THERMAL OXIDIZER CONTROL EFFICIENCY COMPLIANCE TEST REPORT TEST DATES: 28-29 FEBRUARY 2020

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THE CHEMOURS COMPANY

THERMAL OXIDIZER CONTROL EFFICIENCY TEST REPORT

TEST DATES: 28-29 February 2020

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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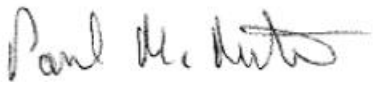


Paul M. Meeter
Weston Solutions, Inc.

TABLE OF CONTENTS

Section **Page**

LIST OF FIGURES

Title **Page**

LIST OF TABLES

Title **Page**

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.

This report presents the results of per- and poly-fluoroalkyl substance (PFAS) control efficiency (CE) testing of the newly installed thermal oxidizer system.

Chemours contracted Weston Solutions, Inc. (Weston) to perform testing for HFPO Dimer Acid Fluoride (as HFPO Dimer Acid) and other target PFAS compounds on the Thermal Oxidizer inlets and stack at the facility. Testing was performed on 28-29 February 2020 and generally followed the "Thermal Oxidizer Test Plan" reviewed and approved by the North Carolina Department of Environmental Quality (NCDEQ).

1.2 TEST OBJECTIVES

The specific objectives for this test program were as follows:

- Measure the Thermal Oxidizer inlet mass feed rates and stack emissions rates of the following target PFAS compounds: Hexafluoropropylene oxide (HFPO Monomer), Hexafluoropropylene Dimer Acid (HFPO-DA), Hexafluoropropylene Dimer Acid Fluoride (HFPO-DAF), Carbonyl Difluoride (COF2) and Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether (Fluoroether E-1).
- Using these data, calculate the Thermal Oxidizer control efficiency (CE) for the target PFAS compounds.
- Monitor and record process data in conjunction with the test program.
- Provide representative emissions data.

Note: The target compound Fluoroether E-1 was added to the testing scope subsequent to preparation of the test plan.

1.3 TEST PROGRAM OVERVIEW

During the emissions test program, the concentrations and mass emissions rates of HFPO Dimer Acid and other target PFAS compounds were measured at the Thermal Oxidizer inlets (monomer and polymer sides) and stack.

Tables 1-1 and 1-2 provide a summary of the test locations 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 A includes process operation data. Raw and reduced test data is included in Appendix B. Appendix C includes the summary reports for the laboratory analytical results including both the emissions test samples and the process samples. Full laboratory reports will be provided in electronic format. Appendix D includes sample calculations. Equipment calibration records are included in Appendix E. A list of Weston project participants is included in Appendix F.

Table 1-1
Sampling Plan for Thermal Oxidizer Stack

Sampling Point & Location	**Thermal Oxidizer Stack**					
Number of Tests:	6 (3 MM18 and 3 M0010)					
Parameters To Be Tested:	HFPO Dimer Acid (HFPO-DA)	HFPO-DAF; HFPO Monomer; Fluoroether E-1; COF2	Volumetric Flow Rate and Gas Velocity	Carbon Dioxide	Oxygen	Water Content
Sampling or Monitoring Method	EPA M-0010	Modified EPA M-18	EPA M1 and M2 in conjunction with M-0010 tests	EPA M3A		EPA M4 in conjunction with M-0010 tests
Sample Extraction/ Analysis Method(s):	LC/MS/MS	GC/MS	NA	NA		NA
Sample Size	≥ 3m[3]	≥ 9ft[3]	NA	NA	NA	NA
Total Number of Samples Collected[1]	3	3	3	3	3	3
Reagent Blanks (Solvents, Resins)[1]	1 set	1 set	0	0	0	0
Field Blank Trains[1]	1 per source	1 per source	0	0	0	0
Proof Blanks[1]	1 per train	1 per train	0	0	0	0
Trip Blanks[1,2]	0 sets	0 sets	0	0	0	0
Lab Blanks	1 per fraction[3]	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Samples (LCS)	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]	0	0	0	0
Media Blanks	1 set[4]	1 set[4]	0	0	0	0
Isotope Dilution Internal Standard Spikes	Each sample	Each sample	0	0	0	0
Total No. of Samples	6[5]	6[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.

Table 1-2
Sampling Plan for Thermal Oxidizer Inlets

Sampling Point & Location	**Thermal Oxidizer Inlets**
Number of Tests:	6 (3 monomer and 3 polymer)
Parameters To Be Tested:	HFPO-DAF; HFPO Monomer; Fluoroether E-1; HFPO Dimer Acid; Carbonyl Difluoride
Sampling or Monitoring Method	Modified EPA M-18
Sample Extraction/ Analysis Method(s):	GC/MS and LC/MS/MS
Sample Size	$\geq 2ft^3$
Total Number of Samples Collected[1]	6
Reagent Blanks (Solvents, Resins)[1]	1 set
Field Blank Trains[1]	1 set
Proof Blanks[1]	1 set
Trip Blanks[1,2]	0
Lab Blanks	1 per fraction[3]
Laboratory or Batch Control Spike Samples (LCS)	1 per fraction[3]
Laboratory or Batch Control Spike Sample Duplicate (LCSD)	1 per fraction[3]
Media Blanks	1 set[4]
Isotope Dilution Internal Standard Spikes	Each sample
Total No. of Samples	6[5]

Key:

[1] Sample collected in field.

[2] Trip blanks include one methanol sample per sample shipment.

[3] Lab blank and LCS/LCSD includes one set per analytical fraction.

[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 runs were performed on each of the Thermal Oxidizer inlets (monomer waste gas feed and polymer waste gas feed). A total of three MM18 and three M0010 test runs were performed on the Thermal Oxidizer/Scrubber stack. Table 2-1 provides a summary of the emissions test results and Thermal Oxidizer control efficiency. Tables 2-2, 2-3, 2-4 and 2-5 provide summaries of the target PFAS compound emissions test results associated with MM18 and M0010 at the Thermal Oxidizer/Scrubber stack and the Thermal Oxidizer inlets. Detailed test results summaries are provided in Section 6.

Table 2-1
Summary of Thermal Oxidizer Control Efficiency Test Results

	Inlet*	Stack	Control Efficiency
	lb/hr	lb/hr	%
R1	9.06E+01	≤1.62E-04	≥99.99982
R2	7.83E+01	≤2.00E-04	≥99.99974
R3	9.55E+01	≤1.34E-04	≥99.99986
Average	8.81E+01	≤1.65E-04	≥99.99981

Note: The control efficiency is calculated using the sum of the mass emission rates in lb/hr of HFPO, HFPO-DA, HFPO-DAF, COF2, and Fluoroether E-1.
*The inlet lb/hr value used to calculate the control efficiency for each run is the sum of the monomer and the polymer lb/hr values for that run except any non-detect values.

Samples taken using MM18 were analyzed for the following volatile organic compounds ("target PFAS compounds"): HFPO Monomer, HFPO-DA, HFPO-DAF, COF2, and Fluoroether E-1. Results of MM18 target PFAS compound analysis for the Thermal Oxidizer/Scrubber stack and Thermal Oxidizer inlet are provided in Tables 2-2, 2-4 and 2-5. Results of M0010 target PFAS compound analysis for the Thermal Oxidizer/Scrubber stack are provided in Table 2-3.

Table 2-2
Summary of MM18 Target Compound Thermal Oxidizer Stack Test Results

Target Compound*	Thermal Oxidizer Stack MM18 Run 1		Thermal Oxidizer Stack MM18 Run 2		Thermal Oxidizer Stack MM18 Run 3	
	g/sec	lb/hr	g/sec	lb/hr	g/sec	lb/hr
HFPO-DAF	<4.88E-06	<3.88E-05	<6.05E-06	<4.80E-05	<4.06E-06	<3.22E-05
HFPO Monomer	<2.21E-07	<1.75E-06	<2.74E-07	<2.18E-06	<1.83E-07	<1.46E-06
Fluoroether E-1	<2.53E-07	<2.01E-06	<3.14E-07	<2.49E-06	<2.10E-07	<1.67E-06
Carbonyl Difluoride	<1.49E-05	<1.18E-04	<1.84E-05	<1.46E-04	<1.23E-05	<9.79E-05

Note: Any < 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.
*The Thermal Oxidizer/Scrubber stack MM18 samples were not analyzed for HFPO-DA.

Table 2-3
Summary of M0010 HFPO-DA Thermal Oxidizer Stack Test Results

Target Compound	Thermal Oxidizer Stack M0010 Run 1		Thermal Oxidizer Stack M0010 Run 2		Thermal Oxidizer Stack M0010 Run 3	
	g/sec	lb/hr	g/sec	lb/hr	g/sec	lb/hr
HFPO-DA	1.51E-07	1.20E-06	1.21E-07	9.60E-07	8.68E-08	6.90E-07

Table 2-4
Summary of MM18 Target Compound Thermal Oxidizer Monomer Inlet Test Results

Target Compound	Thermal Oxidizer Inlet MM18 Run 1		Thermal Oxidizer Inlet MM18 Run 2		Thermal Oxidizer Inlet MM18 Run 3	
	g/sec	lb/hr	g/sec	lb/hr	g/sec	lb/hr
HFPO-DAF	<2.48E-02	<1.97E-01	<4.63E-02	<3.68E-01	<8.45E-03	<6.71E-02
HFPO Monomer	3.20E-01	2.54E+00	2.02E-01	1.60E+00	1.97E-01	1.57E+00
HFPO-DA	4.05E-04	3.22E-03	9.12E-04	7.24E-03	9.13E-04	7.25E-03
Fluoroether E-1	<2.57E-02	<2.04E-01	<3.31E-03	<2.63E-02	<8.75E-03	<6.95E-02
Carbonyl Difluoride	1.11E+01	8.80E+01	8.04E+00	6.39E+01	9.50E+00	7.55E+01

Note: Any < 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.

Table 2-5
Summary of MM18 Target Compound Thermal Oxidizer Polymers Inlet Test Results

Target Compound	Thermal Oxidizer Inlet MM18 Run 1		Thermal Oxidizer Inlet MM18 Run 2		Thermal Oxidizer Inlet MM18 Run 3	
	g/sec	lb/hr	g/sec	lb/hr	g/sec	lb/hr
HFPO-DAF	1.02E-04	8.09E-04	<2.75E-05	<2.18E-04	5.16E-05	4.10E-04
HFPO Monomer	<4.22E-05	<3.35E-04	<4.37E-05	<3.47E-04	<3.30E-05	<2.62E-04
HFPO-DA	1.90E-05	1.51E-04	1.62E-05	1.29E-04	2.17E-05	1.72E-04
Fluoroether E-1	3.34E-04	2.65E-03	6.05E-05	4.81E-04	2.57E-04	2.04E-03
Carbonyl Difluoride	<1.42E-04	<1.13E-03	<1.47E-04	<1.17E-03	<1.10E-04	<8.76E-04

Note: Any < 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 thermal oxidizer and associated four-stage scrubber are identified in the Air Quality Permit respectively as control devices NCD-Q1 and NCD-Q2. The thermal oxidizer is a 10 million BTU per hour (MMBtu/hr), natural gas-fired device. Waste gases from the manufacturing operations collected via header systems are compressed and delivered by pipeline to the thermal oxidizer for destruction of the entrained PFAS compounds. The thermal oxidizer emissions are treated in the scrubber system to control hydrogen fluoride (HF) generated from PFAS compound combustion. The scrubber consists of a four-stage packed bed column with three water scrubbing stages and one caustic scrubbing stage.

3.1 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
VEN	PSEPVE	Condensation is continuous. Agitated Bed Reactor and Refining are batch.
VES	PMVE/PEVE	Semi-continuous – Condensation is continuous. Two Agitated Bed Reactors are batch for 30-40 mins at end of each run. Refining (ether column) is batch
HFPO	HFPO	Continuous
Polymers	SR	Continuous Polymerization

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

- Thermal Oxidizer
  - Waste Gas Feed Rate
  - Thermal Oxidizer Combustion Temperature
  - Scrubber Stage 4 Recycle Rate
  - Scrubber Stage 4 Recycle pH

4. DESCRIPTION OF TEST LOCATIONS

4.1 THERMAL OXIDIZER STACK

Two 4-inch ID test ports are installed on a straight, vertical section of the 18-inch ID stack, 90º apart, as shown below and in Figure 4-1.

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.

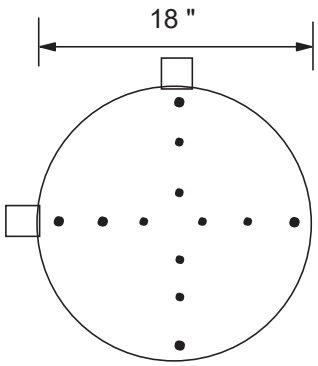
The EPA Method 18 sample was collected at a constant rate at a single point at the approximate center of the stack.

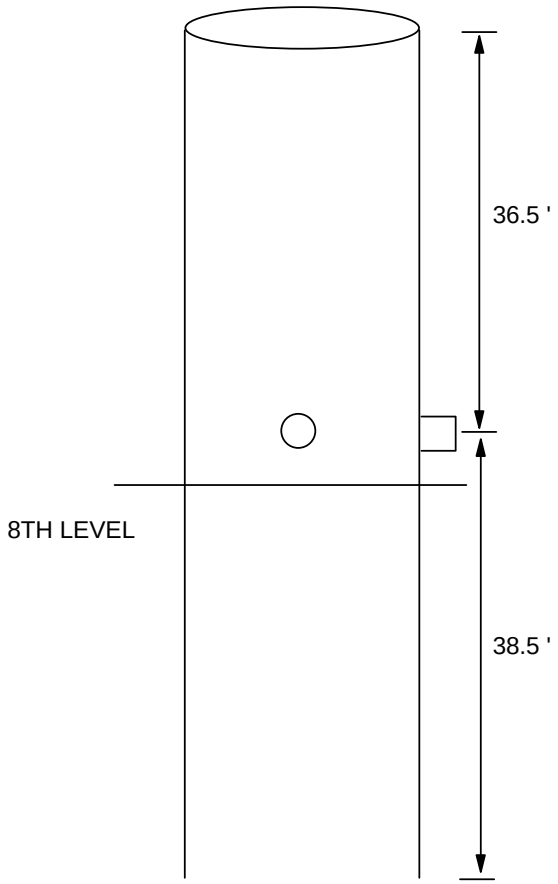
Location	Distance from Flow Disturbance	
	Downstream (B)	Upstream (A)
Thermal Oxidizer Stack	38.5 feet 25.67 duct diameters	36.5 feet 23 duct diameters

4.2 THERMAL OXIDIZER INLET

Two 3-inch waste gas feed lines (monomer and polymers) are installed from the accumulator tanks to the thermal oxidizer. The lines are sampled separately. Sampling is conducted at permanently installed sampling probes, which include a nozzle centered in the line and oriented into the stream flow. The configuration includes Swagelok® connectors that allow for connection of a sampling train. The ball valves allow for starting and stopping the flow of pressurized gas. The "bleed" connection allows for a connection to a compressed nitrogen line to purge and clear the sampling point of any buildup of liquid or debris prior to sampling.

Figure 4-2 provides a schematic of the sampling location.





TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	0.79
2	2.63
3	5.33
4	12.67
5	15.37
6	17.21

DRAWING NOT TO SCALE

FIGURE 4-1
THERMAL OXIDIZER STACK TEST PORT AND TRAVERSE POINT LOCATION

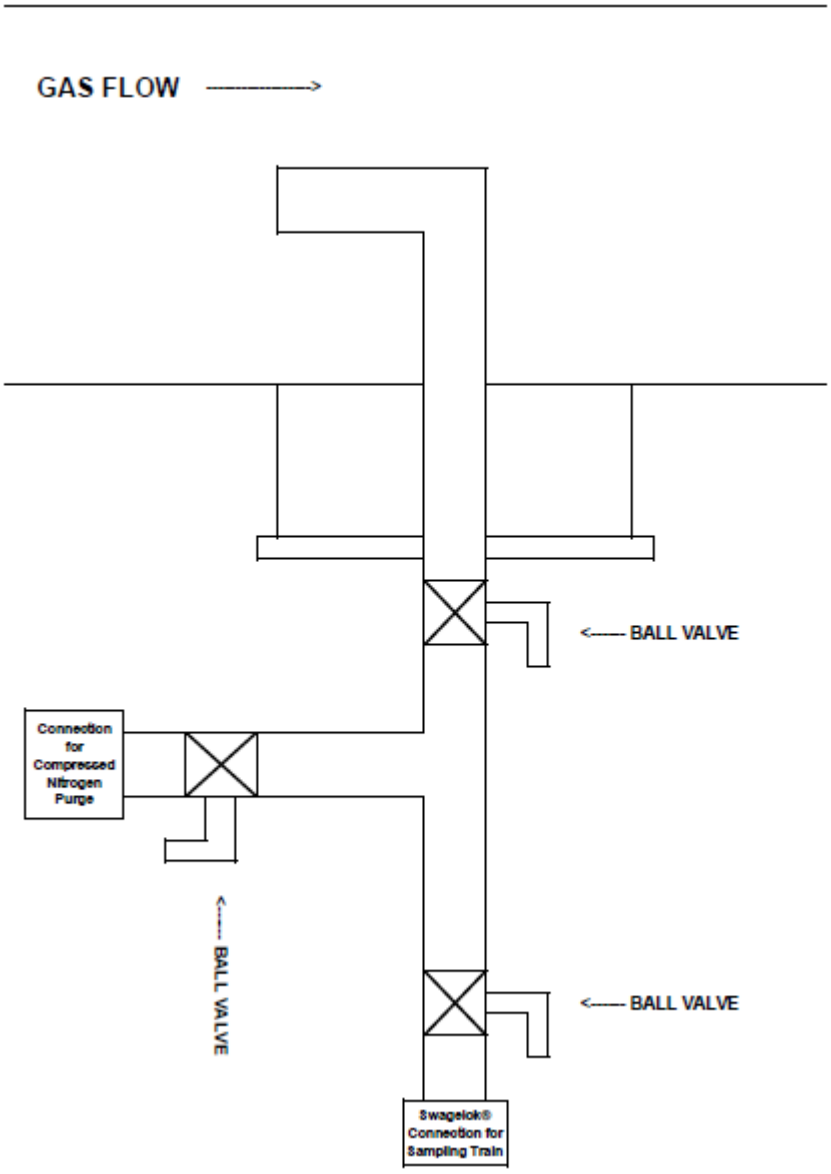


Figure 4-2

Thermal Oxidizer Inlet Sampling Locations

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 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 stack location was a modified 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 ~10-20º 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.

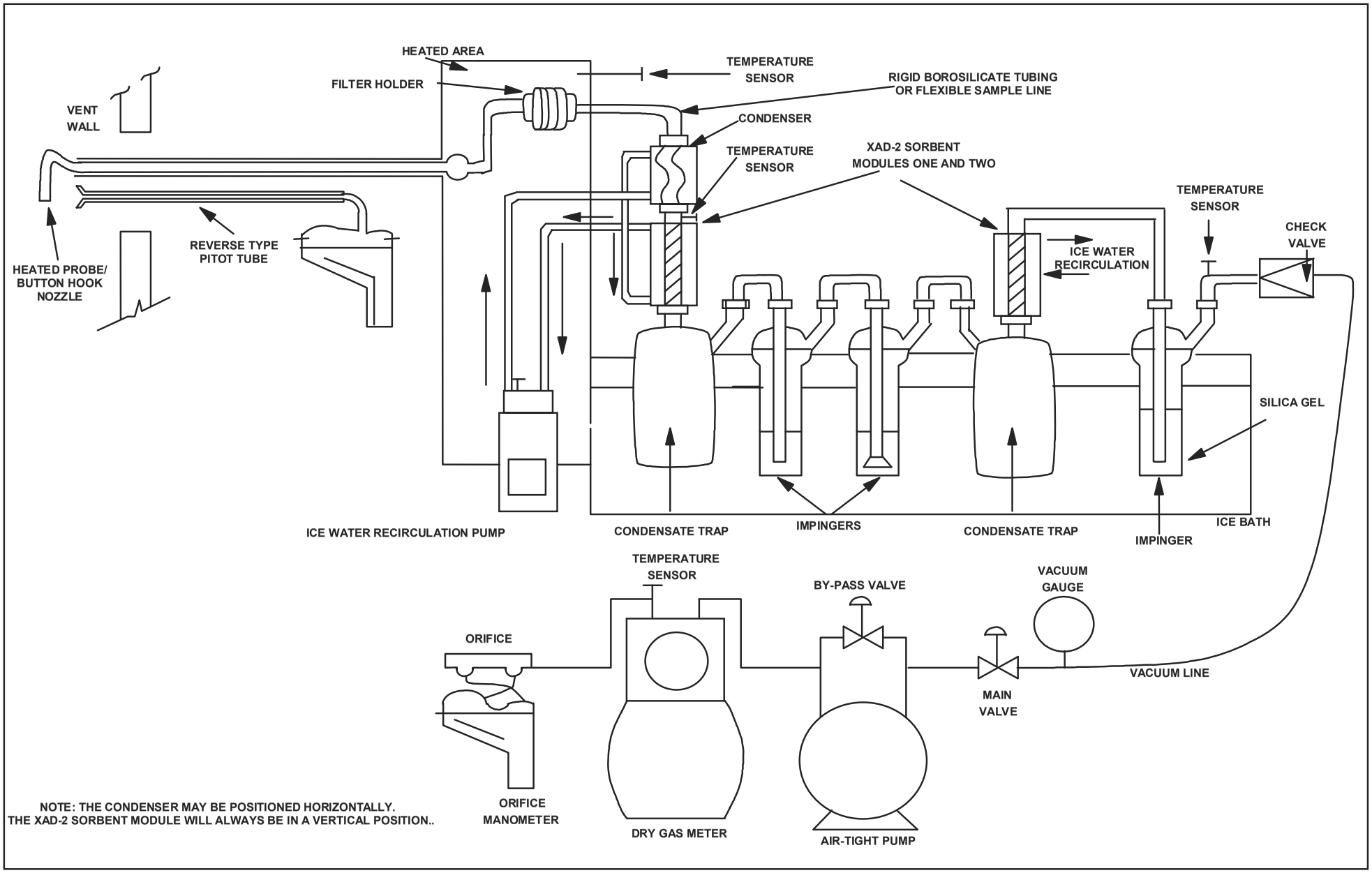


FIGURE 5-1
EPA METHOD 0010 SAMPLING TRAIN

IASDATA\CHEMOURS\15418.002.023/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.

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 sorbent modules (1 and 2) were covered to minimize light degradation, 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, 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 tandem mass spectrometry (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.

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.

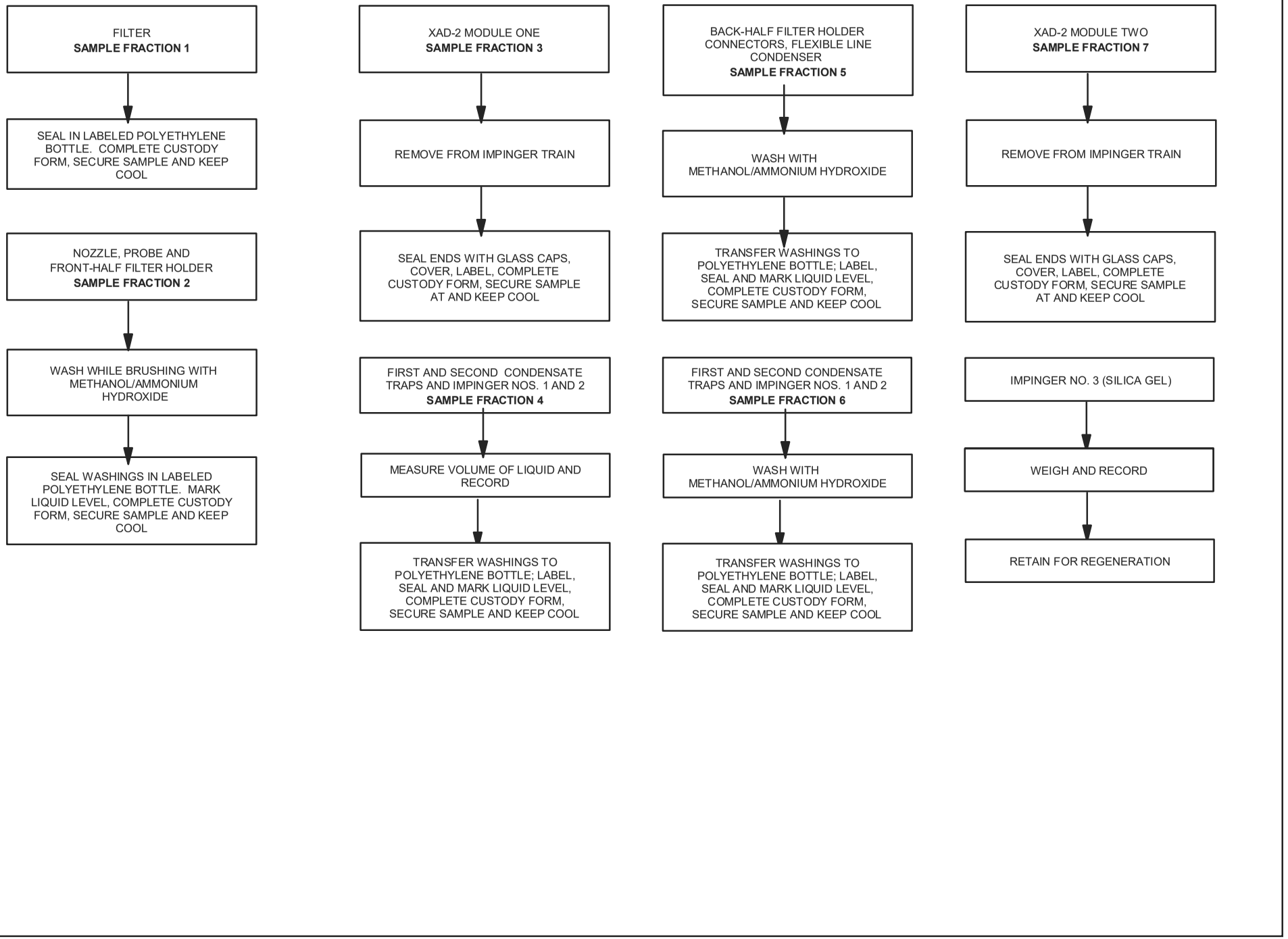


FIGURE 5-2
SAMPLE RECOVERY PROCEDURES FOR METHOD 0010

IASDATA\CHEMOURS\15418.002.023\FIGURE 5-2 EPA 0010

5.3 STACK GAS MM18

A second sampling train utilized to perform the target PFAS compound sampling at the Thermal Oxidizer stack location was a modified EPA Method 18 train using full size Teflon® impingers. All impingers contained 100 mL of methanol and approximately five boiling chips. See Figure 5-3 for the modified EPA Method 18 sampling train.

The version of the modified Method 18 utilized to sample stack gas included an extra impinger not depicted in Figure 5-3. Impinger 1 was placed in an ice water bath. The purpose of impinger 1 was to remove moisture from the sampled gas before the subsequent impingers. Impingers 2-7 were maintained in a dry ice/methanol bath. Sampling time during each test run was 180 minutes (sampled concurrently with the stack gas Method 0010) at a rate of approximately ≥1.5 liters per minute. Each impinger was recovered separately and included a methanol rinse of each impinger and connector.

The impinger contents and rinses were analyzed separately. Each sample was analyzed by EPA SW-846 Method 8260B for COF2, HFPO-DAF, HFPO Monomer, and Fluoroether E-1 by Gas Chromatography/Mass Spectrometry (GC/MS).

During the Thermal Oxidizer test campaign, a blank train was set up near the stack 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.

5.4 INLET GAS MM18

A modified EPA Method 18 train was utilized at the waste gas accumulation tanks to measure the target PFAS compound feed composition to the Thermal Oxidizer inlet. The sampling train used full size Teflon® impingers. Impingers 1-6 each contained 100 mL of methanol and approximately five boiling chips. See Figure 5-3 for the modified EPA Method 18 sampling train.

The impingers were maintained in a dry ice/methanol bath. Sampling time during each test run was >180 minutes (sampled concurrently with the stack gas Method 0010) at a rate of

approximately 0.5 liters per minute. Each impinger was recovered separately and included a methanol rinse of each impinger and connector.

The impinger contents and rinses were analyzed separately. Each sample was analyzed by EPA SW-846 Method 8260B for COF2, HFPO-DAF, HFPO Monomer, and Fluoroether E-1 by Gas Chromatography/Mass Spectrometry (GC/MS). Each sample was also analyzed by EPA SW-846 Method 8321A for HFPO-DA by Liquid Chromatography, Tandem Mass Spectrometry (LC/MS/MS).

During the Thermal Oxidizer test campaign, a blank train was set up near the inlet 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.

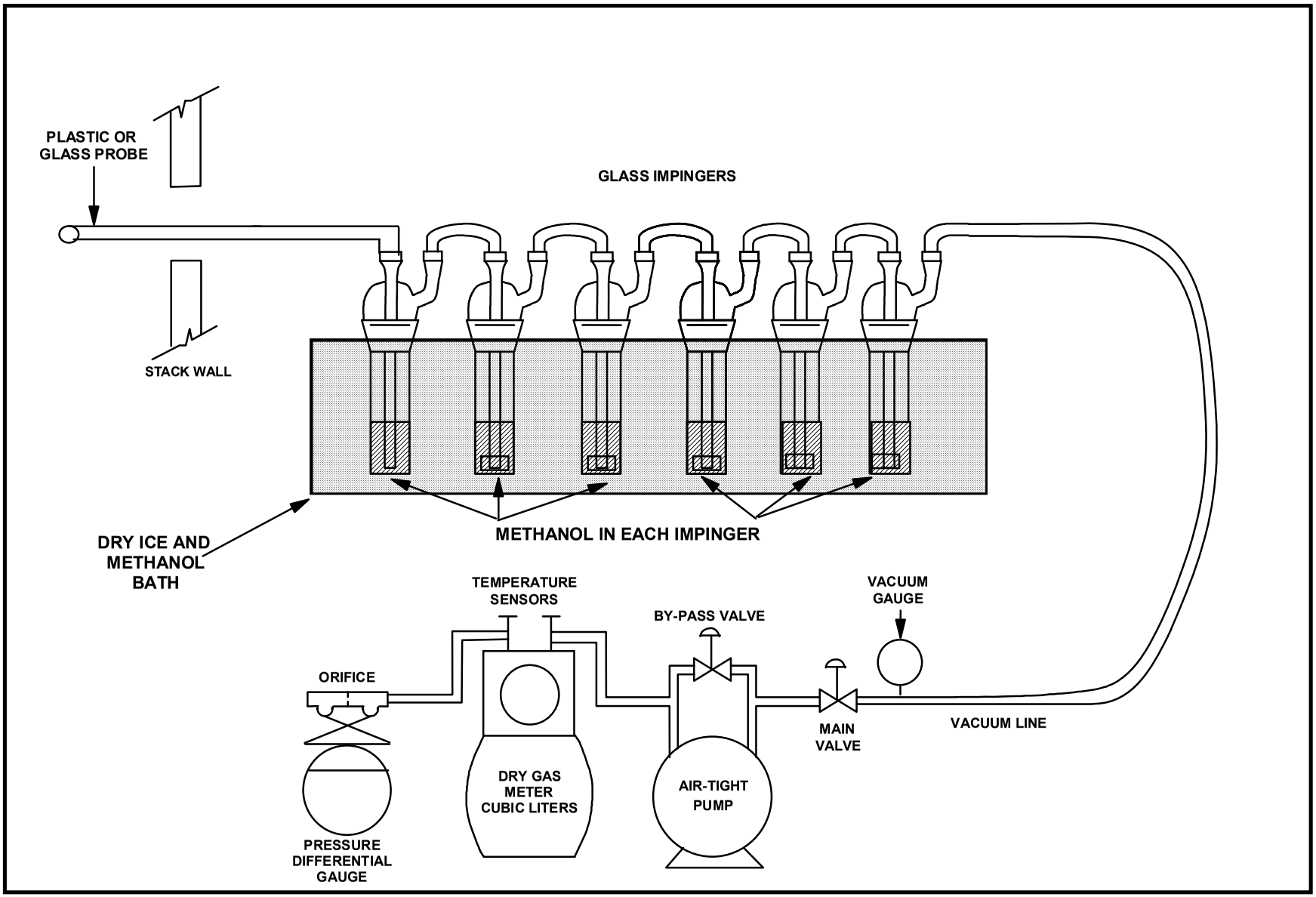


FIGURE 5-3
MODIFIED EPA METHOD 18 SAMPLING TRAIN FOR PFAS COMPOUNDS

5.5 STACK 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 Thermal Oxidizer 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 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 ensure 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 the 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.

