ND		30.4	10.7	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Trichloroethene	ND		30.4	2.19	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Trichlorofluoromethane	ND	*	60.8	5.83	ug/Sample		12/10/19 09:47	12/10/19 22:09	1
Vinyl chloride	ND		60.8	14.6	ug/Sample		12/10/19 09:47	12/10/19 22:09	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*411*	*T J*	*ug/Sample*		*1.13*		*12/10/19 09:47*	*12/10/19 22:09*	*1*
Unknown	*747*	*T J*	*ug/Sample*		*1.18*		*12/10/19 09:47*	*12/10/19 22:09*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*70 - 160*	*12/10/19 09:47*	*12/10/19 22:09*	*1*
4-Bromofluorobenzene (Surr)	*107*		*57 - 152*	*12/10/19 09:47*	*12/10/19 22:09*	*1*
Dibromofluoromethane (Surr)	*103*		*62 - 134*	*12/10/19 09:47*	*12/10/19 22:09*	*1*

Client Sample ID: Y-2978 R3 VEN DIV STACK MM18 IMPINGER #3

Lab Sample ID: 140-17557-3

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*92*		*71 - 139*	*12/10/19 09:47*	*12/10/19 22:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-MTP as HFPO	**1970**		53.1	53.1	ug/Sample		12/10/19 09:47	12/11/19 16:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*70 - 160*	*12/10/19 09:47*	*12/11/19 16:53*	*1*
4-Bromofluorobenzene (Surr)	*108*		*57 - 152*	*12/10/19 09:47*	*12/11/19 16:53*	*1*
Dibromofluoromethane (Surr)	*98*		*62 - 134*	*12/10/19 09:47*	*12/11/19 16:53*	*1*
Toluene-d8 (Surr)	*95*		*71 - 139*	*12/10/19 09:47*	*12/11/19 16:53*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**13600**		6480	3240	ug/Sample		12/10/19 09:47	12/20/19 00:30	1
Hydrogen Fluoride	ND		2670	1220	ug/Sample		12/10/19 09:47	12/24/19 02:48	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.0**	**HF**			SU			12/17/19 13:37	1

Client Sample ID: Y-2979 R3 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17557-4

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		29.7	3.93	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1,1,3,3-Pentafluorobutane	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1,1-Trichloroethane	ND		29.7	4.28	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		59.5	11.8	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1,1-Trifluoroethane	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1,2,2-Tetrachloroethane	ND		29.7	5.71	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		59.5	3.33	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1,2-trichloro-1-fluoroethane	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1,2-Trichloroethane	ND		29.7	3.09	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1-Dichloro-1-fluoroethane	ND		59.5	29.7	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1-dichloro-2,2-difluoroethane	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1-dichloro-2,2-difluoroethene	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1-Dichloroethane	ND		29.7	3.57	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1-Dichloroethene	ND		29.7	4.40	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1-Dichloropropene	ND		29.7	3.21	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,1-Difluoroethene	ND		595	595	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2,2-trichloro-1,1-difluoroethane	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2,3-Trichlorobenzene	ND		29.7	9.52	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2,3-Trichloropropane	ND		29.7	7.38	ug/Sample		12/10/19 09:47	12/10/19 21:45	1

Client Sample ID: Y-2979 R3 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17557-4

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		29.7	10.0	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2,4-Trimethylbenzene	ND		29.7	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2-Dibromo-3-Chloropropane	ND		59.5	10.5	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2-Dibromoethane (EDB)	ND		29.7	3.93	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2-dichloro-1,1-difluoroethane	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2-Dichlorobenzene	ND		29.7	5.24	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2-Dichloroethane	ND		29.7	5.00	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,2-Dichloropropane	ND		29.7	2.97	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,3,5-Trimethylbenzene	ND		29.7	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,3-Dichlorobenzene	ND		29.7	5.12	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,3-Dichloropropane	ND		29.7	3.33	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1,4-Dichlorobenzene	ND		29.7	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
1-Chloro-1,1-difluoroethane	ND		59.5	6.07	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
2,2-Dichloropropane	ND		29.7	8.69	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
2-Butanone (MEK)	ND		119	19.0	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		59.5	8.81	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
2-Chloro-1,1,1-Trifluoroethane	ND		59.5	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
2-Chlorotoluene	ND		29.7	5.59	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
2-Hexanone	ND		119	27.4	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
2-MTP as HFPO	**2560**	**E**	25.9	25.9	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
4-Chlorotoluene	ND		29.7	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
4-Isopropyltoluene	ND		29.7	7.97	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
4-Methyl-2-pentanone (MIBK)	ND		119	19.0	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Acetone	ND		119	70.2	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Benzene	ND		29.7	5.71	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Bromobenzene	ND		29.7	4.16	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Bromochloromethane	ND		29.7	6.66	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Bromodichloromethane	ND		29.7	5.12	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Bromoform	ND		29.7	9.04	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Bromomethane	ND		59.5	34.5	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Carbon disulfide	ND		29.7	7.38	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Carbon tetrachloride	ND		29.7	3.93	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Carbonyl Difluoride	ND		87.2	87.2	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Chlorobenzene	ND		29.7	4.28	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Chlorodibromomethane	ND		29.7	6.43	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Chloroethane	ND		59.5	13.1	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Chloroform	ND		29.7	3.45	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Chloromethane	ND		59.5	24.7	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
cis-1,2-Dichloroethene	ND		29.7	2.38	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
cis-1,3-Dichloropropene	ND		29.7	5.12	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Dibromomethane	ND		29.7	2.86	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Dichlorodifluoromethane	ND		59.5	10.5	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Ethylbenzene	ND		29.7	4.88	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		29.7	29.7	ug/Sample		12/10/19 09:47	12/10/19 21:45	1

Client Sample ID: Y-2979 R3 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17557-4

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorobutadiene	ND		29.7	7.85	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
HFPO dimer, methyl ester as HFPO-DA	ND		28.5	28.5	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Isopropylbenzene	ND		29.7	4.16	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
m,p-Xylene	ND		59.5	4.88	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Methylene Chloride	**20.0**	**J**	29.7	19.0	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Naphthalene	ND		29.7	14.3	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
n-Butylbenzene	ND		29.7	7.62	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
n-Propylbenzene	ND		29.7	6.43	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
o-Xylene	ND		29.7	3.09	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
sec-Butylbenzene	ND		29.7	5.83	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Styrene	ND		29.7	6.43	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
tert-Butylbenzene	ND		29.7	5.24	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Tetrachloroethene	ND		29.7	3.93	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Toluene	ND		29.7	5.47	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
trans-1,2-Dichloroethene	ND		29.7	3.09	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
trans-1,3-Dichloropropene	ND		29.7	10.5	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Trichloroethene	ND		29.7	2.14	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Trichlorofluoromethane	ND	*	59.5	5.71	ug/Sample		12/10/19 09:47	12/10/19 21:45	1
Vinyl chloride	ND		59.5	14.3	ug/Sample		12/10/19 09:47	12/10/19 21:45	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Butanoic acid, heptafluoro-, sodium salt	*545*	*T J N*	*ug/Sample*		*1.13*	*2218-54-4*	*12/10/19 09:47*	*12/10/19 21:45*	*1*
Propane, 1,1,1,2,2,3,3-heptafluoro-3-[(trifluoroethenyl)oxy]	*761*	*T J N*	*ug/Sample*		*1.18*	*1623-05-8*	*12/10/19 09:47*	*12/10/19 21:45*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*70 - 160*	*12/10/19 09:47*	*12/10/19 21:45*	*1*
4-Bromofluorobenzene (Surr)	*110*		*57 - 152*	*12/10/19 09:47*	*12/10/19 21:45*	*1*
Dibromofluoromethane (Surr)	*107*		*62 - 134*	*12/10/19 09:47*	*12/10/19 21:45*	*1*
Toluene-d8 (Surr)	*91*		*71 - 139*	*12/10/19 09:47*	*12/10/19 21:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-MTP as HFPO	**2330**		65.0	65.0	ug/Sample		12/10/19 09:47	12/11/19 17:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*70 - 160*	*12/10/19 09:47*	*12/11/19 17:18*	*1*
4-Bromofluorobenzene (Surr)	*107*		*57 - 152*	*12/10/19 09:47*	*12/11/19 17:18*	*1*
Dibromofluoromethane (Surr)	*98*		*62 - 134*	*12/10/19 09:47*	*12/11/19 17:18*	*1*
Toluene-d8 (Surr)	*95*		*71 - 139*	*12/10/19 09:47*	*12/11/19 17:18*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**5730**	**J**	6350	3170	ug/Sample		12/10/19 09:47	12/20/19 00:53	1
Hydrogen Fluoride	ND		2620	1190	ug/Sample		12/10/19 09:47	12/24/19 03:56	20

Client Sample ID: Y-2979 R3 VEN DIV STACK MM18 IMPINGER #4

Lab Sample ID: 140-17557-4

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.0	HF			SU			12/17/19 13:37	1

Client Sample ID: Y-2980 R3 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17557-5

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		31.0	4.09	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1,1,3,3-Pentafluorobutane	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1,1-Trichloroethane	ND		31.0	4.46	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		61.9	12.3	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1,1-Trifluoroethane	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1,2,2-Tetrachloroethane	ND		31.0	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		61.9	3.47	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1,2-trichloro-1-fluoroethane	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1,2-Trichloroethane	ND		31.0	3.22	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1-Dichloro-1-fluoroethane	ND		61.9	31.0	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1-dichloro-2,2-difluoroethane	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1-dichloro-2,2-difluoroethene	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1-Dichloroethane	ND		31.0	3.72	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1-Dichloroethene	ND		31.0	4.58	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1-Dichloropropene	ND		31.0	3.34	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,1-Difluoroethene	ND		619	619	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2,2-trichloro-1,1-difluoroethane	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2,3-Trichlorobenzene	ND		31.0	9.91	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2,3-Trichloropropane	ND		31.0	7.68	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2,4-Trichlorobenzene	ND		31.0	10.4	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2,4-Trimethylbenzene	ND		31.0	6.44	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2-Dibromo-3-Chloropropane	ND		61.9	10.9	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2-Dibromoethane (EDB)	ND		31.0	4.09	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2-dichloro-1,1-difluoroethane	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2-Dichlorobenzene	ND		31.0	5.45	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2-Dichloroethane	ND		31.0	5.20	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,2-Dichloropropane	ND		31.0	3.10	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,3,5-Trimethylbenzene	ND		31.0	6.44	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,3-Dichlorobenzene	ND		31.0	5.33	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,3-Dichloropropane	ND		31.0	3.47	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1,4-Dichlorobenzene	ND		31.0	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
1-Chloro-1,1-difluoroethane	ND		61.9	6.32	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
2,2-Dichloropropane	ND		31.0	9.04	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
2-Butanone (MEK)	ND		124	19.8	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		61.9	9.17	ug/Sample		12/10/19 09:47	12/10/19 21:20	1

Client Sample ID: Y-2980 R3 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17557-5

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloro-1,1,1-Trifluoroethane	ND		61.9	6.19	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
2-Chlorotoluene	ND		31.0	5.82	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
2-Hexanone	ND		124	28.5	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
2-MTP as HFPO	**2070**		27.1	27.1	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
4-Chlorotoluene	ND		31.0	6.44	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
4-Isopropyltoluene	ND		31.0	8.30	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
4-Methyl-2-pentanone (MIBK)	ND		124	19.8	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Acetone	ND		124	73.1	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Benzene	ND		31.0	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Bromobenzene	ND		31.0	4.34	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Bromochloromethane	ND		31.0	6.94	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Bromodichloromethane	ND		31.0	5.33	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Bromoform	ND		31.0	9.41	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Bromomethane	ND		61.9	35.9	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Carbon disulfide	ND		31.0	7.68	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Carbon tetrachloride	ND		31.0	4.09	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Carbonyl Difluoride	ND		90.9	90.9	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Chlorobenzene	ND		31.0	4.46	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Chlorodibromomethane	ND		31.0	6.69	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Chloroethane	ND		61.9	13.6	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Chloroform	ND		31.0	3.59	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Chloromethane	ND		61.9	25.8	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
cis-1,2-Dichloroethene	ND		31.0	2.48	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
cis-1,3-Dichloropropene	ND		31.0	5.33	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Dibromomethane	ND		31.0	2.97	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Dichlorodifluoromethane	ND		61.9	10.9	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Ethylbenzene	ND		31.0	5.08	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		31.0	31.0	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Hexachlorobutadiene	ND		31.0	8.18	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
HFPO dimer, methyl ester as HFPO-DA	ND		29.7	29.7	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Isopropylbenzene	ND		31.0	4.34	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
m,p-Xylene	ND		61.9	5.08	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Methylene Chloride	ND		31.0	19.8	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Naphthalene	ND		31.0	14.9	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
n-Butylbenzene	ND		31.0	7.93	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
n-Propylbenzene	ND		31.0	6.69	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
o-Xylene	ND		31.0	3.22	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
sec-Butylbenzene	ND		31.0	6.07	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Styrene	ND		31.0	6.69	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
tert-Butylbenzene	ND		31.0	5.45	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Tetrachloroethene	ND		31.0	4.09	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Toluene	ND		31.0	5.70	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
trans-1,2-Dichloroethene	ND		31.0	3.22	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
trans-1,3-Dichloropropene	ND		31.0	10.9	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Trichloroethene	ND		31.0	2.23	ug/Sample		12/10/19 09:47	12/10/19 21:20	1
Trichlorofluoromethane	ND	*	61.9	5.95	ug/Sample		12/10/19 09:47	12/10/19 21:20	1

Client Sample ID: Y-2980 R3 VEN DIV STACK MM18 IMPINGER #5

Lab Sample ID: 140-17557-5

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		61.9	14.9	ug/Sample		12/10/19 09:47	12/10/19 21:20	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Propene, hexafluoro-	*445*	*T J N*	*ug/Sample*		*1.13*	*116-15-4*	*12/10/19 09:47*	*12/10/19 21:20*	*1*
Unknown	*454*	*T J*	*ug/Sample*		*1.18*		*12/10/19 09:47*	*12/10/19 21:20*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*12/10/19 09:47*	*12/10/19 21:20*	*1*
4-Bromofluorobenzene (Surr)	*108*		*57 - 152*	*12/10/19 09:47*	*12/10/19 21:20*	*1*
Dibromofluoromethane (Surr)	*105*		*62 - 134*	*12/10/19 09:47*	*12/10/19 21:20*	*1*
Toluene-d8 (Surr)	*91*		*71 - 139*	*12/10/19 09:47*	*12/10/19 21:20*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**5710**	**J**	6610	3300	ug/Sample		12/10/19 09:47	12/20/19 01:16	1
Hydrogen Fluoride	ND		2730	1240	ug/Sample		12/10/19 09:47	12/24/19 04:19	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.0**	**HF**			SU			12/17/19 13:37	1

Client Sample ID: Y-2981 R3 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17557-6