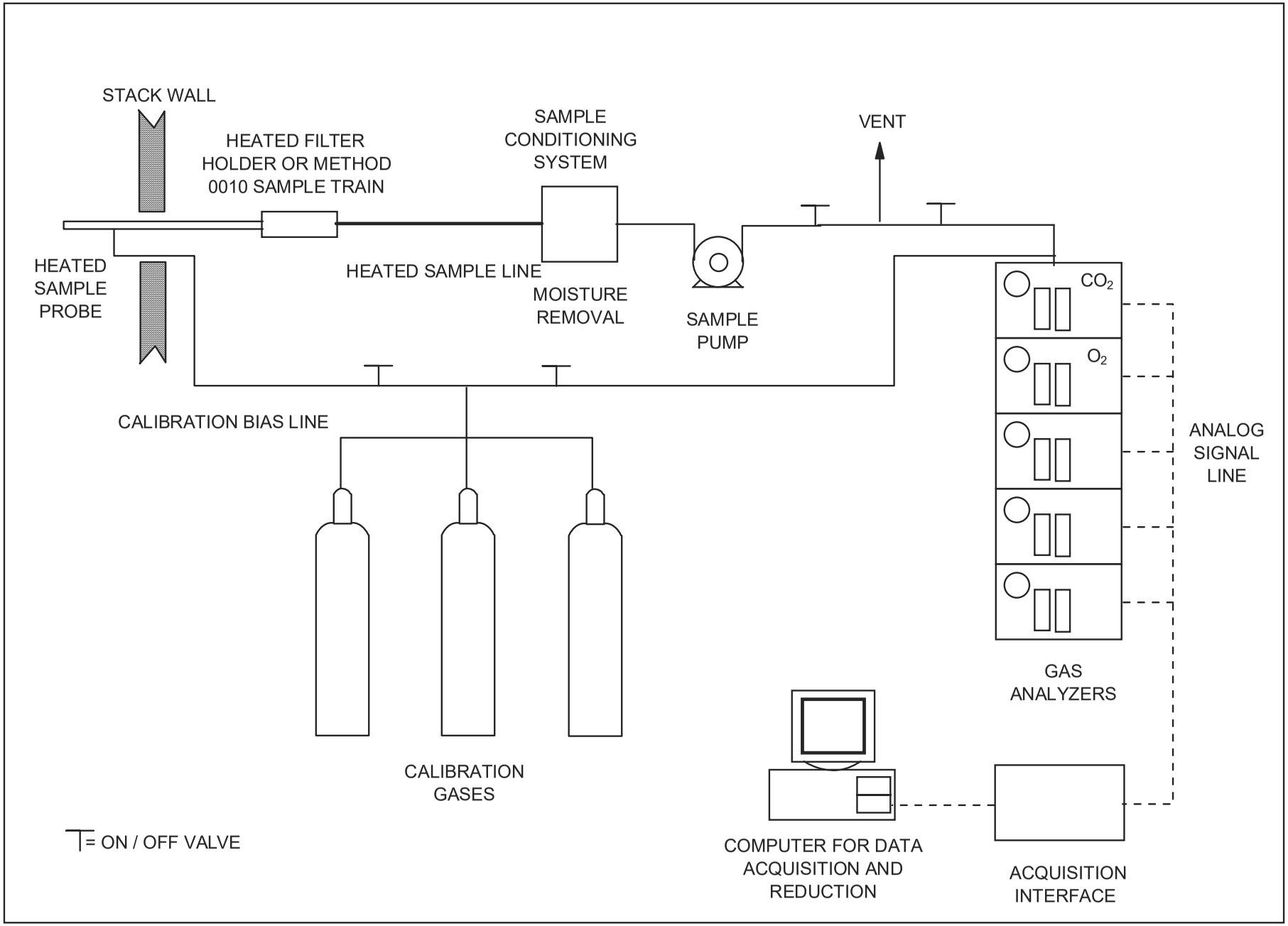


FIGURE 5-4
WESTON SAMPLING SYSTEM

I:\ASDATA\CHEMOURS\15418.002.023\FIGURE 5-4 WESTON SAMPLING SYSTEM

5.6 INLET GAS COMPOSITION

The inlet gas (waste gas) was comprised of nitrogen and organic vapors. This stream was anhydrous. The flow rate of waste gas to the Thermal Oxidizer was continuously measured via mass flow meters. The modified EPA Method 18 train was used to determine the time-integrated composition of the waste gas feed stream during each sampling run.

The Method 18 train utilized to sample the waste gas stream condenses the entrained organic vapors. Therefore, the gas volume measured by the dry gas meter connected to the Method 18 sampling train was the nitrogen less the organic vapors.

The pre-and post-test differential impinger masses were used to determine the mass of condensed vapors in the sampled gas. The total mass of the sampled gas was determined by summing the mass of the condensed organic vapors fraction and the calculated mass of the dry gas fraction measured via the dry gas meter assuming all dry gas flow was 100% nitrogen.

Impinger analysis was used to determine the mass of the target PFAS compounds captured by the Method 18 sampling train. The analysis results are used to calculate the mass of each target PFAS compound per total mass of gas sampled. The mass feed rate of each PFAS compound to the Thermal Oxidizer was then determined by multiplying this mass concentration measured via Method 18 by the waste gas flow rate measured via the system's mass flow meters. For purposes of control efficiency (CE) determinations, zero was used for any non-detect values of the target PFAS compounds; no credit was taken for non-detect values.

6. DETAILED TEST RESULTS AND DISCUSSION

Each test was a minimum of 180 minutes in duration. A total of three M0010 and three MM18 test runs were performed at the Thermal Oxidizer stack. A total of three MM18 test runs were performed at each of the Thermal Oxidizer inlets.

Table 6-1 provides detailed M0010 test data and test results for Thermal Oxidizer stack. Table 6-2 provides detailed MM18 test data and test results for the Thermal Oxidizer stack. Tables 6-3 and 6-4 provide detailed MM18 test data and test results for the Thermal Oxidizer monomer inlet and polymer inlet, respectively.

The Thermal Oxidizer control efficiency was calculated based upon the five target PFAS compound mass emission rates in lb/hr as measured at the inlet and stack.

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

Test Data			
Run number	1	2	3
Location	Thermal Oxidizer Stack	Thermal Oxidizer Stack	Thermal Oxidizer Stack
Date	2/28/2020	2/28/2020	2/29/2020
Time period	1115-1433	1630-1943	0915-1232
SAMPLING DATA:			
Sampling duration, min.	180	180	180
Nozzle diameter, in.	0.210	0.210	0.210
Cross sectional nozzle area, sq.ft.	0.000241	0.000241	0.000241
Barometric pressure, in. Hg	30.07	29.88	30.05
Avg. orifice press. diff., in H_2O	1.96	1.90	2.07
Avg. dry gas meter temp., deg F	50.3	56.3	51.0
Avg. abs. dry gas meter temp., deg. R	510	516	511
Total liquid collected by train, ml	37.0	39.0	32.1
Std. vol. of H_2O vapor coll., cu.ft.	1.7	1.8	1.5
Dry gas meter calibration factor	1.0013	1.0013	1.0013
Sample vol. at meter cond., dcf	121.755	119.570	124.676
Sample vol. at std. cond., dscf [(1)]	127.323	122.804	130.162
Percent of isokinetic sampling	100.4	99.1	99.9
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	2.2	2.3	2.2
O_2, % by volume, dry basis	17.3	17.2	17.3
N_2, % by volume, dry basis	80.5	80.5	80.5
Molecular wt. of dry gas, lb/lb mole	29.04	29.06	29.04
H_20 vapor in gas stream, prop. by vol.	0.014	0.015	0.011
Mole fraction of dry gas	0.986	0.985	0.989
Molecular wt. of wet gas, lb/lb mole	28.89	28.89	28.92
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	0.70	0.70	0.70
Absolute pressure, in. Hg	30.12	29.93	30.10
Avg. temperature, deg. F	62	65	58
Avg. absolute temperature, deg.R	522	525	518
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	12	12	12
Avg. gas stream velocity, ft./sec.	48.7	48.2	49.6
Stack/duct cross sectional area, sq.ft.	1.77	1.77	1.77
Avg. gas stream volumetric flow, wacf/min.	5162	5105	5253
Avg. gas stream volumetric flow, dscf/min.	5179	5058	5320

[(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
THERMAL OXIDIZER STACK

TEST DATA			
Run number	1	2	3
Location	Thermal Oxidizer Stack	Thermal Oxidizer Stack	Thermal Oxidizer Stack
Date	2/28/2020	2/28/2020	2/29/2020
Time period	1115-1433	1630-1943	0915-1232
LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	0.22	0.16	0.12
EMISSION RESULTS, ug/dscm.			
HFPO Dimer Acid	0.06	0.05	0.03
EMISSION RESULTS, lb/dscf.			
HFPO Dimer Acid	3.78E-12	2.87E-12	1.98E-12
EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	1.17E-06	8.70E-07	6.32E-07
EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	1.48E-07	1.09E-07	7.96E-08

TABLE 6-2
CHEMOURS-FAYETTEVILLE, NC
INPUTS FOR TARGET COMPOUND CALCULATIONS
THERMAL OXIDIZER STACK

TEST DATA			
Test run number	1	2	3
Location	Thermal Oxidizer Stack	Thermal Oxidizer Stack	Thermal Oxidizer Stack
Test date	2/28/2020	2/28/2020	2/29/2020
Test time period	1115-1433	1630-1943	0915-1232
Operator	CW	CW	CW
SAMPLING DATA			
Duration, minutes	180	180	180
Average dry gas meter press. in. H2O	1.80	1.80	1.80
Average dry gas meter temp. deg. F	50.56	53.97	47.56
Average absolute meter temp. deg. R	510.6	514.0	507.6
Sample vol. at meter cond., dcl	269.535	270.347	269.831
Meter box calibration, Y	1.0000	1.0000	1.0000
Barometric pressure, in. Hg	30.07	29.88	30.05
Sample volume, dscl (1)	281.262	278.471	283.048
Sample volume, dscf (1)	9.932	9.833	9.995
VOLUMETRIC FLOW RATE			
Avg. gas stream volumetric flow, dscf/min.	5,179	5,058	5,320

(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 TARGET COMPOUND TEST DATA AND TEST RESULTS

TEST DATA						
Run number		1		2		3
Location		Thermal Oxidizer Stack		Thermal Oxidizer Stack		Thermal Oxidizer Stack
Date		2/28/2020		2/28/2020		2/29/2020
Time period		1115-1433		1630-1943		0915-1232
LABORATORY REPORT DATA, ug.						
HFPO-DAF	<	0.5620	<	0.7060	<	0.4580
HFPO Monomer	<	0.0254	<	0.0320	<	0.0207
Fluoroether E-1	<	0.0291	<	0.0366	<	0.0237
Carbonyl Difluoride	<	1.7100	<	2.1500	<	1.3900
EMISSION RESULTS, ug/dscm.						
HFPO-DAF	<	2.00E+00	<	2.54E+00	<	1.62E+00
HFPO Monomer	<	9.03E-02	<	1.15E-01	<	7.31E-02
Fluoroether E-1	<	1.03E-01	<	1.31E-01	<	8.37E-02
Carbonyl Difluoride	<	6.08E+00	<	7.72E+00	<	4.91E+00
EMISSION RESULTS, lb/dscf.						
HFPO-DAF	<	1.25E-10	<	1.58E-10	<	1.01E-10
HFPO Monomer	<	5.64E-12	<	7.17E-12	<	4.57E-12
Fluoroether E-1	<	6.46E-12	<	8.21E-12	<	5.23E-12
Carbonyl Difluoride	<	3.80E-10	<	4.82E-10	<	3.07E-10
EMISSION RESULTS, lb/hr.						
HFPO Dimer Methyl Ester	<	3.88E-05	<	4.80E-05	<	3.22E-05
HFPO Monomer	<	1.75E-06	<	2.18E-06	<	1.46E-06
Fluoroether E-1	<	2.01E-06	<	2.49E-06	<	1.67E-06
Carbonyl Difluoride	<	1.18E-04	<	1.46E-04	<	9.79E-05
EMISSION RESULTS, g/sec.						
HFPO-DAF	<	4.88E-06	<	6.05E-06	<	4.06E-06
HFPO Monomer	<	2.21E-07	<	2.74E-07	<	1.83E-07
Fluoroether E-1	<	2.53E-07	<	3.14E-07	<	2.10E-07
Carbonyl Difluoride	<	1.49E-05	<	1.84E-05	<	1.23E-05

TABLE 6-3
CHEMOURS-FAYETTEVILLE, NC
INPUTS FOR TARGET COMPOUND CALCULATIONS
THERMAL OXIDIZER MONOMER INLET

TEST DATA			
Test run number	1	2	3
Location	TO Monomer Inlet	TO Monomer Inlet	TO Monomer Inlet
Test date	2/28/2020	2/28/2020	2/29/2020
Test time period	1115-1433	1630-1943	0915-1232
Operator	CH	CH	CH
SAMPLING DATA			
Duration, minutes	195	193	197
Average dry gas meter press. in. H2O	1.15	1.20	1.20
Average dry gas meter temp. deg. F	61.40	59.44	62.38
Average absolute meter temp. deg. R	521.4	519.4	522.4
Sample vol. at meter cond., dcl	98.532	96.897	98.459
Meter box calibration, Y	0.9996	0.9996	0.9996
Barometric pressure, in. hg	30.11	29.98	30.05
Sample volume, dscl (1)	100.614	98.903	100.165
Mass of sample gas, kg	0.11711	0.11512	0.11659
VOLUMETRIC FLOW RATE			
Avg. gas stream volumetric flow, kg/hr (from Chemours)	196.7	182.1	181.6
Total weight gain in impingers, kg	0.1208	0.1296	0.1898
Total Mass collected, kg	0.2379	0.2447	0.3064

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

TABLE 6-3 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF TARGET COMPOUND TEST DATA AND TEST RESULTS

TEST DATA						
Run number		1		2		3
Location		TO Monomer Inlet		TO Monomer Inlet		TO Monomer Inlet
Date		2/28/2020		2/28/2020		2/29/2020
Time period		1115-1433		1630-1943		0915-1232
LABORATORY REPORT DATA, ug.						
HFPO-DAF	<	108000	<	268000	<	63600
HFPO Monomer		1394000		1167800		1486600
Fluoroether E-1	<	112000	<	278000	<	65900
HFPO Dimer Acid		1766		5276		6876
Carbonyl Difluoride		48294000		46547400		71559000
Total Target Compounds, kg		0.04969		0.04772		0.07305
Total Impinger and Gas sample Mass, kg		0.2379		0.2447		0.3064
Total Mass Sampled per Total Mass		0.2089		0.1950		0.2384
EMISSION RESULTS, lb/hr.						
HFPO-DAF	<	1.97E-01	<	4.40E-01	<	8.31E-02
HFPO Monomer		2.54E+00		1.92E+00		1.94E+00
Fluoroether E-1	<	2.04E-01	<	4.56E-01	<	8.61E-02
HFPO Dimer Acid		3.22E-03		8.65E-03		8.99E-03
Carbonyl Difluoride		8.80E+01		7.63E+01		9.35E+01
Total Target Compounds		9.06E+01		7.83E+01		9.55E+01
EMISSION RESULTS, g/sec.						
HFPO-DAF	<	2.48E-02	<	5.53E-02	<	1.05E-02
HFPO Monomer		3.20E-01		2.41E-01		2.45E-01
Fluoroether E-1	<	2.57E-02	<	5.74E-02	<	1.08E-02
HFPO Dimer Acid		4.05E-04		1.09E-03		1.13E-03
Carbonyl Difluoride		1.11E+01		9.61E+00		1.18E+01
Total Target Compounds		1.14E+01		9.85E+00		1.20E+01

Note: All < values are non-detects and a value of 0 is used in all calculations

TABLE 6-4
CHEMOURS-FAYETTEVILLE, NC
INPUTS FOR TARGET COMPOUND CALCULATIONS
THERMAL OXIDIZER POLYMERS INLET

TEST DATA			
Test run number	1	2	3
Location	TO Polymers Inlet	TO Polymers Inlet	TO Polymers Inlet
Test date	2/28/2020	2/28/2020	2/29/2020
Test time period	1115-1433	1630-1942	0915-1232
Operator	AS	PMM	BB/CH
SAMPLING DATA			
Duration, minutes	195	192	197
Average dry gas meter press. in. H2O	2.08	2.08	1.00
Average dry gas meter temp. deg. F	61.40	59.69	60.44
Average absolute meter temp. deg. R	521.4	519.7	520.4
Sample vol. at meter cond., dcl	98.333	98.530	98.349
Meter box calibration, Y	1.0088	1.0088	1.0088
Barometric pressure, in. hg	30.11	29.98	30.05
Sample volume, dscl (1)	101.565	101.665	101.301
Mass of sample gas, kg	0.11822	0.11834	0.11791
VOLUMETRIC FLOW RATE			
Avg. gas stream volumetric flow, kg/hr (from Chemours)	109.7	108.9	110.8
Total weight gain in impingers, kg	0.0015	0.0028	0.0042
Total Mass collected, kg	0.1197	0.1211	0.1221

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

TABLE 6-4 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF TARGET COMPOUND TEST DATA AND TEST RESULTS

TEST DATA						
Run number		1		2		3
Location		TO Polymers Inlet		TO Polymers Inlet		TO Polymers Inlet
Date		2/28/2020		2/28/2020		2/29/2020
Time period		1115-1433		1630-1942		0915-1232
LABORATORY REPORT DATA, ug.						
HFPO-DAF		401		110		205
HFPO Monomer	<	166	<	175	<	131
Fluoroether E-1		1313		1045		1020
HFPO Dimer Acid		75		65		86
Carbonyl Difluoride	<	558	<	588	<	438
Total Target Compounds, kg		0.0000018		0.00000122		0.0000013
Total Impinger and Gas Sample Mass, kg		0.1197		0.1211		0.1221
Total Mass Sampled per Total Mass		0.000015		0.0000101		0.000011
EMISSION RESULTS, lb/hr.						
HFPO-DAF		8.09E-04		2.18E-04		4.10E-04
HFPO Monomer	<	3.35E-04	<	3.47E-04	<	2.62E-04
Fluoroether E-1		2.65E-03		2.07E-03		2.04E-03
HFPO Dimer Acid		1.51E-04		1.29E-04		1.72E-04
Carbonyl Difluoride	<	1.13E-03	<	1.17E-03	<	8.76E-04
Total Target Compounds		3.61E-03		2.42E-03		2.62E-03
EMISSION RESULTS, g/sec.						
HFPO-DAF		1.02E-04		2.74E-05		5.16E-05
HFPO Monomer	<	4.22E-05	<	4.37E-05	<	3.30E-05
Fluoroether E-1		3.34E-04		2.61E-04		2.57E-04
HFPO Dimer Acid		1.90E-05		1.62E-05		2.17E-05
Carbonyl Difluoride	<	1.42E-04	<	1.47E-04	<	1.10E-04
Total Target Compounds		4.55E-04		3.04E-04		3.30E-04

Note: All < values are non-detects and a value of 0 is used in all calculations

APPENDIX A
PROCESS OPERATIONS DATA

Date	**2/28/2020**								
Time	1100	1200	1300	1400	1500	1600	1700	1800	1900
Stack Testing		RUN 1 - 1115-1433					RUN 2 -1630-1943		
HFPO									
VEN Product					PSEPVE				
VEN Precursor									
VEN Condensation (HFPO)									
VEN ABR			Burnout						
VEN Refining									
Stripper Column Vent									
VES Product					PM/PE				
VES Precursor									
VES Condensation (HFPO)									
VES ABR (East)									Burnout
VES ABR (West)									
VES Refining									
Dimer ISO Venting									
E2 Production					Down				
Polymers - Recycle Still					Down				
Polymers Polymerization					1000SR				
Polymers Line 4 Extrusion					Down				
Polymers Line 3 Extrusion					Down				

Date	**2/29/2020**				
Time	900	1000	1100	1200	1300
Stack Testing		RUN 3 - 915-1232			
HFPO					
VEN Product			PSEPVE		
VEN Precursor					
VEN Condensation (HFPO)					
VEN ABR					
VEN Refining					
Stripper Column Vent					
VES Product			PM/PE		
VES Precursor					
VES Condensation (HFPO)					
VES ABR (East)					
VES ABR (West)					
VES Refining					
Dimer ISO Venting					
E2 Production			Down		
Polymers - Recycle Still			Down		
Polymers Polymerization			1000SR		
Polymers Line 4 Extrusion			Down		
Polymers Line 3 Extrusion			Down		

Table X. Thermal Oxidizer Destruction Efficiency Test Operating Data

Parameter	Tag No.	Units	Permit	Statistic	Run 1	Run 2	Run 3	Average
Monomer Waste Gas	A41756FC	lb/hr	NA	Average	433.6	401.4	400.4	411.8
				Maximum	455.5	447.1	506.5	469.7
				Minimum	405.1	354.9	343.5	367.8
				Std Dev	13.8	20.7	46.4	27.0
Polymer Waste Gas	A41103FC	lb/hr	NA	Average	241.8	240.1	244.3	242.1
				Maximum	247.5	248.2	250.4	248.7
				Minimum	235.0	233.0	236.5	234.8
				Std Dev	2.4	3.1	2.8	2.8
Total Waste Gas	calculated	lb/hr	<2,200	Average	678.8	641.5	651.2	657.2
				Maximum	1291.0	695.3	1991.2	1325.8
				Minimum	642.7	597.7	592.8	611.1
				Std Dev	46.0	22.0	106.3	58.1
Combustion Temperature	A40937TC	deg F	>1,800	Average	1,922	1,922	1,921	1,922
				Maximum	1,924	1,924	1,923	1,924
				Minimum	1,920	1,919	1,918	1,919
				Std Dev	1	1	1	1
Scrubber Flow Rate	calculated	gpm	>40	Average	60.5	60.5	60.5	60.5
				Maximum	60.8	60.6	60.8	60.8
				Minimum	60.2	60.3	60.2	60.3
				Std Dev	0.1	0.1	0.1	0.1
Scrubber pH	A41261XC	SU	>7.1	Average	8.15	8.15	8.13	8.14
				Maximum	8.18	8.18	8.18	8.18
				Minimum	8.13	8.11	8.09	8.11
				Std Dev	0.02	0.02	0.02	0.02
Date:					28-Feb-20	28-Feb-20	29-Feb-20	
Start:					11:15	16:30	9:15	
Finish:					14:33	19:43	12:32	
Duration:					3:18	3:13	3:17	

	Combustion Chamber Temp	Monomers Gas Feed Rate	Polymers Gas Feed Rate	Total Gas Feed Rate	Stage 4 Rate	Stage 4 Rate	Stage 4 pH
units	F	lb/hr	lb/hr	lb/hr	lb/hr	gpm	
Tag	A40937TC	A41756FC	A41103FC	calculated	A41255FG	calculated	A41261XC
Average	1921.7	433.6	241.8	678.8	30299.0	60.5	8.15
Maximum	1923.5	455.5	247.5	1291.0	30456.1	60.8	8.18
Minimum	1920.3	405.1	235.0	642.7	30149.0	60.2	8.13
Std. Dev.	0.6	13.8	2.4	46.0	55.8	0.1	0.02
2/28/2020 11:15:00	1921.98	446.29	243.91	690.2	30294.693	60.50	8.13
2/28/2020 11:16:00	1921.41	444.12	244.1	688.22	30325.641	60.56	8.13
2/28/2020 11:17:00	1921.58	443.35	242.84	686.19	30343.696	60.60	8.13
2/28/2020 11:18:00	1921.39	436.15	241.4	677.55	30262.622	60.43	8.14
2/28/2020 11:19:00	1921.46	434.98	238.58	673.56	30255.924	60.42	8.14
2/28/2020 11:20:00	1921.66	438.54	240.04	678.58	30361.009	60.63	8.14
2/28/2020 11:21:00	1921.65	442.89	239.95	682.84	30396.651	60.70	8.14
2/28/2020 11:22:00	1921.86	439.32	240.38	679.7	30456.073	60.82	8.14
2/28/2020 11:23:00	1922.64	436.51	243.72	680.23	30306.127	60.52	8.14
2/28/2020 11:24:00	1922.47	434.38	244.32	678.7	30283.114	60.47	8.14
2/28/2020 11:25:00	1921.72	433.88	241.67	675.55	30273.804	60.46	8.14
2/28/2020 11:26:00	1922.63	439.13	243.25	682.38	30228.879	60.37	8.14
2/28/2020 11:27:00	1922.72	437.17	241.45	678.62	30304.877	60.52	8.14
2/28/2020 11:28:00	1922.59	438.61	240.02	678.63	30361.696	60.63	8.14
2/28/2020 11:29:00	1922.45	433.97	240.27	674.24	30321.765	60.55	8.14
2/28/2020 11:30:00	1922.45	435.91	241.74	677.65	30323.626	60.56	8.13
2/28/2020 11:31:00	1922.63	432.46	243.52	675.98	30266.663	60.44	8.13
2/28/2020 11:32:00	1922.49	437.72	242.42	680.14	30320.906	60.55	8.13
2/28/2020 11:33:00	1922.64	438.91	245.57	684.48	30293.285	60.49	8.13
2/28/2020 11:34:00	1923.25	436.53	242.33	678.86	30338.653	60.59	8.13
2/28/2020 11:35:00	1923.25	432.26	242.2	674.46	30323.196	60.55	8.13
2/28/2020 11:36:00	1923.52	437.94	244.45	682.39	30295.718	60.50	8.13
2/28/2020 11:37:00	1922.67	435.72	241.75	677.47	30315.289	60.54	8.13
2/28/2020 11:38:00	1922.71	429.74	240.88	670.62	30248.421	60.41	8.13

2/28/2020 11:39:00	1922.19	428.09	244.21	672.3	30300.345	60.51	8.13
2/28/2020 11:40:00	1922	433.23	243.21	676.44	30321.432	60.55	8.13
2/28/2020 11:41:00	1921.31	434.94	242.16	677.1	30337.955	60.58	8.13
2/28/2020 11:42:00	1922.19	436.37	241.29	677.66	30370.798	60.65	8.13
2/28/2020 11:43:00	1922.19	430.68	241.25	671.93	30246.391	60.40	8.13
2/28/2020 11:44:00	1922.19	430.65	242.64	673.29	30406.219	60.72	8.13
2/28/2020 11:45:00	1922.45	435.77	243.52	679.29	30307.723	60.52	8.13
2/28/2020 11:46:00	1922.18	436.19	243.2	679.39	30313.881	60.54	8.13
2/28/2020 11:47:00	1921.93	442.6	242.59	685.19	30302.435	60.51	8.13
2/28/2020 11:48:00	1922.19	437.75	243.56	681.31	30297.387	60.50	8.13
2/28/2020 11:49:00	1921.88	440.23	240.95	681.18	30304.571	60.52	8.13
2/28/2020 11:50:00	1922.1	442.4	243.08	685.48	30281.267	60.47	8.13
2/28/2020 11:51:00	1922.19	443.23	245.19	688.42	30323.448	60.55	8.13
2/28/2020 11:52:00	1922.46	449.46	244.21	693.67	30276.394	60.46	8.13
2/28/2020 11:53:00	1922.45	446.09	241.32	687.41	30361.464	60.63	8.13
2/28/2020 11:54:00	1922.54	446.76	243.68	690.44	30250.239	60.41	8.13
2/28/2020 11:55:00	1922.05	444.63	242.98	687.61	30290.654	60.49	8.13
2/28/2020 11:56:00	1921.13	444.82	243.76	688.58	30307.256	60.52	8.13
2/28/2020 11:57:00	1921.13	445.9	242.95	688.85	30366.535	60.64	8.13
2/28/2020 11:58:00	1921.13	445.79	246.78	692.57	30359.716	60.63	8.13
2/28/2020 11:59:00	1921.13	445.39	244.97	690.36	30309.732	60.53	8.13
2/28/2020 12:00:00	1921.82	446.14	242.87	689.01	30228.103	60.36	8.13
2/28/2020 12:01:00	1921.22	449.69	242.18	691.87	30242.665	60.39	8.13
2/28/2020 12:02:00	1921.13	447.11	244.07	691.18	30302.611	60.51	8.13
2/28/2020 12:03:00	1921.13	446.42	242.73	689.15	30371.582	60.65	8.13
2/28/2020 12:04:00	1920.95	447.54	242.53	690.07	30310.819	60.53	8.13
2/28/2020 12:05:00	1921.08	451.94	240.69	692.63	30203.774	60.32	8.13
2/28/2020 12:06:00	1921.65	451.48	240.01	691.49	30307.533	60.52	8.13
2/28/2020 12:07:00	1920.61	449.81	238.77	688.58	30373.892	60.66	8.13
2/28/2020 12:08:00	1921.19	455.08	237.35	692.43	30381.669	60.67	8.13
2/28/2020 12:09:00	1921.91	455.3	241.4	696.7	30349.673	60.61	8.13
2/28/2020 12:10:00	1922.12	453.55	243.96	697.51	30288.778	60.49	8.13
2/28/2020 12:11:00	1921.4	450.41	242.92	693.33	30339.842	60.59	8.13
2/28/2020 12:12:00	1921.13	448.01	242.84	690.85	30286.624	60.48	8.14

2/28/2020 12:13:00	1921.13	448.4	239.66	688.06	30281.928	60.47	8.14
2/28/2020 12:14:00	1921.72	447.45	240.86	688.31	30307.425	60.52	8.14
2/28/2020 12:15:00	1921.85	449.56	240.62	690.18	30306.356	60.52	8.14
2/28/2020 12:16:00	1921.4	447.68	242.73	690.41	30310.268	60.53	8.14
2/28/2020 12:17:00	1920.86	451.07	241.1	692.17	30325.935	60.56	8.14
2/28/2020 12:18:00	1921.13	449.94	240.69	690.63	30278.534	60.47	8.14
2/28/2020 12:19:00	1920.74	446.28	243.8	690.08	30333.911	60.58	8.13
2/28/2020 12:20:00	1921.45	450.39	239.84	690.23	30322.657	60.55	8.13
2/28/2020 12:21:00	1921.25	452.68	241.65	694.33	30441.956	60.79	8.13
2/28/2020 12:22:00	1920.67	451.01	245.14	696.15	30347.39	60.60	8.13
2/28/2020 12:23:00	1921.11	449.07	245.31	694.38	30341.636	60.59	8.13
2/28/2020 12:24:00	1921.13	449.08	244.74	693.82	30338.922	60.59	8.13
2/28/2020 12:25:00	1921.13	450.96	244.32	695.28	30332.402	60.57	8.13
2/28/2020 12:26:00	1921.06	455.47	244.66	700.13	30257.985	60.42	8.13
2/28/2020 12:27:00	1920.33	452.85	241.91	694.76	30220.974	60.35	8.13
2/28/2020 12:28:00	1920.66	454.46	244.37	698.83	30249.012	60.41	8.13
2/28/2020 12:29:00	1920.87	454.25	240.51	694.76	30289.244	60.49	8.14
2/28/2020 12:30:00	1921.11	452.77	242.9	695.67	30322.926	60.55	8.14
2/28/2020 12:31:00	1921.71	449.02	244.35	693.37	30205.398	60.32	8.14
2/28/2020 12:32:00	1921.66	449.06	243.78	692.84	30344.968	60.60	8.14
2/28/2020 12:33:00	1922.19	454.29	247.5	701.79	30315.464	60.54	8.14
2/28/2020 12:34:00	1921.95	454	246.36	700.36	30326.21	60.56	8.14
2/28/2020 12:35:00	1921.43	453.93	246.16	700.09	30256.451	60.42	8.14
2/28/2020 12:36:00	1921.46	447.21	245.13	692.34	30289.631	60.49	8.14
2/28/2020 12:37:00	1921.92	444.8	245.82	690.62	30299.975	60.51	8.14
2/28/2020 12:38:00	1922.45	451.42	243.59	695.01	30292.459	60.49	8.14
2/28/2020 12:39:00	1922.19	450.46	243.45	693.91	30327.632	60.56	8.14
2/28/2020 12:40:00	1922.44	446.11	243.97	690.08	30314.931	60.54	8.14
2/28/2020 12:41:00	1922.2	446.55	244.87	691.42	30287.56	60.48	8.13
2/28/2020 12:42:00	1922.19	446.74	244.69	691.43	30272.78	60.45	8.14
2/28/2020 12:43:00	1922.19	446.02	243.82	689.84	30291.387	60.49	8.14
2/28/2020 12:44:00	1922.2	449.86	242.27	692.13	30388.673	60.69	8.14
2/28/2020 12:45:00	1921.81	451.37	240.36	691.73	30376.937	60.66	8.14
2/28/2020 12:46:00	1921.44	448.13	238.5	686.63	30227.202	60.36	8.14

2/28/2020 12:47:00	1921.72	442.84	238.65	681.49	30325.387	60.56	8.14
2/28/2020 12:48:00	1922.18	442.62	241.92	684.54	30378.804	60.67	8.14
2/28/2020 12:49:00	1922.19	440.09	240.55	680.64	30191.068	60.29	8.14
2/28/2020 12:50:00	1921.92	438.18	239.36	677.54	30319.046	60.55	8.14
2/28/2020 12:51:00	1922.19	440.58	239.93	680.51	30405.666	60.72	8.14
2/28/2020 12:52:00	1922.19	441.05	240.7	681.75	30309.698	60.53	8.14
2/28/2020 12:53:00	1921.83	444.37	241.46	685.83	30320.152	60.55	8.14
2/28/2020 12:54:00	1921.5	446.66	238.06	684.72	30272.933	60.45	8.14
2/28/2020 12:55:00	1921.65	445.4	235.4	680.8	30257.303	60.42	8.14
2/28/2020 12:56:00	1921.5	443.24	236.13	679.37	30279.65	60.47	8.14
2/28/2020 12:57:00	1921.04	446.7	237.85	684.55	30341.724	60.59	8.15
2/28/2020 12:58:00	1920.74	448.74	239.22	687.96	30192.507	60.29	8.15
2/28/2020 12:59:00	1920.71	449.71	240.43	690.14	30363.158	60.63	8.15
2/28/2020 13:00:00	1920.37	446.32	242.74	689.06	30405.807	60.72	8.15
2/28/2020 13:01:00	1920.57	440.3	244.51	684.81	30193.546	60.30	8.15
2/28/2020 13:02:00	1921.13	440.92	245.82	686.74	30305.363	60.52	8.15
2/28/2020 13:03:00	1921.13	443.65	244.21	687.86	30392.34	60.69	8.15
2/28/2020 13:04:00	1921.13	437.65	244.3	681.95	30280.365	60.47	8.15
2/28/2020 13:05:00	1921.13	435.37	246.78	682.15	30283.075	60.47	8.15
2/28/2020 13:06:00	1920.86	436.35	245.04	681.39	30259.22	60.43	8.15
2/28/2020 13:07:00	1921.12	436.23	241.41	677.64	30290.852	60.49	8.15
2/28/2020 13:08:00	1921.31	436.67	241.37	678.04	30251.204	60.41	8.16
2/28/2020 13:09:00	1921.39	435.53	242.72	678.25	30284.186	60.48	8.16
2/28/2020 13:10:00	1921.39	432.95	244.54	677.49	30343.013	60.59	8.16
2/28/2020 13:11:00	1920.95	435.22	243.65	678.87	30297.042	60.50	8.16
2/28/2020 13:12:00	1921.13	436.99	243.71	680.7	30199.816	60.31	8.16
2/28/2020 13:13:00	1921.66	433.27	244.02	677.29	30256.835	60.42	8.16
2/28/2020 13:14:00	1921.47	430.53	243.6	674.13	30279.181	60.47	8.16
2/28/2020 13:15:00	1920.86	429.99	243.5	673.49	30395.471	60.70	8.16
2/28/2020 13:16:00	1920.77	428.01	241.42	669.43	30371.992	60.65	8.16
2/28/2020 13:17:00	1921.44	429.45	239.47	668.92	30437.438	60.78	8.16
2/28/2020 13:18:00	1921.67	423.43	238.64	662.07	30227.207	60.36	8.16
2/28/2020 13:19:00	1921.72	425.49	238.73	664.22	30279.289	60.47	8.16
2/28/2020 13:20:00	1921.6	425.02	237.66	662.68	30326.201	60.56	8.16

2/28/2020 13:21:00	1921.17	424.34	239.34	663.68	30256.628	60.42	8.16
2/28/2020 13:22:00	1921.86	423.19	240.92	664.11	30233.172	60.37	8.16
2/28/2020 13:23:00	1921.73	418.67	239.52	658.19	30263.389	60.43	8.16
2/28/2020 13:24:00	1921.58	424.29	237.53	661.82	30282.474	60.47	8.16
2/28/2020 13:25:00	1921.2	422.43	237.22	659.65	30306.154	60.52	8.16
2/28/2020 13:26:00	1921.92	420.31	237.42	657.73	30411.881	60.73	8.16
2/28/2020 13:27:00	1922.13	423.47	238.28	661.75	30289.182	60.49	8.16
2/28/2020 13:28:00	1922.19	422.45	239.81	662.26	30265.231	60.44	8.16
2/28/2020 13:29:00	1922.67	420.73	239.1	659.83	30306.738	60.52	8.16
2/28/2020 13:30:00	1922.7	419.27	241.15	660.42	30335.742	60.58	8.16
2/28/2020 13:31:00	1922.53	421.39	240.01	661.4	30309.504	60.53	8.16
2/28/2020 13:32:00	1922.63	424.93	240.81	665.74	30314.126	60.54	8.16
2/28/2020 13:33:00	1922.28	427.9	239.61	667.51	30148.96	60.21	8.15
2/28/2020 13:34:00	1922.45	427.96	239.29	667.25	30302.713	60.51	8.15
2/28/2020 13:35:00	1923.19	427.95	237.33	665.28	30288.56	60.49	8.16
2/28/2020 13:36:00	1922.5	426.09	238.57	664.66	30277.447	60.46	8.16
2/28/2020 13:37:00	1922.66	423.01	240.74	663.75	30165.808	60.24	8.16
2/28/2020 13:38:00	1922.25	420.8	241.5	662.3	30262.52	60.43	8.15
2/28/2020 13:39:00	1922.19	422.87	238.56	661.43	30391.761	60.69	8.15
2/28/2020 13:40:00	1922.14	424.06	241.37	665.43	30366.396	60.64	8.16
2/28/2020 13:41:00	1921.5	416.75	240.9	657.65	30269.303	60.45	8.16
2/28/2020 13:42:00	1921.92	420.78	242.63	663.41	30327.117	60.56	8.16
2/28/2020 13:43:00	1921.85	418.8	244.03	662.83	30169.697	60.25	8.16
2/28/2020 13:44:00	1921.66	419.41	241.49	660.9	30213.166	60.33	8.16
2/28/2020 13:45:00	1921.45	420.17	240.32	660.49	30206.521	60.32	8.16
2/28/2020 13:46:00	1921.86	426.03	238.78	664.81	30267.963	60.44	8.16
2/28/2020 13:47:00	1921.45	423.76	236.9	660.66	30340.139	60.59	8.16
2/28/2020 13:48:00	1921.13	418.78	237.11	655.89	30290.833	60.49	8.16
2/28/2020 13:49:00	1921.14	420.57	239.71	660.28	30292.678	60.49	8.16
2/28/2020 13:50:00	1921.91	422.22	242.79	665.01	30387.913	60.68	8.17
2/28/2020 13:51:00	1921.13	418.6	244.4	663	30243.73	60.40	8.17
2/28/2020 13:52:00	1921.13	413.44	242.87	656.31	30311.987	60.53	8.17
2/28/2020 13:53:00	1921.34	415.69	243.09	658.78	30262.684	60.43	8.17
2/28/2020 13:54:00	1921.97	416.09	240.38	656.47	30318.77	60.55	8.17

2/28/2020 13:55:00	1921.66	410.85	241.66	652.51	30188.951	60.29	8.17
2/28/2020 13:56:00	1921.33	415.35	242.92	658.27	30245.728	60.40	8.17
2/28/2020 13:57:00	1921.67	417.5	242.06	659.56	30312.166	60.53	8.17
2/28/2020 13:58:00	1922.19	417.63	241.23	658.86	30343.62	60.60	8.17
2/28/2020 13:59:00	1921.41	416.49	240.25	656.74	30259.461	60.43	8.17
2/28/2020 14:00:00	1921.13	417.26	242.39	659.65	30265.945	60.44	8.17
2/28/2020 14:01:00	1921.22	419.11	242.79	661.9	30182.869	60.27	8.17
2/28/2020 14:02:00	1921.92	412.84	246.17	659.01	30209.839	60.33	8.17
2/28/2020 14:03:00	1921.56	411.51	244.21	655.72	30345.244	60.60	8.17
2/28/2020 14:04:00	1921.13	414.58	242.94	657.52	30328.345	60.56	8.18
2/28/2020 14:05:00	1921.62	409.14	243.91	653.05	30230.596	60.37	8.18
2/28/2020 14:06:00	1921.92	410.63	243.28	653.91	30278.826	60.47	8.17
2/28/2020 14:07:00	1921.56	413.44	242.6	656.04	30302.87	60.51	8.17
2/28/2020 14:08:00	1921.62	415.77	242.52	658.29	30267.837	60.44	8.17
2/28/2020 14:09:00	1922.19	414.05	241.48	655.53	30287.116	60.48	8.17
2/28/2020 14:10:00	1922.19	414.03	241.74	655.77	30258.455	60.43	8.17
2/28/2020 14:11:00	1922.19	415.62	241.49	657.11	30272.801	60.45	8.17
2/28/2020 14:12:00	1921.66	419.07	241.85	660.92	30376.14	60.66	8.17
2/28/2020 14:13:00	1921.66	419.36	244.04	663.4	30306.325	60.52	8.18
2/28/2020 14:14:00	1921.29	413.13	244.73	657.86	30326.631	60.56	8.18
2/28/2020 14:15:00	1921.13	419.34	243.16	662.5	30292.366	60.49	8.18
2/28/2020 14:16:00	1922.01	420.36	244.6	664.96	30250.166	60.41	8.18
2/28/2020 14:17:00	1921.83	421.99	239.82	661.81	30380.997	60.67	8.18
2/28/2020 14:18:00	1921.75	418.72	242.01	660.73	30324.764	60.56	8.17
2/28/2020 14:19:00	1921.92	418.06	240.78	658.84	30334.761	60.58	8.17
2/28/2020 14:20:00	1922.09	421.16	241.77	662.93	30181.728	60.27	8.17
2/28/2020 14:21:00	1922.02	421.04	240.21	661.25	30353.647	60.62	8.17
2/28/2020 14:22:00	1921.77	417.95	241.56	659.51	30192.222	60.29	8.17
2/28/2020 14:23:00	1920.67	414.01	241.9	655.91	30260.303	60.43	8.17
2/28/2020 14:24:00	1921.47	409.96	238.93	648.89	30328.074	60.56	8.17
2/28/2020 14:25:00	1920.94	407.67	237.85	645.52	30197.015	60.30	8.17
2/28/2020 14:26:00	1921.47	411.74	237.83	649.57	30217.459	60.34	8.17
2/28/2020 14:27:00	1920.63	416.14	240.99	657.13	30322.8	60.55	8.18
2/28/2020 14:28:00	1921.84	412.61	240.55	653.16	30261.604	60.43	8.18

2/28/2020 14:29:00	1922.72	410.48	241.22	651.7	30226.617	60.36	8.18
2/28/2020 14:30:00	1922.36	408.77	238.85	647.62	30259.414	60.43	8.18
2/28/2020 14:31:00	1922.19	405.06	237.61	642.67	30357.083	60.62	8.18
2/28/2020 14:32:00	1922.54	410.14	235.33	1291.02	30307.247	60.52	8.18
2/28/2020 14:33:00	1922.89	410.53	235.02		30314.148	60.54	8.17

	Combustion Chamber Temp	Monomers Gas Feed Rate	Polymers Gas Feed Rate	Total Gas Feed Rate	Stage 4 Rate	Stage 4 Rate	Stage 4 pH
units	F	lb/h	lb/h	lb/hr	lb/h	gpm	
Tag	A40937TC	A41756FC	A41103FC	calculated	A41255FG	calculated	A41261XC
Average	1921.9	401.4	240.1	641.5	30284.2	60.5	8.15
Maximum	1924.2	447.1	248.2	695.3	30358.9	60.6	8.18
Minimum	1919.4	354.9	233.0	597.7	30201.7	60.3	8.11
Std. Dev.	0.8	20.7	3.1	22.0	30.7	0.1	0.02
2/28/2020 16:30:00	1922.32	430.53	239.12	669.65	30280.351	60.47	8.17
2/28/2020 16:31:00	1922.59	427.87	234.65	662.52	30264.711	60.44	8.17
2/28/2020 16:32:00	1922.45	420.7	236.7	657.4	30351.511	60.61	8.17
2/28/2020 16:33:00	1922.85	421.48	235.75	657.23	30297.294	60.50	8.18
2/28/2020 16:34:00	1922.59	420.37	234.34	654.71	30354.728	60.62	8.18
2/28/2020 16:35:00	1921.84	413.36	237.96	651.32	30308.692	60.53	8.18
2/28/2020 16:36:00	1921.74	412.85	238.71	651.56	30298.973	60.51	8.18
2/28/2020 16:37:00	1922.19	411.87	238.81	650.68	30222.599	60.35	8.18
2/28/2020 16:38:00	1922.48	409.68	242.07	651.75	30265.965	60.44	8.18
2/28/2020 16:39:00	1922.49	407.21	242.04	649.25	30263.572	60.44	8.18
2/28/2020 16:40:00	1922.19	403.26	240.72	643.98	30286.662	60.48	8.18
2/28/2020 16:41:00	1922.27	399.95	239.36	639.31	30277.141	60.46	8.18
2/28/2020 16:42:00	1923.04	401.23	239.42	640.65	30290.767	60.49	8.18
2/28/2020 16:43:00	1922.88	399.44	240.08	639.52	30332.899	60.57	8.18
2/28/2020 16:44:00	1922.98	397.47	242.04	639.51	30239.374	60.39	8.18
2/28/2020 16:45:00	1922.82	396.17	239.21	635.38	30292.63	60.49	8.18
2/28/2020 16:46:00	1922.23	395.96	238.63	634.59	30280.34	60.47	8.18
2/28/2020 16:47:00	1922.97	392.85	238.21	631.06	30289.264	60.49	8.17
2/28/2020 16:48:00	1923.69	391.52	239.55	631.07	30286.19	60.48	8.17
2/28/2020 16:49:00	1924.07	394.54	240.68	635.22	30286.494	60.48	8.16
2/28/2020 16:50:00	1924.17	394.57	242.9	637.47	30288.652	60.49	8.16
2/28/2020 16:51:00	1923.52	396.37	237.97	634.34	30306.45	60.52	8.16
2/28/2020 16:52:00	1922.85	397.6	239.26	636.86	30293.107	60.49	8.15
2/28/2020 16:53:00	1922.98	393.51	239.13	632.64	30271.812	60.45	8.15

2/28/2020 16:54:00	1923.25	394.28	240.92	635.2	30309.031	60.53	8.15
2/28/2020 16:55:00	1923.25	387.62	241.39	629.01	30262.942	60.43	8.16
2/28/2020 16:56:00	1923.09	389.94	240.82	630.76	30300.619	60.51	8.16
2/28/2020 16:57:00	1922.45	395.8	240.11	635.91	30304.935	60.52	8.17
2/28/2020 16:58:00	1922.72	410.38	237.38	647.76	30334.503	60.58	8.17
2/28/2020 16:59:00	1921.63	414.22	240.43	654.65	30283.479	60.48	8.17
2/28/2020 17:00:00	1921.28	415.22	243.59	658.81	30334.762	60.58	8.17
2/28/2020 17:01:00	1921.66	414.04	245.3	659.34	30307.548	60.52	8.17
2/28/2020 17:02:00	1921.23	421.87	244.26	666.13	30285.959	60.48	8.17
2/28/2020 17:03:00	1921.82	425.64	245.68	671.32	30279.046	60.47	8.17
2/28/2020 17:04:00	1921.92	429.52	246.79	676.31	30224.62	60.36	8.17
2/28/2020 17:05:00	1922.35	429.19	245.95	675.14	30231.633	60.37	8.17
2/28/2020 17:06:00	1922.72	425.33	242.29	667.62	30297.612	60.50	8.17
2/28/2020 17:07:00	1922.3	423.58	245.65	669.23	30300.369	60.51	8.17
2/28/2020 17:08:00	1922.19	431.06	247.95	679.01	30260.315	60.43	8.17
2/28/2020 17:09:00	1921.24	437.07	246.52	683.59	30279.413	60.47	8.17
2/28/2020 17:10:00	1921.5	436.58	245.39	681.97	30282.934	60.47	8.17
2/28/2020 17:11:00	1921.01	433.91	244.53	678.44	30252.063	60.41	8.17
2/28/2020 17:12:00	1920.57	430.43	245.32	675.75	30294.242	60.50	8.17
2/28/2020 17:13:00	1920.5	431.84	246.09	677.93	30325.257	60.56	8.17
2/28/2020 17:14:00	1920.93	436.61	246.54	683.15	30247.295	60.40	8.16
2/28/2020 17:15:00	1920.87	441.81	244.73	686.54	30273.709	60.46	8.17
2/28/2020 17:16:00	1921.18	435.93	244.73	680.66	30243.288	60.39	8.17
2/28/2020 17:17:00	1921.59	442.71	246.8	689.51	30326.373	60.56	8.17
2/28/2020 17:18:00	1921.39	447.14	248.18	695.32	30322.509	60.55	8.17
2/28/2020 17:19:00	1920.67	443.09	245.49	688.58	30250.254	60.41	8.17
2/28/2020 17:20:00	1920.59	446.1	242.27	688.37	30288.657	60.49	8.17
2/28/2020 17:21:00	1920.59	441.74	241.33	683.07	30267.722	60.44	8.17
2/28/2020 17:22:00	1920.59	442.68	241.87	684.55	30260.984	60.43	8.16
2/28/2020 17:23:00	1921.25	441.83	246.89	688.72	30247.484	60.40	8.17
2/28/2020 17:24:00	1921.34	437.22	244.36	681.58	30268.838	60.45	8.17
2/28/2020 17:25:00	1921.13	437.6	242.59	680.19	30262.965	60.43	8.17
2/28/2020 17:26:00	1921.13	438.49	242.38	680.87	30256.427	60.42	8.17
2/28/2020 17:27:00	1921.67	439.88	240.4	680.28	30263.988	60.44	8.17

2/28/2020 17:28:00	1922.13	439.63	244.31	683.94	30264.064	60.44	8.17
2/28/2020 17:29:00	1921.71	431.36	243.11	674.47	30231.457	60.37	8.17
2/28/2020 17:30:00	1921.66	422.19	239.42	661.61	30277.636	60.46	8.17
2/28/2020 17:31:00	1922.07	420.54	237.93	658.47	30287.604	60.48	8.17
2/28/2020 17:32:00	1921.2	417.51	239.64	657.15	30278.496	60.47	8.17
2/28/2020 17:33:00	1921.16	414.2	241.65	655.85	30286.321	60.48	8.17
2/28/2020 17:34:00	1922.13	410.99	238.54	649.53	30329.023	60.57	8.17
2/28/2020 17:35:00	1921.71	409.17	237.65	646.82	30307.845	60.52	8.17
2/28/2020 17:36:00	1922.19	409.83	239.46	649.29	30295.45	60.50	8.17
2/28/2020 17:37:00	1922.53	406.43	241.4	647.83	30255.642	60.42	8.17
2/28/2020 17:38:00	1922.46	399.06	240.42	639.48	30235.831	60.38	8.17
2/28/2020 17:39:00	1922.98	394.1	239.57	633.67	30240.004	60.39	8.17
2/28/2020 17:40:00	1922.98	397.21	243.42	640.63	30237.345	60.38	8.17
2/28/2020 17:41:00	1922.55	401.08	241.99	643.07	30276.485	60.46	8.17
2/28/2020 17:42:00	1922.85	408.13	237.73	645.86	30274.296	60.46	8.17
2/28/2020 17:43:00	1922.64	412.48	234.54	647.02	30290.609	60.49	8.17
2/28/2020 17:44:00	1922.2	413.56	232.96	646.52	30262.637	60.43	8.17
2/28/2020 17:45:00	1922.26	415.44	236.02	651.46	30263.072	60.43	8.17
2/28/2020 17:46:00	1922.91	418.2	238.65	656.85	30297.594	60.50	8.16
2/28/2020 17:47:00	1922.46	416.21	241.99	658.2	30248.327	60.40	8.17
2/28/2020 17:48:00	1922.19	413.18	241.25	654.43	30270.822	60.45	8.17
2/28/2020 17:49:00	1922.19	410.93	239.29	650.22	30201.741	60.31	8.16
2/28/2020 17:50:00	1922.19	411.84	239.98	651.82	30272.523	60.45	8.16
2/28/2020 17:51:00	1922.43	409.79	240.68	650.47	30262.933	60.43	8.16
2/28/2020 17:52:00	1922.67	407.04	240.04	647.08	30322.434	60.55	8.16
2/28/2020 17:53:00	1923.24	405.16	236.57	641.73	30284.793	60.48	8.16
2/28/2020 17:54:00	1922.53	402.4	237.1	639.5	30254.796	60.42	8.16
2/28/2020 17:55:00	1922.45	399.73	237.83	637.56	30320.884	60.55	8.16
2/28/2020 17:56:00	1922.46	402.53	238.15	640.68	30331.566	60.57	8.16
2/28/2020 17:57:00	1922.75	401.7	238.16	639.86	30278.869	60.47	8.16
2/28/2020 17:58:00	1922.45	398.42	238.02	636.44	30306.513	60.52	8.16
2/28/2020 17:59:00	1922.42	394.61	241.02	635.63	30271.57	60.45	8.16
2/28/2020 18:00:00	1922.19	390.73	241.66	632.39	30277.901	60.46	8.16
2/28/2020 18:01:00	1922.72	390.03	236.01	626.04	30323.408	60.55	8.16

2/28/2020 18:02:00	1922.18	390.65	236.99	627.64	30298.51	60.51	8.16
2/28/2020 18:03:00	1922.42	386.63	236.61	623.24	30296.635	60.50	8.16
2/28/2020 18:04:00	1922.49	380.11	236.83	616.94	30233.829	60.38	8.16
2/28/2020 18:05:00	1922.19	380.25	238.41	618.66	30245.042	60.40	8.16
2/28/2020 18:06:00	1922.19	380.64	235.62	616.26	30286.842	60.48	8.16
2/28/2020 18:07:00	1922.42	379.53	236.4	615.93	30291.293	60.49	8.16
2/28/2020 18:08:00	1922.75	371.86	235.72	607.58	30254.545	60.42	8.16
2/28/2020 18:09:00	1923.02	371.74	235.59	607.33	30307.68	60.52	8.16
2/28/2020 18:10:00	1922.68	372.44	237.85	610.29	30314.31	60.54	8.16
2/28/2020 18:11:00	1922.42	367.57	238.22	605.79	30230.537	60.37	8.16
2/28/2020 18:12:00	1921.81	367.73	235.67	603.4	30277.052	60.46	8.16
2/28/2020 18:13:00	1921.14	366.47	235.68	602.15	30255.537	60.42	8.16
2/28/2020 18:14:00	1921.69	364.27	237.71	601.98	30283.266	60.47	8.16
2/28/2020 18:15:00	1922.42	366.43	236.61	603.04	30273.426	60.45	8.16
2/28/2020 18:16:00	1922.49	365.32	238.83	604.15	30259.112	60.43	8.16
2/28/2020 18:17:00	1922.42	363.43	242.14	605.57	30268.953	60.45	8.16
2/28/2020 18:18:00	1922.19	361.98	239.88	601.86	30226.91	60.36	8.16
2/28/2020 18:19:00	1921.92	361.65	243.55	605.2	30320.835	60.55	8.16
2/28/2020 18:20:00	1922.16	355.89	243.16	599.05	30308.318	60.52	8.16
2/28/2020 18:21:00	1921.46	354.93	242.8	597.73	30290.464	60.49	8.16
2/28/2020 18:22:00	1921.9	356.23	243.34	599.57	30284.911	60.48	8.16
2/28/2020 18:23:00	1922.81	357.76	240.71	598.47	30261.116	60.43	8.16
2/28/2020 18:24:00	1921.82	357.78	240.4	598.18	30247.341	60.40	8.16
2/28/2020 18:25:00	1921.63	356.75	243.15	599.9	30317.589	60.54	8.16
2/28/2020 18:26:00	1921.69	359.83	243.24	603.07	30279.404	60.47	8.16
2/28/2020 18:27:00	1921.13	365.37	244.26	609.63	30336.181	60.58	8.16
2/28/2020 18:28:00	1921.92	373.28	244.63	617.91	30251.16	60.41	8.16
2/28/2020 18:29:00	1921.69	375.65	242.26	617.91	30312.642	60.53	8.16
2/28/2020 18:30:00	1922.15	381.01	240.76	621.77	30282.419	60.47	8.16
2/28/2020 18:31:00	1922.16	387.6	243.25	630.85	30304.632	60.52	8.16
2/28/2020 18:32:00	1921.43	388.42	242.89	631.31	30228.099	60.36	8.16
2/28/2020 18:33:00	1921.13	388.21	239.82	628.03	30323.839	60.56	8.16
2/28/2020 18:34:00	1921.42	393.18	244.05	637.23	30323.778	60.56	8.15
2/28/2020 18:35:00	1921.39	393.48	242.33	635.81	30299.513	60.51	8.15

2/28/2020 18:36:00	1921.92	396.33	242.75	639.08	30295.929	60.50	8.15
2/28/2020 18:37:00	1921.36	396.64	239.66	636.3	30228.829	60.37	8.15
2/28/2020 18:38:00	1921.13	398.3	240.96	639.26	30234.965	60.38	8.15
2/28/2020 18:39:00	1920.76	401.09	239.7	640.79	30283.832	60.48	8.15
2/28/2020 18:40:00	1921.89	405.93	240.3	646.23	30234.965	60.38	8.14
2/28/2020 18:41:00	1921.93	406.14	235.42	641.56	30341.504	60.59	8.14
2/28/2020 18:42:00	1921.1	409.52	235.39	644.91	30270.747	60.45	8.14
2/28/2020 18:43:00	1920.36	408.86	238.06	646.92	30249.468	60.41	8.14
2/28/2020 18:44:00	1920.29	411.6	241.03	652.63	30298.167	60.50	8.14
2/28/2020 18:45:00	1920.59	408.96	240.5	649.46	30294.201	60.50	8.14
2/28/2020 18:46:00	1920.39	413.62	240.81	654.43	30265.457	60.44	8.14
2/28/2020 18:47:00	1921.09	419.32	243.17	662.49	30285.863	60.48	8.14
2/28/2020 18:48:00	1920.96	416.46	240.96	657.42	30282.49	60.47	8.14
2/28/2020 18:49:00	1920.18	414.17	240.72	654.89	30280.951	60.47	8.14
2/28/2020 18:50:00	1919.68	415.56	242	657.56	30292.885	60.49	8.14
2/28/2020 18:51:00	1919.44	415.99	241.07	657.06	30269.538	60.45	8.13
2/28/2020 18:52:00	1920.37	412.21	237.37	649.58	30293.974	60.50	8.14
2/28/2020 18:53:00	1920.59	403.89	239.21	643.1	30272.505	60.45	8.14
2/28/2020 18:54:00	1920.82	404.17	238.03	642.2	30296.374	60.50	8.13
2/28/2020 18:55:00	1920.33	406.47	235.94	642.41	30246.28	60.40	8.13
2/28/2020 18:56:00	1920.57	407.73	239.71	647.44	30236.902	60.38	8.14
2/28/2020 18:57:00	1920.66	406.32	241.45	647.77	30283.148	60.47	8.13
2/28/2020 18:58:00	1921.1	406.17	238.88	645.05	30255.024	60.42	8.14
2/28/2020 18:59:00	1921.9	405.32	239.44	644.76	30301.298	60.51	8.14
2/28/2020 19:00:00	1921.92	402.43	237.09	639.52	30358.907	60.63	8.13
2/28/2020 19:01:00	1921.15	398.53	237.17	635.7	30304.717	60.52	8.13
2/28/2020 19:02:00	1921.13	397.95	239.5	637.45	30309.66	60.53	8.14
2/28/2020 19:03:00	1921.13	394.52	240.49	635.01	30301.056	60.51	8.13
2/28/2020 19:04:00	1921.17	398.02	241.05	639.07	30317.266	60.54	8.14
2/28/2020 19:05:00	1921.66	399.98	240.86	640.84	30304.8	60.52	8.14
2/28/2020 19:06:00	1921.35	398.74	238.52	637.26	30339.941	60.59	8.13
2/28/2020 19:07:00	1921.13	397.26	238	635.26	30355.663	60.62	8.13
2/28/2020 19:08:00	1921.19	398.92	239.47	638.39	30308.586	60.53	8.13
2/28/2020 19:09:00	1921.79	399.16	239.1	638.26	30292.821	60.49	8.12

2/28/2020 19:10:00	1921.19	399.82	242.69	642.51	30257.58	60.42	8.11
2/28/2020 19:11:00	1921.68	400.33	241.3	641.63	30281.312	60.47	8.11
2/28/2020 19:12:00	1921.37	396.89	240.07	636.96	30307.737	60.52	8.11
2/28/2020 19:13:00	1921.7	392.28	241.4	633.68	30325.65	60.56	8.11
2/28/2020 19:14:00	1921.88	391.76	240.79	632.55	30257.673	60.42	8.11
2/28/2020 19:15:00	1921.13	392.38	242.63	635.01	30307.059	60.52	8.11
2/28/2020 19:16:00	1921.7	393.4	242.64	636.04	30227.319	60.36	8.11
2/28/2020 19:17:00	1921.85	389.91	239.65	629.56	30324.779	60.56	8.11
2/28/2020 19:18:00	1921.96	387.34	237.3	624.64	30256.851	60.42	8.11
2/28/2020 19:19:00	1921.79	391.72	235.64	627.36	30305.016	60.52	8.12
2/28/2020 19:20:00	1922.23	394.09	237.35	631.44	30289.272	60.49	8.12
2/28/2020 19:21:00	1922.68	390.74	240.95	631.69	30313.516	60.54	8.12
2/28/2020 19:22:00	1922.96	385.84	237.03	622.87	30303.779	60.52	8.12
2/28/2020 19:23:00	1922.26	389.59	236.34	625.93	30287.452	60.48	8.12
2/28/2020 19:24:00	1922.41	387.67	237.08	624.75	30276.712	60.46	8.12
2/28/2020 19:25:00	1922.76	391.79	234.91	626.7	30283.808	60.48	8.13
2/28/2020 19:26:00	1922.41	391.3	236.1	627.4	30308.494	60.52	8.12
2/28/2020 19:27:00	1922.34	387.79	237.24	625.03	30322.182	60.55	8.12
2/28/2020 19:28:00	1922.57	390.61	238.75	629.36	30275.276	60.46	8.12
2/28/2020 19:29:00	1922.19	392.58	240.4	632.98	30276.182	60.46	8.12
2/28/2020 19:30:00	1922.19	386.03	239.24	625.27	30257.838	60.42	8.12
2/28/2020 19:31:00	1922.45	383.04	237.13	620.17	30256.072	60.42	8.12
2/28/2020 19:32:00	1922.18	387.69	235.43	623.12	30273.708	60.46	8.12
2/28/2020 19:33:00	1922.01	388.86	234.29	623.15	30329.731	60.57	8.12
2/28/2020 19:34:00	1922.51	389.82	233.51	623.33	30293.639	60.50	8.12
2/28/2020 19:35:00	1922.19	391.26	236.29	627.55	30325.717	60.56	8.12
2/28/2020 19:36:00	1922.19	386.86	239.61	626.47	30336.22	60.58	8.12
2/28/2020 19:37:00	1921.79	386.13	241.64	627.77	30223.173	60.35	8.12
2/28/2020 19:38:00	1921.98	388.85	241.74	630.59	30251.778	60.41	8.12
2/28/2020 19:39:00	1921.92	392.6	239.18	631.78	30332.396	60.57	8.12
2/28/2020 19:40:00	1922.13	392.98	238.21	631.19	30278.972	60.47	8.12
2/28/2020 19:41:00	1921.92	388.74	238.04	626.78	30292.799	60.49	8.11
2/28/2020 19:42:00	1922.19	388.53	237.59	626.12	30330.522	60.57	8.11
2/28/2020 19:43:00	1922.19	391.17	236.75	627.92	30314.895	60.54	8.11

	Combustion Chamber Temp	Monomers Gas Feed Rate	Polymers Gas Feed Rate	Total Gas Feed Rate	Stage 4 Rate	Stage 4 Rate	Stage 4 pH
units	F	lb/h	lb/h	lb/hr	lb/h	gpm	SU
Tag	A40937TC	A41756FC	A41103FC	calculated	A41255FG	calculated	A41261XC
Average	1921.4	400.4	244.3	651.2	30313.4	60.5	8.13
Maximum	1923.4	506.5	250.4	1991.2	30455.6	60.8	8.18
Minimum	1918.2	343.5	236.5	592.8	30162.3	60.2	8.09
Std. Dev.	1.1	46.4	2.8	106.3	44.4	0.1	0.02
2/29/2020 9:15:00	1920.67	356	249.7	605.7	30263.418	60.43	8.13
2/29/2020 9:16:00	1921.04	346.44	249.08	595.52	30339.026	60.59	8.13
2/29/2020 9:17:00	1920.34	343.45	249.34	592.79	30446.651	60.80	8.13
2/29/2020 9:18:00	1920.92	350.23	246.71	596.94	30422.054	60.75	8.12
2/29/2020 9:19:00	1921.38	349.91	244.07	593.98	30392.199	60.69	8.12
2/29/2020 9:20:00	1921.6	349.48	244.08	593.56	30247.313	60.40	8.13
2/29/2020 9:21:00	1921.59	352.97	244.92	597.89	30324.8	60.56	8.13
2/29/2020 9:22:00	1920.74	351.02	247.61	598.63	30303.16	60.51	8.12
2/29/2020 9:23:00	1921.45	351.47	248.49	599.96	30269.186	60.45	8.12
2/29/2020 9:24:00	1922.24	350.43	246.55	596.98	30348.902	60.61	8.12
2/29/2020 9:25:00	1922.65	352.96	250.42	603.38	30367.962	60.64	8.12
2/29/2020 9:26:00	1922.26	351.43	246.93	598.36	30336.355	60.58	8.12
2/29/2020 9:27:00	1922.97	350.2	247.69	597.89	30292.059	60.49	8.12
2/29/2020 9:28:00	1922.65	351.65	248.72	600.37	30251.938	60.41	8.12
2/29/2020 9:29:00	1922.8	350.41	248.53	598.94	30312.621	60.53	8.12
2/29/2020 9:30:00	1922.39	345.95	249.83	595.78	30314.301	60.54	8.12
2/29/2020 9:31:00	1922.25	345.03	250	595.03	30311.573	60.53	8.11
2/29/2020 9:32:00	1923.24	347.53	248.3	595.83	30314.609	60.54	8.11
2/29/2020 9:33:00	1923.18	347.13	246.13	593.26	30287.146	60.48	8.11
2/29/2020 9:34:00	1922.44	346.15	248.92	595.07	30304.117	60.52	8.1
2/29/2020 9:35:00	1923.26	350.08	245.74	595.82	30308.624	60.53	8.1
2/29/2020 9:36:00	1923.39	350.24	244.5	594.74	30310.473	60.53	8.1
2/29/2020 9:37:00	1923.05	351.28	245.71	596.99	30347.025	60.60	8.1
2/29/2020 9:38:00	1923.25	354.73	248.41	603.14	30290.1	60.49	8.1

2/29/2020 9:39:00	1922.67	356.22	246.93	603.15	30286.652	60.48	8.11
2/29/2020 9:40:00	1922.25	356.04	249.2	605.24	30341.921	60.59	8.12
2/29/2020 9:41:00	1922.71	360.18	242.65	602.83	30362.276	60.63	8.12
2/29/2020 9:42:00	1923.25	366.17	242.63	608.8	30358.312	60.62	8.12
2/29/2020 9:43:00	1922.98	365.52	241.59	607.11	30299.209	60.51	8.12
2/29/2020 9:44:00	1923.25	363	243.26	606.26	30345.836	60.60	8.12
2/29/2020 9:45:00	1922.47	359.53	243.42	602.95	30295.764	60.50	8.12
2/29/2020 9:46:00	1922.6	362.77	243.51	606.28	30336.983	60.58	8.11
2/29/2020 9:47:00	1922.19	365.6	243.17	608.77	30281.753	60.47	8.11
2/29/2020 9:48:00	1921.73	363.48	241.78	605.26	30316.684	60.54	8.12
2/29/2020 9:49:00	1922.17	364.42	242.47	606.89	30335.275	60.58	8.12
2/29/2020 9:50:00	1921.92	363.04	247.06	610.1	30312.717	60.53	8.12
2/29/2020 9:51:00	1922.13	361.95	248.13	610.08	30320.699	60.55	8.12
2/29/2020 9:52:00	1921.98	361.63	246.05	607.68	30340.927	60.59	8.13
2/29/2020 9:53:00	1922.51	365.65	244.62	610.27	30286.644	60.48	8.12
2/29/2020 9:54:00	1922.45	370.41	248.91	619.32	30224.375	60.36	8.12
2/29/2020 9:55:00	1922.93	373.54	249.33	622.87	30293.691	60.50	8.12
2/29/2020 9:56:00	1922.44	370.22	247.75	617.97	30282.663	60.47	8.12
2/29/2020 9:57:00	1922.2	367.25	246.8	614.05	30235.565	60.38	8.12
2/29/2020 9:58:00	1922.51	368.63	245.67	614.3	30299.948	60.51	8.12
2/29/2020 9:59:00	1922.65	368.98	244.97	613.95	30279.524	60.47	8.12
2/29/2020 10:00:00	1922.21	371.3	244.93	616.23	30320.441	60.55	8.12
2/29/2020 10:01:00	1922.14	371.6	244.8	616.4	30265.159	60.44	8.12
2/29/2020 10:02:00	1921.39	371.06	245.07	616.13	30270.264	60.45	8.12
2/29/2020 10:03:00	1921.2	368.23	246.87	615.1	30336.591	60.58	8.12
2/29/2020 10:04:00	1921.9	370.04	248.49	618.53	30338.643	60.59	8.12
2/29/2020 10:05:00	1921.92	372.07	249.6	621.67	30346.811	60.60	8.12
2/29/2020 10:06:00	1921.87	375.52	247.17	622.69	30260.938	60.43	8.12
2/29/2020 10:07:00	1921.14	375.12	244.85	619.97	30297.08	60.50	8.13
2/29/2020 10:08:00	1921.13	377.52	246.07	623.59	30312.159	60.53	8.13
2/29/2020 10:09:00	1921.68	382.63	245.95	628.58	30319.461	60.55	8.13
2/29/2020 10:10:00	1922.19	380.05	246.2	626.25	30348.383	60.60	8.13
2/29/2020 10:11:00	1922.19	372.63	246.85	619.48	30291.737	60.49	8.13
2/29/2020 10:12:00	1922.19	372.14	245.39	617.53	30264.353	60.44	8.12