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		30.1	3.97	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1,1,3,3-Pentafluorobutane	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1,1-Trichloroethane	ND		30.1	4.33	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		60.1	11.9	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1,1-Trifluoroethane	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1,2,2-Tetrachloroethane	ND		30.1	5.77	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		60.1	3.37	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1,2-trichloro-1-fluoroethane	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1,2-Trichloroethane	ND		30.1	3.13	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1-Dichloro-1-fluoroethane	ND		60.1	30.1	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1-dichloro-2,2-difluoroethane	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1-dichloro-2,2-difluoroethene	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1-Dichloroethane	ND		30.1	3.61	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1-Dichloroethene	ND		30.1	4.45	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1-Dichloropropene	ND		30.1	3.25	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,1-Difluoroethene	ND		601	601	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2,2-trichloro-1,1-difluoroethane	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2,3-Trichlorobenzene	ND		30.1	9.62	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2,3-Trichloropropane	ND		30.1	7.45	ug/Sample		12/10/19 09:47	12/10/19 20:56	1

Client Sample ID: Y-2981 R3 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17557-6

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	ND		30.1	10.1	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2,4-Trimethylbenzene	ND		30.1	6.25	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2-Dibromo-3-Chloropropane	ND		60.1	10.6	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2-Dibromoethane (EDB)	ND		30.1	3.97	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2-dichloro-1,1-difluoroethane	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2-Dichlorobenzene	ND		30.1	5.29	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2-Dichloroethane	ND		30.1	5.05	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,2-Dichloropropane	ND		30.1	3.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,3,5-Trimethylbenzene	ND		30.1	6.25	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,3-Dichlorobenzene	ND		30.1	5.17	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,3-Dichloropropane	ND		30.1	3.37	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1,4-Dichlorobenzene	ND		30.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
1-Chloro-1,1-difluoroethane	ND		60.1	6.13	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
2,2-Dichloropropane	ND		30.1	8.78	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
2-Butanone (MEK)	ND		120	19.2	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		60.1	8.90	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
2-Chloro-1,1,1-Trifluoroethane	ND		60.1	6.01	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
2-Chlorotoluene	ND		30.1	5.65	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
2-Hexanone	ND		120	27.7	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
2-MTP as HFPO	**2550**	**E**	26.3	26.3	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
4-Chlorotoluene	ND		30.1	6.25	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
4-Isopropyltoluene	ND		30.1	8.06	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
4-Methyl-2-pentanone (MIBK)	ND		120	19.2	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Acetone	ND		120	70.9	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Benzene	ND		30.1	5.77	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Bromobenzene	ND		30.1	4.21	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Bromochloromethane	ND		30.1	6.73	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Bromodichloromethane	ND		30.1	5.17	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Bromoform	ND		30.1	9.14	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Bromomethane	ND		60.1	34.9	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Carbon disulfide	ND		30.1	7.45	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Carbon tetrachloride	ND		30.1	3.97	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Carbonyl Difluoride	ND		87.9	87.9	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Chlorobenzene	ND		30.1	4.33	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Chlorodibromomethane	ND		30.1	6.49	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Chloroethane	ND		60.1	13.2	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Chloroform	ND		30.1	3.49	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Chloromethane	ND		60.1	25.0	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
cis-1,2-Dichloroethene	ND		30.1	2.40	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
cis-1,3-Dichloropropene	ND		30.1	5.17	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Dibromomethane	ND		30.1	2.89	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Dichlorodifluoromethane	ND		60.1	10.6	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Ethylbenzene	ND		30.1	4.93	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		30.1	30.1	ug/Sample		12/10/19 09:47	12/10/19 20:56	1

Client Sample ID: Y-2981 R3 VEN DIV STACK MM18 IMPINGER #6

Lab Sample ID: 140-17557-6

Date Collected: 12/04/19 00:00
Date Received: 12/07/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hexachlorobutadiene	ND		30.1	7.94	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
HFPO dimer, methyl ester as HFPO-DA	ND		28.9	28.9	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Isopropylbenzene	ND		30.1	4.21	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
m,p-Xylene	ND		60.1	4.93	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Methylene Chloride	ND		30.1	19.2	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Naphthalene	ND		30.1	14.4	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
n-Butylbenzene	ND		30.1	7.70	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
n-Propylbenzene	ND		30.1	6.49	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
o-Xylene	ND		30.1	3.13	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
sec-Butylbenzene	ND		30.1	5.89	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Styrene	ND		30.1	6.49	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
tert-Butylbenzene	ND		30.1	5.29	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Tetrachloroethene	ND		30.1	3.97	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Toluene	ND		30.1	5.53	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
trans-1,2-Dichloroethene	ND		30.1	3.13	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
trans-1,3-Dichloropropene	ND		30.1	10.6	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Trichloroethene	ND		30.1	2.16	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Trichlorofluoromethane	ND	*	60.1	5.77	ug/Sample		12/10/19 09:47	12/10/19 20:56	1
Vinyl chloride	ND		60.1	14.4	ug/Sample		12/10/19 09:47	12/10/19 20:56	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Propene, hexafluoro-	*408*	*T J N*	*ug/Sample*		*1.13*	*116-15-4*	*12/10/19 09:47*	*12/10/19 20:56*	*1*
Unknown	*418*	*T J*	*ug/Sample*		*1.18*		*12/10/19 09:47*	*12/10/19 20:56*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*70 - 160*	*12/10/19 09:47*	*12/10/19 20:56*	*1*
4-Bromofluorobenzene (Surr)	*111*		*57 - 152*	*12/10/19 09:47*	*12/10/19 20:56*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*12/10/19 09:47*	*12/10/19 20:56*	*1*
Toluene-d8 (Surr)	*92*		*71 - 139*	*12/10/19 09:47*	*12/10/19 20:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-MTP as HFPO	**2350**		65.7	65.7	ug/Sample		12/10/19 09:47	12/11/19 17:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*70 - 160*	*12/10/19 09:47*	*12/11/19 17:42*	*1*
4-Bromofluorobenzene (Surr)	*107*		*57 - 152*	*12/10/19 09:47*	*12/11/19 17:42*	*1*
Dibromofluoromethane (Surr)	*98*		*62 - 134*	*12/10/19 09:47*	*12/11/19 17:42*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*12/10/19 09:47*	*12/11/19 17:42*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**4990**	**J**	6410	3210	ug/Sample		12/10/19 09:47	12/20/19 01:38	1
Hydrogen Fluoride	ND		2650	1200	ug/Sample		12/10/19 09:47	12/24/19 04:42	20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**5.0**	**HF**			SU			12/17/19 13:39	1

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: VEN Stack - MM-18

Job ID: 140-17557-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Prep: MeOH Prep

Analyte	RL	MDL	Units
1,1,1,2-Tetrachloroethane	2.50	0.330	ug/Sample
1,1,1,3,3-Pentafluorobutane	5.00	0.500	ug/Sample
1,1,1-Trichloroethane	2.50	0.360	ug/Sample
1,1,1-Trifluoro-2,2-dichloroethane	5.00	0.990	ug/Sample
1,1,1-Trifluoroethane	5.00	0.500	ug/Sample
1,1,2,2-Tetrachloroethane	2.50	0.480	ug/Sample
1,1,2-Trichloro-1,2,2-trifluoroethane	5.00	0.280	ug/Sample
1,1,2-trichloro-1-fluoroethane	5.00	0.500	ug/Sample
1,1,2-Trichloroethane	2.50	0.260	ug/Sample
1,1-Dichloro-1-fluoroethane	5.00	2.50	ug/Sample
1,1-dichloro-2,2-difluoroethane	5.00	0.500	ug/Sample
1,1-dichloro-2,2-difluoroethene	5.00	0.500	ug/Sample
1,1-Dichloroethane	2.50	0.300	ug/Sample
1,1-Dichloroethene	2.50	0.370	ug/Sample
1,1-Dichloropropene	2.50	0.270	ug/Sample
1,1-Difluoroethene	50.0	50.0	ug/Sample
1,2,2-trichloro-1,1-difluoroethane	5.00	0.500	ug/Sample
1,2,3-Trichlorobenzene	2.50	0.800	ug/Sample
1,2,3-Trichloropropane	2.50	0.620	ug/Sample
1,2,4-Trichlorobenzene	2.50	0.840	ug/Sample
1,2,4-Trimethylbenzene	2.50	0.520	ug/Sample
1,2-Dibromo-3-Chloropropane	5.00	0.880	ug/Sample
1,2-Dibromoethane (EDB)	2.50	0.330	ug/Sample
1,2-dichloro-1,1-difluoroethane	5.00	0.500	ug/Sample
1,2-Dichlorobenzene	2.50	0.440	ug/Sample
1,2-Dichloroethane	2.50	0.420	ug/Sample
1,2-Dichloropropane	2.50	0.250	ug/Sample
1,3,5-Trimethylbenzene	2.50	0.520	ug/Sample
1,3-Dichlorobenzene	2.50	0.430	ug/Sample
1,3-Dichloropropane	2.50	0.280	ug/Sample
1,4-Dichlorobenzene	2.50	0.500	ug/Sample
1-Chloro-1,1-difluoroethane	5.00	0.510	ug/Sample
2,2-dichloro-1,1-difluoroethylmethyl ether	5.00	0.500	ug/Sample
2,2-Dichloropropane	2.50	0.730	ug/Sample
2-Butanone (MEK)	10.0	1.60	ug/Sample
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	5.00	0.740	ug/Sample
2-Chloro-1,1,1-Trifluoroethane	5.00	0.500	ug/Sample
2-Chlorotoluene	2.50	0.470	ug/Sample
2-Hexanone	10.0	2.30	ug/Sample
2-MTP as HFPO	2.50	2.50	ug/Sample
4-Chlorotoluene	2.50	0.520	ug/Sample
4-Isopropyltoluene	2.50	0.670	ug/Sample
4-Methyl-2-pentanone (MIBK)	10.0	1.60	ug/Sample
Acetone	10.0	5.90	ug/Sample
Benzene	2.50	0.480	ug/Sample
Bromobenzene	2.50	0.350	ug/Sample
Bromochloromethane	2.50	0.560	ug/Sample
Bromodichloromethane	2.50	0.430	ug/Sample
Bromoform	2.50	0.760	ug/Sample
Bromomethane	5.00	2.90	ug/Sample
Carbon disulfide	2.50	0.620	ug/Sample
Carbon tetrachloride	2.50	0.330	ug/Sample

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

Prep: MeOH Prep

Analyte	RL	MDL	Units
Carbonyl Difluoride	10.0	10.0	ug/Sample
Chlorobenzene	2.50	0.360	ug/Sample
Chlorodibromomethane	2.50	0.540	ug/Sample
Chloroethane	5.00	1.10	ug/Sample
Chloroform	2.50	0.290	ug/Sample
Chloromethane	5.00	2.08	ug/Sample
cis-1,2-Dichloroethene	2.50	0.200	ug/Sample
cis-1,3-Dichloropropene	2.50	0.430	ug/Sample
Dibromomethane	2.50	0.240	ug/Sample
Dichlorodifluoromethane	5.00	0.880	ug/Sample
Ethylbenzene	2.50	0.410	ug/Sample
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	2.50	2.50	ug/Sample
Hexachlorobutadiene	2.50	0.660	ug/Sample
HFPO dimer, methyl ester as HFPO-DA	2.50	2.50	ug/Sample
Isopropylbenzene	2.50	0.350	ug/Sample
m,p-Xylene	5.00	0.410	ug/Sample
Methylene Chloride	2.50	1.60	ug/Sample
Naphthalene	2.50	1.20	ug/Sample
n-Butylbenzene	2.50	0.640	ug/Sample
n-Propylbenzene	2.50	0.540	ug/Sample
o-Xylene	2.50	0.260	ug/Sample
sec-Butylbenzene	2.50	0.490	ug/Sample
Styrene	2.50	0.540	ug/Sample
tert-Butylbenzene	2.50	0.440	ug/Sample
Tetrachloroethene	2.50	0.330	ug/Sample
Toluene	2.50	0.460	ug/Sample
trans-1,2-Dichloroethene	2.50	0.260	ug/Sample
trans-1,3-Dichloropropene	2.50	0.880	ug/Sample
Trichloroethene	2.50	0.180	ug/Sample
Trichlorofluoromethane	5.00	0.480	ug/Sample
Vinyl chloride	5.00	1.20	ug/Sample

Method: 9056 - Anions, Ion Chromatography

Prep: MeOH Prep

Analyte	RL	MDL	Units
Hydrogen Fluoride	11.0	5.00	ug/Sample
Total Fluorine	1000	500	ug/Sample

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ANALYTICAL REPORT

Job Number: 140-17462-1

Job Description: VEN MM-18 Field QC

Contract Number: LBIO-67048

For:
Chemours Company FC, LLC The
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, DE 19713

Attention: Michael Aucoin

Approved for release.
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12/23/2019 3:02 PM

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12/23/2019

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS VOA TICs

Qualifier	Qualifier Description
J	Indicates an Estimated Value for TICs
N	Presumptive evidence of material.
T	Result is a tentatively identified compound (TIC) and an estimated value.

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

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

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN MM-18 Field QC

Job ID: 140-17462-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL KNX
9056	Anions, Ion Chromatography	SW846	TAL KNX
8321A	PFOA and PFOS	SW846	TAL DEN
9041A	pH	SW846	TAL KNX
5050	Bomb Preparation Method for Solid Waste	SW846	TAL KNX
MeOH Prep	Methanol Impinger Preparation	None	TAL KNX
None	Leaching Procedure	TAL SOP	TAL DEN

Protocol References:

None = None

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

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN MM-18 Field QC

Job ID: 140-17462-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER # BT	Air	11/22/19 00:00	11/25/19 08:00	
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER # BT	Air	11/22/19 00:00	11/25/19 08:00	
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER # BT	Air	11/22/19 00:00	11/25/19 08:00	
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER # BT	Air	11/22/19 00:00	11/25/19 08:00	
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER # BT	Air	11/22/19 00:00	11/25/19 08:00	
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER # BT	Air	11/22/19 00:00	11/25/19 08:00	
140-17462-7	A-5786 QC MEOH RB	Air	11/22/19 00:00	11/25/19 08:00	
140-17462-8	A-5787 QC MEOH TB	Air	11/22/19 00:00	11/25/19 08:00	
140-17462-9	A-5788 QC MEOH PB	Air	11/22/19 00:00	11/25/19 08:00	

Job Narrative
140-17462-1

Sample Receipt

The samples were received on November 25, 2019 at 8:00 AM in good condition and properly preserved. The temperature of the cooler at receipt was 3.3º C.

GC/MS VOA

Impinger Sample Preparation and Analysis: Impinger samples were analyzed for the volatile organic target analytes by purge and trap GCMS using Eurofins TestAmerica Knoxville standard operating procedure KNOX-MS-0015, based on the following method:

· SW-846 8260B, "Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS)"

Each sample is prepared by adding a known amount of sample to the purge water in a purge and trap vessel and spiking with internal standards, surrogates, and matrix spike analytes (as needed). Volatile compounds are introduced into the gas chromatograph by the purge and trap method. The components are separated using the chromatograph and detected using a mass spectrometer, which provides both qualitative and quantitative information.