2/29/2020 10:13:00	1922.19	367.44	245.86	613.3	30241.399	60.39	8.13
2/29/2020 10:14:00	1922.19	367.34	245.47	612.81	30362.972	60.63	8.15
2/29/2020 10:15:00	1922.19	373.1	239.67	612.77	30350.121	60.61	8.16
2/29/2020 10:16:00	1922.72	378.44	236.5	614.94	30404.922	60.72	8.18
2/29/2020 10:17:00	1922.72	376.48	238.97	615.45	30352.956	60.61	8.18
2/29/2020 10:18:00	1922.62	377.56	241.32	618.88	30273.997	60.46	8.17
2/29/2020 10:19:00	1921.91	381.61	241.99	623.6	30313.061	60.53	8.15
2/29/2020 10:20:00	1921.93	376.13	242.25	618.38	30265.38	60.44	8.14
2/29/2020 10:21:00	1922.19	371.09	243.89	614.98	30308.368	60.52	8.13
2/29/2020 10:22:00	1922.65	373.46	244.33	617.79	30353.594	60.62	8.12
2/29/2020 10:23:00	1922.26	372.28	242.52	614.8	30276.361	60.46	8.13
2/29/2020 10:24:00	1922.19	371.73	237.98	609.71	30212.73	60.33	8.13
2/29/2020 10:25:00	1921.94	377.3	245.26	622.56	30312.812	60.53	8.12
2/29/2020 10:26:00	1921.6	377.02	247.18	624.2	30306.714	60.52	8.12
2/29/2020 10:27:00	1921.66	374.72	242.5	617.22	30345.665	60.60	8.12
2/29/2020 10:28:00	1921.16	380.26	244.89	625.15	30342.613	60.59	8.12
2/29/2020 10:29:00	1921.49	380.24	245.93	626.17	30328.111	60.56	8.13
2/29/2020 10:30:00	1921.39	382.47	245.3	627.77	30334.882	60.58	8.13
2/29/2020 10:31:00	1921.45	382.29	247.62	629.91	30338.224	60.58	8.13
2/29/2020 10:32:00	1921.58	384.1	248.96	633.06	30353.99	60.62	8.12
2/29/2020 10:33:00	1921.2	383.31	245.27	628.58	30284.061	60.48	8.12
2/29/2020 10:34:00	1921.91	381.4	245.9	627.3	30287.241	60.48	8.12
2/29/2020 10:35:00	1921.67	382.8	246.25	629.05	30266.169	60.44	8.13
2/29/2020 10:36:00	1921.85	386.49	245.75	632.24	30292.013	60.49	8.13
2/29/2020 10:37:00	1921.46	387.43	245.17	632.6	30257.822	60.42	8.12
2/29/2020 10:38:00	1921.58	393.45	245.11	638.56	30320.636	60.55	8.12
2/29/2020 10:39:00	1921.72	395.39	246.7	642.09	30282.074	60.47	8.12
2/29/2020 10:40:00	1921.66	389.32	247.15	636.47	30312.685	60.53	8.12
2/29/2020 10:41:00	1921.92	379.93	244.22	624.15	30365.559	60.64	8.12
2/29/2020 10:42:00	1921.61	378.83	243.46	622.29	30301.95	60.51	8.12
2/29/2020 10:43:00	1921.91	383.99	244.02	628.01	30367.15	60.64	8.13
2/29/2020 10:44:00	1921.08	388.19	246.04	634.23	30428.508	60.76	8.13
2/29/2020 10:45:00	1919.83	387.43	243.3	630.73	30326.806	60.56	8.13
2/29/2020 10:46:00	1920.57	390.33	245.56	635.89	30324.453	60.56	8.13

2/29/2020 10:47:00	1920.9	383.94	242.88	626.82	30299.23	60.51	8.13
2/29/2020 10:48:00	1921.25	383.41	244.07	627.48	30241.664	60.39	8.13
2/29/2020 10:49:00	1921.78	382.01	241.2	623.21	30330.791	60.57	8.13
2/29/2020 10:50:00	1921.73	380.17	240.26	620.43	30272.816	60.45	8.13
2/29/2020 10:51:00	1921.58	379.53	237.12	616.65	30249.011	60.41	8.13
2/29/2020 10:52:00	1921.14	374.75	242.27	617.02	30326.009	60.56	8.13
2/29/2020 10:53:00	1920.77	378.67	241.65	620.32	30372.379	60.65	8.13
2/29/2020 10:54:00	1920.68	381	241.13	622.13	30323.628	60.56	8.14
2/29/2020 10:55:00	1921.13	384.69	241.56	626.25	30334.648	60.58	8.13
2/29/2020 10:56:00	1920.8	381.08	240.17	621.25	30296.479	60.50	8.14
2/29/2020 10:57:00	1920.91	381.32	242.41	623.73	30300.152	60.51	8.14
2/29/2020 10:58:00	1921.13	378.58	240.28	618.86	30277.637	60.46	8.13
2/29/2020 10:59:00	1921.18	377.38	241.58	618.96	30307.596	60.52	8.14
2/29/2020 11:00:00	1921.64	379	241.17	620.17	30348.62	60.61	8.14
2/29/2020 11:01:00	1921.92	379.77	241.35	621.12	30301.172	60.51	8.14
2/29/2020 11:02:00	1921.88	377.44	243.26	620.7	30337.677	60.58	8.14
2/29/2020 11:03:00	1921.13	379.57	243.21	622.78	30276.848	60.46	8.15
2/29/2020 11:04:00	1921.13	385.77	244.16	629.93	30297.253	60.50	8.15
2/29/2020 11:05:00	1921.09	381.06	245.77	626.83	30387.769	60.68	8.15
2/29/2020 11:06:00	1919.8	382.09	244.15	626.24	30311.263	60.53	8.15
2/29/2020 11:07:00	1920.32	387.5	244.55	632.05	30294.74	60.50	8.15
2/29/2020 11:08:00	1920.39	391.86	244.87	636.73	30339.504	60.59	8.14
2/29/2020 11:09:00	1921.13	386.97	242.51	629.48	30296.333	60.50	8.15
2/29/2020 11:10:00	1921.06	388.6	243.15	631.75	30270.571	60.45	8.15
2/29/2020 11:11:00	1920.34	390.7	246.26	636.96	30388.047	60.68	8.15
2/29/2020 11:12:00	1921.16	384.44	246.16	630.6	30310.735	60.53	8.14
2/29/2020 11:13:00	1920.87	388.34	243.53	631.87	30332.655	60.57	8.14
2/29/2020 11:14:00	1921.13	387.98	246.54	634.52	30266.632	60.44	8.14
2/29/2020 11:15:00	1921.45	387.74	246.18	633.92	30271.959	60.45	8.15
2/29/2020 11:16:00	1921.13	386.31	246.06	632.37	30304.002	60.52	8.15
2/29/2020 11:17:00	1921.08	387.51	244.13	631.64	30317.392	60.54	8.15
2/29/2020 11:18:00	1921.5	386.79	244.7	631.49	30341.435	60.59	8.15
2/29/2020 11:19:00	1921.73	385.69	246.2	631.89	30303.256	60.51	8.15
2/29/2020 11:20:00	1921.6	383.81	243.23	627.04	30413.202	60.73	8.14

2/29/2020 11:21:00	1920.86	386.45	242.83	629.28	30348.249	60.60	8.15
2/29/2020 11:22:00	1920.87	382.83	242.95	625.78	30303.494	60.52	8.14
2/29/2020 11:23:00	1920.28	381.84	246.29	628.13	30304.066	60.52	8.15
2/29/2020 11:24:00	1920.36	381.74	244.06	625.8	30282.025	60.47	8.14
2/29/2020 11:25:00	1921.19	378.98	245.48	624.46	30375.052	60.66	8.14
2/29/2020 11:26:00	1921.6	374.75	243.83	618.58	30353.109	60.61	8.15
2/29/2020 11:27:00	1921.13	377.42	248.64	626.06	30325.72	60.56	8.15
2/29/2020 11:28:00	1921.45	380.87	242.7	623.57	30276.015	60.46	8.15
2/29/2020 11:29:00	1922.17	376.89	243.26	620.15	30298.405	60.50	8.15
2/29/2020 11:30:00	1921.94	376.64	245.6	622.24	30251.015	60.41	8.14
2/29/2020 11:31:00	1921.66	376.49	247.02	623.51	30333.676	60.58	8.14
2/29/2020 11:32:00	1921.85	377.52	245.48	623	30346.619	60.60	8.14
2/29/2020 11:33:00	1921.98	382.48	247.29	629.77	30307.659	60.52	8.14
2/29/2020 11:34:00	1922.26	394.46	245.48	639.94	30265.138	60.44	8.15
2/29/2020 11:35:00	1922.38	414.98	243.14	658.12	30256.994	60.42	8.15
2/29/2020 11:36:00	1921.85	419.53	243	662.53	30308.867	60.53	8.15
2/29/2020 11:37:00	1921.73	423.51	243.81	667.32	30323.929	60.56	8.14
2/29/2020 11:38:00	1921.59	446.96	243.04	690	30323.386	60.55	8.14
2/29/2020 11:39:00	1920.79	444.38	245	689.38	30332.533	60.57	8.14
2/29/2020 11:40:00	1921.01	443.47	243.02	686.49	30277.806	60.46	8.13
2/29/2020 11:41:00	1921.57	446.84	243.55	690.39	30275.262	60.46	8.13
2/29/2020 11:42:00	1921.13	458.09	244.27	702.36	30305.168	60.52	8.13
2/29/2020 11:43:00	1921.39	478.03	242.62	720.65	30303.332	60.51	8.13
2/29/2020 11:44:00	1921.05	461.79	242.95	704.74	30270.018	60.45	8.13
2/29/2020 11:45:00	1920.34	468.69	242.42	711.11	30238.829	60.39	8.12
2/29/2020 11:46:00	1920.06	466.17	242.54	708.71	30276.097	60.46	8.12
2/29/2020 11:47:00	1920.4	478.12	240.71	718.83	30333.674	60.58	8.12
2/29/2020 11:48:00	1920.33	481.12	240.73	721.85	30292.163	60.49	8.12
2/29/2020 11:49:00	1920.5	483.31	242.32	725.63	30340.863	60.59	8.12
2/29/2020 11:50:00	1919.22	480.72	239.57	720.29	30329.732	60.57	8.11
2/29/2020 11:51:00	1919.26	482.87	239.33	722.2	30348.746	60.61	8.11
2/29/2020 11:52:00	1919.27	488.01	238.96	726.97	30348.455	60.60	8.1
2/29/2020 11:53:00	1919.33	491.53	238.04	729.57	30222.756	60.35	8.1
2/29/2020 11:54:00	1919.73	494.74	238.64	733.38	30266.752	60.44	8.1

2/29/2020 11:55:00	1919	492.36	240.74	733.1	30281.987	60.47	8.09
2/29/2020 11:56:00	1919	491.59	243.19	734.78	30344.985	60.60	8.09
2/29/2020 11:57:00	1919	506.5	241.11	747.61	30347.23	60.60	8.09
2/29/2020 11:58:00	1919	494.67	241.09	735.76	30255.608	60.42	8.09
2/29/2020 11:59:00	1919.33	496.01	242.55	738.56	30325.431	60.56	8.09
2/29/2020 12:00:00	1919.04	499.24	241.04	740.28	30285.363	60.48	8.09
2/29/2020 12:01:00	1918.24	496.14	238.59	734.73	30272.006	60.45	8.1
2/29/2020 12:02:00	1918.99	497.81	237.48	735.29	30385.436	60.68	8.11
2/29/2020 12:03:00	1918.47	496.58	238.48	735.06	30376.383	60.66	8.11
2/29/2020 12:04:00	1919.59	493.4	242.37	735.77	30325.933	60.56	8.11
2/29/2020 12:05:00	1920.06	494.25	242.91	737.16	30328.377	60.56	8.12
2/29/2020 12:06:00	1919.53	497.43	239.45	736.88	30295.268	60.50	8.12
2/29/2020 12:07:00	1919.45	493.39	241.32	734.71	30300.688	60.51	8.12
2/29/2020 12:08:00	1918.36	492.21	245.65	737.86	30364.557	60.64	8.12
2/29/2020 12:09:00	1919.32	496.02	247.3	743.32	30254.089	60.42	8.13
2/29/2020 12:10:00	1920.06	484.76	247.8	732.56	30320.802	60.55	8.12
2/29/2020 12:11:00	1920.06	476.57	245.6	722.17	30455.562	60.82	8.12
2/29/2020 12:12:00	1920.65	472.17	244.07	716.24	30426.518	60.76	8.13
2/29/2020 12:13:00	1920.86	474.68	244.83	719.51	30296.491	60.50	8.13
2/29/2020 12:14:00	1920.34	474.5	244.52	719.02	30274.487	60.46	8.13
2/29/2020 12:15:00	1921.11	474.26	242.32	716.58	30281.131	60.47	8.13
2/29/2020 12:16:00	1920.59	470.7	242.43	713.13	30294.132	60.50	8.13
2/29/2020 12:17:00	1920.6	460.39	245.43	705.82	30350.538	60.61	8.13
2/29/2020 12:18:00	1920.81	461.46	245.91	707.37	30369.979	60.65	8.13
2/29/2020 12:19:00	1920.76	460.99	244.53	705.52	30363.268	60.63	8.13
2/29/2020 12:20:00	1921.71	450.98	243.8	694.78	30305.014	60.52	8.13
2/29/2020 12:21:00	1922.19	454.56	245.61	700.17	30251.755	60.41	8.13
2/29/2020 12:22:00	1922.19	444.82	245.82	690.64	30377.776	60.66	8.13
2/29/2020 12:23:00	1922.19	441.46	242.33	683.79	30204.361	60.32	8.13
2/29/2020 12:24:00	1922.26	431.11	241.93	673.04	30333.077	60.57	8.13
2/29/2020 12:25:00	1922.71	431.74	240.97	672.71	30380.5	60.67	8.13
2/29/2020 12:26:00	1922.23	438.38	242.01	680.39	30291.767	60.49	8.13
2/29/2020 12:27:00	1921.92	440.55	244.7	685.25	30325.137	60.56	8.13
2/29/2020 12:28:00	1922.29	439.77	244.11	683.88	30392.853	60.69	8.13

2/29/2020 12:29:00	1922.82	430.07	245.21	675.28	30323.107	60.55	8.14
2/29/2020 12:30:00	1922.72	420.46	244.25	1991.17	30309.981	60.53	8.14
2/29/2020 12:31:00	1922.91	420.35	244.83		30162.265	60.23	8.14
2/29/2020 12:32:00	1922.26	417.85	243.43		30316.194	60.54	8.14

APPENDIX B
RAW AND REDUCED TEST DATA

Sample and Velocity Traverse Point Data Sheet - Method 1

Client	Chemours	Operator	SR
Loaction/Plant	Fayetteville, NC	Date	3-Jan-20
Source	Thermal Oxidizer Outlet	W.O. Number	15418.002.019.0001

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	36.0
Port Depth (in.) = D	18.0
Depth of Duct, diameter (in.) = C-D	18
Area of Duct (ft^2)	1.767
Total Traverse Points	12
Total Traverse Points per Port	6

Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	

Flow Disturbances	
Upstream - A (ft)	34.5
Downstream - B (ft)	38.5
Upstream - A (duct diameters)	23.00
Downstream - B (duct diameters)	25.67

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)	Distance from Outside of Port (in)
1	4.4	0.79	18.79	18 6/8
2	14.6	2.63	20.63	20 5/8
3	29.6	5.33	23.33	23 3/8
4	70.4	12.67	30.67	30 5/8
5	85.4	15.37	33.37	33 3/8
6	95.6	17.21	35.21	35 2/8
7				
8				
9				
10				
11				
12				

CEM 3 Point (Long Measurement Line) Statification Point Locations

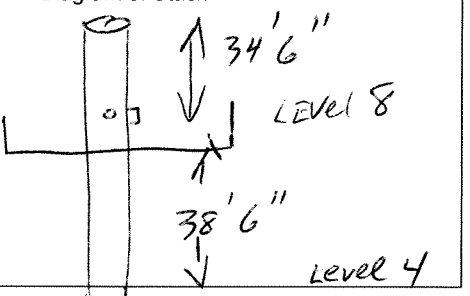
1	16.7	3.01	21.01	21
2	50.0	9.00	27.00	27
3	83.3	14.99	32.99	33

Note:If stack dia<24 inches adjust traverse points to 0.5 inches from wall

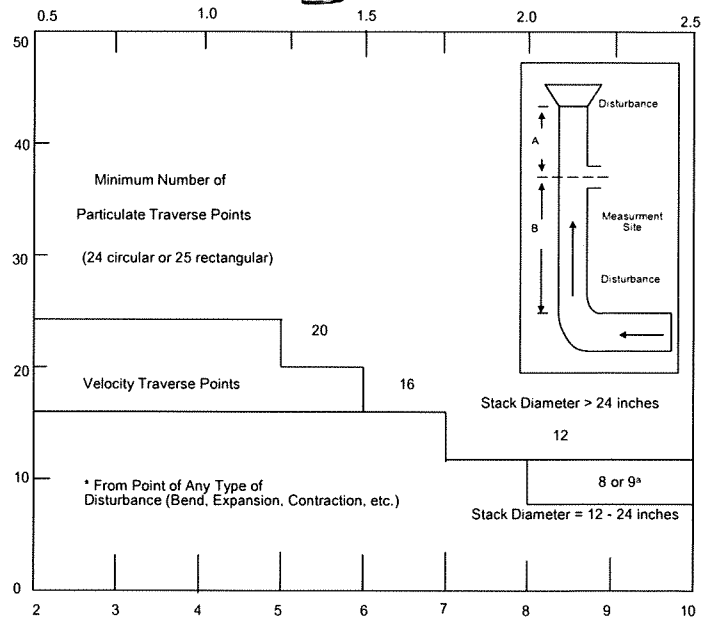
Note:If stack dia>24 inches adjust traverse points to 1.0 inches from wall

Equivalent Diameter = (2*L*W)/(L+W)

Diagram of Stack



Duct Diameters Upstream from Flow Disturbance* (Distance A)



Duct Diameters Downstream from Flow Disturbance* (Distance B)

Traverse Point Location Percent of Stack -Circular

Traverse Point Location	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 Location	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

Rectangular Stack Points & Matrix

9 - 3 x 3
12 - 4 x 3
16 - 4 x 4
20 - 5 x 4
25 - 5 x 5
30 - 6 x 5
36 - 6 x 6
42 - 7 x 6
49 - 7 x 7

Determination of Stack Gas Velocity - Method 2

Client: CHEMOURS - Fayetteville | Operator: MW | Pitot Coeff (Cp): 0.87
Location/Plant: Fayetteville, NC. | Date: 1/[illegible]/2019 2020 | Stack Area, ft² (As): 1.767
Source: THERMAL OXIDIZER | W.O. Number: | Pitot Tube/Thermo ID: P-74

Run Number	1 PM		
Time	1528		
Barometric Press, in Hg (Pb)	29.78		
Static Press, in H_2O (Pstatic)	-0.30		
Source Moisture, % (BWS)			
O_2, %			
CO_2, %			

Cyclonic Flow Determination		Traverse Location		Leak Check good ? (Y) N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Delta P at O°	Angle yeilding zero Delta P	Port	Point	0.59 Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
0	<5	A	1	~~0.05~~	81				
0	<5		2	0.59	84				
0			3	0.59	84				
0			4	0.57	87				
0			5	0.56	87				
0			6	0.50	88				
0		B	1	0.50	87				
0	<5		2	0.54	88				
0	<5		3	0.56	88				
0	<5		4	0.56	88				
0			5	0.56	88				
0			6	0.52	88				
					~~86.7~~ MW				
Avg Angle		Avg Delta P & Temp		0.55333	86.7				
		avg $\sqrt{DeltaP}$		0.743862					
Average gas stream velocity, ft/sec.									
Vol. flow rate @ actual conditions, wacf/min									
Vol. flow rate at standard conditions, dscf/min									

$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$

$MWs = (MWd * (1 - (BWS/100))) + (18 * (BWS/100))$

$Tsa = Ts + 460$

$Ps = Pb + (Pstatic/13.6)$

$Vs = 85.49 * Cp * avg\sqrt{DeltaP} * \sqrt{Tsa/(Ps * MWs)}$

$Qs(act) = 60 * Vs * As$

$Qs(std) = 17.64 * (1 - (BWS/100)) * (Ps/Tsa) * Qs(act)$

MWd = Dry molecular weight source gas, lb/lb-mole.
MWs = Wet molecular weight source gas, lb/lb-mole.
Tsa = Source Temperature, absolute(oR)
Ps = Absolute stack static pressure, inches Hg.
Vs = Average gas stream velocity, ft/sec.
Qs(act) = Volumetric flow rate of wet stack gas at actual, wacf/min
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

Note: Micromanometer is required if:
(A) The average Delta P readings are less than 0.05 inches of water.
(B) For traverses of 12 or more points, more than 10% of the Delta P readings are below 0.05 inches of water.
(C) For traverses of less than 12 points, more than one Delta P readings is below 0.05 inches of water.

WESTON SOLUTIONS

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

Test Data

Run number	1	2	3
Location	Thermal Oxidizer Stack	Thermal Oxidizer Stack	Thermal Oxidizer Stack
Date	2/28/2020	2/28/2020	2/29/2020
Time period	1115-1433	1630-1943	0915-1232
Operator	MW	MW	MW

Inputs For Calcs.

Sq. rt. delta P	0.87504	0.86056	0.89416
Delta H	1.9619	1.9036	2.0678
Stack temp. (deg.F)	62.4	65.1	58.4
Meter temp. (deg.F)	50.3	56.3	51.0
Sample volume (act.)	121.755	119.570	124.676
Barometric press. (in.Hg)	30.07	29.88	30.05
Volume H_2O imp. (ml)	4.0	16.0	8.0
Weight change sil. gel (g)	33.0	23.0	24.1
% CO_2	2.2	2.3	2.2
% O_2	17.3	17.2	17.3
% N_2	80.5	80.5	80.5
Area of stack (sq.ft.)	1.767	1.767	1.767
Sample time (min.)	180	180	180
Static pressure (in.H_2O)	0.70	0.70	0.70
Nozzle dia. (in.)	0.210	0.210	0.210
Meter box cal.	1.0013	1.0013	1.0013
Cp of pitot tube	0.84	0.84	0.84
Traverse points	12	12	12

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 2

		Stack Conditions	Assumed	Actual
Client	Chemours			
W.O.#	15418.002.021			
Project ID	Chemours	% Moisture	2	
Mode/Source ID	Thermal Oxidizer	Impinger Vol (ml)		4
Samp. Loc. ID	STK	Silica gel (g)		33
Run No.ID	1	CO2, % by Vol	2	
Test Method ID	M0010	O2, % by Vol	19	
Date ID	25 FEB2020	Temperature (°F)	63	
Source/Location	Thermal Oxidizer Stack	Meter Temp (°F)	50	
Sample Date	2/28/20 ✓	Static Press (in H_2O)	+0.7	0.7
Baro. Press (in Hg)	30.07 ✓			
Operator	MP, WENKELER	Ambient Temp (°F)	50	

Meter Box ID	33		
Meter Box Y	1.0013 ✓		
Meter Box Del H	2.3982		
Probe ID / Length	P 562	4'	Sample Train (ft³)
Probe Material	Boro		Leak Check @ (in Hg)
Pitot / Thermocouple ID	MP 2426/10 562	562	Pitot leak check good
Pitot Coefficient	0.84		Pitot Inspection good
Nozzle ID	G-210		Method 3 System good
Nozzle Measurements	0.210 | 0.210 | 0.210		**Temp Check**
Avg Nozzle Dia (in)	0.210 ✓		Meter Box Temp
Area of Stack (ft²)	1.767 ✓		Reference Temp
Sample Time	180 ✓		Pass/Fail (+/- 2°)
Total Traverse Pts	12 ✓		Temp Change Response ?

K Factor 2.54

	Initial	Mid-Point	Final
Sample Train (ft³)	0.001	0.001	0.001
Leak Check @ (in Hg)	@ 15	@ 3	@ 3
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
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	49		49
Reference Temp	49		49
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 (ft³)	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	1115 ✓			318.350									
A 1	5		1.1	2.79	322.24	63	48	100	103	49	5	42		
1	10		1.0	2.54	326.05	63	48	100	103	49	5	42		
1	15		1.0	2.54	330.05	63	48	100	100	49	5	42		
2	20		0.95	2.39	333.59	63	48	100	100	45	5	42		
2	25		0.90	2.26	337.25	63	48	100	100	45	5	42		
2	30		0.90	2.26	340.92	63	48	100	105	46	5	42		
3	35		0.90	2.26	344.80	63	48	100	100	46	5	42		
3	40		0.90	2.26	348.135	63	48	100	100	46	5	42		
3	45		0.90	2.26	352.135	63	48	100	100	46	5	42		
4	50		0.90	2.26	355.10	63	50	100	100	46	5	42		
4	55		0.65	1.63	358.44	62	50	101	105	46	3	42		
4	60		0.65	1.63	361.92	62	50	101	100	47	3	43		
5	65		0.70	1.76	365.40	61	50	100	103	48	3	43		
5	70		0.70	1.76	368.36	61	50	100	103	48	3	43		
5	75		0.70	1.76	371.23	61	50	100	103	48	3	43		
6	80		0.70	1.76	374.31	61	50	100	103	48	3	43		
6	85		0.50	1.26	377.30	61	50	100	100	48	3	43		
6	90	1245	0.50	1.26	380.100	61	50	100	100	48	3	43		
														61.750

	Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max
✓	0.779161	1.96194	121.755	62	50	100/101	95/105	51	6	41/46
✓	Avg Sqrt Delta P	Avg Sqrt Del H	Comments:	62.44	50.33					
	0.875038	1.388470								

EPA Method 0010 from EPA SW-846

ISOKINETIC FIELD DATA SHEET — EPA Method 0010 - HFPO Dimer Acid

Client: Chemours | Operator: MW WINKELER
Source: Thermal Oxidizer | Run No.: 1
Sample Loc.: Stack | Date: 2/28/20 | K Factor: 2.52

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 (ft³)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1303			380.215						MP 2/28/20		
B 1	5		1.0	2.52	383.600	64	51	100	95	48	4	41	
1	10		1.0	2.52	387.55	64	51	100	95	48	4	41	
1	15		1.0	2.52	391.30	64	51	100	95	48	4	41	
2	20		1.0	2.52	395.00	64	51	100	95	48	6	41	
2	25		1.0	2.52	399.50	64	51	100	98	48	6	41	
2	30		1.0	2.52	402.62	64	51	100	98	48	6	41	
3	35		0.90	2.26	406.41	63	52	100	103	51	5	43	
3	40		0.90	2.26	410.21	63	52	100	103	51	5	43	
3	45		0.90	2.26	413.92	63	52	100	103	51	5	43	
4	50		0.60	1.51	417.37	62	52	100	103	51	5	43	
4	55		0.60	1.51	420.26	61	52	100	100	51	5	43	
4	60		0.60	1.51	423.36	61	52	100	100	51	5	43	
5	65		0.50	1.26	426.10	61	52	100	100	51	3	43	
5	70		0.50	1.26	428.95	62	52	100	100	51	3	43	
5	75		0.50	1.26	431.81	62	52	100	100	51	3	43	
6	80		0.50	1.26	434.65	62	52	100	100	51	3	43	
6	85		0.50	1.26	437.4	62	52	100	100	51	3	43	
6	90	1433	0.50	1.26	440.220	62	52	100	100	51	3	43	
													60.005
			Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp	
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:								

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 2

		Stack Conditions	Assumed	Actual
Client	Chemours			
W.O.#	15418.002.021			
Project ID	Chemours	% Moisture	≈2	
Mode/Source ID	Thermal Oxidizer	Impinger Vol (ml)		
Samp. Loc. ID	STK	Silica gel (g)		
Run No.ID	2	CO2, % by Vol	2	
Test Method ID	M0010	O2, % by Vol	19	
Date ID	28_FEB2020	Temperature (°F)	60	
Source/Location	Thermal Oxidizer Stack	Meter Temp (°F)	59	
Sample Date	2/28/20 ✓	Static Press (in H_2O)	-0.7	0.7
Baro. Press (in Hg)	29.88 ✓			
Operator	MR WEAVER ✓	Ambient Temp (°F)	≈54	

Meter Box ID	B3		K Factor	2.54
Meter Box Y	1.0013 ✓		Initial	Mid-Point / Final
Meter Box Del H	2.2982			
Probe ID / Length	PS12 / 4'	Sample Train (ft^3)	0.001	0.001 / 0.001
Probe Material	Boro	Leak Check @ (in Hg)	@15	@15 / @7
Pitot / Thermocouple ID	PT62	Pitot leak check good	yes / no	yes / no
Pitot Coefficient	0.84 ✓	Pitot Inspection good	yes / no	yes / no
Nozzle ID	G210	Method 3 System good	yes / no	yes / no
Nozzle Measurements	0.210 / 0.210 / 0.210	**Temp Check**	Pre-Test Set	Post-Test Set
Avg Nozzle Dia (in)	0.210 ✓	Meter Box Temp	54	43
Area of Stack (ft^2)	1.767 ✓	Reference Temp	54	43
Sample Time	180 ✓	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	1630			440.610									
B 1	5		1.0	2.54	443.70	67	58	100	100	51	5	44		
1	10		0.95	2.41	448.20	67	58	100	100	50	5	44		
1	15		0.95	2.41	452.21	66	58	100	102	50	5	44		
2	20		0.90	2.28	455.96	67	58	100	102	50	5	44		
2	25		0.90	2.34	459.46	67	58	100	102	50	5	44		
2	30		0.90	2.28	463.10	67	58	100	102	50	5	44		
3	35		0.90	2.28	466.80	67	57	100	102	50	5	44		
3	40		0.90	2.28	470.45	66	58	100	102	50	5	44		
3	45		0.90	2.28	474.10	66	58	100	100	50	5	44		
4	50		0.70	1.77	477.32	65	57	100	99	50	5	44		
4	55		0.70	1.77	480.61	65	57	100	99	50	5	43		
4	60		0.70	1.77	483.91	64	57	100	99	50	5	43		
5	65		0.55	1.39	487.42	64	57	100	100	51	5	44		
5	70		0.55	1.39	490.29	64	57	100	100	51	5	44		
5	75		0.55	1.39	493.33	64	57	100	100	51	5	44		
6	80		0.50	1.27	496.12	64	57	100	100	51	5	44		
6	85		0.50	1.27	498.90	64	58	100	100	48	5	44		
6	90	1800	0.50	1.27	501.625	64	58	100	100	48	3	44		61.015
			Avg Delta P	√Avg Delta H	√Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
			0.752778	1.905611	114.570	65	56							
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:	65.1	56.3							
			0.861515	1.369725										

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

0.75139
0.861515

ISOKINETIC FIELD DATA SHEET — EPA Method 0010 - HFPO Dimer Acid

Client: Chemours | Operator: M WINKELER
Source: Thermal Oxidizer | Run No.: 2
Sample Loc.: Stack | Date: 2/28/20 | K Factor: 2.54

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 (ft³)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1813			501.825								
A 1	5		0.90	2.28	504.375	66	56	100	101	49	3	46	
1	10		0.90	2.28	507.96	66	56	100	101	49	3	46	
1	15		0.90	2.27	511.37	66	56	100	101	48	3	46	
2	20		0.90	2.28	515.15	66	56	100	100	48	3	46	
2	25		0.90	2.28	518.62	66	56	100	100	48	3	46	
2	30		0.90	2.28	522.30	66	55	100	100	46	5	41	
3	35		0.90	2.28	525.83	66	55	100	100	46	5	41	
3	40		0.90	2.28	529.42	66	55	100	100	47	5	41	
3	45		0.90	2.28	532.81	66	55	100	100	47	5	41	
4	50		0.75	1.90	536.10	66	55	100	100	47	5	41	
4	55		0.75	1.90	539.92	66	55	100	100	47	5	41	
4	60		0.75	1.90	543.24	66	55	100	100	47	5	41	
5	65		0.55	1.39	546.50	62	54	100	100	47	5	41	
5	70		0.55	1.39	549.32	62	54	100	100	47	5	41	
5	75		0.55	1.39	552.30	62	54	100	100	47	5	41	
6	80		0.50	1.27	554.85	62	54	100	99	47	3	43	
6	85		0.50	1.27	557.59	62	54	100	100	47	3	43	
6	90	1943	0.50	1.27	560.380	62	54	100	100	47	3	43	
													58.555

Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp
0.752778	1.903611								
Avg Sqrt Delta P	Avg Sqrt Del H	Comments:							
0.861515	1.369725								

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

			Stack Conditions	
Client	Chemours		Assumed	Actual
W.O.#	15418.002.021			
Project ID	Chemours	% Moisture	2	
Mode/Source ID	Thermal Oxidizer	Impinger Vol (ml)		
Samp. Loc. ID	STK	Silica gel (g)		
Run No.ID	3	CO2, % by Vol	2	
Test Method ID	M0010	O2, % by Vol	19	
Date ID	20FEB2020	Temperature (°F)	200	
Source/Location	Thermal Oxidizer Stack	Meter Temp (°F)	= 46	
Sample Date	2/29/20 ✓	Static Press (in H_2O)	0.7	0.7
Baro. Press (in Hg)	30.05 ✓			
Operator	MP WINKELER	Ambient Temp (°F)	=47	

Meter Box I	23		
Meter Box Y	1.0013 ✓		
Meter Box Del H	2.2982		
Probe ID / Length	P562	4'	Sample Train (ft^3)
Probe Material	Boro		Leak Check @ (in Hg)
Pitot / Thermocouple ID	K562		Pitot leak check good
Pitot Coefficient	0.84 ✓		Pitot Inspection good
Nozzle ID	G-210		Method 3 System good
Nozzle Measurements	0.210	0.210 / 0.210	**Temp Check**
Avg Nozzle Dia (in)	0.210		Meter Box Temp
Area of Stack (ft^2)	1.767 ✓		Reference Temp
Sample Time	180 ✓		Pass/Fail (+/- 2°)
Total Traverse Pts	12 ✓		Temp Change Response ?

K Factor 2.55

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.021	0.001	0.001
Leak Check @ (in Hg)	215	C6	27
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
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	44		46
Reference Temp	44		45
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 (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	0915 ✓			560.570									
1	5		1.0	2.55	564.55	57	45	100	100	44	5	39		
1	10		1.0	2.55	568.67	57	45	100	100	44	5	39		
1	15		1.0	2.55	572.16	57	45	100	100	44	5	39		
2	20		1.0	2.55	575.63	56	46	100	100	44	5	39		
2	25		1.0	2.55	579.63	56	46	100	100	44	5	39		
2	30		1.0	2.55	583.50	56	47	100	100	44	5	39		
3	35		1.0	2.55	587.40	54	47	100	100	44	5	39		
3	40		1.0	2.55	591.23	55	47	100	100	44	5	39		
3	45		1.0	2.55	595.00	55	48	100	100	44	5	39		
4	50		0.60	1.53	598.13	55	49	100	100	44	3	39		
4	55		0.60	1.53	601.22	55	50	100	100	44	3	38		
4	60		0.60	1.53	604.30	56	52	100	100	44	3	38		
5	65		0.60	1.53	607.62	57	52	100	100	44	3	39		
5	70		0.60	1.53	610.35	56	52	100	100	44	3	39		
5	75		0.60	1.53	613.36	56	52	100	100	44	3	39		
6	80		0.55	1.40	616.47	57	52	100	99	46	3	41		
6	85		0.55	1.40	619.23	57	52	100	102	46	3	41		
6	90	1045	0.55	1.40	622.001	57	52	100	102	46	3	41		61.431
			Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
			0.911167	2.06778	129.676	58.4	51.0							
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
			0.89416	1.42715										

EPA Method 0010 from EPA SW-846

NWA

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Client: Chemours
Source: Thermal Oxidizer
Sample Loc.: Stack
Operator: MP WINKELER
Run No.: 3
Date: 2/29/20
K Factor: 2.55

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 (ft³)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPING EXIT TEMP (°F)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)	COMMENTS
	0	1102			622.100								
1	5		1.0	2.55	625.90	62	53	100	101	49	5	39	
1	10		1.0	2.55	630.10	62	53	100	101	49	5	39	
1	15		1.0	2.55	633.75	62	53	100	101	49	5	39	
2	20		1.0	2.55	637.35	62	53	100	100	49	5	39	
2	25		1.0	2.55	641.20	62	53	100	100	49	5	39	
2	30		1.0	2.55	646.10	62	53	100	100	49	5	39	
3	35		0.96	2.44	648.62	62	53	100	100	49	5	39	
3	40		0.96	2.44	652.22	62	53	100	100	49	5	39	
3	45		0.96	2.44	656.10	61	53	100	100	49	5	39	
4	50		0.96	2.44	660.01	61	53	100	100	49	5	39	
4	55	* 1152	0.66	1.68	664.15	61	53	100	100	49	5	43	
4	60		0.66	1.68	667.11	59	53	100	99	44	5	43	
5	65		0.70	~~1.68~~ 1.72	670.00	59	55	100	99	44	5	43	
5	70		0.70	1.72	673.20	60	55	100	101	46	3	42	
5	75		0.72	1.83	676.37	59	55	100	101	46	3	42	
6	80		0.55	1.40	679.67	58	52	100	100	46	3	42	
6	85		0.57	1.45	682.55	59	52	100	100	46	3	42	
6	90	1232√	0.57	1.45	685.345	59	52	100	101	47	3	43	
													63.245

Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max Temp	Max Vac	Max Temp

Avg Sqrt Delta P	Avg Sqrt Del H

Comments:
* 1158 ~~FLOW DOWN~~ MP 2/29/20
FLOW VARIATION START
GSMP 2/29/20

WESTON SOLUTIONS

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - HFPO Dimer Acid

Client	Chemours	W.O. #	15418.002.021
Location/Plant	Fayetteville, NC	Source & Location	Thermal Oxidizer Stack

Run No. 1 — Sample Date 2/28 — Recovery Date 2/28

Sample I.D. Chemours - Thermal Oxidizer - STK - 1 - M0010 - — Analyst BB/WF — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty					Silica Gel	
Final	4	100	100	0					333	
Initial	0	100	100	0					300	
Gain	4	~~0~~	0	0				4 ✓	33 ✓	37

Impinger Color: Clear — Labeled? ✓

Silica Gel Condition: 3/4 blue — Sealed? ✓

Run No. 2 — Sample Date 2/28/20 — Recovery Date 2/28/20

Sample I.D. Chemours - Thermal Oxidizer - STK - 2 - M0010 - — Analyst WF/BB — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	14	95	97	10					323	
Initial	0	100	100	0					300	
Gain	14	-5	-3	10				16 ✓	23 ✓	39

Impinger Color: Clear — Labeled? ✓

Silica Gel Condition: 3/4 Blue — Sealed? ✓

Run No. 3 — Sample Date 2/29/20 — Recovery Date 2/29/20

Sample I.D. Chemours - Thermal Oxidizer - STK - 3 - M0010 - — Analyst WF — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	8	94	103	3					324.1	
Initial	0	100	100	0					300	
Gain	8	-6	3	3				8 ✓	24.1 ✓	32.1

Impinger Color: Clear — Labeled? ✓

Silica Gel Condition: 3/4 Blue — Sealed? ✓

Check COC for Sample IDs of Media Blanks

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - HFPO Dimer Acid

Client: Chemours | W.O. #: 15418.002.021

Location/Plant: Fayetteville, NC | Source & Location: Thermal Oxidizer Stack

Run No. WF 1 BT | Sample Date 2/29/20 | Recovery Date 2/29/20

Sample I.D. Chemours - Thermal Oxidizer - STK - BT - M0010 - WF | Analyst WF | Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	/	106	100	/					300	
Initial WF	~~664~~ 10	100	100	0					300	
Gain	/	0	0	/					0	

Impinger Color: Clear | Labeled? ✓

Silica Gel Condition: Good | Sealed? ✓

Run No. 2 | Sample Date _____ | Recovery Date _____

Sample I.D. Chemours - Thermal Oxidizer - STK - 2 - M0010 - | Analyst _____ | Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color _____ | Labeled? _____

Silica Gel Condition _____ | Sealed? _____

Run No. 3 | Sample Date _____ | Recovery Date _____

Sample I.D. Chemours - Thermal Oxidizer - STK - 3 - M0010 - | Analyst _____ | Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color _____ | Labeled? _____

Silica Gel Condition _____ | Sealed? _____

Check COC for Sample IDs of Media Blanks

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	1	Meter Box ID	VOST 9
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	1.000 ✓
Project ID	CHEM-F	Date	~~28~~ Feb. 2020 ✓	Probe ID/Length	Leak Check @ (in Hg)
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	30.07	Probe Material	Pitot leak check good
Samp. Loc.	Stack	Ambient Temp (°F)	51		
Source	TO Stack	Operator	CW ✓		
		Sample Time	180 ✓		

0.045 @ 3" | 0.013 @ 1" | ~~yes / no~~ | ~~yes / no~~ | ~~yes / no~~

0.0498"

Comments: Initial Probe Leak check:

Final Probe Leak check:

	0	1115 ✓			0.000							
B	5		1.5	1.8	7.5	52	NA	1.0	-100		
	10		1.5	1.8	15.0	51		1.0	-99		
	15		1.5	1.8	22.7	52		1.0	-99		
	20		1.5	1.8	30.4	51		1.0	-106		
	25		1.5	1.8	38.2	51		1.0	-107		
	30		1.5	1.8	45.8	51		1.0	-107		
	35		1.5	1.8	53.9	50		1.0	-105		
	40		1.5	1.8	61.2	51		1.0	-107		
	45		1.5	1.8	69.0	51		1.0	-105		VOL. 0223
	50		1.5	1.8	76.4	51		1.0	-105		
	55		1.5	1.8	83.8	50		1.0	-106		
	60		1.5	1.8	91.5	50		1.0	-106		
	65		1.5	1.8	99.5	50		1.0	-107		
	70		1.5	1.8	106.5	50		1.0	-106		
	75		1.5	1.8	114.2	50		1.0	-107		
	80		1.5	1.8	121	50		1.0	-107		
	85		1.5	1.8	180.1	50		1.0	-107		
	90	1245	1.5	1.8	135.337	50		1.0	-107		
				Avg Delta H	Total Volume	Avg Tm	Max Temp	Max Vac	Max Temp		
						50.56					

FIELD DATA SHEET

MM 18

Client	Chemours	Operator	CW
Samp. Loc.	Stack	Run No.	1
Source	TO Stack	Date	28 Feb. 2020

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	ROTOMETER SETTING	VELOCITY PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°F)	STACK TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)		COMMENTS
		1303			135.560							
A	95		1.5	1.8	142.6	NA	50	NA	1.0	-107		
	100		1.5	1.8	151.1		50		1.0	-107		
	105		1.5	1.8	157.3		50		1.0	-105		
	110		1.5	1.8	164.7		50		1.0	-105		
	115		1.5	1.8	171.8		50		1.0	-104		
	120		1.5	1.8	179.4		50		1.0	-105		
	125		1.5	1.8	187.3		50		1.0	-105		
	130		1.5	1.8	195.2		50		1.0	-105		
	135		1.5	1.8	203.0		50		1.0	-105		
	140		1.5	1.8	210.3		50		1.0	-105		
	145		1.5	1.8	217.9		51		1.0	-107		
	150		1.5	1.8	225.3		51		1.0	-104		
	155		1.5	1.8	232.8		51		1.0	-104		
	160		1.5	1.8	241.6		51		1.0	-107		
	165		1.5	1.8	247.7		51		1.0	-106		
	170		1.5	1.8	255.2		51		1.0	-105		
	175		1.5	1.8	262.3		51		1.0	-104		
	180	1433 ✓	1.5	1.8	269.758		52		1.0	-104		

		Avg Delta H	Total Volume	Avg Tm	Max Temp	Max Vac	~~MW~~/ Max ~~Temp~~	
WESTON SOLUTIONS	1.5	1.8 ✓	269.535 ✓	50.56 ✓	NA	1.0	-99 / -108	

Comments:

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	2	Meter Box ID	VOST 9
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	1.000 ✓
Project ID	CHEM-F	Date	28 Feb. 2020 ✓	Probe ID/Length	
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	29.88 ✓	Probe Material	
Samp. Loc.	Stack	Ambient Temp (°F)	55		
Source	TO Stack	Operator	CW ✓		
		Sample Time	180 ✓		

Leak Check @ (in Hg)	0.025 @ 6"	0.013 @ 1.5"
Pitot leak check good	~~yes / no~~	~~yes / no~~ yes / ~~no~~

Comments: Initial Probe Leak check:

Final Probe Leak check:

	0	1630 ✓			0.000							
A	5		1.5	1.8	7.7	NA	55	NA	1.0	-107		
	10		1.5	1.8	15.1		54		1.0	-104		
	15		1.5	1.8	22.7		55		1.0	-105		
	20		1.5	1.8	29.9		55		1.0	-104		
	25		1.5	1.8	37.3		55		1.0	-105		
	30		1.5	1.8	44.9		54		1.0	-105		
	35		1.5	1.8	52.5		54		1.0	-105		
	40		1.5	1.8	60.1		55		1.0	-105		
	45		1.5	1.8	68.6		55		1.0	-105		
	50		1.5	1.8	75.2		54		1.0	-105		
	55		1.5	1.8	83.0		54		1.0	-105		
	60		1.5	1.8	90.7		55		1.0	-105		
	65		1.5	1.8	98.0		55		1.0	-105		
	70		1.5	1.8	106.0		55		1.0	-106		
	75		1.5	1.8	113.0		54		1.0	-107		
	80		1.5	1.8	120.3		54		1.0	-107		
	85		1.5	1.8	128.5		54		1.0	-106		
	90	1800	1.5	1.8	135.730		54		1.0	-107		
WESTON SOLUTIONS				Avg Delta H	Total Volume	Avg Tm		Max Temp	Max Vac	Max Temp		

mmd

FIELD DATA SHEET

MM 18

Client	Chemours	Operator	CW
Samp. Loc.	Stack	Run No.	2
Source	TO Stack	Date	28 Feb. 2020

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	ROTOMETER SETTING	VELOCITY PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°F)	STACK TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)		COMMENTS
		1813			135.730							
B	95		1.5	1.8	143.3	NA	54	NA	1.0	-107		
	100		1.5	1.8	148.9		54		1.0	-107		
	105		1.5	1.8	150.7		53		1.0	-106		
	110		1.5	1.8	165.2		54		1.0	-106		
	115		1.5	1.8	172.1		54		1.0	-106		
	120		1.5	1.8	179.3		54		1.0	-106		
	125		1.5	1.8	186.9		54		1.0	-106		
	130		1.5	1.8	195.1		54		1.0	-105		
	135		1.5	1.8	202.9		54		1.0	-105		
	140		1.5	1.8	211.5		53		1.0	-105		
	145		1.5	1.8	218.9		53		1.0	-106		
	150		1.5	1.8	226.4		53		1.0	-106		
	155		1.5	1.8	233.7		53		1.0	-106		
	160		1.5	1.8	240.8		53		1.0	-106		
	165		1.5	1.8	248.2		53		1.0	-106		
	170		1.5	1.8	255.8		53		1.0	-106		
	175		1.5	1.8	266.9		53		1.0	-106		
	180	1943 ✓	1.5	1.8	270.347		53		1.0	-105		

WESTON SOLUTIONS		Avg Delta H	Total Volume	Avg Tm	Max Temp	Max Vac	Min/Max Temp	
	1.5	1.8	270.347 ✓	53.97 ✓	NA	1.0	-104 / -107	

Comments:

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	3	Meter Box ID	VOST 9
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	1.000 ✓
Project ID	CHEM-F	Date	29 Feb. 2020 ✓	Probe ID/Length	
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	~~29.97~~	Probe Material	30.05
Samp. Loc.	Stack	Ambient Temp (°F)	43		
Source	TO Stack	Operator	CW ✓		
		Sample Time	1180 ✓		

	Leak Check @ (in Hg)	Pitot leak check good
	0.000 02"	~~yes / no~~
	0.000 0.5"	~~yes / no~~
	0.000 0.5	~~yes / no~~

Comments: Initial Probe Leak check:

Final Probe Leak check:

	0	0915			0.000							
B	5		1.5	1.8	7.8	NA	44	NA	1.0	-113		
	10		1.5	1.8	14.9		43		1.0	-113		
	15		1.5	1.8	22.1		44		1.0	-113		
	20		1.5	1.8	29.2		44		1.0	-113		
	25		1.5	1.8	36.6		45		1.0	-113		
	30		1.5	1.8	44.4		45		1.0	-113		
	35		1.5	1.8	52.2		46		1.0	-113		
	40		1.5	1.8	59.7		46		1.0	-113		
	45		1.5	1.8	67.4		46		1.0	-113		
	50		1.5	1.8	75.3		46		1.0	-112		
	55		1.5	1.8	83.1		47		1.0	-113		
	60		1.5	1.8	90.8		47		1.0	-112		
	65		1.5	1.8	98.6		47		1.0	-112		
	70		1.5	1.8	106.4		48		1.0	-112		
	75		1.5	1.8	113.6		48		1.0	-112		
	80		1.5	1.8	120.6		48		1.0	-112		
	85		1.5	1.8	127.7		48		1.0	-112		
	90	1045	1.5	1.8	134.864		48		1.0	-112		
				Avg Delta H	Total Volume		Avg Tm	Max Temp	Max Vac	Max Temp		

WESTON SOLUTIONS

amd

FIELD DATA SHEET

MM 18

Client: Chemours | Operator: CW
Samp. Loc.: Stack | Run No.: 3
Source: TO Stack | Date: 29 Feb. 2020

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	ROTOMETER SETTING	VELOCITY PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°F)	STACK TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)		COMMENTS
		1102			134988							
A	95		1.5	1.8	142.7	N/A	49	N/A	1.0	-111		
	100		1.5	1.8	149.9		49		1.0	-110		
	105		1.5	1.8	157.6		49		1.0	-110		
	110		1.5	1.8	165.3		49		1.0	-110		LC Vol 0.124
	115		1.5	1.8	172.7		49		1.0	-110		
	120		1.5	1.8	180.1		49		1.0	-110		
	125		1.5	1.8	187.6		49		1.0	-110		
	130		1.5	1.8	194.6		49		1.0	-110		
	135		1.5	1.8	202.8		49		1.0	-111		
	140		1.5	1.8	209.8		49		1.0	-110		
	145		1.5	1.8	218.0		49		1.0	-110		
	150		1.5	1.8	225.4		49		1.0	-110		
	155		1.5	1.8	233.4		49		1.0	-110		
	160		1.5	1.8	240.9		49		1.0	-110		
	165		1.5	1.8	248.6		49		1.0	-110		
	170		1.5	1.8	256.0		49		1.0	-109		
	175		1.5	1.8	262.7		49		1.0	-109		
	180	1232	1.5	1.8	269.831		49		1.0	-109		
			1.5	Avg Delta H 1.8	Total Volume 269.707	Avg Tm 47.56		Max Temp NA	Max Vac 1.0	mm Max Temp -109 / 113		

Comments:

SAMPLE RECOVERY FIELD DATA

EPA Method ~~0010~~ M18 Modified - HFPO Dimer Acid

Client: Chemours | W.O. #:

Location/Plant: Fayetteville, NC | Source & Location: Therm Ox Outlet

Run No. 1 | Sample Date 2/28/20 | Recovery Date 2/28/20

Sample I.D. Chemours - ThermOx - Outlet - 1 - M18 | Analyst WF | Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7			
Final	594.0	624.3	613.1	609.7	609.3	607.9	634.2			
Initial	607.5	615.1	609.4	607.8	608.0	607.2	633.6			
Gain	-13.5	9.2	3.7	1.9	1.3	0.7	0.6			3.9

Impinger Color: Clear | Labeled? ✓

Silica Gel Condition: NA | Sealed? ✓

Run No. 2 | Sample Date 2/28/20 | Recovery Date 2/28/20

Sample I.D. Chemours - ThermOx - Outlet - 2 - M18 | Analyst WF | Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7			
Final	593.0	619.4	610.8	609.4	613.1	607.1	632.0			
Initial	604.9	610.8	606.6	607.9	612.0	606.5	632.0			
Gain	-11.9	8.6	4.2	1.5	1.1	0.6	0.0			4.1

Impinger Color: Clear | Labeled? ✓

Silica Gel Condition: NA | Sealed? ✓

Run No. 3 | Sample Date 2/29/20 | Recovery Date 2/29/20

Sample I.D. Chemours - ThermOx - Outlet - 3 - M18 | Analyst WF | Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7			
Final	592.8	626.4	607.5	611.6	608.7	632.3	612.7			
Initial	607.1	613.9	606.5	609.3	606.7	608.9	634.8			
Gain	-14.3	12.5	1.0	2.3	2.0	23.4	-22.1			4.8

Impinger Color: Clear | Labeled? ✓

Silica Gel Condition: — | Sealed? ✓

Check COC for Sample IDs of Media Blanks

SAMPLE RECOVERY FIELD DATA

EPA Method ~~0010~~ 0023A - HFPO Dimer Acid
18 Modified

Client: Chemours | W.O. #:
Location/Plant: Fayetteville, NC | Source & Location: Therm Ox Outlet

Run No. 1 | Sample Date: | Recovery Date:

Sample I.D. Chemours - ThermOx - Outlet - 1 - M18 | Analyst: | Filter Number:

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Impinger 1	Impinger 2	Impinger 3	Impinger 4	Impinger 5	Impinger 6	Impinger 7			
Final	604.0	612.7	609.0	609.0	608.4	607.5	633.5			
Initial	604.1	612.8	609.0	609.1	608.3	607.5	633.6			
Gain										

Impinger Color: | Labeled?:

Silica Gel Condition: | Sealed?:

Run No. 2 | Sample Date: | Recovery Date:

Sample I.D. Chemours - ThermOx - Outlet - 2 - M18 | Analyst: | Filter Number:

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

Impinger Color: | Labeled?:

Silica Gel Condition: | Sealed?:

Run No. 3 | Sample Date: | Recovery Date:

Sample I.D. Chemours - ThermOx - Outlet - 3 - M18 | Analyst: | Filter Number:

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

Impinger Color: | Labeled?:

Silica Gel Condition: | Sealed?:

Check COC for Sample IDs of Media Blanks

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	1	Meter Box ID	VOST 5
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	0.9996
Project ID	CHEM-F	Date	28 Feb. 2020 ✓	Probe ID/Length	
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	30.11	Probe Material	
Samp. Loc.	TO Inlet	Ambient Temp (°F)	3 45 ✓	Leak Check @ (in Hg)	0.005@5" / 0.008@2"
Source	Monomers	Operator	41	Pitot leak check good	yes / no / yes / no / yes / no
		Sample Time	~~2-28-2020~~ 4 195		

Comments: Initial Probe Leak check:

Final Probe Leak check:

	0	1115 ✓			0.000						
	5		0.5	1.0	2.42	65	n/a	<1	-101		
	10		0.5	1.0	5.04	64		<1	-101		
	15		0.5	1.0	7.56	64		<1	-102		
	20		0.5	1.0	9.99	63		<1	-101		
	25		0.5	1.0	12.51	63		<1	-101		
	30		0.5	1.0	15.07	63		<1	-101		
	35		0.5	1.0	17.62	62		<1	-101		
	40		0.5	1.0	20.08	62		<1	-101		
	45		0.5	1.0	21.99	62		<1	-101		
	50		0.5	1.2	25.07	62		<1	-101		
	55		0.5	1.2	27.53	62		<1	-101		
	60		0.5	1.2	30.06	62		<1	-101		
	65		0.5	1.2	32.57	62		<1	-101		
	70		0.5	1.2	34.99	62		<1	-100		
	75		0.5	1.2	37.44	61		<1	-101		
	80		0.5	1.2	40.01	61		<1	-101		
	85		0.5	1.2	42.53	60		<1	-101		
	90		0.5	1.2	45.01	60		<1	-101		
	95		0.5	1.2	47.47	59		<1	-101		
	100		0.5	1.2	49.93	59		<1	-101		
	105		0.5	1.2	52.52	60		<1	-100		
	110		0.5	1.2	55.06	60		<1	-101		
	115		0.5	1.2	57.43	61	↓	<1	-101		
WESTON SOLUTIONS			0.5	Avg Delta H 1.15	Total Volume 98.532	Avg Tm 61.4	Max Temp	Max Vac	Max Temp		

FIELD DATA SHEET

MM 18

(4) 2X Page 1 of 2

Client: Chemours | Operator: 4
Samp. Loc.: TO Inlet | Run No.: 1
Source: Monomers | Date: 28 Feb. 2020

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	ROTOMETER SETTING	VELOCITY PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°F)	STACK TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)		COMMENTS
	120		0.5	1.7	60.04	n/a	61	n/a	<1	~10		
	125		0.5	1.2	62.41		61		<1	~10		
	130		0.5	1.2	65.09		61		<1	~10		
	135		0.5	1.2	67.43		61		<1	~10		
	140		0.5	1.2	70.12		61		<1	~10		
	145		0.5	1.2	72.56		61		<1	~10		
	150		0.5	1.2	75.03		61		<1	~10		
	155		0.5	1.2	77.54		61		<1	~10		
	160		0.5	1.2	80.08		61		<1	~10		
	165		0.5	1.2	82.50		61		<1	~10		
	170		0.5	1.2	85.07		61		<1	~10		
	175		0.5	1.2	87.45		61		<1	~10		
	180		0.5	1.2	90.00		61		<1	~10		
	185		0.5	1.2	92.543		61		<1	~10		
	190		0.5	1.2	95.11		61		<1	~10		
	195		0.5	1.2	97.59		61		<1	~10		
		1433	0.5	1.2	98.532		61		<1	~10		
				Avg Delta H	Total Volume	Avg Tm		Max Temp	Max Vac	Max Temp		

Comments:

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	2	Meter Box ID	VOST #5
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	0.9996
Project ID	CHEM-F	Date	23 Feb. 2020	Probe ID/Length	
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	29.98	Probe Material	
Samp. Loc.	TO Inlet	Ambient Temp (°F)	45		
Source	Monomers	Operator	CL		
		Sample Time	193		

Leak Check @ (in Hg) 0.012@4" | | 0.006@2"

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

Comments: Initial Probe Leak check:

Final Probe Leak check:

	0	1630			0.000					OF 0		
	5		0.5	1.2	2.51	n/a	61	n/a	<1	-106		
	10		0.5	1.2	4.90		61		<1	-106		
	15		0.5	1.2	7.42		61		<1	-105		
	20		0.5	1.2	10.13		61		<1	-106		
	25		0.5	1.2	12.62		61		<1	-105		
	30		0.5	1.2	15.15		61		<1	-105		
	35		0.5	1.2	17.62		61		<1	-105		
	40		0.5	1.2	19.90		61		<1	-105		
	45		0.5	1.2	22.52		61		<1	-105		
	50		0.5	1.2	25.03		61		<1	-105		
	55		0.5	1.2	27.39		61		<1	-105		
	60		0.5	1.2	30.12		61		<1	-105		
	65		0.5	1.2	32.60		61		<1	-105		
	70		0.5	1.2	34.97		60		<1	-105		
	75		0.5	1.2	37.48		60		<1	-105		
	80		0.5	1.2	40.10		60		<1	-105		
	85		0.5	1.2	42.48		60		<1	-105		
	90		0.5	1.2	44.93		60		<1	-105		
	95		0.5	1.2	47.52		60		<1	-105		
	100		0.5	1.2	49.90		59		<1	-105		
	105		0.5	1.2	52.46		59		<1	-105		
	110		0.5	1.2	55.10		59		<1	-105		
	115		0.5	1.2	57.53		59		<1	-105		
WESTON SOLUTIONS			0.5	Avg Delta H 1.2	Total Volume 96.897		Avg Tm 59.44	Max Temp	Max Vac	Max Temp		

FIELD DATA SHEET

MM 18

Client: Chemours | Operator: 4

Samp. Loc.: TO Inlet | Run No.: 2

Source: Monomers | Date: 28 Feb. 2020

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	ROTOMETER SETTING	VELOCITY PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°F)	STACK TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)		COMMENTS
	120		0.5	1.2	60.14	n/a	58	n/a	<1	-105		
	125		0.5	1.2	62.55		58		<1	-105		
	130		0.5	1.2	64.84		59		<1	-105		
	135		0.5	1.2	67.43		58		<1	-105		
	140		0.5	1.2	70.02		58		<1	-105		
	145		0.5	1.2	72.57		58		<1	-105		
	150		0.5	1.2	75.03		58		<1	-105		
	155		0.5	1.2	77.62		58		<1	-105		
	160		0.5	1.2	80.11		58		<1	-105		
	165		0.5	1.2	82.56		58		<1	-105		
	170		0.5	1.2	85.03		58		<1	-105		
	175		0.5	1.2	87.51		58		<1	-105		
	180		0.5	1.2	90.02		58		<1	-105		
	185		0.5	1.2	92.52		58		<1	-105		
	190		0.5	1.2	95.13		58		<1	-105		
(4)	193	1943	0.5	1.2	96.847		58		<1	-105		
	~~195~~ 190											
				Avg Delta H	Total Volume	Avg Tm		Max Temp	Max Vac	Max Temp		

Comments:

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	3	Meter Box ID	Vost 5
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	0.9996
Project ID	CHEM-F	Date	29 Feb. 2020	Probe ID/Length	
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	30.05	Probe Material	
Samp. Loc.	TO Inlet	Ambient Temp (°F)	45		
Source	Monomers	Operator	4		
		Sample Time	197		

Leak Check @ (in Hg) 0.015@2" | | 0.012@1.5"

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

Comments: Initial Probe Leak check:

Final Probe Leak check:

	0	0915			0.000							
	5		0.5	1.0	2.561	n/a	54	n/a	<1	-109		
	10		0.5	1.2	4.90		55		<1	-109		
	15		0.5	1.2	7.42		56		<1	-109		
	20		0.5	1.2	10.05		56		<1	-108		
	25		0.5	1.2	12.44		56		<1	-108		
	30		0.5	1.2	15.06		57		<1	-107		
	35		0.5	1.2	17.61		57		<1	-107		
	40		0.5	1.2	20.18		58		<1	-107		
	45		0.5	1.2	22.64		58		<1	-107		
	50		0.5	1.2	25.12		59		<1	-107		
	55		0.5	1.2	27.50		59		<1	-107		
	60		0.5	1.2	29.93		60		<1	-107		
	65		0.5	1.2	32.41		61		<1	-107		
	70		0.5	1.2	34.93		62		<1	-107		
	75		0.5	1.2	37.40		63		<1	-107		
	80		0.5	1.2	39.95		64		<1	-107		
	85		0.5	1.2	42.55		65		<1	-107		
	90		0.5	1.2	45.10		65		<1	-107		
	95		0.5	1.2	47.52		65		<1	-107		
	100		0.5	1.2	50.12		65		<1	-107		
	105		0.5	1.2	52.41		65		<1	-107		
	110		0.5	1.2	54.96		65		<1	-107		
	115		0.5	1.2	57.50		65		<1	-107		
			0.5	Avg Delta H	Total Volume		Avg Tm	Max Temp	Max Vac	Max Temp		
				1.2	98.459		62.38					

FIELD DATA SHEET

MM 18

Client: Chemours | Operator: 4

Samp. Loc.: TO Inlet | Run No.: 3

Source: Monomers | Date: 29 Feb. 2020

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	ROTOMETER SETTING	VELOCITY PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°F)	STACK TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)		COMMENTS
	120		0.5	1.2	60.06	n/a	66	n/a	<1	-107		
	125		0.5	1.2	62.43		66		<1	-107		
	130		0.5	1.2	65.03		66		<1	-107		
	135		0.5	1.2	~~70.09~~ (4)		66		<1	-107		67.53
	140		0.5	1.2	70.02		65		<1	-107		
	145		0.5	1.2	72.61		65		<1	-107		
	150		0.5	1.2	75.09		65		<1	-107		
	155		0.5	1.2	77.56		65		<1	-107		
	160		0.5	1.2	80.11		66		<1	-107		
	165		0.5	1.2	82.63		66		<1	-107		
	170		0.5	1.2	85.20		66		<1	-107		
	175		0.5	1.2	87.66		65		<1	-107		
	180		0.5	1.2	90.02		65		<1	-108		
	185		0.5	1.2	92.44		64		<1	-108		
	190		0.5	1.2	94.88		64		<1	-108		
	195		0.5	1.2	97.41		63		<1	-108		
	197	1232	0.5	1.2	98.459	↓	62	↓	<1	-108		
				Avg Delta H	Total Volume	Avg Tm		Max Temp	Max Vac	Max Temp		

Comments:

SAMPLE RECOVERY FIELD DATA

Client	Chemours	W.O. #	15418.002.022
Location/Plant	Fayetteville NC	Source & Location	Monomers

Run No. 1 Sample Date 28-Feb-20 Recovery Date 28-Feb-20

Sample I.D. - - - 1 - - Chemours- Monomers Analyst SR Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents										
Final	700.6	605.2	600.1	598.9	603.5	626.0				
Initial	599.2	599.1	597.6	596.9	595.9	624.8				
Gain	101.4	6.1	2.5	2.0	7.6	1.2		120.8		

Impinger Color Clear Labeled? ✓

Silica Gel Condition ✓ Sealed? ✓

Run No. 2 Sample Date 28-Feb-20 Recovery Date 28-Feb-20

Sample I.D. - - - 2 - - Chemours- Monomers Analyst SR Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents										
Final	737.1	615.8	603.4	604.7	606.1	631.0				
Initial	620.9	606.4	607.4	601.9	603.7	628.2				
Gain	116.2	9.4	-4.0	2.8	2.4	2.8		129.6		

Impinger Color Clear Labeled? ✓

Silica Gel Condition ✓ Sealed? ✓

Run No. 3 Sample Date 29-Feb-20 Recovery Date 2/29/2020

Sample I.D. - - - 3 - - Chemours- Monomers Analyst SR Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents			596.9							
Final	775.5	607.3	~~596.8~~	599.2	600.2	635.2				
Initial	605.4	596.8	593.9	596.9	598.6	632.9				
Gain	170.1	10.5	3.0	2.3	1.6	2.3		189.8		

Impinger Color Clear Labeled? ✓

Silica Gel Condition ✓ Sealed? ✓

~~Check COC for Sample IDs of Media Blanks~~

SAMPLE RECOVERY FIELD DATA

Client	Chemours	W.O. #	15418.002.022
Location/Plant	Fayetteville NC	Source & Location	Monomer

Run No. 1 — Sample Date 29-Feb-20 — Recovery Date 29-Feb-20

Sample I.D. BLANK- Chemours- ~~Monomer~~ Blank train — Analyst SR — Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents										
Final	602.6	603.8	603.1	601.6	602.1	635.3				
Initial	602.6	603.9	603.1	601.6	602.3	635.4				
Gain	0.0	-0.1	0.0	0.0	-0.2	-0.1		-0.4		

Impinger Color _____ Labeled? _____

Silica Gel Condition _____ Sealed? _____

Run No. 2 — Sample Date _____ — Recovery Date _____

Sample I.D. - - - 2 - - Chemours- Polymers — Analyst _____ — Filter Number NA

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

Impinger Color _____ Labeled? _____

Silica Gel Condition _____ Sealed? _____

Run No. 3 — Sample Date _____ — Recovery Date _____

Sample I.D. - - - 3 - - Chemours- Polymers — Analyst _____ — Filter Number NA

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

Impinger Color _____ Labeled? _____

Silica Gel Condition _____ Sealed? _____

~~Check COC for Sample IDs of Media Blanks~~

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	1	Meter Box ID	Vost 8					
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	1.0170					
Project ID	CHEM-F	Date	28 Feb. 2020	Probe ID/Length	—	—	Leak Check @ (in Hg)	0.00 /5		
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	30.11	Probe Material	—		Pitot leak check good	yes / no	yes / no	yes / no
Samp. Loc.	TO Inlet	Ambient Temp (°F)	45							
Source	Polymers	Operator	AS							
		Sample Time	180 Min							