Impinger sample results were calculated using the following equation:

Concentration, µg/sample = (C × DF × W × Vt) / (Va)
Where:
C = On-column concentration, µg/L
DF = Dilution factor
W = Volume of water purged, L
Vt = Methanol extract final volume, µL
Va = Volume of extract analyzed, µL

Method 8260B: The following analyte(s) recovered outside control limits, but within marginal exceedance limits, for the LCS associated with batch 140-35880: Trichlorofluoromethane. This is not indicative of a systematic control problem because these were random marginal exceedances. Qualified results have been reported.

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

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

General Chemistry
Total Chlorine: The samples were prepared for total chlorine using SOP number KNOX-WC-0016 (based on ASTM Method E442 and SW-846 Method 5050). The sample is oxidized by combustion in an oxygen flask at atmospheric pressure or a bomb containing oxygen under pressure. The liberated halogen compounds are absorbed primarily as halides in a sodium carbonate/sodium bicarbonate buffer solution. The combustion products are collected by repeated rinsing of the combustion apparatus, and analyzed by ion chromatography in accordance with SOP KNOX- WC-0005 (based on SW-846 Method 9056). The results are calculated using the following equation:

C = [(Ccom × Vcom) / W] × 1000 g/Kg

Where:
C = Concentration of analyte in the sample, mg/Kg
Ccom = Concentration of analyte in the combustate, mg/L
Vcom = Total volume of combustate, L
W = Weight of sample combusted, g

Anions in Impinger Solutions: Anions are is determined in accordance to SOP KNOX-WC-0005 (based on methods 300.0A and 9056). The samples were diluted a minimum of 1/20 in ion chromatography solvent buffer solution to reduce the methanol concentration before injection. Buffer concentrate was added until the pH was 10. Samples are diluted with ion chromatography eluate solution to bring the concentrations within the calibration range when necessary. Higher dilutions are applied as necessary.

An aliquot of prepared sample is introduced into the ion chromatograph. Anions are identified based on their retention times as compared to those of known standards. Quantification is accomplished by measuring the peak response and comparing it to a calibration curve generated from known standards.

The pH of all samples were tested with pH paper. QC consisted of initial CCV and LCS which also serve as initial calibration, duplicate analysis for every 10 samples, and closing CCV. A certified thermometer was used to check the ambient temperature.

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

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

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

GC/MS VOA

Prep Batch: 35705

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	MeOH Prep	
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	MeOH Prep	
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	MeOH Prep	
MB 140-35705/2-A	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-35705/1-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
140-17462-2 MS	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-2 MSD	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	

Analysis Batch: 35880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35705
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35705
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35705
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35705
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35705
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35705
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	8260B	35705
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	8260B	35705
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	8260B	35705
MB 140-35705/2-A	Method Blank	Total/NA	Air	8260B	35705
LCS 140-35705/1-A	Lab Control Sample	Total/NA	Air	8260B	35705
LCS 140-35705/1-A	Lab Control Sample	Total/NA	Air	8260B	35705
140-17462-2 MS	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35705
140-17462-2 MSD	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8260B	35705

HPLC/IC

Prep Batch: 35705

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	MeOH Prep	
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	MeOH Prep	
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	MeOH Prep	
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	MeOH Prep	
MB 140-35705/14-A	Method Blank	Total/NA	Air	MeOH Prep	
MB 140-35705/14-B	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-35705/15-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
LCS 140-35705/15-B	Lab Control Sample	Total/NA	Air	MeOH Prep	
LCSD 140-35705/16-A	Lab Control Sample Dup	Total/NA	Air	MeOH Prep	
LCSD 140-35705/16-B	Lab Control Sample Dup	Total/NA	Air	MeOH Prep	

QC Association Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN MM-18 Field QC

Job ID: 140-17462-1

HPLC/IC

Prep Batch: 35762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35705
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35705
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35705
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35705
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35705
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	5050	35705
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	5050	35705
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	5050	35705
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	5050	35705
MB 140-35705/14-B	Method Blank	Total/NA	Air	5050	35705
LCS 140-35705/15-B	Lab Control Sample	Total/NA	Air	5050	35705
LCSD 140-35705/16-B	Lab Control Sample Dup	Total/NA	Air	5050	35705

Analysis Batch: 36121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35762
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	9056	35762
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	9056	35762
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	9056	35762
MB 140-35705/14-B	Method Blank	Total/NA	Air	9056	35762
LCS 140-35705/15-B	Lab Control Sample	Total/NA	Air	9056	35762
LCSD 140-35705/16-B	Lab Control Sample Dup	Total/NA	Air	9056	35762

Analysis Batch: 36210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35705
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35705
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35705
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35705
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35705
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9056	35705
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	9056	35705
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	9056	35705
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	9056	35705
MB 140-35705/14-A	Method Blank	Total/NA	Air	9056	35705
LCS 140-35705/15-A	Lab Control Sample	Total/NA	Air	9056	35705
LCSD 140-35705/16-A	Lab Control Sample Dup	Total/NA	Air	9056	35705

LCMS

Analysis Batch: 464589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-464589/13	Lab Control Sample	Total/NA	Air	8321A	

QC Association Summary

Client: Chemours Company FC, LLC The
Project/Site: VEN MM-18 Field QC

Job ID: 140-17462-1

LCMS

Prep Batch: 479505

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	None	
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	None	
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	None	
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	None	
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	None	
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	None	
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	None	
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	None	
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	None	
MB 280-479505/1-A	Method Blank	Total/NA	Air	None	
LCS 280-479505/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-479505/3-A	Lab Control Sample Dup	Total/NA	Air	None	

Analysis Batch: 479931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8321A	479505
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8321A	479505
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8321A	479505
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8321A	479505
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8321A	479505
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	8321A	479505
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	8321A	479505
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	8321A	479505
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	8321A	479505
MB 280-479505/1-A	Method Blank	Total/NA	Air	8321A	479505
LCS 280-479505/2-A	Lab Control Sample	Total/NA	Air	8321A	479505
LCSD 280-479505/3-A	Lab Control Sample Dup	Total/NA	Air	8321A	479505

General Chemistry

Analysis Batch: 36086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-17462-1	A-5780 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17462-2	A-5781 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17462-3	A-5782 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17462-4	A-5783 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17462-5	A-5784 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17462-6	A-5785 QC VEN DIV STACK MM18 IMPINGER #	Total/NA	Air	9041A	
140-17462-7	A-5786 QC MEOH RB	Total/NA	Air	9041A	
140-17462-8	A-5787 QC MEOH TB	Total/NA	Air	9041A	
140-17462-9	A-5788 QC MEOH PB	Total/NA	Air	9041A	
LCS 140-36086/2	Lab Control Sample	Total/NA	Air	9041A	

Client Sample ID: A-5780 QC VEN DIV STACK MM18 IMPINGER #1 BT

Lab Sample ID: 140-17462-1

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		28.7	3.79	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1,1,3,3-Pentafluorobutane	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1,1-Trichloroethane	ND		28.7	4.13	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		57.4	11.4	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1,1-Trifluoroethane	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1,2,2-Tetrachloroethane	ND		28.7	5.51	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		57.4	3.21	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1,2-trichloro-1-fluoroethane	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1,2-Trichloroethane	ND		28.7	2.98	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1-Dichloro-1-fluoroethane	ND		57.4	28.7	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1-dichloro-2,2-difluoroethane	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1-dichloro-2,2-difluoroethene	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1-Dichloroethane	ND		28.7	3.44	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1-Dichloroethene	ND		28.7	4.25	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1-Dichloropropene	ND		28.7	3.10	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,1-Difluoroethene	ND		574	574	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2,2-trichloro-1,1-difluoroethane	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2,3-Trichlorobenzene	ND		28.7	9.18	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2,3-Trichloropropane	ND		28.7	7.12	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2,4-Trichlorobenzene	ND		28.7	9.64	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2,4-Trimethylbenzene	ND		28.7	5.97	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2-Dibromo-3-Chloropropane	ND		57.4	10.1	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2-Dibromoethane (EDB)	ND		28.7	3.79	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2-dichloro-1,1-difluoroethane	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2-Dichlorobenzene	ND		28.7	5.05	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2-Dichloroethane	ND		28.7	4.82	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,2-Dichloropropane	ND		28.7	2.87	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,3,5-Trimethylbenzene	ND		28.7	5.97	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,3-Dichlorobenzene	ND		28.7	4.94	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,3-Dichloropropane	ND		28.7	3.21	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1,4-Dichlorobenzene	ND		28.7	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
1-Chloro-1,1-difluoroethane	ND		57.4	5.85	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
2,2-Dichloropropane	ND		28.7	8.38	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
2-Butanone (MEK)	ND		115	18.4	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		57.4	8.49	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
2-Chloro-1,1,1-Trifluoroethane	ND		57.4	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
2-Chlorotoluene	ND		28.7	5.40	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
2-Hexanone	ND		115	26.4	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
2-MTP as HFPO	ND		25.1	25.1	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
4-Chlorotoluene	ND		28.7	5.97	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
4-Isopropyltoluene	ND		28.7	7.69	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
4-Methyl-2-pentanone (MIBK)	ND		115	18.4	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Acetone	ND		115	67.7	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Benzene	ND		28.7	5.51	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Bromobenzene	ND		28.7	4.02	ug/Sample		11/29/19 10:45	12/06/19 15:17	1

Client Sample ID: A-5780 QC VEN DIV STACK MM18 IMPINGER #1 BT

Lab Sample ID: 140-17462-1

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromochloromethane	ND		28.7	6.43	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Bromodichloromethane	ND		28.7	4.94	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Bromoform	ND		28.7	8.72	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Bromomethane	ND		57.4	33.3	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Carbon disulfide	ND		28.7	7.12	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Carbon tetrachloride	ND		28.7	3.79	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Carbonyl Difluoride	ND		84.3	84.3	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Chlorobenzene	ND		28.7	4.13	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Chlorodibromomethane	ND		28.7	6.20	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Chloroethane	ND		57.4	12.6	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Chloroform	ND		28.7	3.33	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Chloromethane	ND		57.4	23.9	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
cis-1,2-Dichloroethene	ND		28.7	2.30	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
cis-1,3-Dichloropropene	ND		28.7	4.94	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Dibromomethane	ND		28.7	2.75	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Dichlorodifluoromethane	ND		57.4	10.1	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Ethylbenzene	ND		28.7	4.71	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		28.7	28.7	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Hexachlorobutadiene	ND		28.7	7.58	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
HFPO dimer, methyl ester as HFPO-DA	ND		27.5	27.5	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Isopropylbenzene	ND		28.7	4.02	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
m,p-Xylene	ND		57.4	4.71	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Methylene Chloride	ND		28.7	18.4	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Naphthalene	ND		28.7	13.8	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
n-Butylbenzene	ND		28.7	7.35	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
n-Propylbenzene	ND		28.7	6.20	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
o-Xylene	ND		28.7	2.98	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
sec-Butylbenzene	ND		28.7	5.62	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Styrene	ND		28.7	6.20	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
tert-Butylbenzene	ND		28.7	5.05	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Tetrachloroethene	ND		28.7	3.79	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Toluene	ND		28.7	5.28	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
trans-1,2-Dichloroethene	ND		28.7	2.98	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
trans-1,3-Dichloropropene	ND		28.7	10.1	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Trichloroethene	ND		28.7	2.07	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Trichlorofluoromethane	ND	*	57.4	5.51	ug/Sample		11/29/19 10:45	12/06/19 15:17	1
Vinyl chloride	ND		57.4	13.8	ug/Sample		11/29/19 10:45	12/06/19 15:17	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/Sample*				*11/29/19 10:45*	*12/06/19 15:17*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:45*	*12/06/19 15:17*	*1*
4-Bromofluorobenzene (Surr)	*111*		*57 - 152*	*11/29/19 10:45*	*12/06/19 15:17*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:45*	*12/06/19 15:17*	*1*
Toluene-d8 (Surr)	*97*		*71 - 139*	*11/29/19 10:45*	*12/06/19 15:17*	*1*

Client Sample ID: A-5780 QC VEN DIV STACK MM18 IMPINGER #1 BT

Lab Sample ID: 140-17462-1

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**11800**		6120	3060	ug/Sample		11/29/19 10:45	12/13/19 21:53	1
Hydrogen Fluoride	ND		2530	1150	ug/Sample		11/29/19 10:45	12/18/19 13:19	20

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 10:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*130*		*50 - 200*	*12/04/19 10:05*	*12/08/19 10:37*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: A-5781 QC VEN DIV STACK MM18 IMPINGER #2 BT

Lab Sample ID: 140-17462-2

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		29.9	3.94	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1,1,3,3-Pentafluorobutane	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1,1-Trichloroethane	ND		29.9	4.30	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		59.8	11.8	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1,1-Trifluoroethane	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1,2,2-Tetrachloroethane	ND		29.9	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		59.8	3.35	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1,2-trichloro-1-fluoroethane	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1,2-Trichloroethane	ND		29.9	3.11	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1-Dichloro-1-fluoroethane	ND		59.8	29.9	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1-dichloro-2,2-difluoroethane	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1-dichloro-2,2-difluoroethene	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1-Dichloroethane	ND		29.9	3.59	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1-Dichloroethene	ND		29.9	4.42	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1-Dichloropropene	ND		29.9	3.23	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,1-Difluoroethene	ND		598	598	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2,2-trichloro-1,1-difluoroethane	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2,3-Trichlorobenzene	ND		29.9	9.56	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2,3-Trichloropropane	ND		29.9	7.41	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2,4-Trichlorobenzene	ND		29.9	10.0	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2,4-Trimethylbenzene	ND		29.9	6.21	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2-Dibromo-3-Chloropropane	ND		59.8	10.5	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2-Dibromoethane (EDB)	ND		29.9	3.94	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2-dichloro-1,1-difluoroethane	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2-Dichlorobenzene	ND		29.9	5.26	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,2-Dichloroethane	ND		29.9	5.02	ug/Sample		11/29/19 10:45	12/06/19 15:42	1

Client Sample ID: A-5781 QC VEN DIV STACK MM18 IMPINGER #2 BT

Lab Sample ID: 140-17462-2

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		29.9	2.99	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,3,5-Trimethylbenzene	ND		29.9	6.21	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,3-Dichlorobenzene	ND		29.9	5.14	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,3-Dichloropropane	ND		29.9	3.35	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1,4-Dichlorobenzene	ND		29.9	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
1-Chloro-1,1-difluoroethane	ND		59.8	6.10	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
2,2-Dichloropropane	ND		29.9	8.72	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
2-Butanone (MEK)	ND		120	19.1	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		59.8	8.84	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
2-Chloro-1,1,1-Trifluoroethane	ND		59.8	5.98	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
2-Chlorotoluene	ND		29.9	5.62	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
2-Hexanone	ND		120	27.5	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
2-MTP as HFPO	ND		26.1	26.1	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
4-Chlorotoluene	ND		29.9	6.21	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
4-Isopropyltoluene	ND		29.9	8.01	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
4-Methyl-2-pentanone (MIBK)	ND		120	19.1	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Acetone	ND		120	70.5	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Benzene	ND		29.9	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Bromobenzene	ND		29.9	4.18	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Bromochloromethane	ND		29.9	6.69	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Bromodichloromethane	ND		29.9	5.14	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Bromoform	ND		29.9	9.08	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Bromomethane	ND		59.8	34.7	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Carbon disulfide	ND		29.9	7.41	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Carbon tetrachloride	ND		29.9	3.94	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Carbonyl Difluoride	ND		87.9	87.9	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Chlorobenzene	ND		29.9	4.30	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Chlorodibromomethane	ND		29.9	6.45	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Chloroethane	ND		59.8	13.1	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Chloroform	ND		29.9	3.47	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Chloromethane	ND		59.8	24.9	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
cis-1,2-Dichloroethene	ND		29.9	2.39	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
cis-1,3-Dichloropropene	ND		29.9	5.14	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Dibromomethane	ND		29.9	2.87	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Dichlorodifluoromethane	ND		59.8	10.5	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Ethylbenzene	ND		29.9	4.90	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		29.9	29.9	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Hexachlorobutadiene	ND		29.9	7.89	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
HFPO dimer, methyl ester as HFPO-DA	ND		28.7	28.7	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Isopropylbenzene	ND		29.9	4.18	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
m,p-Xylene	ND		59.8	4.90	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Methylene Chloride	ND		29.9	19.1	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Naphthalene	ND		29.9	14.3	ug/Sample		11/29/19 10:45	12/06/19 15:42	1