Comments: Initial Probe Leak check: 0.00

Final Probe Leak check:

	o										
	5	11:15	.5	1.9	7.526	61		CL	-104		
	10		.5	1.9	5.069	61		CL	-104		
	15		.5	1.9	7.714	61		CL	-104		
	20		.5	2.3	10.356	61		CL	-103		
	25		.5	2.3	13.581	61		CL	-103		
	30		.5	2.3	16.861	61		CL	-103		
	35		.5	2.3	20.016	61		CL	-103		
	40		.5	2.3	24.016	61		CL	-103		
	45		.5	2.3	28.757	61		CL	-103		
	50		.5	2.3	32.091	61		CL	-103		
	55		.5	2.3	35.619	61		CL	-103		
	60		.5	2.3	38.914	61		CL	-103		
	65		.5	2.3	42.106	61		CL	-103		
	70		.5	2.3	44.618	61		CL	-103		
	75		.5	2.3	47.319	61		CL	-103		
	80		.5	2.3	49.847	61		CL	-103		
	85		.5	2.3	52.134	61		CL	-103		
	90		.5	2.3	55.364	61		CL	-103		
	95		.5	2.4	57.901	61		CL	-103		
	100		.5	2.4	60.104	61		CL	-103		
	105		.5	2.4	65.011	61		CL	-103		
	110		.5	2.4	67.000	61		CL	-103		
	115		.5	2.4	69.176	61		CL	-103		
				Avg Delta H	Total Volume	Avg Tm	Max Temp	Max Vac	Max Temp		

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	2 1 AS	Meter Box ID	Nost 8
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	1.014
Project ID	CHEM-F	Date	Feb. 2020	Probe ID/Length	/
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	30.11	Probe Material	/
Samp. Loc.	TO Inlet	Ambient Temp (°F)	45		
Source	Polymers	Operator	TS		
		Sample Time	180		

Leak Check @ (in Hg)	.000	/	.003
Pitot leak check good	yes / no	yes / no	yes / no

Comments: Initial Probe Leak check: .003

Final Probe Leak check: .004

	O											
	120		.5	1.8	70.614		60		61	-103		
	125		.5	1.8	72.939		60		61	-103		
	130		.5	1.8	75.214		62		61	-103		
	135		.5	1.8	77.819		62		61	-103		
	140		.5	1.8	80.314		62		61	-104		
	145		.5	1.8	82.896		62		61	-104		
	150		.5	1.8	85.261		62		61	-104		
	155		.5	1.8	87.961		62		61	-103		
	160		.5	1.8	90.477		63		61	-103		
	165		.5	1.8	86.761		63		61	-103		
	170		.5	1.9	55.106		63		61	-103		
	175		.5	1.8	57.338		63		61	-103		
	180		.5	1.8	91.376		63		61	-103		
	185		.5	1.8	91.964		63		61	-103		
	190		.5	1.8	94.812		63		61	-103		
	195	1433	.5	1.8	98.333		63		61	-103		
				Avg Delta H	Total Volume		Avg Tm	Max Temp	Max Vac	Max Temp		

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	2	Meter Box ID	VOST 8
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	1.0140
Project ID	CHEM-F	Date	23 Feb. 2020	Probe ID/Length	43.5"
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	29.92	Probe Material	
Samp. Loc.	TO Inlet	Ambient Temp (°F)	45	Leak Check @ (in Hg)	0.020 / .008 @35'
Source	Polymers	Operator	Roman	Pitot leak check good	yes / no; yes / no; yes / no
		Sample Time	1492		NA

Comments: Initial Probe Leak check:

Final Probe Leak check:

	0	1630			0.000							
	5		0.5	1.7	2.43	NA	62	NA	0.5	-100		
	10		0.5	1.7	5.31		62		0.5	-101		
	15		0.5	1.7	7.52		62		0.5	-102		
	20		0.5	1.7	9.6		62		0.5	-102		
	25		0.5	1.7	11.8		62		0.5	-102		
	30		0.5	1.8	13.9		62		0.5	-102		
	35		0.5	1.8	15.8		62		0.5	-102		
	40		0.5	1.8	18.1		61		0.5	-102		
	45		0.5	1.8	21.0		61		0.5	-102		
	50		0.5	1.8	24.0		61		0.5	-102		
	55		0.5	1.8	28.3		61		0.5	-102		
	60		0.5	1.9	29.5		60		0.5	-101		
	65		0.5	1.9	32.5		60		0.5	-101		
	70		0.5	2.0	34.9		60		0.5	-101		
	75		0.5	2.1	37.8		60		0.5	-102		
	80		0.5	2.2	40.0		60		0.5	-102		
	85		0.5	2.2	43.1		60		0.5	-102		
	90		0.5	2.2	46.0		60		0.5	-102		
	95		0.5	2.2	48.1		60		0.5	-102		
	100		0.5	2.2	50.4		60		0.5	-102		
	105		0.5	2.2	52.8		59		0.5	-101		
	110		0.5	2.2	55.1		59		0.5	-102		
	115		0.5	2.2	60.5		59		0.5	-101		
				Avg Delta H	Total Volume		Avg Tm	Max Temp	Max Vac	Max Temp		

FIELD DATA SHEET

MM 18

Client: Chemours | Operator: Paul M
Samp. Loc.: TO Inlet | Run No.: 2
Source: Polymers | Date: 22 Feb. 2020

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	ROTOMETER SETTING	VELOCITY PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°F)	STACK TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)		COMMENTS
	120		0.5	2.2	62.8	dd	59	dd	0.5	-102		
	125		0.5	2.2	65.2		59		0.5	-104		
	130		0.5	2.3	67.5		59		0.5	-106		
	135		0.5	2.3	69.8		59		0.5	-106		
	140		0.5	2.3	72.4		59		0.5	-108		
	145		0.5	2.2	74.9		58		0.5	-108		
	150		0.5	2.3	77.6		58		0.5	-108		
	155		0.5	2.3	80.1		58		0.5	-108		
	160		0.5	2.3	82.7		58		0.5	-108		
	165		0.5	2.3	85.3		58		0.5	-108		
	170		0.5	2.3	87.8		58		0.5	-108		
	175		0.5	2.3	90.3		58		0.5	-108		
	180		0.5	2.3	92.6		58		0.5	-108		
	185		0.5	2.3	94.9		58		0.5	-108		
	190		0.5	2.3	97.3		58		0.5	-108		
	192	1942	0.5	2.2	98530		58		0.5	-108		
(SP)	199		(SP) 0.5									
				Avg Delta H	Total Volume	Avg Tm		Max Temp	Max Vac	Max Temp		

WESTON SOLUTIONS

Comments:

FIELD DATA SHEET

MM 18

Client	Chemours	Run No.	3	Meter Box ID	VOST #8				
W.O.#	15418.002.021	Test Method	Modified M18	Meter Box Y	1.0141				
Project ID	CHEM-F	Date	29 Feb. 2020	Probe ID/Length			Leak Check @ (in Hg)	.006@21	.002@15
Mode/Source ID	Thermal Oxidizer	Baro. Press (in Hg)	30.05	Probe Material			Pitot leak check good	~~yes / no~~	yes / no	yes / no
Samp. Loc.	TO Inlet	Ambient Temp (°F)	36						
Source	Polymers	Operator	BB						
		Sample Time	1900						

Comments: Initial Probe Leak check:

Final Probe Leak check:

	0	0915			0.000							
	5		0.5	1.0	3.2	NA	50	NA	0.5	-103		
	10		0.5	1.0	6.1		53		0.5	-102		
	15		0.5	1.0	9.0		53		0.5	-102		
	20		0.5	1.0	11.8		56		0.5	-102		
	25		0.5	1.0	15.8		58		0.5	-101		
	30		0.5	1.0	17.6		59		0.5	-101		
	35		0.5	1.0	20.4		59		0.5	-101		
	40		0.5	1.0	22.7		59		0.5	-102		
	45		0.5	1.0	24.8		60		0.5	-101		
	50		0.5	1.0	27.3		61		0.5	-101		
	55		0.5	1.0	~~32.2~~ 29.1	BB	61		0.5	-101		
	60		0.5	1.0	32.2		61		0.5	-100		
	65		0.5	1.0	34.7		61		0.5	-103		
	70		0.5	1.0	36.9		62		0.5	-104		
	75		0.5	1.0	39.4		61		0.5	-104		
	80		0.5	1.0	41.8		62		0.5	-104		
	85		0.5	1.0	44.3		62		0.5	-104		
	90		0.5	1.0	46.5		62		0.5	-103		
	95		0.5	1.0	49.1		62		0.5	-103		
	100		0.5	1.0	51.5		62		0.5	-104		
	105		0.5	1.0	54.0		62		0.5	-104		
	110		0.5	1.0	56.3		62		0.5	-103		
	115		0.5	1.0			63		0.5	-104		
				Avg Delta H	Total Volume		Avg Tm	Max Temp	Max Vac	Max Temp		

FIELD DATA SHEET

MM 18

Client: Chemours | Operator: BB/CH

Samp. Loc.: TO Inlet | Run No.: 3

Source: Polymers | Date: 29 Feb. 2020

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	ROTOMETER SETTING	VELOCITY PRESSURE Delta H (in H2O)	DRY GAS METER READING (liters)	DGM INLET TEMP (°C)	DGM OUTLET TEMP (°F)	STACK TEMP (°C)	SAMPLE TRAIN VAC (in Hg)	METHANOL BATH TEMP (°C/F)	VAC (in Hg)	COMMENTS
	120	1115			61.2							
	125		0.5	1.0	63.7	NA	63	NA	NA	-103	<1	
	130		0.5	1.0	65.3		63			-103	<1	
	135		0.5	1.0	68.7		63			-103	<1	
	140		0.5	1.0	71.1		63			-103	<1	
	145		0.5	1.0	73.4		63			-103	<1	
	150		0.5	1.0	75.6		63			-103	<1	
	155		0.5	1.0	77.5		63			-103	<1	
	160		0.5	1.0	80.1		63			-103	<1	
	165		0.5	1.0	82.8		63			-103	<1	
	170		0.5	1.0	85.3		62			-103	<1	
	175		0.5	1.0	87.8		61			-103	<1	
	180		0.5	1.0	90.1		60			-103	<1	
	185		0.5	1.0	92.5		60			-103	<1	
	190		0.5	1.0	94.9		59			-103	<1	
	195		0.5	1.0	97.4		59			-103	<1	
	197	1232	0.5	1.0	98.349		58			-103	<1	
				Avg Delta H	Total Volume	Avg Tm		Max Temp	Max Vac	Max Temp		

Comments:

SAMPLE RECOVERY FIELD DATA

Client	Chemours	W.O. #	15418.002.022
Location/Plant	Fayetteville NC	Source & Location	Polymers

Run No. 1 | Sample Date 28-Feb-20 | Recovery Date 28-Feb-20

Sample I.D. - - - 1 - - Chemours- Polymers | Analyst SR | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents										
Final	604.1	596.5	597.5	613.1	604.0	625.9				
Initial	603.4	596.1	597.3	612.9	604.0	625.9				
Gain	0.7	0.4	0.2	0.2	0.0	0.0		1.5		

Impinger Color clear | Labeled? ✓

Silica Gel Condition — | Sealed? ✓

Run No. 2 | Sample Date 28-Feb-20 | Recovery Date 28-Feb-20

Sample I.D. - - - 2 - - Chemours- Polymers | Analyst SR | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents										
Final	630.1	595.6	607.5	607.8	604.2	637.4				
Initial	614.6	606.5	609.9	607.4	603.9	637.5				
Gain	15.5	-10.9 SA 10.9	-2.4	0.4	0.3	-0.1		2.8		

Impinger Color clear | Labeled? ✓

Silica Gel Condition — | Sealed? ✓

Run No. 3 | Sample Date 29-Feb-20 | Recovery Date 2/29/2020

Sample I.D. - - - 3 - - Chemours- Polymers | Analyst SR | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents										
Final	597.8	599.5	598.3	603.8	603.9	623.5				
Initial	594.9	599.1	597.9	603.5	603.8	623.4				
Gain	2.9	0.4	0.4	0.3	0.1	0.1		4.2		

Impinger Color clear | Labeled? ✓

Silica Gel Condition — | Sealed? ✓

~~Check COC for Sample IDs of Media Blanks~~

METHODS AND ANALYZERS

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Date: **28 Feb 2020**

t Folders.A-F\Chemours Fayetteville\15418.002.023 Fayetteville February 2020 Thermal Oxidizer Retest\Data\Field

Program Version: 2.1, built 19 May 2017 **File Version:** 2.03
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**17.3**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Start Time: 07:10

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	EB0109777
21.0	XC008031B

Calibration Results

Zero	13 mv
Span, 21.0 %	8011 mv

Curve Coefficients

Slope	**Intercept**
380.1	13

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
9.1	EB0109777
17.3	XC021800B

Calibration Results

Zero	4 mv
Span, 17.3 %	8635 mv

Curve Coefficients

Slope	**Intercept**
499.2	4

CALIBRATION ERROR DATA

Number 1

Client: **Chemours** Project Number: **15418.002.022**
Location: **Fayetteville, NC** Operator:
Source: **TO** Calibration **1** Date: **28 Feb 2020**

Start Time: 07:10

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 380.1 **Intercept** 13.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 17.3 %
Slope 499.2 **Intercept** 4.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
9.1	8.9	-0.2	-1.2	Pass
17.3	17.3	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Calibration **1** | Date: **28 Feb 2020**

Start Time: 07:18

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 17.3 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	8.9	0.0	0.0	Pass

RUN DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
11:16	21.0	0.0
11:17	18.4	0.9
11:18	17.1	1.9
11:19	17.0	2.0
11:20	17.0	2.2
11:21	17.0	2.2
11:22	17.0	2.3
11:23	17.0	2.3
11:24	17.0	2.3
11:25	17.0	2.3
11:26	17.0	2.3
11:27	17.0	2.3
11:28	17.0	2.3
11:29	17.0	2.3
11:30	17.0	2.3
11:31	17.0	2.3
11:32	17.0	2.3
11:33	17.0	2.3
11:34	17.0	2.3
11:35	17.0	2.3
11:36	17.0	2.3
11:37	17.0	2.3
11:38	17.0	2.3
11:39	17.0	2.3
11:40	17.0	2.3
11:41	17.0	2.3
11:42	17.0	2.3
11:43	17.0	2.3
11:44	17.0	2.3
11:45	17.0	2.3
11:46	17.0	2.3
11:47	17.0	2.3
11:48	17.0	2.3
11:49	17.0	2.3
11:50	17.0	2.4
11:51	17.0	2.4
11:52	17.0	2.4
11:53	17.0	2.4
11:54	17.0	2.4
11:55	17.0	2.4

RUN DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
11:56	17.0	2.4
11:57	17.0	2.4
11:58	17.0	2.4
11:59	17.0	2.4
12:00	17.0	2.4
12:01	17.0	2.4
12:02	17.0	2.4
12:03	17.0	2.4
12:04	17.0	2.4
12:05	17.0	2.4
12:06	17.0	2.4
12:07	17.0	2.4
12:08	17.0	2.4
12:09	17.0	2.4
12:10	17.0	2.4
12:11	17.0	2.4
12:12	17.0	2.4
12:13	17.0	2.4
12:14	17.0	2.4
12:15	17.0	2.4
12:16	17.0	2.4
12:17	17.0	2.4
12:18	17.0	2.4
12:19	17.0	2.4
12:20	17.0	2.4
12:21	17.0	2.4
12:22	17.0	2.4
12:23	17.0	2.4
12:24	17.0	2.4
12:25	17.0	2.4
12:26	17.0	2.4
12:27	16.9	2.4
12:28	16.9	2.4
12:29	16.9	2.4
12:30	16.9	2.5
12:31	17.0	2.5
12:32	17.0	2.4
12:33	16.9	2.4
12:34	16.9	2.4
12:35	17.0	2.4

RUN DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
12:36	16.9	2.4
12:37	16.9	2.4
12:38	16.9	2.5
12:39	17.0	2.4
12:40	17.0	2.4
12:41	17.0	2.4
12:42	17.0	2.4
12:43	17.0	2.4
12:44	17.0	2.4
12:45	17.0	2.4
12:46	18.5	1.7
12:47	20.9	0.1
12:48	20.9	0.1
12:49	20.9	0.1
12:50	20.9	0.1
12:51	20.9	0.0
12:52	20.3	0.4
12:53	20.7	0.5
12:54	20.9	0.1
12:55	20.9	0.0
12:56	20.9	0.0
12:57	20.9	0.0
12:58	20.9	0.0
12:59	20.9	0.0
13:00	20.9	0.0
13:01	20.9	0.0
13:02	20.9	0.0
13:03	20.9	0.0
13:04	18.3	1.5
13:05	17.1	2.2
13:06	16.9	2.3
13:07	16.9	2.4
13:08	16.9	2.5
13:09	16.9	2.5
13:10	16.9	2.5
13:11	16.9	2.4
13:12	16.9	2.4
13:13	16.9	2.4
13:14	16.9	2.4
13:15	16.9	2.4

RUN DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
13:16	16.9	2.4
13:17	16.9	2.4
13:18	16.9	2.5
13:19	16.9	2.4
13:20	16.9	2.4
13:21	16.9	2.4
13:22	16.9	2.4
13:23	16.9	2.4
13:24	16.9	2.4
13:25	16.9	2.4
13:26	16.9	2.4
13:27	16.9	2.4
13:28	16.9	2.4
13:29	16.9	2.4
13:30	16.9	2.4
13:31	16.9	2.4
13:32	16.9	2.4
13:33	16.9	2.4
13:34	16.9	2.4
13:35	16.9	2.4
13:36	16.9	2.4
13:37	16.9	2.4
13:38	16.9	2.4
13:39	16.9	2.4
13:40	16.9	2.4
13:41	16.9	2.4
13:42	16.8	2.4
13:43	16.9	2.4
13:44	16.9	2.4
13:45	16.9	2.4
13:46	16.8	2.4
13:47	16.9	2.4
13:48	16.9	2.4
13:49	16.8	2.4
13:50	16.8	2.4
13:51	16.9	2.4
13:52	16.8	2.4
13:53	16.8	2.4
13:54	16.8	2.4
13:55	16.8	2.4

RUN DATA

Number 1

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Calibration **1** | Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
13:56	16.8	2.4
13:57	16.8	2.4
13:58	16.8	2.4
13:59	16.8	2.4
14:00	16.8	2.4
14:01	16.9	2.4
14:02	16.8	2.4
14:03	16.8	2.4
14:04	16.8	2.4
14:05	16.8	2.4
14:06	16.8	2.4
14:07	16.8	2.4
14:08	16.8	2.4
14:09	16.8	2.4
14:10	16.8	2.4
14:11	16.8	2.4
14:12	16.8	2.4
14:13	16.8	2.4
14:14	16.8	2.4
14:15	16.8	2.4
14:16	16.8	2.4
14:17	16.8	2.4
14:18	16.8	2.4
14:19	16.8	2.4
14:20	16.8	2.4
14:21	16.8	2.4
14:22	16.8	2.4
14:23	16.8	2.4
14:24	16.8	2.4
14:25	16.8	2.4
14:26	16.8	2.4
14:27	16.8	2.4
14:28	16.8	2.4
14:29	16.8	2.4
14:30	16.8	2.4
14:31	16.8	2.4
14:32	16.8	2.4
14:33	16.8	2.4
Avgs	**17.3**	**2.2**

RUN SUMMARY

Number 1

Client: **Chemours** Project Number: **15418.002.022**
Location: **Fayetteville, NC** Operator:
Source: **TO** Calibration **1** Date: **28 Feb 2020**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 11:15 to 14:33

Run Averages

17.3	2.2

Pre-run Bias at 07:18

Zero Bias	0.0	0.0
Span Bias	12.0	8.9
Span Gas	12.0	9.1

Post-run Bias at 14:35

Zero Bias	0.1	0.0
Span Bias	12.0	8.8
Span Gas	12.0	9.1

Run averages corrected for the average of the pre-run and post-run bias

17.3	2.2

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Calibration **1** | Date: **28 Feb 2020**

Start Time: 14:35

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.5	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.1	0.1	0.5	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 17.3 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	8.8	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	8.8	-0.1	-0.6	Pass

*Bias No. 1

RUN DATA

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
16:31	17.9	1.2
16:32	16.9	2.1
16:33	16.8	2.2
16:34	16.8	2.3
16:35	16.8	2.4
16:36	16.8	2.4
16:37	16.8	2.4
16:38	16.8	2.4
16:39	16.8	2.4
16:40	16.8	2.4
16:41	16.8	2.4
16:42	16.8	2.4
16:43	16.8	2.4
16:44	16.8	2.4
16:45	16.8	2.4
16:46	16.8	2.4
16:47	16.8	2.4
16:48	16.8	2.4
16:49	16.8	2.4
16:50	16.9	2.4
16:51	16.9	2.4
16:52	16.9	2.4
16:53	16.9	2.4
16:54	16.9	2.4
16:55	16.9	2.4
16:56	16.9	2.4
16:57	16.9	2.4
16:58	16.9	2.4
16:59	16.9	2.4
17:00	16.9	2.4
17:01	16.9	2.4
17:02	16.9	2.4
17:03	16.9	2.4
17:04	16.8	2.4
17:05	16.8	2.4
17:06	16.8	2.4
17:07	16.8	2.4
17:08	16.8	2.4
17:09	16.8	2.4
17:10	16.8	2.4

RUN DATA

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
17:11	16.8	2.4
17:12	16.8	2.4
17:13	16.8	2.4
17:14	16.8	2.4
17:15	16.8	2.4
17:16	16.8	2.4
17:17	16.8	2.4
17:18	16.8	2.4
17:19	16.8	2.4
17:20	16.8	2.5
17:21	16.8	2.5
17:22	16.8	2.5
17:23	16.8	2.5
17:24	16.8	2.5
17:25	16.8	2.5
17:26	16.8	2.5
17:27	16.8	2.5
17:28	16.8	2.5
17:29	16.8	2.5
17:30	16.8	2.5
17:31	16.8	2.4
17:32	16.8	2.5
17:33	16.8	2.4
17:34	16.8	2.4
17:35	16.8	2.4
17:36	16.8	2.4
17:37	16.8	2.4
17:38	16.8	2.4
17:39	16.8	2.4
17:40	16.8	2.4
17:41	16.8	2.4
17:42	16.8	2.4
17:43	16.8	2.4
17:44	16.8	2.4
17:45	16.8	2.4
17:46	16.8	2.4
17:47	16.8	2.4
17:48	16.8	2.4
17:49	16.8	2.4
17:50	16.8	2.4

RUN DATA

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
17:51	16.8	2.4
17:52	16.8	2.4
17:53	16.8	2.4
17:54	16.8	2.4
17:55	16.8	2.4
17:56	16.8	2.4
17:57	16.8	2.4
17:58	16.8	2.4
17:59	16.8	2.4
18:00	18.1	1.8
18:01	20.9	0.1
18:02	20.9	0.1
18:03	20.9	0.1
18:04	20.1	0.7
18:05	20.9	0.1
18:06	20.9	0.1
18:07	20.9	0.0
18:08	20.1	0.4
18:09	20.3	0.6
18:10	20.8	0.1
18:11	20.8	0.0
18:12	20.8	0.0
18:13	20.5	0.1
18:14	17.9	1.7
18:15	17.1	1.9
18:16	16.9	2.2
18:17	16.9	2.3
18:18	16.9	2.3
18:19	16.9	2.3
18:20	16.9	2.3
18:21	16.9	2.3
18:22	16.9	2.4
18:23	16.9	2.4
18:24	16.9	2.3
18:25	16.9	2.3
18:26	16.9	2.4
18:27	16.9	2.3
18:28	16.9	2.3
18:29	16.9	2.4
18:30	16.9	2.4

RUN DATA

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
18:31	16.9	2.4
18:32	16.9	2.4
18:33	16.9	2.4
18:34	16.9	2.4
18:35	16.9	2.4
18:36	16.9	2.4
18:37	16.9	2.4
18:38	16.9	2.4
18:39	16.9	2.4
18:40	16.9	2.4
18:41	16.9	2.4
18:42	16.9	2.4
18:43	16.9	2.4
18:44	16.9	2.4
18:45	16.9	2.5
18:46	16.9	2.5
18:47	16.9	2.5
18:48	16.9	2.5
18:49	16.9	2.5
18:50	16.9	2.5
18:51	16.9	2.5
18:52	16.9	2.5
18:53	16.9	2.5
18:54	16.9	2.5
18:55	16.9	2.5
18:56	16.9	2.5
18:57	16.9	2.5
18:58	16.9	2.5
18:59	16.9	2.5
19:00	16.9	2.5
19:01	16.9	2.5
19:02	16.9	2.5
19:03	16.9	2.5
19:04	16.9	2.4
19:05	16.9	2.5
19:06	16.9	2.5
19:07	16.9	2.5
19:08	16.9	2.5
19:09	16.9	2.5
19:10	16.9	2.5

RUN DATA

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **28 Feb 2020**

Time	O_2 %	CO_2 %
19:11	16.9	2.5
19:12	16.9	2.5
19:13	16.9	2.5
19:14	16.9	2.5
19:15	16.9	2.5
19:16	16.9	2.5
19:17	16.9	2.5
19:18	16.9	2.5
19:19	16.9	2.5
19:20	16.9	2.4
19:21	16.9	2.4
19:22	16.9	2.5
19:23	16.9	2.4
19:24	16.9	2.4
19:25	16.9	2.4
19:26	16.9	2.4
19:27	16.9	2.4
19:28	16.9	2.5
19:29	16.9	2.5
19:30	16.9	2.5
19:31	16.9	2.5
19:32	16.9	2.5
19:33	16.9	2.4
19:34	16.9	2.5
19:35	16.9	2.5
19:36	16.9	2.5
19:37	16.9	2.5
19:38	16.9	2.5
19:39	16.9	2.5
19:40	16.9	2.5
19:41	16.9	2.5
19:42	16.9	2.5
19:43	17.6	2.2
Avgs	**17.1**	**2.3**

RUN SUMMARY

Number 2

Client: **Chemours** Project Number: **15418.002.022**
Location: **Fayetteville, NC** Operator:
Source: **TO** Calibration **1** Date: **28 Feb 2020**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 16:30 to 19:43

Run Averages

17.1 2.3

Pre-run Bias at 14:35

Zero Bias	0.1	0.0
Span Bias	12.0	8.8
Span Gas	12.0	9.1

Post-run Bias at 20:13

Zero Bias	0.1	0.0
Span Bias	12.0	8.8
Span Gas	12.0	9.1

Run averages corrected for the average of the pre-run and post-run bias

17.2 2.3

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Calibration **1** | Date: **28 Feb 2020**

Start Time: 20:13

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.5	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.1	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 17.3 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	8.8	-0.1	-0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.8	8.8	0.0	0.0	Pass

*Bias No. 2

METHODS AND ANALYZERS

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Date: **29 Feb 2020**

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Program Version: 2.1, built 19 May 2017 **File Version:** 2.03
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**17.3**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Project Number: **15418.002.022**
Operator:
Date: **29 Feb 2020**

Start Time: 08:23

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	EB0109777
21.0	XC008031B

Calibration Results

Zero	8 mv
Span, 21.0 %	8020 mv

Curve Coefficients

Slope	**Intercept**
380.8	8

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
9.1	EB0109777
17.3	XC021800B

Calibration Results

Zero	-8 mv
Span, 17.3 %	8637 mv

Curve Coefficients

Slope	**Intercept**
500.0	-8

CALIBRATION ERROR DATA

Number 1

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Calibration **1** | Date: **29 Feb 2020**

Start Time: 08:23

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 380.8 **Intercept** 8.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 17.3 %
Slope 500.0 **Intercept** -8.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
9.1	8.9	-0.2	-1.2	Pass
17.3	17.3	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Calibration **1** | Date: **29 Feb 2020**

Start Time: 08:31

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 17.3 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	8.9	0.0	0.0	Pass

RUN DATA

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **29 Feb 2020**

Time	O_2 %	CO_2 %
09:16	19.8	0.6
09:17	17.5	1.5
09:18	17.0	1.9
09:19	17.0	2.0
09:20	17.0	2.1
09:21	17.0	2.1
09:22	17.0	2.2
09:23	17.0	2.2
09:24	16.9	2.2
09:25	16.9	2.2
09:26	17.0	2.2
09:27	17.0	2.2
09:28	16.9	2.2
09:29	17.0	2.2
09:30	17.0	2.2
09:31	17.0	2.2
09:32	17.0	2.2
09:33	17.0	2.2
09:34	17.0	2.2
09:35	17.0	2.2
09:36	17.0	2.2
09:37	17.0	2.2
09:38	17.0	2.2
09:39	17.0	2.3
09:40	17.0	2.3
09:41	17.0	2.3
09:42	17.0	2.3
09:43	17.0	2.3
09:44	17.0	2.3
09:45	17.0	2.3
09:46	17.0	2.3
09:47	17.0	2.3
09:48	17.0	2.3
09:49	17.0	2.3
09:50	17.0	2.3
09:51	17.0	2.3
09:52	17.0	2.3
09:53	17.1	2.3
09:54	17.0	2.3
09:55	17.0	2.3

RUN DATA

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **29 Feb 2020**

Time	O_2 %	CO_2 %
09:56	17.1	2.3
09:57	17.0	2.3
09:58	17.0	2.3
09:59	17.0	2.3
10:00	17.0	2.3
10:01	17.0	2.3
10:02	17.0	2.3
10:03	17.0	2.3
10:04	17.0	2.3
10:05	17.1	2.3
10:06	17.0	2.3
10:07	17.0	2.3
10:08	17.0	2.3
10:09	17.0	2.3
10:10	17.0	2.3
10:11	17.0	2.3
10:12	17.0	2.3
10:13	17.0	2.3
10:14	17.0	2.3
10:15	17.0	2.3
10:16	17.0	2.3
10:17	17.0	2.3
10:18	17.0	2.3
10:19	17.0	2.3
10:20	17.1	2.3
10:21	17.0	2.3
10:22	17.0	2.3
10:23	17.0	2.3
10:24	17.0	2.3
10:25	17.0	2.3
10:26	17.0	2.3
10:27	17.0	2.3
10:28	17.0	2.3
10:29	17.0	2.3
10:30	17.0	2.3
10:31	17.0	2.3
10:32	17.0	2.4
10:33	17.0	2.4
10:34	17.0	2.4
10:35	17.0	2.3

RUN DATA

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **29 Feb 2020**

Time	O_2 %	CO_2 %
10:36	17.0	2.4
10:37	17.0	2.4
10:38	17.0	2.4
10:39	17.0	2.4
10:40	17.0	2.4
10:41	17.0	2.4
10:42	17.0	2.4
10:43	17.0	2.4
10:44	17.0	2.4
10:45	17.0	2.4
10:46	19.1	1.4
10:47	20.9	0.1
10:48	20.9	0.1
10:49	20.9	0.1
10:50	20.2	0.6
10:51	20.9	0.2
10:52	20.9	0.1
10:53	20.9	0.1
10:54	20.9	0.1
10:55	20.9	0.1
10:56	20.9	0.1
10:57	20.9	0.1
10:58	20.9	0.1
10:59	20.9	0.1
11:00	20.8	0.1
11:01	20.9	0.1
11:02	20.9	0.1
11:03	19.5	0.7
11:04	17.3	2.1
11:05	17.0	2.2
11:06	17.0	2.4
11:07	17.0	2.4
11:08	17.0	2.4
11:09	17.0	2.4
11:10	16.9	2.4
11:11	17.0	2.4
11:12	17.0	2.4
11:13	17.0	2.4
11:14	16.9	2.4
11:15	16.9	2.4

RUN DATA

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **29 Feb 2020**

Time	O_2 %	CO_2 %
11:16	16.9	2.4
11:17	16.9	2.4
11:18	16.9	2.4
11:19	16.9	2.4
11:20	16.9	2.4
11:21	16.9	2.4
11:22	17.0	2.4
11:23	17.0	2.4
11:24	16.9	2.4
11:25	16.9	2.4
11:26	16.9	2.4
11:27	16.9	2.4
11:28	16.9	2.4
11:29	17.0	2.4
11:30	17.0	2.4
11:31	16.9	2.4
11:32	16.9	2.4
11:33	16.9	2.4
11:34	16.9	2.4
11:35	16.9	2.4
11:36	16.9	2.4
11:37	16.9	2.4
11:38	16.9	2.4
11:39	16.9	2.5
11:40	16.9	2.5
11:41	16.9	2.5
11:42	16.9	2.5
11:43	16.9	2.5
11:44	16.9	2.5
11:45	16.9	2.5
11:46	16.9	2.6
11:47	16.9	2.6
11:48	16.8	2.6
11:49	16.8	2.6
11:50	16.8	2.6
11:51	16.8	2.6
11:52	16.8	2.6
11:53	16.8	2.6
11:54	16.8	2.6
11:55	16.8	2.6

RUN DATA

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **TO**

Calibration **1**

Project Number: **15418.002.022**
Operator:
Date: **29 Feb 2020**

Time	O_2 %	CO_2 %
11:56	16.8	2.6
11:57	16.8	2.6
11:58	16.8	2.6
11:59	16.7	2.6
12:00	16.7	2.6
12:01	16.7	2.6
12:02	16.7	2.6
12:03	16.7	2.6
12:04	16.7	2.6
12:05	16.7	2.7
12:06	16.7	2.7
12:07	16.7	2.7
12:08	16.7	2.6
12:09	16.7	2.7
12:10	16.7	2.7
12:11	16.7	2.7
12:12	16.7	2.7
12:13	16.7	2.6
12:14	16.7	2.6
12:15	16.7	2.6
12:16	16.7	2.6
12:17	16.7	2.6
12:18	16.7	2.6
12:19	16.7	2.6
12:20	16.7	2.6
12:21	16.7	2.6
12:22	16.7	2.6
12:23	16.7	2.6
12:24	16.7	2.6
12:25	16.7	2.6
12:26	16.7	2.6
12:27	16.7	2.6
12:28	16.7	2.6
12:29	16.7	2.6
12:30	16.7	2.6
12:31	16.7	2.6
12:32	16.7	2.6
Avgs	**17.3**	**2.2**

RUN SUMMARY

Number 3

Client: **Chemours** Project Number: **15418.002.022**
Location: **Fayetteville, NC** Operator:
Source: **TO** Calibration **1** Date: **29 Feb 2020**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 09:15 to 12:32

Run Averages

17.3	2.2

Pre-run Bias at 08:31

Zero Bias	0.0	0.1
Span Bias	12.0	8.9
Span Gas	12.0	9.1

Post-run Bias at 13:00

Zero Bias	0.0	0.1
Span Bias	12.0	8.9
Span Gas	12.0	9.1

Run averages corrected for the average of the pre-run and post-run bias

17.3	2.2

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours** | Project Number: **15418.002.022**
Location: **Fayetteville, NC** | Operator:
Source: **TO** | Calibration **1** | Date: **29 Feb 2020**

Start Time: 13:00

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 17.3 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	8.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.1	0.0	0.0	Pass
Span	8.9	8.9	0.0	0.0	Pass

*Bias No. 1

APPENDIX C
LABORATORY ANALYTICAL REPORT

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Job Number: 140-18415-1

Job Description: TO CPT Stack - M0010

Contract Number: LBIO-67048

For:
The Chemours Company FC, LLC
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
3/13/2020 10:49 AM

Courtney M Adkins, Project Manager II
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
03/13/2020

Table of Contents

Table of Contents

Qualifiers

LCMS

Qualifier	Qualifier Description
X	Surrogate recovery exceeds control limits

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: The Chemours Company FC, LLC
Job ID: 140-18415-1
Project/Site: TO CPT Stack - M0010

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
None	Leaching Procedure	TAL SOP	TAL SAC
None	Leaching Procedure for Condensate	TAL SOP	TAL SAC
None	Leaching Procedure for XAD	TAL SOP	TAL SAC
Preparation	Dilution	None	TAL SAC
Split	Source Air Split	None	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

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

Job ID: 140-18415-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-18415-1	M-1177,1178 TO CPT STACK R1 M0010 FH	Air	02/28/20 00:00	03/01/20 07:00	
140-18415-2	M-1179,1180,1182 TO CPT STACK R1 M0010 BH	Air	02/28/20 00:00	03/01/20 07:00	
140-18415-3	M-1181 TO CPT STACK R1 M0010 IMP 1,2&3 CONDENSATE	Air	02/28/20 00:00	03/01/20 07:00	
140-18415-4	M-1183 TO CPT STACK R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	02/28/20 00:00	03/01/20 07:00	
140-18415-5	M-1184,1185 TO CPT STACK R2 M0010 FH	Air	02/28/20 00:00	03/01/20 07:00	
140-18415-6	M-1186,1187,1189 TO CPT STACK R2 M0010 BH	Air	02/28/20 00:00	03/01/20 07:00	
140-18415-7	M-1188 TO CPT STACK R2 M0010 IMP 1,2&3 CONDENSATE	Air	02/28/20 00:00	03/01/20 07:00	
140-18415-8	M-1190 TO CPT STACK R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	02/28/20 00:00	03/01/20 07:00	
140-18415-9	M-1191,1192 TO CPT STACK R3 M0010 FH	Air	02/29/20 00:00	03/01/20 07:00	
140-18415-10	M-1193,1194,1196 TO CPT STACK R3 M0010 BH	Air	02/29/20 00:00	03/01/20 07:00	
140-18415-11	M-1195 TO CPT STACK R3 M0010 IMP 1,2&3 CONDENSATE	Air	02/29/20 00:00	03/01/20 07:00	
140-18415-12	M-1197 TO CPT STACK R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	02/29/20 00:00	03/01/20 07:00	

Job Narrative
140-18415-1

Sample Receipt

The samples were received on March 1, 2020 at 7:00 AM in good condition and properly preserved. The temperature of the cooler at receipt was 0.5º 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 Sacramento laboratory for PFAS analysis. All results are reported in "Total ng" per sample.