Client Sample ID: A-5781 QC VEN DIV STACK MM18 IMPINGER #2 BT

Lab Sample ID: 140-17462-2

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
n-Butylbenzene	ND		29.9	7.65	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
n-Propylbenzene	ND		29.9	6.45	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
o-Xylene	ND		29.9	3.11	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
sec-Butylbenzene	ND		29.9	5.86	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Styrene	ND		29.9	6.45	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
tert-Butylbenzene	ND		29.9	5.26	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Tetrachloroethene	ND		29.9	3.94	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Toluene	ND		29.9	5.50	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
trans-1,2-Dichloroethene	ND		29.9	3.11	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
trans-1,3-Dichloropropene	ND		29.9	10.5	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Trichloroethene	ND		29.9	2.15	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Trichlorofluoromethane	ND	*	59.8	5.74	ug/Sample		11/29/19 10:45	12/06/19 15:42	1
Vinyl chloride	ND		59.8	14.3	ug/Sample		11/29/19 10:45	12/06/19 15:42	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Cyclohexane	*43.3*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:45*	*12/06/19 15:42*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:45*	*12/06/19 15:42*	*1*
4-Bromofluorobenzene (Surr)	*109*		*57 - 152*	*11/29/19 10:45*	*12/06/19 15:42*	*1*
Dibromofluoromethane (Surr)	*105*		*62 - 134*	*11/29/19 10:45*	*12/06/19 15:42*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:45*	*12/06/19 15:42*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**14800**		6370	3190	ug/Sample		11/29/19 10:45	12/13/19 22:14	1
Hydrogen Fluoride	ND		2630	1200	ug/Sample		11/29/19 10:45	12/18/19 13:40	20

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 10:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*131*		*50 - 200*	*12/04/19 10:05*	*12/08/19 10:40*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: A-5782 QC VEN DIV STACK MM18 IMPINGER #3 BT

Lab Sample ID: 140-17462-3

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		29.1	3.84	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1,1,3,3-Pentafluorobutane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1

Client Sample ID: A-5782 QC VEN DIV STACK MM18 IMPINGER #3 BT

Lab Sample ID: 140-17462-3

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		29.1	4.19	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		58.2	11.5	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1,1-Trifluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1,2,2-Tetrachloroethane	ND		29.1	5.59	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		58.2	3.26	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1,2-trichloro-1-fluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1,2-Trichloroethane	ND		29.1	3.03	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1-Dichloro-1-fluoroethane	ND		58.2	29.1	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1-dichloro-2,2-difluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1-dichloro-2,2-difluoroethene	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1-Dichloroethane	ND		29.1	3.49	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1-Dichloroethene	ND		29.1	4.31	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1-Dichloropropene	ND		29.1	3.14	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,1-Difluoroethene	ND		582	582	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2,2-trichloro-1,1-difluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2,3-Trichlorobenzene	ND		29.1	9.32	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2,3-Trichloropropane	ND		29.1	7.22	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2,4-Trichlorobenzene	ND		29.1	9.78	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2,4-Trimethylbenzene	ND		29.1	6.06	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2-Dibromo-3-Chloropropane	ND		58.2	10.2	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2-Dibromoethane (EDB)	ND		29.1	3.84	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2-dichloro-1,1-difluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2-Dichlorobenzene	ND		29.1	5.12	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2-Dichloroethane	ND		29.1	4.89	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,2-Dichloropropane	ND		29.1	2.91	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,3,5-Trimethylbenzene	ND		29.1	6.06	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,3-Dichlorobenzene	ND		29.1	5.01	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,3-Dichloropropane	ND		29.1	3.26	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1,4-Dichlorobenzene	ND		29.1	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
1-Chloro-1,1-difluoroethane	ND		58.2	5.94	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
2,2-Dichloropropane	ND		29.1	8.50	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
2-Butanone (MEK)	ND		116	18.6	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		58.2	8.62	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
2-Chloro-1,1,1-Trifluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
2-Chlorotoluene	ND		29.1	5.47	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
2-Hexanone	ND		116	26.8	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
2-MTP as HFPO	ND		25.4	25.4	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
4-Chlorotoluene	ND		29.1	6.06	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
4-Isopropyltoluene	ND		29.1	7.80	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
4-Methyl-2-pentanone (MIBK)	ND		116	18.6	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Acetone	ND		116	68.7	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Benzene	ND		29.1	5.59	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Bromobenzene	ND		29.1	4.08	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Bromochloromethane	ND		29.1	6.52	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Bromodichloromethane	ND		29.1	5.01	ug/Sample		11/29/19 10:45	12/06/19 16:06	1

Client Sample ID: A-5782 QC VEN DIV STACK MM18 IMPINGER #3 BT

Lab Sample ID: 140-17462-3

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromoform	ND		29.1	8.85	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Bromomethane	ND		58.2	33.8	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Carbon disulfide	ND		29.1	7.22	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Carbon tetrachloride	ND		29.1	3.84	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Carbonyl Difluoride	ND		85.0	85.0	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Chlorobenzene	ND		29.1	4.19	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Chlorodibromomethane	ND		29.1	6.29	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Chloroethane	ND		58.2	12.8	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Chloroform	ND		29.1	3.38	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Chloromethane	ND		58.2	24.2	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
cis-1,2-Dichloroethene	ND		29.1	2.33	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
cis-1,3-Dichloropropene	ND		29.1	5.01	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Dibromomethane	ND		29.1	2.80	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Dichlorodifluoromethane	ND		58.2	10.2	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Ethylbenzene	ND		29.1	4.77	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		29.1	29.1	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Hexachlorobutadiene	ND		29.1	7.69	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
HFPO dimer, methyl ester as HFPO-DA	ND		27.9	27.9	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Isopropylbenzene	ND		29.1	4.08	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
m,p-Xylene	ND		58.2	4.77	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Methylene Chloride	ND		29.1	18.6	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Naphthalene	ND		29.1	14.0	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
n-Butylbenzene	ND		29.1	7.45	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
n-Propylbenzene	ND		29.1	6.29	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
o-Xylene	ND		29.1	3.03	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
sec-Butylbenzene	ND		29.1	5.71	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Styrene	ND		29.1	6.29	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
tert-Butylbenzene	ND		29.1	5.12	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Tetrachloroethene	ND		29.1	3.84	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Toluene	ND		29.1	5.36	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
trans-1,2-Dichloroethene	ND		29.1	3.03	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
trans-1,3-Dichloropropene	ND		29.1	10.2	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Trichloroethene	ND		29.1	2.10	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Trichlorofluoromethane	ND	*	58.2	5.59	ug/Sample		11/29/19 10:45	12/06/19 16:06	1
Vinyl chloride	ND		58.2	14.0	ug/Sample		11/29/19 10:45	12/06/19 16:06	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Cyclohexane	*42.4*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:45*	*12/06/19 16:06*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:45*	*12/06/19 16:06*	*1*
4-Bromofluorobenzene (Surr)	*111*		*57 - 152*	*11/29/19 10:45*	*12/06/19 16:06*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:45*	*12/06/19 16:06*	*1*
Toluene-d8 (Surr)	*98*		*71 - 139*	*11/29/19 10:45*	*12/06/19 16:06*	*1*

Client Sample ID: A-5782 QC VEN DIV STACK MM18 IMPINGER #3 BT

Lab Sample ID: 140-17462-3

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**6110**	**J**	6210	3110	ug/Sample		11/29/19 10:45	12/13/19 22:35	1
Hydrogen Fluoride	ND		2560	1160	ug/Sample		11/29/19 10:45	12/18/19 14:01	20

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 10:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*129*		*50 - 200*	*12/04/19 10:05*	*12/08/19 10:44*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:01	1

Client Sample ID: A-5783 QC VEN DIV STACK MM18 IMPINGER #4 BT

Lab Sample ID: 140-17462-4

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		30.4	4.02	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1,1,3,3-Pentafluorobutane	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1,1-Trichloroethane	ND		30.4	4.38	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		60.8	12.0	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1,1-Trifluoroethane	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1,2,2-Tetrachloroethane	ND		30.4	5.84	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		60.8	3.41	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1,2-trichloro-1-fluoroethane	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1,2-Trichloroethane	ND		30.4	3.16	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1-Dichloro-1-fluoroethane	ND		60.8	30.4	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1-dichloro-2,2-difluoroethane	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1-dichloro-2,2-difluoroethene	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1-Dichloroethane	ND		30.4	3.65	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1-Dichloroethene	ND		30.4	4.50	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1-Dichloropropene	ND		30.4	3.29	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,1-Difluoroethene	ND		608	608	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2,2-trichloro-1,1-difluoroethane	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2,3-Trichlorobenzene	ND		30.4	9.74	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2,3-Trichloropropane	ND		30.4	7.54	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2,4-Trichlorobenzene	ND		30.4	10.2	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2,4-Trimethylbenzene	ND		30.4	6.33	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2-Dibromo-3-Chloropropane	ND		60.8	10.7	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2-Dibromoethane (EDB)	ND		30.4	4.02	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2-dichloro-1,1-difluoroethane	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2-Dichlorobenzene	ND		30.4	5.35	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,2-Dichloroethane	ND		30.4	5.11	ug/Sample		11/29/19 10:45	12/06/19 16:31	1

Client Sample ID: A-5783 QC VEN DIV STACK MM18 IMPINGER #4 BT

Lab Sample ID: 140-17462-4

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		30.4	3.04	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,3,5-Trimethylbenzene	ND		30.4	6.33	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,3-Dichlorobenzene	ND		30.4	5.23	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,3-Dichloropropane	ND		30.4	3.41	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1,4-Dichlorobenzene	ND		30.4	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
1-Chloro-1,1-difluoroethane	ND		60.8	6.21	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
2,2-Dichloropropane	ND		30.4	8.88	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
2-Butanone (MEK)	ND		122	19.5	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		60.8	9.01	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
2-Chloro-1,1,1-Trifluoroethane	ND		60.8	6.08	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
2-Chlorotoluene	ND		30.4	5.72	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
2-Hexanone	ND		122	28.0	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
2-MTP as HFPO	ND		26.6	26.6	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
4-Chlorotoluene	ND		30.4	6.33	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
4-Isopropyltoluene	ND		30.4	8.15	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
4-Methyl-2-pentanone (MIBK)	ND		122	19.5	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Acetone	ND		122	71.8	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Benzene	ND		30.4	5.84	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Bromobenzene	ND		30.4	4.26	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Bromochloromethane	ND		30.4	6.81	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Bromodichloromethane	ND		30.4	5.23	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Bromoform	ND		30.4	9.25	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Bromomethane	ND		60.8	35.3	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Carbon disulfide	ND		30.4	7.54	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Carbon tetrachloride	ND		30.4	4.02	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Carbonyl Difluoride	ND		89.4	89.4	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Chlorobenzene	ND		30.4	4.38	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Chlorodibromomethane	ND		30.4	6.57	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Chloroethane	ND		60.8	13.4	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Chloroform	ND		30.4	3.53	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Chloromethane	ND		60.8	25.3	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
cis-1,2-Dichloroethene	ND		30.4	2.43	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
cis-1,3-Dichloropropene	ND		30.4	5.23	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Dibromomethane	ND		30.4	2.92	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Dichlorodifluoromethane	ND		60.8	10.7	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Ethylbenzene	ND		30.4	4.99	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		30.4	30.4	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Hexachlorobutadiene	ND		30.4	8.03	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
HFPO dimer, methyl ester as HFPO-DA	ND		29.2	29.2	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Isopropylbenzene	ND		30.4	4.26	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
m,p-Xylene	ND		60.8	4.99	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Methylene Chloride	ND		30.4	19.5	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Naphthalene	ND		30.4	14.6	ug/Sample		11/29/19 10:45	12/06/19 16:31	1

Client Sample ID: A-5783 QC VEN DIV STACK MM18 IMPINGER #4 BT

Lab Sample ID: 140-17462-4

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
n-Butylbenzene	ND		30.4	7.79	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
n-Propylbenzene	ND		30.4	6.57	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
o-Xylene	ND		30.4	3.16	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
sec-Butylbenzene	ND		30.4	5.96	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Styrene	ND		30.4	6.57	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
tert-Butylbenzene	ND		30.4	5.35	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Tetrachloroethene	ND		30.4	4.02	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Toluene	ND		30.4	5.60	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
trans-1,2-Dichloroethene	ND		30.4	3.16	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
trans-1,3-Dichloropropene	ND		30.4	10.7	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Trichloroethene	ND		30.4	2.19	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Trichlorofluoromethane	ND	*	60.8	5.84	ug/Sample		11/29/19 10:45	12/06/19 16:31	1
Vinyl chloride	ND		60.8	14.6	ug/Sample		11/29/19 10:45	12/06/19 16:31	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Cyclohexane	*45.4*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:45*	*12/06/19 16:31*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*70 - 160*	*11/29/19 10:45*	*12/06/19 16:31*	*1*
4-Bromofluorobenzene (Surr)	*110*		*57 - 152*	*11/29/19 10:45*	*12/06/19 16:31*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:45*	*12/06/19 16:31*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:45*	*12/06/19 16:31*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**4170**	**J**	6490	3250	ug/Sample		11/29/19 10:45	12/13/19 22:56	1
Hydrogen Fluoride	ND		2680	1220	ug/Sample		11/29/19 10:45	12/18/19 14:21	20

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 10:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*126*		*50 - 200*	*12/04/19 10:05*	*12/08/19 10:47*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:03	1

Client Sample ID: A-5784 QC VEN DIV STACK MM18 IMPINGER #5 BT

Lab Sample ID: 140-17462-5

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		26.9	3.55	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1,1,3,3-Pentafluorobutane	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1