Notes

Breakthrough from the Modified Method 0010 Sampling Train for PFAS compounds will be measured by the percentage (%) concentration of a specific PFAS target analyte determined to be present in the Breakthrough XAD-2 resin module of a test run. If the concentration of a specific PFAS compound is ≤30% of the sum of the concentrations determined for the other three (3) fractions of the sampling train, then sampling breakthrough is determined not to have occurred. Also, no breakthrough will be determined to have occurred if < 250 µg of a target analyte is collected on all fractions of a sampling train. Breakthrough the sampling train implies that sample loss through the train has occurred and results in a negative bias to the sample results

LCMS

Prep Batch: 361039

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-1	M-1177,1178 TO CPT STACK R1 M0010 FH	Total/NA	Air	None	
140-18415-5	M-1184,1185 TO CPT STACK R2 M0010 FH	Total/NA	Air	None	
140-18415-9	M-1191,1192 TO CPT STACK R3 M0010 FH	Total/NA	Air	None	
MB 320-361039/1-C	Method Blank	Total/NA	Air	None	
LCS 320-361039/2-C	Lab Control Sample	Total/NA	Air	None	
LCSD 320-361039/3-C	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 361040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-2	M-1179,1180,1182 TO CPT STACK R1 M0010 B	Total/NA	Air	None	
140-18415-4	M-1183 TO CPT STACK R1 M0010 BREAKTHR(	Total/NA	Air	None	
140-18415-6	M-1186,1187,1189 TO CPT STACK R2 M0010 B	Total/NA	Air	None	
140-18415-8	M-1190 TO CPT STACK R2 M0010 BREAKTHR(	Total/NA	Air	None	
140-18415-10	M-1193,1194,1196 TO CPT STACK R3 M0010 B	Total/NA	Air	None	
140-18415-12	M-1197 TO CPT STACK R3 M0010 BREAKTHR(	Total/NA	Air	None	
MB 320-361040/1-C	Method Blank	Total/NA	Air	None	
LCS 320-361040/2-C	Lab Control Sample	Total/NA	Air	None	
LCSD 320-361040/3-C	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 361065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-3	M-1181 TO CPT STACK R1 M0010 IMP 1,2&3 C	Total/NA	Air	None	
140-18415-7	M-1188 TO CPT STACK R2 M0010 IMP 1,2&3 C	Total/NA	Air	None	
140-18415-11	M-1195 TO CPT STACK R3 M0010 IMP 1,2&3 C	Total/NA	Air	None	
MB 320-361065/1-B	Method Blank	Total/NA	Air	None	
LCS 320-361065/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 320-361065/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 361105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-3	M-1181 TO CPT STACK R1 M0010 IMP 1,2&3 C	Total/NA	Air	Preparation	361065
140-18415-7	M-1188 TO CPT STACK R2 M0010 IMP 1,2&3 C	Total/NA	Air	Preparation	361065
140-18415-11	M-1195 TO CPT STACK R3 M0010 IMP 1,2&3 C	Total/NA	Air	Preparation	361065
MB 320-361065/1-B	Method Blank	Total/NA	Air	Preparation	361065
LCS 320-361065/2-B	Lab Control Sample	Total/NA	Air	Preparation	361065
LCSD 320-361065/3-B	Lab Control Sample Dup	Total/NA	Air	Preparation	361065

Cleanup Batch: 361347

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-1	M-1177,1178 TO CPT STACK R1 M0010 FH	Total/NA	Air	Split	361039
140-18415-5	M-1184,1185 TO CPT STACK R2 M0010 FH	Total/NA	Air	Split	361039
140-18415-9	M-1191,1192 TO CPT STACK R3 M0010 FH	Total/NA	Air	Split	361039
MB 320-361039/1-C	Method Blank	Total/NA	Air	Split	361039
LCS 320-361039/2-C	Lab Control Sample	Total/NA	Air	Split	361039
LCSD 320-361039/3-C	Lab Control Sample Dup	Total/NA	Air	Split	361039

Cleanup Batch: 361696

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-2	M-1179,1180,1182 TO CPT STACK R1 M0010 B	Total/NA	Air	Split	361040
140-18415-4	M-1183 TO CPT STACK R1 M0010 BREAKTHR(	Total/NA	Air	Split	361040
140-18415-6	M-1186,1187,1189 TO CPT STACK R2 M0010 B	Total/NA	Air	Split	361040

LCMS (Continued)

Cleanup Batch: 361696 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-8	M-1190 TO CPT STACK R2 M0010 BREAKTHR(	Total/NA	Air	Split	361040
140-18415-10	M-1193,1194,1196 TO CPT STACK R3 M0010 B	Total/NA	Air	Split	361040
140-18415-12	M-1197 TO CPT STACK R3 M0010 BREAKTHR(	Total/NA	Air	Split	361040
MB 320-361040/1-C	Method Blank	Total/NA	Air	Split	361040
LCS 320-361040/2-C	Lab Control Sample	Total/NA	Air	Split	361040
LCSD 320-361040/3-C	Lab Control Sample Dup	Total/NA	Air	Split	361040

Cleanup Batch: 362105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-1	M-1177,1178 TO CPT STACK R1 M0010 FH	Total/NA	Air	Preparation	361347
140-18415-5	M-1184,1185 TO CPT STACK R2 M0010 FH	Total/NA	Air	Preparation	361347
140-18415-9	M-1191,1192 TO CPT STACK R3 M0010 FH	Total/NA	Air	Preparation	361347
MB 320-361039/1-C	Method Blank	Total/NA	Air	Preparation	361347
LCS 320-361039/2-C	Lab Control Sample	Total/NA	Air	Preparation	361347
LCSD 320-361039/3-C	Lab Control Sample Dup	Total/NA	Air	Preparation	361347

Analysis Batch: 362233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-361065/1-B	Method Blank	Total/NA	Air	537 (modified)	361105
LCS 320-361065/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	361105
LCSD 320-361065/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	361105

Cleanup Batch: 362370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-2	M-1179,1180,1182 TO CPT STACK R1 M0010 B	Total/NA	Air	Preparation	361696
140-18415-4	M-1183 TO CPT STACK R1 M0010 BREAKTHR(	Total/NA	Air	Preparation	361696
140-18415-6	M-1186,1187,1189 TO CPT STACK R2 M0010 B	Total/NA	Air	Preparation	361696
140-18415-8	M-1190 TO CPT STACK R2 M0010 BREAKTHR(	Total/NA	Air	Preparation	361696
140-18415-10	M-1193,1194,1196 TO CPT STACK R3 M0010 B	Total/NA	Air	Preparation	361696
140-18415-12	M-1197 TO CPT STACK R3 M0010 BREAKTHR(	Total/NA	Air	Preparation	361696
MB 320-361040/1-C	Method Blank	Total/NA	Air	Preparation	361696
LCS 320-361040/2-C	Lab Control Sample	Total/NA	Air	Preparation	361696
LCSD 320-361040/3-C	Lab Control Sample Dup	Total/NA	Air	Preparation	361696

Analysis Batch: 362836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 320-361039/1-C	Method Blank	Total/NA	Air	537 (modified)	362105
LCS 320-361039/2-C	Lab Control Sample	Total/NA	Air	537 (modified)	362105
LCSD 320-361039/3-C	Lab Control Sample Dup	Total/NA	Air	537 (modified)	362105

Analysis Batch: 362840

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-3	M-1181 TO CPT STACK R1 M0010 IMP 1,2&3 C	Total/NA	Air	537 (modified)	361105
140-18415-7	M-1188 TO CPT STACK R2 M0010 IMP 1,2&3 C	Total/NA	Air	537 (modified)	361105
140-18415-11	M-1195 TO CPT STACK R3 M0010 IMP 1,2&3 C	Total/NA	Air	537 (modified)	361105

Analysis Batch: 362844

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-2	M-1179,1180,1182 TO CPT STACK R1 M0010 B	Total/NA	Air	537 (modified)	362370
MB 320-361040/1-C	Method Blank	Total/NA	Air	537 (modified)	362370
LCS 320-361040/2-C	Lab Control Sample	Total/NA	Air	537 (modified)	362370

LCMS (Continued)

Analysis Batch: 362844 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 320-361040/3-C	Lab Control Sample Dup	Total/NA	Air	537 (modified)	362370

Analysis Batch: 363067

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18415-1	M-1177,1178 TO CPT STACK R1 M0010 FH	Total/NA	Air	537 (modified)	362105
140-18415-4	M-1183 TO CPT STACK R1 M0010 BREAKTHR(	Total/NA	Air	537 (modified)	362370
140-18415-5	M-1184,1185 TO CPT STACK R2 M0010 FH	Total/NA	Air	537 (modified)	362105
140-18415-6	M-1186,1187,1189 TO CPT STACK R2 M0010 B	Total/NA	Air	537 (modified)	362370
140-18415-8	M-1190 TO CPT STACK R2 M0010 BREAKTHR(	Total/NA	Air	537 (modified)	362370
140-18415-9	M-1191,1192 TO CPT STACK R3 M0010 FH	Total/NA	Air	537 (modified)	362105
140-18415-10	M-1193,1194,1196 TO CPT STACK R3 M0010 B	Total/NA	Air	537 (modified)	362370
140-18415-12	M-1197 TO CPT STACK R3 M0010 BREAKTHR(	Total/NA	Air	537 (modified)	362370

Client Sample ID: M-1177,1178 TO CPT STACK R1 M0010 FH

Lab Sample ID: 140-18415-1

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	28.4		3.00	1.51	ng/Sample		03/02/20 11:00	03/09/20 19:29	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	93		25 - 150	03/02/20 11:00	03/09/20 19:29	1

Client Sample ID: M-1179,1180,1182 TO CPT STACK R1 M0010 BH

Lab Sample ID: 140-18415-2

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	164		160	81.4	ng/Sample		03/02/20 11:00	03/08/20 20:12	100

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	97		25 - 150	03/02/20 11:00	03/08/20 20:12	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 PFOA	132		50 - 150	03/02/20 11:00	03/08/20 20:12	100
13C8 PFOS	87		50 - 150	03/02/20 11:00	03/08/20 20:12	100

Client Sample ID: M-1181 TO CPT STACK R1 M0010 IMP 1,2&3 CONDENSATE

Lab Sample ID: 140-18415-3

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	25.9		12.0	5.98	ng/Sample		03/02/20 11:48	03/08/20 18:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	99		25 - 150	03/02/20 11:48	03/08/20 18:21	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 PFOA	0.1	X	50 - 150	03/02/20 11:48	03/08/20 18:21	1
13C8 PFOS	0.05	X	50 - 150	03/02/20 11:48	03/08/20 18:21	1

Client Sample ID: M-1183 TO CPT STACK R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-18415-4

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	4.88		1.60	0.814	ng/Sample		03/02/20 11:00	03/09/20 16:49	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	93		25 - 150	03/02/20 11:00	03/09/20 16:49	1

Client Sample ID: M-1183 TO CPT STACK R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE
Lab Sample ID: 140-18415-4

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 PFOA	0.04	X	50 - 150	03/02/20 11:00	03/09/20 16:49	1
13C8 PFOS	0.03	X	50 - 150	03/02/20 11:00	03/09/20 16:49	1

Client Sample ID: M-1184,1185 TO CPT STACK R2 M0010 FH
Lab Sample ID: 140-18415-5

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	27.9		2.98	1.50	ng/Sample		03/02/20 11:00	03/09/20 19:39	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	79		25 - 150	03/02/20 11:00	03/09/20 19:39	1

Client Sample ID: M-1186,1187,1189 TO CPT STACK R2 M0010 BH
Lab Sample ID: 140-18415-6

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	94.1		1.60	0.814	ng/Sample		03/02/20 11:00	03/09/20 16:59	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	92		25 - 150	03/02/20 11:00	03/09/20 16:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 PFOA	102		50 - 150	03/02/20 11:00	03/09/20 16:59	1
13C8 PFOS	91		50 - 150	03/02/20 11:00	03/09/20 16:59	1

Client Sample ID: M-1188 TO CPT STACK R2 M0010 IMP 1,2&3 CONDENSATE
Lab Sample ID: 140-18415-7

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	37.6		12.0	5.98	ng/Sample		03/02/20 11:48	03/08/20 18:31	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	95		25 - 150	03/02/20 11:48	03/08/20 18:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 PFOA	0.9	X	50 - 150	03/02/20 11:48	03/08/20 18:31	1
13C8 PFOS	0.2	X	50 - 150	03/02/20 11:48	03/08/20 18:31	1

Client Sample ID: M-1190 TO CPT STACK R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-18415-8

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	16.7		1.60	0.814	ng/Sample		03/02/20 11:00	03/09/20 17:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*84*		*25 - 150*	*03/02/20 11:00*	*03/09/20 17:09*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*0.06*	*X*	*50 - 150*	*03/02/20 11:00*	*03/09/20 17:09*	*1*
13C8 PFOS	*0.006*	*X*	*50 - 150*	*03/02/20 11:00*	*03/09/20 17:09*	*1*

Client Sample ID: M-1191,1192 TO CPT STACK R3 M0010 FH

Lab Sample ID: 140-18415-9

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	21.6		2.97	1.50	ng/Sample		03/02/20 11:00	03/09/20 19:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*88*		*25 - 150*	*03/02/20 11:00*	*03/09/20 19:49*	*1*

Client Sample ID: M-1193,1194,1196 TO CPT STACK R3 M0010 BH

Lab Sample ID: 140-18415-10

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	71.6		1.60	0.814	ng/Sample		03/02/20 11:00	03/09/20 17:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*92*		*25 - 150*	*03/02/20 11:00*	*03/09/20 17:19*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*104*		*50 - 150*	*03/02/20 11:00*	*03/09/20 17:19*	*1*
13C8 PFOS	*94*		*50 - 150*	*03/02/20 11:00*	*03/09/20 17:19*	*1*

Client Sample ID: M-1195 TO CPT STACK R3 M0010 IMP 1,2&3 CONDENSATE

Lab Sample ID: 140-18415-11

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	23.7		12.0	5.98	ng/Sample		03/02/20 11:48	03/08/20 18:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*102*		*25 - 150*	*03/02/20 11:48*	*03/08/20 18:41*	*1*

Client Sample ID: M-1195 TO CPT STACK R3 M0010 IMP 1,2&3 CONDENSATE

Lab Sample ID: 140-18415-11

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*0.3*	*X*	*50 - 150*	*03/02/20 11:48*	*03/08/20 18:41*	*1*
13C8 PFOS	*0.06*	*X*	*50 - 150*	*03/02/20 11:48*	*03/08/20 18:41*	*1*

Client Sample ID: M-1197 TO CPT STACK R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-18415-12

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	10.7		1.60	0.814	ng/Sample		03/02/20 11:00	03/09/20 17:29	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*89*		*25 - 150*	*03/02/20 11:00*	*03/09/20 17:29*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 PFOA	*0.08*	*X*	*50 - 150*	*03/02/20 11:00*	*03/09/20 17:29*	*1*
13C8 PFOS	*0.07*	*X*	*50 - 150*	*03/02/20 11:00*	*03/09/20 17:29*	*1*

Default Detection Limits

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

Job ID: 140-18415-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: None

Analyte	RL	MDL	Units
HFPO-DA	3.00	1.51	ng/Sample
HFPO-DA	1.60	0.814	ng/Sample
HFPO-DA	12.0	5.98	ng/Sample

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ANALYTICAL REPORT

Job Number: 140-18369-1

Job Description: TO CPT Stack - MM-18

Contract Number: LBIO-67048

For:
The Chemours Company FC, LLC
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
3/13/2020 3:04 PM

Courtney M Adkins, Project Manager II
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
03/13/2020

Table of Contents

Table of Contents

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: The Chemours Company FC, LLC
Project/Site: TO CPT Stack - MM-18

Job ID: 140-18369-1

Method	Method Description	Protocol	Laboratory
8260B SIM	Volatile Organic Compounds (GC/MS)	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: The Chemours Company FC, LLC
Project/Site: TO CPT Stack - MM-18

Job ID: 140-18369-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-18369-1	G-2764 R1 CPT TO STACK-IMP #1 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-2	G-2765 R1 CPT TO STACK-IMP #2 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-3	G-2766 R1 CPT TO STACK-IMP #3 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-4	G-2767 R1 CPT TO STACK-IMP #4 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-5	G-2768 R1 CPT TO STACK-IMP #5 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-6	G-2769 R1 CPT TO STACK-IMP #6 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-7	G-2770 R1 CPT TO STACK-IMP #7 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-8	G-2771 R2 CPT TO STACK-IMP #1 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-9	G-2772 R2 CPT TO STACK-IMP #2 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-10	G-2773 R2 CPT TO STACK-IMP #3 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-11	G-2774 R2 CPT TO STACK-IMP #4 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-12	G-2775 R2 CPT TO STACK-IMP #5 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-13	G-2776 R2 CPT TO STACK-IMP #6 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-14	G-2777 R2 CPT TO STACK-IMP #7 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18369-15	G-2778 R3 CPT TO STACK-IMP #1 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18369-16	G-2779 R3 CPT TO STACK-IMP #2 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18369-17	G-2780 R3 CPT TO STACK-IMP #3 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18369-18	G-2781 R3 CPT TO STACK-IMP #4 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18369-19	G-2782 R3 CPT TO STACK-IMP #5 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18369-20	G-2783 R3 CPT TO STACK-IMP #6 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18369-21	G-2784 R3 CPT TO STACK-IMP #7 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	

Job Narrative
140-18369-1

Sample Receipt

The samples were received on March 1, 2020 at 7:00 AM in good condition and properly preserved. The temperatures of the 2 coolers at receipt time were 0.4º C and 0.6º 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.

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

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

GC/MS VOA

Prep Batch: 37990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18369-1	G-2764 R1 CPT TO STACK-IMP #1 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-2	G-2765 R1 CPT TO STACK-IMP #2 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-3	G-2766 R1 CPT TO STACK-IMP #3 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-4	G-2767 R1 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-6	G-2769 R1 CPT TO STACK-IMP #6 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-7	G-2770 R1 CPT TO STACK-IMP #7 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-8	G-2771 R2 CPT TO STACK-IMP #1 /MEOH RINS	Total/NA	Air	MeOH Prep	
MB 140-37990/2-A	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-37990/1-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
140-18369-4 MS	G-2767 R1 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-4 MSD	G-2767 R1 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	MeOH Prep	

Prep Batch: 37991

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18369-5	G-2768 R1 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-9	G-2772 R2 CPT TO STACK-IMP #2 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-10	G-2773 R2 CPT TO STACK-IMP #3 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-11	G-2774 R2 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-12	G-2775 R2 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-13	G-2776 R2 CPT TO STACK-IMP #6 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-14	G-2777 R2 CPT TO STACK-IMP #7 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-15	G-2778 R3 CPT TO STACK-IMP #1 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-16	G-2779 R3 CPT TO STACK-IMP #2 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-17	G-2780 R3 CPT TO STACK-IMP #3 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-18	G-2781 R3 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-19	G-2782 R3 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-20	G-2783 R3 CPT TO STACK-IMP #6 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-21	G-2784 R3 CPT TO STACK-IMP #7 /MEOH RINS	Total/NA	Air	MeOH Prep	
MB 140-37991/2-A	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-37991/1-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
140-18369-5 MS	G-2768 R1 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	MeOH Prep	
140-18369-5 MSD	G-2768 R1 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	MeOH Prep	

Analysis Batch: 38023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18369-1	G-2764 R1 CPT TO STACK-IMP #1 /MEOH RINS	Total/NA	Air	8260B SIM	37990
140-18369-2	G-2765 R1 CPT TO STACK-IMP #2 /MEOH RINS	Total/NA	Air	8260B SIM	37990
140-18369-3	G-2766 R1 CPT TO STACK-IMP #3 /MEOH RINS	Total/NA	Air	8260B SIM	37990
140-18369-4	G-2767 R1 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	8260B SIM	37990
140-18369-6	G-2769 R1 CPT TO STACK-IMP #6 /MEOH RINS	Total/NA	Air	8260B SIM	37990
140-18369-7	G-2770 R1 CPT TO STACK-IMP #7 /MEOH RINS	Total/NA	Air	8260B SIM	37990
140-18369-8	G-2771 R2 CPT TO STACK-IMP #1 /MEOH RINS	Total/NA	Air	8260B SIM	37990
MB 140-37990/2-A	Method Blank	Total/NA	Air	8260B SIM	37990
LCS 140-37990/1-A	Lab Control Sample	Total/NA	Air	8260B SIM	37990
140-18369-4 MS	G-2767 R1 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	8260B SIM	37990
140-18369-4 MSD	G-2767 R1 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	8260B SIM	37990

Analysis Batch: 38051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18369-5	G-2768 R1 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-9	G-2772 R2 CPT TO STACK-IMP #2 /MEOH RINS	Total/NA	Air	8260B SIM	37991

GC/MS VOA (Continued)

Analysis Batch: 38051 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18369-10	G-2773 R2 CPT TO STACK-IMP #3 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-11	G-2774 R2 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-12	G-2775 R2 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-13	G-2776 R2 CPT TO STACK-IMP #6 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-14	G-2777 R2 CPT TO STACK-IMP #7 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-15	G-2778 R3 CPT TO STACK-IMP #1 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-16	G-2779 R3 CPT TO STACK-IMP #2 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-17	G-2780 R3 CPT TO STACK-IMP #3 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-18	G-2781 R3 CPT TO STACK-IMP #4 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-19	G-2782 R3 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-20	G-2783 R3 CPT TO STACK-IMP #6 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-21	G-2784 R3 CPT TO STACK-IMP #7 /MEOH RINS	Total/NA	Air	8260B SIM	37991
MB 140-37991/2-A	Method Blank	Total/NA	Air	8260B SIM	37991
LCS 140-37991/1-A	Lab Control Sample	Total/NA	Air	8260B SIM	37991
140-18369-5 MS	G-2768 R1 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	8260B SIM	37991
140-18369-5 MSD	G-2768 R1 CPT TO STACK-IMP #5 /MEOH RINS	Total/NA	Air	8260B SIM	37991

Client Sample ID: G-2764 R1 CPT TO STACK-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18369-1

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		1.71	1.71	ug/Sample		03/02/20 11:33	03/03/20 16:58	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.562	0.562	ug/Sample		03/02/20 11:33	03/03/20 16:58	1
2-MTP as HFPO	ND		0.0254	0.0254	ug/Sample		03/02/20 11:33	03/03/20 16:58	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0291	0.0291	ug/Sample		03/02/20 11:33	03/03/20 16:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*50 - 150*	*03/02/20 11:33*	*03/03/20 16:58*	*1*
Dibromofluoromethane (Surr)	*91*		*50 - 150*	*03/02/20 11:33*	*03/03/20 16:58*	*1*

Client Sample ID: G-2765 R1 CPT TO STACK-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18369-2

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.40	2.40	ug/Sample		03/02/20 11:33	03/03/20 17:23	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.788	0.788	ug/Sample		03/02/20 11:33	03/03/20 17:23	1
2-MTP as HFPO	ND		0.0356	0.0356	ug/Sample		03/02/20 11:33	03/03/20 17:23	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0408	0.0408	ug/Sample		03/02/20 11:33	03/03/20 17:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*50 - 150*	*03/02/20 11:33*	*03/03/20 17:23*	*1*
Dibromofluoromethane (Surr)	*88*		*50 - 150*	*03/02/20 11:33*	*03/03/20 17:23*	*1*

Client Sample ID: G-2766 R1 CPT TO STACK-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18369-3

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.25	2.25	ug/Sample		03/02/20 11:33	03/03/20 17:47	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.740	0.740	ug/Sample		03/02/20 11:33	03/03/20 17:47	1
2-MTP as HFPO	ND		0.0335	0.0335	ug/Sample		03/02/20 11:33	03/03/20 17:47	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0383	0.0383	ug/Sample		03/02/20 11:33	03/03/20 17:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*50 - 150*	*03/02/20 11:33*	*03/03/20 17:47*	*1*
Dibromofluoromethane (Surr)	*87*		*50 - 150*	*03/02/20 11:33*	*03/03/20 17:47*	*1*

Client Sample ID: G-2767 R1 CPT TO STACK-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18369-4

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		1.87	1.87	ug/Sample		03/02/20 11:33	03/03/20 18:12	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.616	0.616	ug/Sample		03/02/20 11:33	03/03/20 18:12	1
2-MTP as HFPO	ND		0.0279	0.0279	ug/Sample		03/02/20 11:33	03/03/20 18:12	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0319	0.0319	ug/Sample		03/02/20 11:33	03/03/20 18:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*50 - 150*	*03/02/20 11:33*	*03/03/20 18:12*	*1*
Dibromofluoromethane (Surr)	*89*		*50 - 150*	*03/02/20 11:33*	*03/03/20 18:12*	*1*

Client Sample ID: G-2768 R1 CPT TO STACK-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18369-5

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.42	2.42	ug/Sample		03/02/20 11:36	03/04/20 13:09	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.797	0.797	ug/Sample		03/02/20 11:36	03/04/20 13:09	1
2-MTP as HFPO	ND		0.0361	0.0361	ug/Sample		03/02/20 11:36	03/04/20 13:09	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0413	0.0413	ug/Sample		03/02/20 11:36	03/04/20 13:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*50 - 150*	*03/02/20 11:36*	*03/04/20 13:09*	*1*
Dibromofluoromethane (Surr)	*85*		*50 - 150*	*03/02/20 11:36*	*03/04/20 13:09*	*1*

Client Sample ID: G-2769 R1 CPT TO STACK-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18369-6

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		1.94	1.94	ug/Sample		03/02/20 11:33	03/03/20 18:36	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.641	0.641	ug/Sample		03/02/20 11:33	03/03/20 18:36	1
2-MTP as HFPO	ND		0.0290	0.0290	ug/Sample		03/02/20 11:33	03/03/20 18:36	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0332	0.0332	ug/Sample		03/02/20 11:33	03/03/20 18:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*50 - 150*	*03/02/20 11:33*	*03/03/20 18:36*	*1*
Dibromofluoromethane (Surr)	*88*		*50 - 150*	*03/02/20 11:33*	*03/03/20 18:36*	*1*

Client Sample ID: G-2770 R1 CPT TO STACK-IMP #7 /MEOH RINSES

Lab Sample ID: 140-18369-7

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.22	2.22	ug/Sample		03/02/20 11:33	03/03/20 19:01	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.731	0.731	ug/Sample		03/02/20 11:33	03/03/20 19:01	1
2-MTP as HFPO	ND		0.0331	0.0331	ug/Sample		03/02/20 11:33	03/03/20 19:01	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0379	0.0379	ug/Sample		03/02/20 11:33	03/03/20 19:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*50 - 150*	*03/02/20 11:33*	*03/03/20 19:01*	*1*
Dibromofluoromethane (Surr)	*87*		*50 - 150*	*03/02/20 11:33*	*03/03/20 19:01*	*1*

Client Sample ID: G-2771 R2 CPT TO STACK-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18369-8

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.15	2.15	ug/Sample		03/02/20 11:33	03/03/20 19:26	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.706	0.706	ug/Sample		03/02/20 11:33	03/03/20 19:26	1
2-MTP as HFPO	ND		0.0320	0.0320	ug/Sample		03/02/20 11:33	03/03/20 19:26	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0366	0.0366	ug/Sample		03/02/20 11:33	03/03/20 19:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*50 - 150*	*03/02/20 11:33*	*03/03/20 19:26*	*1*
Dibromofluoromethane (Surr)	*87*		*50 - 150*	*03/02/20 11:33*	*03/03/20 19:26*	*1*

Client Sample ID: G-2772 R2 CPT TO STACK-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18369-9

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.25	2.25	ug/Sample		03/02/20 11:36	03/04/20 13:33	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.740	0.740	ug/Sample		03/02/20 11:36	03/04/20 13:33	1
2-MTP as HFPO	ND		0.0335	0.0335	ug/Sample		03/02/20 11:36	03/04/20 13:33	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0384	0.0384	ug/Sample		03/02/20 11:36	03/04/20 13:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*50 - 150*	*03/02/20 11:36*	*03/04/20 13:33*	*1*
Dibromofluoromethane (Surr)	*88*		*50 - 150*	*03/02/20 11:36*	*03/04/20 13:33*	*1*

Client Sample ID: G-2773 R2 CPT TO STACK-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18369-10

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.32	2.32	ug/Sample		03/02/20 11:36	03/04/20 13:58	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.764	0.764	ug/Sample		03/02/20 11:36	03/04/20 13:58	1
2-MTP as HFPO	ND		0.0346	0.0346	ug/Sample		03/02/20 11:36	03/04/20 13:58	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0396	0.0396	ug/Sample		03/02/20 11:36	03/04/20 13:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*50 - 150*	*03/02/20 11:36*	*03/04/20 13:58*	*1*
Dibromofluoromethane (Surr)	*88*		*50 - 150*	*03/02/20 11:36*	*03/04/20 13:58*	*1*

Client Sample ID: G-2774 R2 CPT TO STACK-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18369-11

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.29	2.29	ug/Sample		03/02/20 11:36	03/04/20 14:23	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.754	0.754	ug/Sample		03/02/20 11:36	03/04/20 14:23	1
2-MTP as HFPO	ND		0.0341	0.0341	ug/Sample		03/02/20 11:36	03/04/20 14:23	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0390	0.0390	ug/Sample		03/02/20 11:36	03/04/20 14:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*50 - 150*	*03/02/20 11:36*	*03/04/20 14:23*	*1*
Dibromofluoromethane (Surr)	*89*		*50 - 150*	*03/02/20 11:36*	*03/04/20 14:23*	*1*

Client Sample ID: G-2775 R2 CPT TO STACK-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18369-12

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.48	2.48	ug/Sample		03/02/20 11:36	03/04/20 14:48	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.818	0.818	ug/Sample		03/02/20 11:36	03/04/20 14:48	1
2-MTP as HFPO	ND		0.0370	0.0370	ug/Sample		03/02/20 11:36	03/04/20 14:48	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0424	0.0424	ug/Sample		03/02/20 11:36	03/04/20 14:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*50 - 150*	*03/02/20 11:36*	*03/04/20 14:48*	*1*
Dibromofluoromethane (Surr)	*88*		*50 - 150*	*03/02/20 11:36*	*03/04/20 14:48*	*1*

Client Sample ID: G-2776 R2 CPT TO STACK-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18369-13

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.32	2.32	ug/Sample		03/02/20 11:36	03/04/20 15:12	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.764	0.764	ug/Sample		03/02/20 11:36	03/04/20 15:12	1
2-MTP as HFPO	ND		0.0346	0.0346	ug/Sample		03/02/20 11:36	03/04/20 15:12	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0396	0.0396	ug/Sample		03/02/20 11:36	03/04/20 15:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*50 - 150*	*03/02/20 11:36*	*03/04/20 15:12*	*1*
Dibromofluoromethane (Surr)	*90*		*50 - 150*	*03/02/20 11:36*	*03/04/20 15:12*	*1*