Client Sample ID: A-5784 QC VEN DIV STACK MM18 IMPINGER #5 BT

Lab Sample ID: 140-17462-5

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		26.9	3.87	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		53.8	10.6	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1,1-Trifluoroethane	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1,2,2-Tetrachloroethane	ND		26.9	5.16	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		53.8	3.01	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1,2-trichloro-1-fluoroethane	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1,2-Trichloroethane	ND		26.9	2.80	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1-Dichloro-1-fluoroethane	ND		53.8	26.9	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1-dichloro-2,2-difluoroethane	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1-dichloro-2,2-difluoroethene	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1-Dichloroethane	ND		26.9	3.23	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1-Dichloroethene	ND		26.9	3.98	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1-Dichloropropene	ND		26.9	2.90	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,1-Difluoroethene	ND		538	538	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2,2-trichloro-1,1-difluoroethane	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2,3-Trichlorobenzene	ND		26.9	8.60	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2,3-Trichloropropane	ND		26.9	6.67	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2,4-Trichlorobenzene	ND		26.9	9.03	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2,4-Trimethylbenzene	ND		26.9	5.59	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2-Dibromo-3-Chloropropane	ND		53.8	9.46	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2-Dibromoethane (EDB)	ND		26.9	3.55	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2-dichloro-1,1-difluoroethane	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2-Dichlorobenzene	ND		26.9	4.73	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2-Dichloroethane	ND		26.9	4.52	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,2-Dichloropropane	ND		26.9	2.69	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,3,5-Trimethylbenzene	ND		26.9	5.59	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,3-Dichlorobenzene	ND		26.9	4.62	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,3-Dichloropropane	ND		26.9	3.01	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1,4-Dichlorobenzene	ND		26.9	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
1-Chloro-1,1-difluoroethane	ND		53.8	5.48	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
2,2-Dichloropropane	ND		26.9	7.85	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
2-Butanone (MEK)	ND		108	17.2	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		53.8	7.96	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
2-Chloro-1,1,1-Trifluoroethane	ND		53.8	5.38	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
2-Chlorotoluene	ND		26.9	5.05	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
2-Hexanone	ND		108	24.7	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
2-MTP as HFPO	ND		23.5	23.5	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
4-Chlorotoluene	ND		26.9	5.59	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
4-Isopropyltoluene	ND		26.9	7.20	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
4-Methyl-2-pentanone (MIBK)	ND		108	17.2	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Acetone	ND		108	63.4	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Benzene	ND		26.9	5.16	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Bromobenzene	ND		26.9	3.76	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Bromochloromethane	ND		26.9	6.02	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Bromodichloromethane	ND		26.9	4.62	ug/Sample		11/29/19 10:45	12/06/19 16:55	1

Client Sample ID: A-5784 QC VEN DIV STACK MM18 IMPINGER #5 BT

Lab Sample ID: 140-17462-5

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bromoform	ND		26.9	8.17	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Bromomethane	ND		53.8	31.2	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Carbon disulfide	ND		26.9	6.67	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Carbon tetrachloride	ND		26.9	3.55	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Carbonyl Difluoride	ND		79.1	79.1	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Chlorobenzene	ND		26.9	3.87	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Chlorodibromomethane	ND		26.9	5.81	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Chloroethane	ND		53.8	11.8	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Chloroform	ND		26.9	3.12	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Chloromethane	ND		53.8	22.4	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
cis-1,2-Dichloroethene	ND		26.9	2.15	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
cis-1,3-Dichloropropene	ND		26.9	4.62	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Dibromomethane	ND		26.9	2.58	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Dichlorodifluoromethane	ND		53.8	9.46	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Ethylbenzene	ND		26.9	4.41	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		26.9	26.9	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Hexachlorobutadiene	ND		26.9	7.10	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
HFPO dimer, methyl ester as HFPO-DA	ND		25.8	25.8	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Isopropylbenzene	ND		26.9	3.76	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
m,p-Xylene	ND		53.8	4.41	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Methylene Chloride	ND		26.9	17.2	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Naphthalene	ND		26.9	12.9	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
n-Butylbenzene	ND		26.9	6.88	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
n-Propylbenzene	ND		26.9	5.81	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
o-Xylene	ND		26.9	2.80	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
sec-Butylbenzene	ND		26.9	5.27	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Styrene	ND		26.9	5.81	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
tert-Butylbenzene	ND		26.9	4.73	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Tetrachloroethene	ND		26.9	3.55	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Toluene	ND		26.9	4.95	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
trans-1,2-Dichloroethene	ND		26.9	2.80	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
trans-1,3-Dichloropropene	ND		26.9	9.46	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Trichloroethene	ND		26.9	1.94	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Trichlorofluoromethane	ND	*	53.8	5.16	ug/Sample		11/29/19 10:45	12/06/19 16:55	1
Vinyl chloride	ND		53.8	12.9	ug/Sample		11/29/19 10:45	12/06/19 16:55	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Cyclohexane	*43.6*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:45*	*12/06/19 16:55*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*70 - 160*	*11/29/19 10:45*	*12/06/19 16:55*	*1*
4-Bromofluorobenzene (Surr)	*109*		*57 - 152*	*11/29/19 10:45*	*12/06/19 16:55*	*1*
Dibromofluoromethane (Surr)	*103*		*62 - 134*	*11/29/19 10:45*	*12/06/19 16:55*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:45*	*12/06/19 16:55*	*1*

Client Sample ID: A-5784 QC VEN DIV STACK MM18 IMPINGER #5 BT

Lab Sample ID: 140-17462-5

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	ND		5730	2870	ug/Sample		11/29/19 10:45	12/13/19 23:16	1
Hydrogen Fluoride	ND		2370	1080	ug/Sample		11/29/19 10:45	12/18/19 14:42	20

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 10:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*125*		*50 - 200*	*12/04/19 10:05*	*12/08/19 10:53*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.00	HF			SU			12/13/19 15:03	1

Client Sample ID: A-5785 QC VEN DIV STACK MM18 IMPINGER #6 BT

Lab Sample ID: 140-17462-6

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		29.1	3.84	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1,1,3,3-Pentafluorobutane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1,1-Trichloroethane	ND		29.1	4.19	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		58.2	11.5	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1,1-Trifluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1,2,2-Tetrachloroethane	ND		29.1	5.59	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		58.2	3.26	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1,2-trichloro-1-fluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1,2-Trichloroethane	ND		29.1	3.03	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1-Dichloro-1-fluoroethane	ND		58.2	29.1	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1-dichloro-2,2-difluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1-dichloro-2,2-difluoroethene	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1-Dichloroethane	ND		29.1	3.49	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1-Dichloroethene	ND		29.1	4.31	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1-Dichloropropene	ND		29.1	3.14	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,1-Difluoroethene	ND		582	582	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2,2-trichloro-1,1-difluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2,3-Trichlorobenzene	ND		29.1	9.31	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2,3-Trichloropropane	ND		29.1	7.22	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2,4-Trichlorobenzene	ND		29.1	9.78	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2,4-Trimethylbenzene	ND		29.1	6.05	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2-Dibromo-3-Chloropropane	ND		58.2	10.2	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2-Dibromoethane (EDB)	ND		29.1	3.84	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2-dichloro-1,1-difluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2-Dichlorobenzene	ND		29.1	5.12	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,2-Dichloroethane	ND		29.1	4.89	ug/Sample		11/29/19 10:45	12/06/19 17:20	1

Client Sample ID: A-5785 QC VEN DIV STACK MM18 IMPINGER #6 BT

Lab Sample ID: 140-17462-6

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		29.1	2.91	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,3,5-Trimethylbenzene	ND		29.1	6.05	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,3-Dichlorobenzene	ND		29.1	5.01	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,3-Dichloropropane	ND		29.1	3.26	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1,4-Dichlorobenzene	ND		29.1	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
1-Chloro-1,1-difluoroethane	ND		58.2	5.94	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
2,2-Dichloropropane	ND		29.1	8.50	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
2-Butanone (MEK)	ND		116	18.6	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		58.2	8.61	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
2-Chloro-1,1,1-Trifluoroethane	ND		58.2	5.82	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
2-Chlorotoluene	ND		29.1	5.47	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
2-Hexanone	ND		116	26.8	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
2-MTP as HFPO	ND		25.4	25.4	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
4-Chlorotoluene	ND		29.1	6.05	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
4-Isopropyltoluene	ND		29.1	7.80	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
4-Methyl-2-pentanone (MIBK)	ND		116	18.6	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Acetone	ND		116	68.7	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Benzene	ND		29.1	5.59	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Bromobenzene	ND		29.1	4.07	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Bromochloromethane	ND		29.1	6.52	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Bromodichloromethane	ND		29.1	5.01	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Bromoform	ND		29.1	8.85	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Bromomethane	ND		58.2	33.8	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Carbon disulfide	ND		29.1	7.22	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Carbon tetrachloride	ND		29.1	3.84	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Carbonyl Difluoride	ND		85.0	85.0	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Chlorobenzene	ND		29.1	4.19	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Chlorodibromomethane	ND		29.1	6.29	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Chloroethane	ND		58.2	12.8	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Chloroform	ND		29.1	3.38	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Chloromethane	ND		58.2	24.2	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
cis-1,2-Dichloroethene	ND		29.1	2.33	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
cis-1,3-Dichloropropene	ND		29.1	5.01	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Dibromomethane	ND		29.1	2.79	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Dichlorodifluoromethane	ND		58.2	10.2	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Ethylbenzene	ND		29.1	4.77	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		29.1	29.1	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Hexachlorobutadiene	ND		29.1	7.68	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
HFPO dimer, methyl ester as HFPO-DA	ND		27.9	27.9	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Isopropylbenzene	ND		29.1	4.07	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
m,p-Xylene	ND		58.2	4.77	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Methylene Chloride	ND		29.1	18.6	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Naphthalene	ND		29.1	14.0	ug/Sample		11/29/19 10:45	12/06/19 17:20	1

Client Sample ID: A-5785 QC VEN DIV STACK MM18 IMPINGER #6 BT

Lab Sample ID: 140-17462-6

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
n-Butylbenzene	ND		29.1	7.45	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
n-Propylbenzene	ND		29.1	6.29	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
o-Xylene	ND		29.1	3.03	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
sec-Butylbenzene	ND		29.1	5.70	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Styrene	ND		29.1	6.29	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
tert-Butylbenzene	ND		29.1	5.12	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Tetrachloroethene	ND		29.1	3.84	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Toluene	ND		29.1	5.35	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
trans-1,2-Dichloroethene	ND		29.1	3.03	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
trans-1,3-Dichloropropene	ND		29.1	10.2	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Trichloroethene	ND		29.1	2.10	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Trichlorofluoromethane	ND	*	58.2	5.59	ug/Sample		11/29/19 10:45	12/06/19 17:20	1
Vinyl chloride	ND		58.2	14.0	ug/Sample		11/29/19 10:45	12/06/19 17:20	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/Sample*				*11/29/19 10:45*	*12/06/19 17:20*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*70 - 160*	*11/29/19 10:45*	*12/06/19 17:20*	*1*
4-Bromofluorobenzene (Surr)	*109*		*57 - 152*	*11/29/19 10:45*	*12/06/19 17:20*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:45*	*12/06/19 17:20*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:45*	*12/06/19 17:20*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	ND		6480	3240	ug/Sample		11/29/19 10:45	12/13/19 23:37	1
Hydrogen Fluoride	ND		2560	1160	ug/Sample		11/29/19 10:45	12/18/19 15:03	20

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 10:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*127*		*50 - 200*	*12/04/19 10:05*	*12/08/19 10:57*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:03	1

Client Sample ID: A-5786 QC MEOH RB

Lab Sample ID: 140-17462-7

Date Collected: 11/22/19 00:00
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		20.3	2.68	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1,1,3,3-Pentafluorobutane	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1,1-Trichloroethane	ND		20.3	2.93	ug/Sample		11/29/19 10:45	12/06/19 14:04	1

Client Sample ID: A-5786 QC MEOH RB

Lab Sample ID: 140-17462-7

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trifluoro-2,2-dichloroethane	ND		40.6	8.04	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1,1-Trifluoroethane	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1,2,2-Tetrachloroethane	ND		20.3	3.90	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		40.6	2.28	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1,2-trichloro-1-fluoroethane	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1,2-Trichloroethane	ND		20.3	2.11	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1-Dichloro-1-fluoroethane	ND		40.6	20.3	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1-dichloro-2,2-difluoroethane	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1-dichloro-2,2-difluoroethene	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1-Dichloroethane	ND		20.3	2.44	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1-Dichloroethene	ND		20.3	3.01	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1-Dichloropropene	ND		20.3	2.19	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,1-Difluoroethene	ND		406	406	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2,2-trichloro-1,1-difluoroethane	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2,3-Trichlorobenzene	ND		20.3	6.50	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2,3-Trichloropropane	ND		20.3	5.04	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2,4-Trichlorobenzene	ND		20.3	6.83	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2,4-Trimethylbenzene	ND		20.3	4.23	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2-Dibromo-3-Chloropropane	ND		40.6	7.15	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2-Dibromoethane (EDB)	ND		20.3	2.68	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2-dichloro-1,1-difluoroethane	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2-Dichlorobenzene	ND		20.3	3.58	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2-Dichloroethane	ND		20.3	3.41	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,2-Dichloropropane	ND		20.3	2.03	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,3,5-Trimethylbenzene	ND		20.3	4.23	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,3-Dichlorobenzene	ND		20.3	3.49	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,3-Dichloropropane	ND		20.3	2.28	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1,4-Dichlorobenzene	ND		20.3	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
1-Chloro-1,1-difluoroethane	ND		40.6	4.14	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
2,2-Dichloropropane	ND		20.3	5.93	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
2-Butanone (MEK)	ND		81.3	13.0	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		40.6	6.01	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
2-Chloro-1,1,1-Trifluoroethane	ND		40.6	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
2-Chlorotoluene	ND		20.3	3.82	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
2-Hexanone	ND		81.3	18.7	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
2-MTP as HFPO	ND		17.7	17.7	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
4-Chlorotoluene	ND		20.3	4.23	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
4-Isopropyltoluene	ND		20.3	5.44	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
4-Methyl-2-pentanone (MIBK)	ND		81.3	13.0	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Acetone	ND		81.3	47.9	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Benzene	ND		20.3	3.90	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Bromobenzene	ND		20.3	2.84	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Bromochloromethane	ND		20.3	4.55	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Bromodichloromethane	ND		20.3	3.49	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Bromoform	ND		20.3	6.18	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Bromomethane	ND		40.6	23.6	ug/Sample		11/29/19 10:45	12/06/19 14:04	1

Client Sample ID: A-5786 QC MEOH RB

Lab Sample ID: 140-17462-7

Date Collected: 11/22/19 00:00
Matrix: Air
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon disulfide	ND		20.3	5.04	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Carbon tetrachloride	ND		20.3	2.68	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Carbonyl Difluoride	ND		59.6	59.6	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Chlorobenzene	ND		20.3	2.93	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Chlorodibromomethane	ND		20.3	4.39	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Chloroethane	ND		40.6	8.94	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Chloroform	ND		20.3	2.36	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Chloromethane	ND		40.6	16.9	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
cis-1,2-Dichloroethene	ND		20.3	1.63	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
cis-1,3-Dichloropropene	ND		20.3	3.49	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Dibromomethane	ND		20.3	1.95	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Dichlorodifluoromethane	ND		40.6	7.15	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Ethylbenzene	ND		20.3	3.33	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		20.3	20.3	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Hexachlorobutadiene	ND		20.3	5.36	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
HFPO dimer, methyl ester as HFPO-DA	ND		19.5	19.5	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Isopropylbenzene	ND		20.3	2.84	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
m,p-Xylene	ND		40.6	3.33	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Methylene Chloride	**13.1**	**J B**	20.3	13.0	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Naphthalene	ND		20.3	9.75	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
n-Butylbenzene	ND		20.3	5.20	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
n-Propylbenzene	ND		20.3	4.39	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
o-Xylene	ND		20.3	2.11	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
sec-Butylbenzene	ND		20.3	3.98	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Styrene	ND		20.3	4.39	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
tert-Butylbenzene	ND		20.3	3.58	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Tetrachloroethene	ND		20.3	2.68	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Toluene	ND		20.3	3.74	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
trans-1,2-Dichloroethene	ND		20.3	2.11	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
trans-1,3-Dichloropropene	ND		20.3	7.15	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Trichloroethene	ND		20.3	1.46	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Trichlorofluoromethane	ND	*	40.6	3.90	ug/Sample		11/29/19 10:45	12/06/19 14:04	1
Vinyl chloride	ND		40.6	9.75	ug/Sample		11/29/19 10:45	12/06/19 14:04	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Cyclohexane	*34.9*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:45*	*12/06/19 14:04*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*70 - 160*	*11/29/19 10:45*	*12/06/19 14:04*	*1*
4-Bromofluorobenzene (Surr)	*110*		*57 - 152*	*11/29/19 10:45*	*12/06/19 14:04*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:45*	*12/06/19 14:04*	*1*
Toluene-d8 (Surr)	*97*		*71 - 139*	*11/29/19 10:45*	*12/06/19 14:04*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	ND		4330	2170	ug/Sample		11/29/19 10:45	12/13/19 23:58	1
Hydrogen Fluoride	ND		1790	813	ug/Sample		11/29/19 10:45	12/18/19 15:24	20

Client Sample ID: A-5786 QC MEOH RB

Lab Sample ID: 140-17462-7

Date Collected: 11/22/19 00:00
Matrix: Air
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0106	J	0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 11:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*125*		*50 - 200*	*12/04/19 10:05*	*12/08/19 11:00*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	4.00	HF			SU			12/13/19 15:03	1

Client Sample ID: A-5787 QC MEOH TB

Lab Sample ID: 140-17462-8

Date Collected: 11/22/19 00:00
Matrix: Air
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		15.4	2.03	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1,1,3,3-Pentafluorobutane	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1,1-Trichloroethane	ND		15.4	2.22	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		30.8	6.09	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1,1-Trifluoroethane	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1,2,2-Tetrachloroethane	ND		15.4	2.95	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		30.8	1.72	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1,2-trichloro-1-fluoroethane	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1,2-Trichloroethane	ND		15.4	1.60	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1-Dichloro-1-fluoroethane	ND		30.8	15.4	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1-dichloro-2,2-difluoroethane	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1-dichloro-2,2-difluoroethene	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1-Dichloroethane	ND		15.4	1.85	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1-Dichloroethene	ND		15.4	2.28	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1-Dichloropropene	ND		15.4	1.66	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,1-Difluoroethene	ND		308	308	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2,2-trichloro-1,1-difluoroethane	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2,3-Trichlorobenzene	ND		15.4	4.92	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2,3-Trichloropropane	ND		15.4	3.82	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2,4-Trichlorobenzene	ND		15.4	5.17	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2,4-Trimethylbenzene	ND		15.4	3.20	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2-Dibromo-3-Chloropropane	ND		30.8	5.42	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2-Dibromoethane (EDB)	ND		15.4	2.03	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2-dichloro-1,1-difluoroethane	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2-Dichlorobenzene	ND		15.4	2.71	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2-Dichloroethane	ND		15.4	2.59	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,2-Dichloropropane	ND		15.4	1.54	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,3,5-Trimethylbenzene	ND		15.4	3.20	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,3-Dichlorobenzene	ND		15.4	2.65	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,3-Dichloropropane	ND		15.4	1.72	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1,4-Dichlorobenzene	ND		15.4	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
1-Chloro-1,1-difluoroethane	ND		30.8	3.14	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1

Client Sample ID: A-5787 QC MEOH TB

Lab Sample ID: 140-17462-8

Date Collected: 11/22/19 00:00

Matrix: Air

Date Received: 11/25/19 08:00

Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,2-Dichloropropane	ND		15.4	4.49	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
2-Butanone (MEK)	ND		61.6	9.85	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		30.8	4.55	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
2-Chloro-1,1,1-Trifluoroethane	ND		30.8	3.08	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
2-Chlorotoluene	ND		15.4	2.89	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
2-Hexanone	ND		61.6	14.2	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
2-MTP as HFPO	ND		13.5	13.5	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
4-Chlorotoluene	ND		15.4	3.20	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
4-Isopropyltoluene	ND		15.4	4.12	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
4-Methyl-2-pentanone (MIBK)	ND		61.6	9.85	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Acetone	ND		61.6	36.3	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Benzene	ND		15.4	2.95	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Bromobenzene	ND		15.4	2.15	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Bromochloromethane	ND		15.4	3.45	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Bromodichloromethane	ND		15.4	2.65	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Bromoform	ND		15.4	4.68	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Bromomethane	ND		30.8	17.8	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Carbon disulfide	ND		15.4	3.82	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Carbon tetrachloride	ND		15.4	2.03	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Carbonyl Difluoride	ND		45.1	45.1	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Chlorobenzene	ND		15.4	2.22	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Chlorodibromomethane	ND		15.4	3.32	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Chloroethane	ND		30.8	6.77	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Chloroform	ND		15.4	1.78	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Chloromethane	ND		30.8	12.8	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
cis-1,2-Dichloroethene	ND		15.4	1.23	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
cis-1,3-Dichloropropene	ND		15.4	2.65	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Dibromomethane	ND		15.4	1.48	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Dichlorodifluoromethane	ND		30.8	5.42	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Ethylbenzene	ND		15.4	2.52	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		15.4	15.4	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Hexachlorobutadiene	ND		15.4	4.06	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
HFPO dimer, methyl ester as HFPO-DA	ND		14.8	14.8	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Isopropylbenzene	ND		15.4	2.15	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
m,p-Xylene	ND		30.8	2.52	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Methylene Chloride	**10.1**	**J B**	15.4	9.85	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Naphthalene	ND		15.4	7.39	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
n-Butylbenzene	ND		15.4	3.94	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
n-Propylbenzene	ND		15.4	3.32	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
o-Xylene	ND		15.4	1.60	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
sec-Butylbenzene	ND		15.4	3.02	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Styrene	ND		15.4	3.32	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
tert-Butylbenzene	ND		15.4	2.71	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Tetrachloroethene	ND		15.4	2.03	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Toluene	ND		15.4	2.83	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
trans-1,2-Dichloroethene	ND		15.4	1.60	ug/Sample		11/29/19 10:45	12/06/19 14:28	1

Client Sample ID: A-5787 QC MEOH TB

Lab Sample ID: 140-17462-8

Date Collected: 11/22/19 00:00
Matrix: Air
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-1,3-Dichloropropene	ND		15.4	5.42	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Trichloroethene	ND		15.4	1.11	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Trichlorofluoromethane	ND	*	30.8	2.95	ug/Sample		11/29/19 10:45	12/06/19 14:28	1
Vinyl chloride	ND		30.8	7.39	ug/Sample		11/29/19 10:45	12/06/19 14:28	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Cyclohexane	*41.7*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:45*	*12/06/19 14:28*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*70 - 160*	*11/29/19 10:45*	*12/06/19 14:28*	*1*
4-Bromofluorobenzene (Surr)	*111*		*57 - 152*	*11/29/19 10:45*	*12/06/19 14:28*	*1*
Dibromofluoromethane (Surr)	*105*		*62 - 134*	*11/29/19 10:45*	*12/06/19 14:28*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:45*	*12/06/19 14:28*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**9720**		3280	1640	ug/Sample		11/29/19 10:45	12/14/19 00:18	1
Hydrogen Fluoride	ND		1350	616	ug/Sample		11/29/19 10:45	12/19/19 09:19	20

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 11:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*125*		*50 - 200*	*12/04/19 10:05*	*12/08/19 11:03*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:03	1

Client Sample ID: A-5788 QC MEOH PB

Lab Sample ID: 140-17462-9

Date Collected: 11/22/19 00:00
Matrix: Air
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		18.1	2.38	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1,1,3,3-Pentafluorobutane	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1,1-Trichloroethane	ND		18.1	2.60	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1,1-Trifluoro-2,2-dichloroethane	ND		36.1	7.15	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1,1-Trifluoroethane	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1,2,2-Tetrachloroethane	ND		18.1	3.47	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		36.1	2.02	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1,2-trichloro-1-fluoroethane	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1,2-Trichloroethane	ND		18.1	1.88	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1-Dichloro-1-fluoroethane	ND		36.1	18.1	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1-dichloro-2,2-difluoroethane	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1-dichloro-2,2-difluoroethene	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1-Dichloroethane	ND		18.1	2.17	ug/Sample		11/29/19 10:45	12/06/19 14:53	1

Client Sample ID: A-5788 QC MEOH PB

Lab Sample ID: 140-17462-9

Date Collected: 11/22/19 00:00
Matrix: Air
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		18.1	2.67	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1-Dichloropropene	ND		18.1	1.95	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,1-Difluoroethene	ND		361	361	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2,2-trichloro-1,1-difluoroethane	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2,3-Trichlorobenzene	ND		18.1	5.78	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2,3-Trichloropropane	ND		18.1	4.48	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2,4-Trichlorobenzene	ND		18.1	6.07	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2,4-Trimethylbenzene	ND		18.1	3.75	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2-Dibromo-3-Chloropropane	ND		36.1	6.35	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2-Dibromoethane (EDB)	ND		18.1	2.38	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2-dichloro-1,1-difluoroethane	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2-Dichlorobenzene	ND		18.1	3.18	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2-Dichloroethane	ND		18.1	3.03	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,2-Dichloropropane	ND		18.1	1.81	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,3,5-Trimethylbenzene	ND		18.1	3.75	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,3-Dichlorobenzene	ND		18.1	3.11	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,3-Dichloropropane	ND		18.1	2.02	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1,4-Dichlorobenzene	ND		18.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
1-Chloro-1,1-difluoroethane	ND		36.1	3.68	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
2,2-dichloro-1,1-difluoroethylmethyl ether	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
2,2-Dichloropropane	ND		18.1	5.27	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
2-Butanone (MEK)	ND		72.2	11.6	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	ND		36.1	5.34	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
2-Chloro-1,1,1-Trifluoroethane	ND		36.1	3.61	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
2-Chlorotoluene	ND		18.1	3.39	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
2-Hexanone	ND		72.2	16.6	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
2-MTP as HFPO	ND		15.8	15.8	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
4-Chlorotoluene	ND		18.1	3.75	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
4-Isopropyltoluene	ND		18.1	4.84	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
4-Methyl-2-pentanone (MIBK)	ND		72.2	11.6	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Acetone	ND		72.2	42.6	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Benzene	ND		18.1	3.47	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Bromobenzene	ND		18.1	2.53	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Bromochloromethane	ND		18.1	4.04	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Bromodichloromethane	ND		18.1	3.11	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Bromoform	ND		18.1	5.49	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Bromomethane	ND		36.1	20.9	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Carbon disulfide	ND		18.1	4.48	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Carbon tetrachloride	ND		18.1	2.38	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Carbonyl Difluoride	ND		52.9	52.9	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Chlorobenzene	ND		18.1	2.60	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Chlorodibromomethane	ND		18.1	3.90	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Chloroethane	ND		36.1	7.94	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Chloroform	ND		18.1	2.09	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Chloromethane	ND		36.1	15.0	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
cis-1,2-Dichloroethene	ND		18.1	1.44	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
cis-1,3-Dichloropropene	ND		18.1	3.11	ug/Sample		11/29/19 10:45	12/06/19 14:53	1

Client Sample ID: A-5788 QC MEOH PB

Lab Sample ID: 140-17462-9

Date Collected: 11/22/19 00:00
Matrix: Air
Date Received: 11/25/19 08:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibromomethane	ND		18.1	1.73	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Dichlorodifluoromethane	ND		36.1	6.35	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Ethylbenzene	ND		18.1	2.96	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		18.1	18.1	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Hexachlorobutadiene	ND		18.1	4.77	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
HFPO dimer, methyl ester as HFPO-DA	ND		17.4	17.4	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Isopropylbenzene	ND		18.1	2.53	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
m,p-Xylene	ND		36.1	2.96	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Methylene Chloride	**13.6**	**J B**	18.1	11.6	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Naphthalene	ND		18.1	8.67	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
n-Butylbenzene	ND		18.1	4.62	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
n-Propylbenzene	ND		18.1	3.90	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
o-Xylene	ND		18.1	1.88	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
sec-Butylbenzene	ND		18.1	3.54	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Styrene	ND		18.1	3.90	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
tert-Butylbenzene	ND		18.1	3.18	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Tetrachloroethene	ND		18.1	2.38	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Toluene	ND		18.1	3.32	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
trans-1,2-Dichloroethene	ND		18.1	1.88	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
trans-1,3-Dichloropropene	ND		18.1	6.35	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Trichloroethene	ND		18.1	1.30	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Trichlorofluoromethane	ND	*	36.1	3.47	ug/Sample		11/29/19 10:45	12/06/19 14:53	1
Vinyl chloride	ND		36.1	8.67	ug/Sample		11/29/19 10:45	12/06/19 14:53	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Cyclohexane	*28.0*	*T J N*	*ug/Sample*		*4.42*	*110-82-7*	*11/29/19 10:45*	*12/06/19 14:53*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 160*	*11/29/19 10:45*	*12/06/19 14:53*	*1*
4-Bromofluorobenzene (Surr)	*108*		*57 - 152*	*11/29/19 10:45*	*12/06/19 14:53*	*1*
Dibromofluoromethane (Surr)	*104*		*62 - 134*	*11/29/19 10:45*	*12/06/19 14:53*	*1*
Toluene-d8 (Surr)	*96*		*71 - 139*	*11/29/19 10:45*	*12/06/19 14:53*	*1*

Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Fluorine	**2450**	**J**	3850	1930	ug/Sample		11/29/19 10:45	12/14/19 00:39	1
Hydrogen Fluoride	ND		1590	722	ug/Sample		11/29/19 10:45	12/19/19 09:40	20

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		12/04/19 10:05	12/08/19 11:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*131*		*50 - 200*	*12/04/19 10:05*	*12/08/19 11:06*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	**4.00**	**HF**			SU			12/13/19 15:03	1

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: VEN MM-18 Field QC

Job ID: 140-17462-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Prep: MeOH Prep

Analyte	RL	MDL	Units
1,1,1,2-Tetrachloroethane	2.50	0.330	ug/Sample
1,1,1,3,3-Pentafluorobutane	5.00	0.500	ug/Sample
1,1,1-Trichloroethane	2.50	0.360	ug/Sample
1,1,1-Trifluoro-2,2-dichloroethane	5.00	0.990	ug/Sample
1,1,1-Trifluoroethane	5.00	0.500	ug/Sample
1,1,2,2-Tetrachloroethane	2.50	0.480	ug/Sample
1,1,2-Trichloro-1,2,2-trifluoroethane	5.00	0.280	ug/Sample
1,1,2-trichloro-1-fluoroethane	5.00	0.500	ug/Sample
1,1,2-Trichloroethane	2.50	0.260	ug/Sample
1,1-Dichloro-1-fluoroethane	5.00	2.50	ug/Sample
1,1-dichloro-2,2-difluoroethane	5.00	0.500	ug/Sample
1,1-dichloro-2,2-difluoroethene	5.00	0.500	ug/Sample
1,1-Dichloroethane	2.50	0.300	ug/Sample
1,1-Dichloroethene	2.50	0.370	ug/Sample
1,1-Dichloropropene	2.50	0.270	ug/Sample
1,1-Difluoroethene	50.0	50.0	ug/Sample
1,2,2-trichloro-1,1-difluoroethane	5.00	0.500	ug/Sample
1,2,3-Trichlorobenzene	2.50	0.800	ug/Sample
1,2,3-Trichloropropane	2.50	0.620	ug/Sample
1,2,4-Trichlorobenzene	2.50	0.840	ug/Sample
1,2,4-Trimethylbenzene	2.50	0.520	ug/Sample
1,2-Dibromo-3-Chloropropane	5.00	0.880	ug/Sample
1,2-Dibromoethane (EDB)	2.50	0.330	ug/Sample
1,2-dichloro-1,1-difluoroethane	5.00	0.500	ug/Sample
1,2-Dichlorobenzene	2.50	0.440	ug/Sample
1,2-Dichloroethane	2.50	0.420	ug/Sample
1,2-Dichloropropane	2.50	0.250	ug/Sample
1,3,5-Trimethylbenzene	2.50	0.520	ug/Sample
1,3-Dichlorobenzene	2.50	0.430	ug/Sample
1,3-Dichloropropane	2.50	0.280	ug/Sample
1,4-Dichlorobenzene	2.50	0.500	ug/Sample
1-Chloro-1,1-difluoroethane	5.00	0.510	ug/Sample
2,2-dichloro-1,1-difluoroethylmethyl ether	5.00	0.500	ug/Sample
2,2-Dichloropropane	2.50	0.730	ug/Sample
2-Butanone (MEK)	10.0	1.60	ug/Sample
2-chloro-1,1,1,4,4,4-hexafluoro-2-butene	5.00	0.740	ug/Sample
2-Chloro-1,1,1-Trifluoroethane	5.00	0.500	ug/Sample
2-Chlorotoluene	2.50	0.470	ug/Sample
2-Hexanone	10.0	2.30	ug/Sample
2-MTP as HFPO	2.50	2.50	ug/Sample
4-Chlorotoluene	2.50	0.520	ug/Sample
4-Isopropyltoluene	2.50	0.670	ug/Sample
4-Methyl-2-pentanone (MIBK)	10.0	1.60	ug/Sample
Acetone	10.0	5.90	ug/Sample
Benzene	2.50	0.480	ug/Sample
Bromobenzene	2.50	0.350	ug/Sample
Bromochloromethane	2.50	0.560	ug/Sample
Bromodichloromethane	2.50	0.430	ug/Sample
Bromoform	2.50	0.760	ug/Sample
Bromomethane	5.00	2.90	ug/Sample
Carbon disulfide	2.50	0.620	ug/Sample
Carbon tetrachloride	2.50	0.330	ug/Sample

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

Prep: MeOH Prep

Analyte	RL	MDL	Units
Carbonyl Difluoride	10.0	10.0	ug/Sample
Chlorobenzene	2.50	0.360	ug/Sample
Chlorodibromomethane	2.50	0.540	ug/Sample
Chloroethane	5.00	1.10	ug/Sample
Chloroform	2.50	0.290	ug/Sample
Chloromethane	5.00	2.08	ug/Sample
cis-1,2-Dichloroethene	2.50	0.200	ug/Sample
cis-1,3-Dichloropropene	2.50	0.430	ug/Sample
Dibromomethane	2.50	0.240	ug/Sample
Dichlorodifluoromethane	5.00	0.880	ug/Sample
Ethylbenzene	2.50	0.410	ug/Sample
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	2.50	2.50	ug/Sample
Hexachlorobutadiene	2.50	0.660	ug/Sample
HFPO dimer, methyl ester as HFPO-DA	2.50	2.50	ug/Sample
Isopropylbenzene	2.50	0.350	ug/Sample
m,p-Xylene	5.00	0.410	ug/Sample
Methylene Chloride	2.50	1.60	ug/Sample
Naphthalene	2.50	1.20	ug/Sample
n-Butylbenzene	2.50	0.640	ug/Sample
n-Propylbenzene	2.50	0.540	ug/Sample
o-Xylene	2.50	0.260	ug/Sample
sec-Butylbenzene	2.50	0.490	ug/Sample
Styrene	2.50	0.540	ug/Sample
tert-Butylbenzene	2.50	0.440	ug/Sample
Tetrachloroethene	2.50	0.330	ug/Sample
Toluene	2.50	0.460	ug/Sample
trans-1,2-Dichloroethene	2.50	0.260	ug/Sample
trans-1,3-Dichloropropene	2.50	0.880	ug/Sample
Trichloroethene	2.50	0.180	ug/Sample
Trichlorofluoromethane	5.00	0.480	ug/Sample
Vinyl chloride	5.00	1.20	ug/Sample

Method: 9056 - Anions, Ion Chromatography

Prep: MeOH Prep

Analyte	RL	MDL	Units
Hydrogen Fluoride	11.0	5.00	ug/Sample
Total Fluorine	1000	500	ug/Sample

Method: 8321A - PFOA and PFOS

Prep: None

Analyte	RL	MDL	Units
HFPO-DA	0.100	0.0200	ug/Sample

APPENDIX D
SAMPLE CALCULATIONS

EXAMPLE CALCULATIONS FOR
VOLUMETRIC FLOW AND MOISTURE AND ISOKINETICS

Client: Chemours	Facility: Fayetteville, NC
Test Number: Run 1	Test Date: 11/22/19
Test Location: Division Stack	Test Period: 0826-1022

1. Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 \times Y \times Vm \times \left(Pb + \frac{delta\ H}{13.6} \right)}{(Tm + 460)}$$

$$Vm(std) = \frac{17.64 \times 0.9972 \times 63.136 \times \left(30.02 + \frac{1.403}{13.6} \right)}{57.04 + 460} = 64.704$$

Where:

Vm(std) =	Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscf.
Vm =	Volume of gas sample measured by the dry gas meter at meter conditions, dcf.
Pb =	Barometric Pressure, in Hg.
delt H =	Average pressure drop across the orifice meter, in H_2O
Tm =	Average dry gas meter temperature , deg F.
Y =	Dry gas meter calibration factor.
17.64 =	Factor that includes ratio of standard temperature (528 deg R) to standard pressure (29.92 in. Hg), deg R/in. Hg.
13.6 =	Specific gravity of mercury.

2. Volume of water vapor in the gas sample corrected to standard conditions, scf.

$$Vw(std) = (0.04707 \times Vwc) + (0.04715 \times Wwsg)$$

$$Vw(std) = (0.04707 \times 10.0) + (0.04715 \times 24.4) = 1.62$$

Where:

Vw(std) =	Volume of water vapor in the gas sample corrected to standard conditions, scf.
Vwc =	Volume of liquid condensed in impingers, ml.
Wwsg =	Weight of water vapor collected in silica gel, g.
0.04707 =	Factor which includes the density of water (0.002201 lb/ml), the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), ft^3/ml.
0.04715 =	Factor which includes the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), and 453.6 g/lb, ft^3/g.

3. Moisture content

$$bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

$$bws = \frac{1.62}{1.62 + 64.704} = 0.024$$

Where:

bws = Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

$$Md = 1 - bws$$

$$Md = 1 - 0.024 = 0.976$$

Where:

Md = Mole fraction of dry gas, dimensionless.

5. Dry molecular weight of gas stream, lb/lb-mole.

$$MWd = (0.440 \times \%\ CO_2) + (0.320 \times \%\ O_2) + (0.280 \times (\%\ N_2 + \%\ CO))$$

$$MWd = (0.440 \times 0.0) + (0.320 \times 20.9) + (0.280 \times (79.1 + 0.00))$$

$$MWd = 28.84$$

Where:

MWd = Dry molecular weight , lb/lb-mole.
% CO2 = Percent carbon dioxide by volume, dry basis.
$\%\ O_2$ = Percent oxygen by volume, dry basis.
$\%\ N_2$ = Percent nitrogen by volume, dry basis.
% CO = Percent carbon monoxide by volume, dry basis.
0.440 = Molecular weight of carbon dioxide, divided by 100.
0.320 = Molecular weight of oxygen, divided by 100.
0.280 = Molecular weight of nitrogen or carbon monoxide, divided by 100.

6. Actual molecular weight of gas stream (wet basis), lb/lb-mole.

$$MWs = (MWd \times Md) + (18 \times (1 - Md))$$

$$MWs = (28.84 \times 0.976) +(18 (1 - 0.976)) = 28.57$$

Where:

MWs = Molecular weight of wet gas, lb/lb-mole.
18 = Molecular weight of water, lb/lb-mole.

7. Average velocity of gas stream at actual conditions, ft/sec.

$$Vs = 85.49 \times Cp \times ((\text{delt } p)^{1/2})avg \times \left(\frac{Ts\ (avg)}{Ps \times MWs} \right)^{1/2}$$

$$Vs = 85.49 \times 0.84 \times 1.45039 \times \left(\frac{532}{29.99 \times 28.57} \right)^{\wedge}1/2 = 82.0$$

Where:

Vs = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, ft/sec x $\frac{(lb/lb\text{-}mole)(in.\ Hg)^{1/2}}{(deg\ R)(in\ H_2O)}$

Cp = Pitot tube coefficient, dimensionless.

Ts = Absolute gas stream temperature, deg R = Ts, deg F + 460.

Ps = Absolute gas stack pressure, in. Hg. = Pb + $\frac{P(static)}{13.6}$

delt p = Velocity head of stack, in. H_2O.

8. Average gas stream volumetric flow rate at actual conditions, wacf/min.

$$Qs(act) = 60 \times Vs \times As$$

$$Qs(act) = 60 \times 82.0 \times 7.07 = 34799$$

Where:

Qs(act) = Volumetric flow rate of wet stack gas at actual conditions, wacf/min.

As = Cross-sectional area of stack, ft^2.

60 = Conversion factor from seconds to minutes.

9. Average gas stream dry volumetric flow rate at standard conditions, dscf/min.

$$Qs(std) = 17.64 \times Md \times \frac{Ps}{Ts} \times Qs(act)$$

$$Qs(std) = 17.64 \times 0.976 \times \frac{29.99}{531.6} \times 34799$$

$$Qs(std) = 33787$$

Where:

Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min.

10. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.327 \times Ts \times Vm(std)}{Vs \times O \times Ps \times Md \times (Dn)^2}$$

$$I = \frac{17.327 \times 532 \times 64.704}{82.0 \times 96 \times 29.99 \times 0.976 \times (0.160)^2} = 101.0$$

Where:

I =	Percent of isokinetic sampling.
O =	Total sampling time, minutes.
Dn =	Diameter of nozzle, inches.
17.327 =	Factor which includes standard temperature (528 deg R), standard pressure (29.92 in. Hg), the formula for calculating area of circle $D^{2/4}$, conversion of square feet to square inches (144), conversion of seconds to minutes (60), and conversion to percent (100), $\frac{(\text{in. Hg})(\text{in}^2)(\text{min})}{(\text{deg R})(\text{ft}^2)(\text{sec})}$

SAMPLE CALCULATIONS FOR
HFPO DIMER ACID (METHOD 0010)

Client: Chemours | **Plant: Fayetteville, NC**
Test Number: Run 1 | **Test Date: 11/22/19**
Test Location: Divison Stack | **Test Period: 0826-1022**

1. HFPO Dimer Acid concentration, lbs/dscf.

$$Conc1 = \frac{W \times 2.2046 \times 10^{-9}}{Vm(std)}$$

$$Conc1 = \frac{22.3 \times 2.2046 \times 10\text{-}9}{64.704}$$

Conc1 = 7.60E-10

Where:

W = Weight of HFPO Dimer Acid collected in sample in ug.

Conc1 = Division Stack HFPO Dimer Acid concentration, lbs/dscf.

2.2046×10^{-9} = Conversion factor from ug to lbs.

2. HFPO Dimer Acid concentration, ug/dscm.

Conc2 = W / (Vm(std) x 0.02832)

Conc2 = 22.3 / (64.704 x 0.02832)

Conc2 = 1.22E+01

Where:

Conc2 = Division Stack HFPO Dimer Acid concentration, ug/dscm.

0.02832 = Conversion factor from cubic feet to cubic meters.

3. HFPO Dimer Acid mass emission rate, lbs/hr.

$MR1_{(Outlet)}$ = Conc1 x Qs(std) x 60 min/hr

$MR1_{(Outlet)}$ = 7.60E-10 x 33787 x 60

$MR1_{(Outlet)}$ = 1.54E-03

Where:

$MR1_{(Outlet)}$ = Division Stack HFPO Dimer Acid mass emission rate, lbs/hr.

4. HFPO Dimer Acid mass emission rate, g/sec.

$MR2_{(Outlet)}$ = PMR1 x 453.59 / 3600

$MR2_{(Outlet)}$ = 1.54E-03 x 453.59 /3600

$MR2_{(Outlet)}$ = 1.94E-04

Where:

$MR2_{(Outlet)}$ = Division Stack HFPO Dimer Acid mass emission rate, g/sec.

453.6 = Conversion factor from pounds to grams.

3600 = Conversion factor from hours to seconds.

APPENDIX E
EQUIPMENT CALIBRATION RECORDS

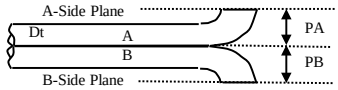
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-694**

Inspection Date 2/19/19 Individual Conducting Inspection ks

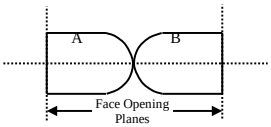
If all Criteria PASS
Cp is equal to 0.84

		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	

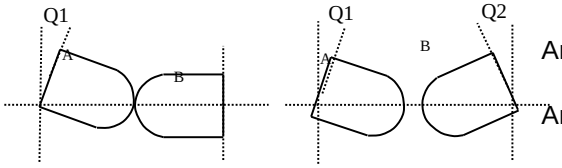


$1.05\ D_t < P < 1.5\ D_t$

PA must Equal PB



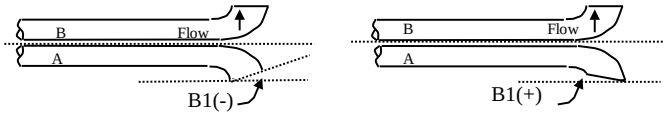
Are Open Faces Aligned Perpendicular to the Tube Axis: (●) YES ( ) NO — PASS



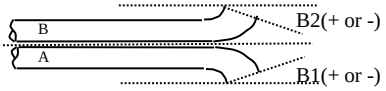
Angle of Q1 from vertical A Tube- degrees (absolute): 0 — PASS

Angle of Q2 from vertical B Tube- degrees (absolute): 0 — PASS

Q1 and Q2 must be $\leq 10^o$



Angle of B1 from vertical A Tube- degrees (absolute): 0 — PASS

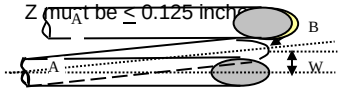


Angle of B1 from vertical B Tube- degrees (absolute): 0 — PASS

B1 or B2 must be $\leq 5^o$

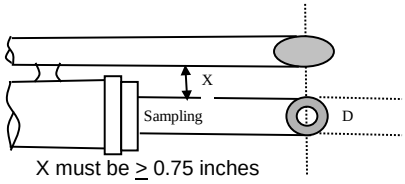
Horizontal offset between A and B Tubes (Z) - inches: 0.004 — PASS

Z must be $\leq$ 0.125 inches



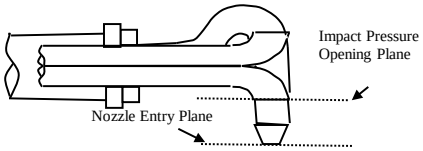
Vertical offset between A and B Tubes (W) - inches: 0.015 — PASS

W must be $\leq$ 0.03125 inches

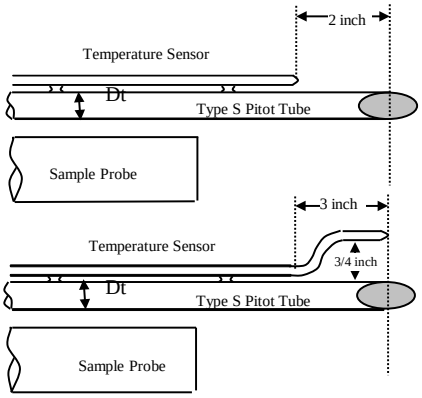


Distance between Sample Nozzle and Pitot (X) - inches: 0.8 — PASS

X must be $\geq$ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane: (●) YES ( ) NO ( ) NA



Thermocouple meets the Distance Criteria in the adjacent figure: (●) YES ( ) NO ( ) NA

Thermocouple meets the Distance Criteria in the adjacent figure: ( ) YES ( ) NO (●) NA

Long Cal and Temperature Cal Datasheet for Standard Dry Gas Meter Console

Calibrator MDW | **Meter Box Number** 30 | **Ambient Temp** 72

Date 21-Feb-19 | **Wet Test Meter Number** P-2952 | **Temp Reference Source** Thermocouple Simulator (Accuracy +/- 1°F)

Dry Gas Meter Number 17485131

Baro Press, in Hg (Pb)	29.87

Setting	Gas Volume		Temperatures					Calibration Results	
Orifice Manometer	Wet Test Meter	Dry gas Meter	Wet Test Meter	Dry Gas Meter					
in H_20 (ΔH)	ft^3 (Vw)	ft^3 (Vd)	°F (Tw)	Outlet, °F (Td_o)	Inlet, °F (Td_i)	Average, °F (Td)	Time, min (O)	Y	ΔH
0.5	5.0	905.750	70.0	70.00	70.00	68.0	12.8	1.0002	1.8501
		910.724		70.00	70.00				
		4.974		70.00	70.00				
1.0	5.0	911.701	70.0	71.00	71.00	70.0	9.0	1.0007	1.8224
		916.685		71.00	71.00				
		4.984		71.00	71.00				
1.5	10.0	917.680	70.0	72.00	72.00	72.5	15.0	0.9995	1.8894
		927.695		74.00	74.00				
		10.015		73.00	73.00				
2.0	10.0	928.690	70.0	74.00	74.00	74.5	13.0	0.9946	1.8851
		938.780		75.00	75.00				
		10.090		74.50	74.50				
3.0	10.0	939.800	70.0	76.00	76.00	76.0	10.7	0.9910	1.9103
		949.930		77.00	77.00				
		10.130		76.50	76.50				
							Average	**0.9972**	**1.8715**

Vw - Gas Volume passing through the wet test meter
Vd - Gas Volume passing through the dry gas meter
Tw - Temp of gas in the wet test meter
Tdi - Temp of the inlet gas of the dry gas meter
Tdo - Temp of the outlet gas of the dry gas meter
Td - Average temp of the gas in the dry gas meter

0 - Time of calibration run
Pb - Barometric Pressure
ΔH - Pressure differential across orifice
Y - Ratio of accuracy of wet test meter to dry gas meter

$$Y = \frac{Vw * Pb * (td + 460)}{Vd * \left[Pb + \frac{(\Delta H)}{13.6} \right] * (tw + 460)}$$

$$\Delta H = \left[\frac{0.0317 * \Delta H}{Pb * (td + 460)} \right] * \left[\frac{(tw + 460) * O}{Vw} \right]^2$$

Reference Temperature	Temperature Reading from Individual Thermocouple Input [1]						Average Temperature Reading	Temp Difference [2] (%)
Select Temperature ○ °C ◉ °F	Channel Number							
	1	2	3	4	5	6		
32	32	32	32	32	32		32.0	0.0%
212	212	213	213	212	212		212.4	-0.1%
932	932	933	933	932	932		932.4	0.0%
1832	1832	1832	1832	1832	1832		1832.0	0.0%

1 - Channel Temps must agree with +/- 5°F or 3°C

2 - Acceptable Temperature Difference less than 1.5 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(^\circ F) + 460) - (\text{Test Temp}(^\circ F) + 460)}{\text{Reference Temp}(^\circ F) + 460} \right]$$

Y Factor Calibration Check Calculation

MODIFIED METHOD 0010 TEST TRAIN

DIVISION STACK

METER BOX NO. 30

11/22/2019

	Run 1	Run 2
MWd = Dry molecular weight source gas, lb/lb-mole.		
0.32 = Molecular weight of oxygen, divided by 100.		
0.44 = Molecular weight of carbon dioxide, divided by 100.		
0.28 = Molecular weight of nitrogen or carbon monoxide, divided by 100.		
% CO_2 = Percent carbon dioxide by volume, dry basis.	0.0	0.0
% O_2 = Percent oxygen by volume, dry basis.	20.9	20.9

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWd = (0.32 * 20.9) + (0.44 * 0) + (0.28 * (100 - (0 + 20.9)))$$

$$MWd = (6.69) + (0.00) + (22.15)$$

MWd =	28.84	28.84

Tma = Source Temperature, absolute(^oR)		
Tm = Average dry gas meter temperature , deg F.	57.0	65.2

$$Tma = Ts + 460$$

$$Tma = 57.04 + 460$$

Tma =	517.04	525.19

Ps = Absolute meter pressure, inches Hg.		
13.60 = Specific gravity of mercury.		
delta H = Avg pressure drop across the orifice meter during sampling, in H2O	1.40	1.00
Pb = Barometric Pressure, in Hg.	30.02	30.02

$$Pm = Pb + (delta\ H / 13.6)$$

$$Pm = 30.02 + (1.4025 / 13.6)$$

Pm =	30.12	30.09

Yqa = dry gas meter calibration check value, dimensionless.		
0.03 = (29.92/528)(0.75)2 (in. Hg/°/R) cfm2.		
29.00 = dry molecular weight of air, lb/lb-mole.		
Vm = Volume of gas sample measured by the dry gas meter at meter conditions, dcf.	63.136	47.088
Y = Dry gas meter calibration factor (based on full calibration)	0.9972	0.9972
Delta H@ = Dry Gas meter orifice calibration coefficient, in. H2O.	1.8715	1.8715
avg SQRT Delta H = Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	1.1783	0.9984
O = Total sampling time, minutes.	96	84

$$Yqa = (O / Vm) * SQRT (0.0319 * Tma * 29) / (Delta\ H@ * Pm * MWd) * avg\ SQRT\ Delta\ H$$

$$Yqa = (96.00 / 63.14) * SQRT (0.0319 * 517.04 * 29) / (1.87 * 30.12 * 28.84) * 1.18$$

$$Yqa = 1.521 * SQRT 478.315 / 1,625.473 * 1.18$$

Yqa =	0.9719	0.9742

Diff = Absolute difference between Yqa and Y	2.54	2.31

$$Diff = ((Y - Yqa) / Y) * 100$$

$$Diff = ((0.9972 - 0.972) / 0.9972) * 100$$

Average Diff = 2.43

Allowable = 5.0

Long Cal and Temperature Cal Datasheet for VOST Dry Gas Meter Console

Calibrator PM | **VOST Box Number** VOST 5 | **Ambient Temp** 72

Date 29-Nov-18 | **Wet Test Meter Number** 10BB-1 | **Temp Reference Source** Thermocouple Simulator (Accuracy +/- 1°F)

Dry Gas Meter Number 3605443

Setting			Gas Volume		Temperatures				Baro Press, in Hg (Pb)	29.75
			Wet Test Meter	Dry gas Meter	Wet Test Meter	Dry Gas Meter				Results
Liters per minute	Roto-meter	Orifice Manometer in H_20 (ΔH)	liters (Vw)	liters (Vd)	°F (Tw)	Outlet, °C (Td_o)	Inlet, °C (Td_i)	Average, °F (Td)	Time, min (O)	Y
0.50	0.70	0.45	5.0	0.000	72.5	20.00	20.00	68.5	10.2	1.0137
				4.890		20.50	20.50			
				4.890		20.25	21.60			
1.00	1.20	0.85	10.0	0.000	72.5	20.50	20.50	69.5	10.0	1.0154
				9.772		21.00	21.00			
				9.772		20.75	22.80			
1.5	1.7	1.2	15.0	0.000	72.5	22.20	22.20	72.0	11.0	1.0118
				14.768		22.20	22.20			
				14.768		22.20	22.20			
2.0	2.3	2.0	20.0	0.000	72.5	22.80	22.80	73.0	20.0	0.9943
				20.034		22.80	22.80			
				20.034		22.80	22.80			
									Average	**1.0088**

Vw - Gas Volume passing through the wet test meter
Vd - Gas Volume passing through the dry gas meter
Tw - Temp of gas in the wet test meter
Tdi - Temp of the inlet gas of the dry gas meter
Tdo - Temp of the outlet gas of the dry gas meter
Td - Average temp of the gas in the dry gas meter

0 - Time of calibration run
Pb - Barometric Pressure
ΔH - Pressure differential across orifice
Y - Ratio of accuracy of wet test meter to dry gas meter

$$Y = \frac{Vw * Pb * (td + 460)}{Vd * \left[Pb + \frac{(\Delta H)}{13.6} \right] * (tw + 460)}$$

$$\Delta H = \left[\frac{0.0317 * \Delta H}{Pb * (td + 460)} \right] * \left[\frac{(tw + 460) * O}{Vw} \right]^2$$

Reference Temperature	Temperature Reading from Individual Thermocouple Input [1]						Average Temperature Reading	Temp Difference [2] (%)
Select Temperature ◉ °C ○ °F	Channel Number							
	1	2	3	4	5	6		
0	0	0	0	0			0.0	0.0%
100	100	100	100	100			100.0	0.0%
500	500	500	500	500			500.0	0.0%
1000	1000	1000	1000	1000			1000.0	0.0%

1 - Channel Temps must agree with +/- 5°F or 3°C

2 - Acceptable Temperature Difference less than 1.5 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(^\circ F) + 460) - (\text{Test Temp}(^\circ F) + 460)}{\text{Reference Temp}(^\circ F) + 460} \right]$$

Long Cal and Temperature Cal Datasheet for VOST Dry Gas Meter Console

Calibrator MDW | **VOST Box Number** VOST 8 | **Ambient Temp** 73

Date 21-Sep-19 | **Wet Test Meter Number** 10BB-1 | **Temp Reference Source** Thermocouple Simulator (Accuracy +/- 1°F)

Dry Gas Meter Number 3602380

Setting			Gas Volume		Temperatures				Baro Press, in Hg (Pb)	30.08
			Wet Test Meter	Dry gas Meter	Wet Test Meter	Dry Gas Meter				Results
Liters per minute	Roto-meter	Orifice Manometer in H_20 (ΔH)	liters (Vw)	liters (Vd)	°F (Tw)	Outlet, °C (Td_o)	Inlet, °C (Td_i)	Average, °F (Td)	Time, min (O)	Y
0.25	0.25	0.00	3.0	0.000	72.0	24.00	24.00	75.0	11.8	1.0060
				2.999		24.00	24.00			
				2.999		24.00	24.00			
0.50	0.50	0.35	9.0	0.000	72.0	24.00	24.00	75.0	17.8	1.0093
				8.960		24.00	24.00			
				8.960		24.00	24.00			
1.0	1.0	1.00	10.0	0.000	72.0	24.00	24.00	75.0	10.0	1.0099
				9.934		24.00	24.00			
				9.934		24.00	24.00			
2.0	2.0	1.70	19.0	0.000	72.0	24.00	24.00	71.0	9.9	1.0099
				18.700		24.00	24.00			
				18.700		24.00	24.00			
									Average	1.0088

Vw - Gas Volume passing through the wet test meter
Vd - Gas Volume passing through the dry gas meter
Tw - Temp of gas in the wet test meter
Tdi - Temp of the inlet gas of the dry gas meter
Tdo - Temp of the outlet gas of the dry gas meter
Td - Average temp of the gas in the dry gas meter

0 - Time of calibration run
Pb - Barometric Pressure
ΔH - Pressure differential across orifice
Y - Ratio of accuracy of wet test meter to dry gas meter

$$Y = \frac{Vw * Pb * (td + 460)}{Vd * \left[Pb + \frac{(\Delta H)}{13.6} \right] * (tw + 460)}$$

$$\Delta H = \left[\frac{0.0317 * \Delta H}{Pb * (td + 460)} \right] * \left[\frac{(tw + 460) * O}{Vw} \right]^2$$

Reference Temperature	Temperature Reading from Individual Thermocouple Input [1]						Average Temperature Reading	Temp Difference [2] (%)
Select Temperature ○ °C ◉ °F	Channel Number							
	1	2	3	4	5	6		
32	32	32	32	32			32.0	0.0%
212	212	212	212	212			212.0	0.0%
932	932	932	932	932			932.0	0.0%
1832	1829	1829	1829	1829			1829.0	0.1%

1 - Channel Temps must agree with +/- 5°F or 3°C

2 - Acceptable Temperature Difference less than 1.5 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(^\circ F) + 460) - (\text{Test Temp}(^\circ F) + 460)}{\text{Reference Temp}(^\circ F) + 460} \right]$$

APPENDIX F
LIST OF PROJECT PARTICIPANTS

The following WESTON employees participated in this project.

Paul Meeter	Senior Project Manager
Jeff O'Neill	Senior Project Manager
Wes Fritz	Senior Project Manager
Matt Winkeler	Team Member
Kyle Schweitzer	Team Member
Brandon Berger	Team Member