Client Sample ID: G-2777 R2 CPT TO STACK-IMP #7 /MEOH RINSES

Lab Sample ID: 140-18369-14

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.09	2.09	ug/Sample		03/02/20 11:36	03/04/20 15:37	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.687	0.687	ug/Sample		03/02/20 11:36	03/04/20 15:37	1
2-MTP as HFPO	ND		0.0311	0.0311	ug/Sample		03/02/20 11:36	03/04/20 15:37	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0356	0.0356	ug/Sample		03/02/20 11:36	03/04/20 15:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*50 - 150*	*03/02/20 11:36*	*03/04/20 15:37*	*1*
Dibromofluoromethane (Surr)	*89*		*50 - 150*	*03/02/20 11:36*	*03/04/20 15:37*	*1*

Client Sample ID: G-2778 R3 CPT TO STACK-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18369-15

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		1.39	1.39	ug/Sample		03/02/20 11:36	03/04/20 16:01	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.458	0.458	ug/Sample		03/02/20 11:36	03/04/20 16:01	1
2-MTP as HFPO	ND		0.0207	0.0207	ug/Sample		03/02/20 11:36	03/04/20 16:01	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0237	0.0237	ug/Sample		03/02/20 11:36	03/04/20 16:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*50 - 150*	*03/02/20 11:36*	*03/04/20 16:01*	*1*
Dibromofluoromethane (Surr)	*89*		*50 - 150*	*03/02/20 11:36*	*03/04/20 16:01*	*1*

Client Sample ID: G-2779 R3 CPT TO STACK-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18369-16

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.19	2.19	ug/Sample		03/02/20 11:36	03/04/20 16:26	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.722	0.722	ug/Sample		03/02/20 11:36	03/04/20 16:26	1
2-MTP as HFPO	ND		0.0327	0.0327	ug/Sample		03/02/20 11:36	03/04/20 16:26	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0374	0.0374	ug/Sample		03/02/20 11:36	03/04/20 16:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*50 - 150*	*03/02/20 11:36*	*03/04/20 16:26*	*1*
Dibromofluoromethane (Surr)	*90*		*50 - 150*	*03/02/20 11:36*	*03/04/20 16:26*	*1*

Client Sample ID: G-2780 R3 CPT TO STACK-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18369-17

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		1.47	1.47	ug/Sample		03/02/20 11:36	03/04/20 16:50	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.486	0.486	ug/Sample		03/02/20 11:36	03/04/20 16:50	1
2-MTP as HFPO	ND		0.0220	0.0220	ug/Sample		03/02/20 11:36	03/04/20 16:50	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0252	0.0252	ug/Sample		03/02/20 11:36	03/04/20 16:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*50 - 150*	*03/02/20 11:36*	*03/04/20 16:50*	*1*
Dibromofluoromethane (Surr)	*90*		*50 - 150*	*03/02/20 11:36*	*03/04/20 16:50*	*1*

Client Sample ID: G-2781 R3 CPT TO STACK-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18369-18

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		1.85	1.85	ug/Sample		03/02/20 11:36	03/04/20 17:15	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.611	0.611	ug/Sample		03/02/20 11:36	03/04/20 17:15	1
2-MTP as HFPO	ND		0.0277	0.0277	ug/Sample		03/02/20 11:36	03/04/20 17:15	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0317	0.0317	ug/Sample		03/02/20 11:36	03/04/20 17:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*50 - 150*	*03/02/20 11:36*	*03/04/20 17:15*	*1*
Dibromofluoromethane (Surr)	*90*		*50 - 150*	*03/02/20 11:36*	*03/04/20 17:15*	*1*

Client Sample ID: G-2782 R3 CPT TO STACK-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18369-19

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.13	2.13	ug/Sample		03/02/20 11:36	03/04/20 17:39	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.703	0.703	ug/Sample		03/02/20 11:36	03/04/20 17:39	1
2-MTP as HFPO	ND		0.0318	0.0318	ug/Sample		03/02/20 11:36	03/04/20 17:39	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0364	0.0364	ug/Sample		03/02/20 11:36	03/04/20 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*50 - 150*	*03/02/20 11:36*	*03/04/20 17:39*	*1*
Dibromofluoromethane (Surr)	*92*		*50 - 150*	*03/02/20 11:36*	*03/04/20 17:39*	*1*

Client Sample ID: G-2783 R3 CPT TO STACK-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18369-20

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		2.18	2.18	ug/Sample		03/02/20 11:36	03/04/20 18:04	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.718	0.718	ug/Sample		03/02/20 11:36	03/04/20 18:04	1
2-MTP as HFPO	ND		0.0325	0.0325	ug/Sample		03/02/20 11:36	03/04/20 18:04	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0372	0.0372	ug/Sample		03/02/20 11:36	03/04/20 18:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*50 - 150*	*03/02/20 11:36*	*03/04/20 18:04*	*1*
Dibromofluoromethane (Surr)	*90*		*50 - 150*	*03/02/20 11:36*	*03/04/20 18:04*	*1*

Client Sample ID: G-2784 R3 CPT TO STACK-IMP #7 /MEOH RINSES

Lab Sample ID: 140-18369-21

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		1.30	1.30	ug/Sample		03/02/20 11:36	03/04/20 18:28	1
HFPO dimer, methyl ester as HFPO-DAF	ND		0.427	0.427	ug/Sample		03/02/20 11:36	03/04/20 18:28	1
2-MTP as HFPO	ND		0.0193	0.0193	ug/Sample		03/02/20 11:36	03/04/20 18:28	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		0.0221	0.0221	ug/Sample		03/02/20 11:36	03/04/20 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*50 - 150*	*03/02/20 11:36*	*03/04/20 18:28*	*1*
Dibromofluoromethane (Surr)	*92*		*50 - 150*	*03/02/20 11:36*	*03/04/20 18:28*	*1*

Default Detection Limits

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

Job ID: 140-18369-1

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

Prep: MeOH Prep

Analyte	RL	MDL	Units
2-MTP as HFPO	0.00250	0.00250	ug/Sample
Carbonyl Difluoride	0.200	0.200	ug/Sample
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	0.00250	0.00250	ug/Sample
HFPO dimer, methyl ester as HFPO-DAF	0.0500	0.0500	ug/Sample

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ANALYTICAL REPORT

Job Number: 140-18367-1

Job Description: TO CPT Inlet Line #1 - MM-18

Contract Number: LBIO-67048

For:
The Chemours Company FC, LLC
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
3/13/2020 2:58 PM

Courtney M Adkins, Project Manager II
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
03/13/2020

Table of Contents

Table of Contents

Definitions/Glossary

Client: The Chemours Company FC, LLC
Job ID: 140-18367-1
Project/Site: TO CPT Inlet Line #1 - MM-18

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
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.

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.
X	Surrogate recovery exceeds control limits

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: The Chemours Company FC, LLC
Job ID: 140-18367-1
Project/Site: TO CPT Inlet Line #1 - MM-18

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL KNX
8321A	PFOA and PFOS	SW846	TAL DEN
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: The Chemours Company FC, LLC
Project/Site: TO CPT Inlet Line #1 - MM-18

Job ID: 140-18367-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-18367-1	Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-2	Z-1335 R1 CPT TO_FEED LINE #1-IMP #2 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-3	Z-1336 R1 CPT TO_FEED LINE #1-IMP #3 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-4	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-5	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-6	Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-7	Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-8	Z-1341 R2 CPT TO_FEED LINE #1-IMP #2 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-9	Z-1342 R2 CPT TO_FEED LINE #1-IMP #3 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-10	Z-1343 R2 CPT TO_FEED LINE #1-IMP #4 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-11	Z-1344 R2 CPT TO_FEED LINE #1-IMP #5 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-12	Z-1345 R2 CPT TO_FEED LINE #1-IMP #6 /MEC RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18367-13	Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEC RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18367-14	Z-1347 R3 CPT TO_FEED LINE #1-IMP #2 /MEC RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18367-15	Z-1348 R3 CPT TO_FEED LINE #1-IMP #3 /MEC RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18367-16	Z-1349 R3 CPT TO_FEED LINE #1-IMP #4 /MEC RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18367-17	Z-1350 R3 CPT TO_FEED LINE #1-IMP #5 /MEC RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18367-18	Z-1351 R3 CPT TO_FEED LINE #1-IMP #6 /MEC RINSES	Air	02/29/20 00:00	03/01/20 07:00	

Job Narrative
140-18367-1

Sample Receipt

The samples were received on March 1, 2020 at 7:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.1º C and 0.6º 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.

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 samples were diluted to bring the concentration of target analytes within the calibration range: Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES (140-18367-1), Z-1335 R1 CPT TO_FEED LINE #1-IMP #2 /MEOH RINSES (140-18367-2), Z-1336 R1 CPT TO_FEED LINE #1-IMP #3 /MEOH RINSES (140-18367-3), Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEOH RINSES (140-18367-4), Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEOH RINSES (140-18367-5), Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEOH RINSES (140-18367-6), Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES (140-18367-7), Z-1341 R2 CPT TO_FEED LINE #1-IMP #2 /MEOH RINSES (140-18367-8), Z-1342 R2 CPT TO_FEED LINE #1-IMP #3 /MEOH RINSES (140-18367-9), Z-1343 R2 CPT TO_FEED LINE #1-IMP #4 /MEOH RINSES (140-18367-10), Z-1344 R2 CPT TO_FEED LINE #1-IMP #5 /MEOH RINSES (140-18367-11), Z-1345 R2 CPT TO_FEED LINE #1-IMP #6 /MEOH RINSES (140-18367-12), Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES (140-18367-13), Z-1347 R3 CPT TO_FEED LINE #1-IMP #2 /MEOH RINSES (140-18367-14), Z-1348 R3 CPT TO_FEED LINE #1-IMP #3 /MEOH RINSES (140-18367-15), Z-1349 R3 CPT TO_FEED LINE #1-IMP #4 /MEOH RINSES (140-18367-16), Z-1350 R3 CPT TO_FEED LINE #1-IMP #5 /MEOH RINSES (140-18367-17) and Z-1351 R3 CPT TO_FEED LINE #1-IMP #6 /MEOH RINSES (140-18367-18). Elevated reporting limits (RLs) are provided.

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

LCMS

Method 8321A: The Surrogate/Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES (140-18367-1), Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEOH RINSES (140-18367-5), Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES (140-18367-7), Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES (140-18367-13) and (CCV 280-488044/69). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

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

GC/MS VOA

Prep Batch: 38068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18367-1	Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	MeOH Prep	
140-18367-1 - DL	Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	MeOH Prep	
140-18367-2	Z-1335 R1 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	MeOH Prep	
140-18367-3	Z-1336 R1 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	MeOH Prep	
140-18367-4	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	MeOH Prep	
140-18367-5	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	MeOH Prep	
140-18367-6 - DL	Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	MeOH Prep	
140-18367-6	Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	MeOH Prep	
140-18367-7	Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	MeOH Prep	
140-18367-8	Z-1341 R2 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	MeOH Prep	
140-18367-9	Z-1342 R2 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	MeOH Prep	
140-18367-10	Z-1343 R2 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	MeOH Prep	
140-18367-11	Z-1344 R2 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	MeOH Prep	
140-18367-12	Z-1345 R2 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	MeOH Prep	
140-18367-13	Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	MeOH Prep	
140-18367-13 - DL	Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	MeOH Prep	
140-18367-14	Z-1347 R3 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	MeOH Prep	
140-18367-15	Z-1348 R3 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	MeOH Prep	
140-18367-16	Z-1349 R3 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	MeOH Prep	
140-18367-17	Z-1350 R3 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	MeOH Prep	
140-18367-18	Z-1351 R3 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	MeOH Prep	
MB 140-38068/2-A	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-38068/1-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
140-18367-4 MS	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	MeOH Prep	
140-18367-4 MSD	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	MeOH Prep	
140-18367-5 MS	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	MeOH Prep	
140-18367-5 MSD	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	MeOH Prep	

Analysis Batch: 38148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18367-1 - DL	Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	8260B	38068
140-18367-1	Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	8260B	38068
140-18367-2	Z-1335 R1 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	8260B	38068
140-18367-3	Z-1336 R1 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	8260B	38068
140-18367-4	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	8260B	38068
140-18367-5	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	8260B	38068
140-18367-6	Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	8260B	38068
140-18367-6 - DL	Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	8260B	38068
140-18367-7	Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	8260B	38068
140-18367-8	Z-1341 R2 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	8260B	38068
140-18367-9	Z-1342 R2 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	8260B	38068
140-18367-10	Z-1343 R2 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	8260B	38068
140-18367-11	Z-1344 R2 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	8260B	38068
140-18367-12	Z-1345 R2 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	8260B	38068
140-18367-13 - DL	Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	8260B	38068
140-18367-14	Z-1347 R3 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	8260B	38068
140-18367-15	Z-1348 R3 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	8260B	38068
140-18367-16	Z-1349 R3 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	8260B	38068
140-18367-17	Z-1350 R3 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	8260B	38068
140-18367-18	Z-1351 R3 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	8260B	38068
MB 140-38068/2-A	Method Blank	Total/NA	Air	8260B	38068

GC/MS VOA (Continued)

Analysis Batch: 38148 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 140-38068/1-A	Lab Control Sample	Total/NA	Air	8260B	38068
140-18367-4 MS	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	8260B	38068
140-18367-4 MSD	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	8260B	38068
140-18367-5 MS	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	8260B	38068
140-18367-5 MSD	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	8260B	38068

Analysis Batch: 38189

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18367-13	Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	8260B	38068

LCMS

Analysis Batch: 481729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-481729/13	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 487774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18367-1	Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	None	
140-18367-2	Z-1335 R1 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	None	
140-18367-3	Z-1336 R1 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	None	
140-18367-4	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	None	
140-18367-5	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	None	
140-18367-6	Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	None	
140-18367-7	Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	None	
140-18367-8	Z-1341 R2 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	None	
140-18367-9	Z-1342 R2 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	None	
140-18367-10	Z-1343 R2 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	None	
140-18367-11	Z-1344 R2 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	None	
140-18367-12	Z-1345 R2 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	None	
140-18367-13	Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	None	
140-18367-14	Z-1347 R3 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	None	
140-18367-15	Z-1348 R3 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	None	
140-18367-16	Z-1349 R3 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	None	
140-18367-17	Z-1350 R3 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	None	
140-18367-18	Z-1351 R3 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	None	
MB 280-487774/14-A	Method Blank	Total/NA	Air	None	
MB 280-487774/1-A	Method Blank	Total/NA	Air	None	
LCS 280-487774/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-487774/3-A	Lab Control Sample Dup	Total/NA	Air	None	

Analysis Batch: 488044

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18367-1	Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	8321A	487774
140-18367-2	Z-1335 R1 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	8321A	487774
140-18367-3	Z-1336 R1 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	8321A	487774
140-18367-4	Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	8321A	487774
140-18367-5	Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	8321A	487774
140-18367-6	Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	8321A	487774
140-18367-7	Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	8321A	487774
140-18367-8	Z-1341 R2 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	8321A	487774

LCMS (Continued)

Analysis Batch: 488044 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18367-9	Z-1342 R2 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	8321A	487774
140-18367-10	Z-1343 R2 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	8321A	487774
140-18367-11	Z-1344 R2 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	8321A	487774
140-18367-12	Z-1345 R2 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	8321A	487774
140-18367-13	Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEC	Total/NA	Air	8321A	487774
140-18367-14	Z-1347 R3 CPT TO_FEED LINE #1-IMP #2 /MEC	Total/NA	Air	8321A	487774
140-18367-15	Z-1348 R3 CPT TO_FEED LINE #1-IMP #3 /MEC	Total/NA	Air	8321A	487774
140-18367-16	Z-1349 R3 CPT TO_FEED LINE #1-IMP #4 /MEC	Total/NA	Air	8321A	487774
140-18367-17	Z-1350 R3 CPT TO_FEED LINE #1-IMP #5 /MEC	Total/NA	Air	8321A	487774
140-18367-18	Z-1351 R3 CPT TO_FEED LINE #1-IMP #6 /MEC	Total/NA	Air	8321A	487774
MB 280-487774/14-A	Method Blank	Total/NA	Air	8321A	487774
MB 280-487774/1-A	Method Blank	Total/NA	Air	8321A	487774
LCS 280-487774/2-A	Lab Control Sample	Total/NA	Air	8321A	487774
LCSD 280-487774/3-A	Lab Control Sample Dup	Total/NA	Air	8321A	487774

Client Sample ID: Z-1334 R1 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18367-1

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	**47300000**	**E**	329000	329000	ug/Sample		03/04/20 15:20	03/09/20 22:05	200
HFPO dimer, methyl ester as HFPO-DAF	ND		108000	108000	ug/Sample		03/04/20 15:20	03/09/20 22:05	200
2-MTP as HFPO	**180000**		97800	97800	ug/Sample		03/04/20 15:20	03/09/20 22:05	200
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		112000	112000	ug/Sample		03/04/20 15:20	03/09/20 22:05	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 160*	*03/04/20 15:20*	*03/09/20 22:05*	*200*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 22:05*	*200*
Dibromofluoromethane (Surr)	*93*		*62 - 134*	*03/04/20 15:20*	*03/09/20 22:05*	*200*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 22:05*	*200*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	**46600000**		821000	821000	ug/Sample		03/04/20 15:20	03/09/20 12:59	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:20*	*03/09/20 12:59*	*200*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 12:59*	*200*
Dibromofluoromethane (Surr)	*95*		*62 - 134*	*03/04/20 15:20*	*03/09/20 12:59*	*200*
Toluene-d8 (Surr)	*96*		*71 - 139*	*03/04/20 15:20*	*03/09/20 12:59*	*200*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**1410**		114	22.7	ug/Sample		03/05/20 09:21	03/07/20 15:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*33*	*X*	*50 - 200*	*03/05/20 09:21*	*03/07/20 15:43*	*1*

Client Sample ID: Z-1335 R1 CPT TO_FEED LINE #1-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18367-2

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	**1570000**		45700	45700	ug/Sample		03/04/20 15:20	03/09/20 13:24	200
HFPO dimer, methyl ester as HFPO-DAF	ND		15100	15100	ug/Sample		03/04/20 15:20	03/09/20 13:24	200
2-MTP as HFPO	**345000**		13600	13600	ug/Sample		03/04/20 15:20	03/09/20 13:24	200
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		15600	15600	ug/Sample		03/04/20 15:20	03/09/20 13:24	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:20*	*03/09/20 13:24*	*200*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 13:24*	*200*
Dibromofluoromethane (Surr)	*94*		*62 - 134*	*03/04/20 15:20*	*03/09/20 13:24*	*200*
Toluene-d8 (Surr)	*96*		*71 - 139*	*03/04/20 15:20*	*03/09/20 13:24*	*200*

Client Sample ID: Z-1335 R1 CPT TO_FEED LINE #1-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18367-2

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**156**		62.5	12.5	ug/Sample		03/05/20 09:21	03/07/20 15:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*83*		*50 - 200*	*03/05/20 09:21*	*03/07/20 15:47*	*1*

Client Sample ID: Z-1336 R1 CPT TO_FEED LINE #1-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18367-3

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	**124000**		21500	21500	ug/Sample		03/04/20 15:20	03/09/20 13:48	100
HFPO dimer, methyl ester as HFPO-DAF	ND		7090	7090	ug/Sample		03/04/20 15:20	03/09/20 13:48	100
2-MTP as HFPO	**266000**		6420	6420	ug/Sample		03/04/20 15:20	03/09/20 13:48	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		7350	7350	ug/Sample		03/04/20 15:20	03/09/20 13:48	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 13:48*	*100*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 13:48*	*100*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:20*	*03/09/20 13:48*	*100*
Toluene-d8 (Surr)	*97*		*71 - 139*	*03/04/20 15:20*	*03/09/20 13:48*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**69.2**		29.4	5.88	ug/Sample		03/05/20 09:21	03/07/20 15:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*77*		*50 - 200*	*03/05/20 09:21*	*03/07/20 15:51*	*1*

Client Sample ID: Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18367-4

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		17100	17100	ug/Sample		03/04/20 15:20	03/09/20 14:15	100
HFPO dimer, methyl ester as HFPO-DAF	ND		5620	5620	ug/Sample		03/04/20 15:20	03/09/20 14:15	100
2-MTP as HFPO	**208000**		5080	5080	ug/Sample		03/04/20 15:20	03/09/20 14:15	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		5820	5820	ug/Sample		03/04/20 15:20	03/09/20 14:15	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 14:15*	*100*

Client Sample ID: Z-1337 R1 CPT TO_FEED LINE #1-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18367-4

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 14:15*	*100*
Dibromofluoromethane (Surr)	*94*		*62 - 134*	*03/04/20 15:20*	*03/09/20 14:15*	*100*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 14:15*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**35.6**		29.1	5.81	ug/Sample		03/05/20 09:21	03/07/20 15:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	*98*		*50 - 200*	*03/05/20 09:21*	*03/07/20 15:55*	*1*

Client Sample ID: Z-1338 R1 CPT TO_FEED LINE #1-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18367-5

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		11700	11700	ug/Sample		03/04/20 15:20	03/09/20 14:40	100
HFPO dimer, methyl ester as HFPO-DAF	ND		3860	3860	ug/Sample		03/04/20 15:20	03/09/20 14:40	100
2-MTP as HFPO	**153000**		3490	3490	ug/Sample		03/04/20 15:20	03/09/20 14:40	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		4000	4000	ug/Sample		03/04/20 15:20	03/09/20 14:40	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 160*	*03/04/20 15:20*	*03/09/20 14:40*	*100*
4-Bromofluorobenzene (Surr)	*95*		*57 - 152*	*03/04/20 15:20*	*03/09/20 14:40*	*100*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:20*	*03/09/20 14:40*	*100*
Toluene-d8 (Surr)	*96*		*71 - 139*	*03/04/20 15:20*	*03/09/20 14:40*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**66.0**		12.0	2.40	ug/Sample		03/05/20 09:21	03/07/20 15:58	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	*44*	*X*	*50 - 200*	*03/05/20 09:21*	*03/07/20 15:58*	*1*

Client Sample ID: Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18367-6

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		8130	8130	ug/Sample		03/04/20 15:20	03/09/20 15:04	100

Client Sample ID: Z-1339 R1 CPT TO_FEED LINE #1-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18367-6

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
HFPO dimer, methyl ester as HFPO-DAF	ND		2680	2680	ug/Sample		03/04/20 15:20	03/09/20 15:04	100
2-MTP as HFPO	**246000**	**E**	2430	2430	ug/Sample		03/04/20 15:20	03/09/20 15:04	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		2780	2780	ug/Sample		03/04/20 15:20	03/09/20 15:04	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 15:04*	*100*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 15:04*	*100*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:20*	*03/09/20 15:04*	*100*
Toluene-d8 (Surr)	*96*		*71 - 139*	*03/04/20 15:20*	*03/09/20 15:04*	*100*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-MTP as HFPO	**242000**		4860	4860	ug/Sample		03/04/20 15:20	03/09/20 22:54	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 22:54*	*100*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 22:54*	*100*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:20*	*03/09/20 22:54*	*100*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 22:54*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**29.2**		11.1	2.22	ug/Sample		03/05/20 09:21	03/07/20 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*57*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:02*	*1*

Client Sample ID: Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18367-7

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	**45300000**		813000	813000	ug/Sample		03/04/20 15:20	03/09/20 15:29	200
HFPO dimer, methyl ester as HFPO-DAF	ND		268000	268000	ug/Sample		03/04/20 15:20	03/09/20 15:29	200
2-MTP as HFPO	**338000**		243000	243000	ug/Sample		03/04/20 15:20	03/09/20 15:29	200
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		278000	278000	ug/Sample		03/04/20 15:20	03/09/20 15:29	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 15:29*	*200*
4-Bromofluorobenzene (Surr)	*95*		*57 - 152*	*03/04/20 15:20*	*03/09/20 15:29*	*200*
Dibromofluoromethane (Surr)	*95*		*62 - 134*	*03/04/20 15:20*	*03/09/20 15:29*	*200*
Toluene-d8 (Surr)	*97*		*71 - 139*	*03/04/20 15:20*	*03/09/20 15:29*	*200*

Client Sample ID: Z-1340 R2 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18367-7

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	5050		109	21.7	ug/Sample		03/05/20 09:21	03/07/20 16:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*20*	*X*	*50 - 200*	*03/05/20 09:21*	*03/07/20 16:10*	*1*

Client Sample ID: Z-1341 R2 CPT TO_FEED LINE #1-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18367-8

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	1180000		45200	45200	ug/Sample		03/04/20 15:20	03/09/20 15:53	200
HFPO dimer, methyl ester as HFPO-DAF	ND		14900	14900	ug/Sample		03/04/20 15:20	03/09/20 15:53	200
2-MTP as HFPO	285000		13500	13500	ug/Sample		03/04/20 15:20	03/09/20 15:53	200
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		15400	15400	ug/Sample		03/04/20 15:20	03/09/20 15:53	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 15:53*	*200*
4-Bromofluorobenzene (Surr)	*96*		*57 - 152*	*03/04/20 15:20*	*03/09/20 15:53*	*200*
Dibromofluoromethane (Surr)	*94*		*62 - 134*	*03/04/20 15:20*	*03/09/20 15:53*	*200*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 15:53*	*200*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	114		61.0	12.2	ug/Sample		03/05/20 09:21	03/07/20 16:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*75*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:14*	*1*

Client Sample ID: Z-1342 R2 CPT TO_FEED LINE #1-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18367-9

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	67400		20200	20200	ug/Sample		03/04/20 15:20	03/09/20 16:18	100
HFPO dimer, methyl ester as HFPO-DAF	ND		6650	6650	ug/Sample		03/04/20 15:20	03/09/20 16:18	100
2-MTP as HFPO	203000		6020	6020	ug/Sample		03/04/20 15:20	03/09/20 16:18	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		6890	6890	ug/Sample		03/04/20 15:20	03/09/20 16:18	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 16:18*	*100*

Client Sample ID: Z-1342 R2 CPT TO_FEED LINE #1-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18367-9

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	*96*		*57 - 152*	*03/04/20 15:20*	*03/09/20 16:18*	*100*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:20*	*03/09/20 16:18*	*100*
Toluene-d8 (Surr)	*96*		*71 - 139*	*03/04/20 15:20*	*03/09/20 16:18*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**57.7**		27.5	5.49	ug/Sample		03/05/20 09:21	03/07/20 16:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	*64*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:18*	*1*

Client Sample ID: Z-1343 R2 CPT TO_FEED LINE #1-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18367-10

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		16400	16400	ug/Sample		03/04/20 15:20	03/09/20 16:45	100
HFPO dimer, methyl ester as HFPO-DAF	ND		5400	5400	ug/Sample		03/04/20 15:20	03/09/20 16:45	100
2-MTP as HFPO	**164000**		4890	4890	ug/Sample		03/04/20 15:20	03/09/20 16:45	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		5600	5600	ug/Sample		03/04/20 15:20	03/09/20 16:45	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 160*	*03/04/20 15:20*	*03/09/20 16:45*	*100*
4-Bromofluorobenzene (Surr)	*95*		*57 - 152*	*03/04/20 15:20*	*03/09/20 16:45*	*100*
Dibromofluoromethane (Surr)	*93*		*62 - 134*	*03/04/20 15:20*	*03/09/20 16:45*	*100*
Toluene-d8 (Surr)	*97*		*71 - 139*	*03/04/20 15:20*	*03/09/20 16:45*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**32.2**		28.1	5.62	ug/Sample		03/05/20 09:21	03/07/20 16:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	*67*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:22*	*1*

Client Sample ID: Z-1344 R2 CPT TO_FEED LINE #1-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18367-11

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		10900	10900	ug/Sample		03/04/20 15:20	03/09/20 17:10	100

Client Sample ID: Z-1344 R2 CPT TO_FEED LINE #1-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18367-11

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
HFPO dimer, methyl ester as HFPO-DAF	ND		3600	3600	ug/Sample		03/04/20 15:20	03/09/20 17:10	100
2-MTP as HFPO	**102000**		3260	3260	ug/Sample		03/04/20 15:20	03/09/20 17:10	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		3730	3730	ug/Sample		03/04/20 15:20	03/09/20 17:10	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 160*	*03/04/20 15:20*	*03/09/20 17:10*	*100*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 17:10*	*100*
Dibromofluoromethane (Surr)	*93*		*62 - 134*	*03/04/20 15:20*	*03/09/20 17:10*	*100*
Toluene-d8 (Surr)	*97*		*71 - 139*	*03/04/20 15:20*	*03/09/20 17:10*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**15.8**		11.2	2.24	ug/Sample		03/05/20 09:21	03/07/20 16:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*91*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:30*	*1*

Client Sample ID: Z-1345 R2 CPT TO_FEED LINE #1-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18367-12

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		7840	7840	ug/Sample		03/04/20 15:20	03/09/20 17:35	100
HFPO dimer, methyl ester as HFPO-DAF	ND		2570	2570	ug/Sample		03/04/20 15:20	03/09/20 17:35	100
2-MTP as HFPO	**75800**		2320	2320	ug/Sample		03/04/20 15:20	03/09/20 17:35	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		2660	2660	ug/Sample		03/04/20 15:20	03/09/20 17:35	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 160*	*03/04/20 15:20*	*03/09/20 17:35*	*100*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 17:35*	*100*
Dibromofluoromethane (Surr)	*94*		*62 - 134*	*03/04/20 15:20*	*03/09/20 17:35*	*100*
Toluene-d8 (Surr)	*96*		*71 - 139*	*03/04/20 15:20*	*03/09/20 17:35*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**6.34**	**J**	10.6	2.13	ug/Sample		03/05/20 09:21	03/07/20 16:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*93*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:33*	*1*

Client Sample ID: Z-1346 R3 CPT TO_FEED LINE #1-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18367-13

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	**72500000**	**E**	193000	193000	ug/Sample		03/04/20 15:20	03/10/20 13:23	200
HFPO dimer, methyl ester as HFPO-DAF	ND		63600	63600	ug/Sample		03/04/20 15:20	03/10/20 13:23	200
2-MTP as HFPO	**90800**		57600	57600	ug/Sample		03/04/20 15:20	03/10/20 13:23	200
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		65900	65900	ug/Sample		03/04/20 15:20	03/10/20 13:23	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 160*	*03/04/20 15:20*	*03/10/20 13:23*	*200*
4-Bromofluorobenzene (Surr)	*98*		*57 - 152*	*03/04/20 15:20*	*03/10/20 13:23*	*200*
Dibromofluoromethane (Surr)	*95*		*62 - 134*	*03/04/20 15:20*	*03/10/20 13:23*	*200*
Toluene-d8 (Surr)	*94*		*71 - 139*	*03/04/20 15:20*	*03/10/20 13:23*	*200*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	**68000000**		967000	967000	ug/Sample		03/04/20 15:20	03/09/20 17:59	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 160*	*03/04/20 15:20*	*03/09/20 17:59*	*200*
4-Bromofluorobenzene (Surr)	*96*		*57 - 152*	*03/04/20 15:20*	*03/09/20 17:59*	*200*
Dibromofluoromethane (Surr)	*94*		*62 - 134*	*03/04/20 15:20*	*03/09/20 17:59*	*200*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 17:59*	*200*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**6440**		132	26.3	ug/Sample		03/05/20 09:21	03/07/20 16:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*14*	*X*	*50 - 200*	*03/05/20 09:21*	*03/07/20 16:37*	*1*

Client Sample ID: Z-1347 R3 CPT TO_FEED LINE #1-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18367-14

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	**3420000**		51000	51000	ug/Sample		03/04/20 15:20	03/09/20 18:24	200
HFPO dimer, methyl ester as HFPO-DAF	ND		16800	16800	ug/Sample		03/04/20 15:20	03/09/20 18:24	200
2-MTP as HFPO	**461000**		15200	15200	ug/Sample		03/04/20 15:20	03/09/20 18:24	200
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		17400	17400	ug/Sample		03/04/20 15:20	03/09/20 18:24	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:20*	*03/09/20 18:24*	*200*
4-Bromofluorobenzene (Surr)	*96*		*57 - 152*	*03/04/20 15:20*	*03/09/20 18:24*	*200*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:20*	*03/09/20 18:24*	*200*
Toluene-d8 (Surr)	*96*		*71 - 139*	*03/04/20 15:20*	*03/09/20 18:24*	*200*

Client Sample ID: Z-1347 R3 CPT TO_FEED LINE #1-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18367-14

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	254		69.4	13.9	ug/Sample		03/05/20 09:21	03/07/20 16:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*58*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:45*	*1*

Client Sample ID: Z-1348 R3 CPT TO_FEED LINE #1-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18367-15

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	139000		22600	22600	ug/Sample		03/04/20 15:20	03/09/20 18:49	100
HFPO dimer, methyl ester as HFPO-DAF	ND		7420	7420	ug/Sample		03/04/20 15:20	03/09/20 18:49	100
2-MTP as HFPO	365000		6720	6720	ug/Sample		03/04/20 15:20	03/09/20 18:49	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		7690	7690	ug/Sample		03/04/20 15:20	03/09/20 18:49	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 160*	*03/04/20 15:20*	*03/09/20 18:49*	*100*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 18:49*	*100*
Dibromofluoromethane (Surr)	*90*		*62 - 134*	*03/04/20 15:20*	*03/09/20 18:49*	*100*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 18:49*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	78.8		30.9	6.17	ug/Sample		03/05/20 09:21	03/07/20 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*56*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:49*	*1*

Client Sample ID: Z-1349 R3 CPT TO_FEED LINE #1-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18367-16

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		15500	15500	ug/Sample		03/04/20 15:20	03/09/20 19:13	100
HFPO dimer, methyl ester as HFPO-DAF	ND		5090	5090	ug/Sample		03/04/20 15:20	03/09/20 19:13	100
2-MTP as HFPO	267000		4600	4600	ug/Sample		03/04/20 15:20	03/09/20 19:13	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		5270	5270	ug/Sample		03/04/20 15:20	03/09/20 19:13	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 19:13*	*100*

Client Sample ID: Z-1349 R3 CPT TO_FEED LINE #1-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18367-16

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:20*	*03/09/20 19:13*	*100*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:20*	*03/09/20 19:13*	*100*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 19:13*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**43.6**		26.3	5.26	ug/Sample		03/05/20 09:21	03/07/20 16:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	*70*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:53*	*1*

Client Sample ID: Z-1350 R3 CPT TO_FEED LINE #1-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18367-17

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		10300	10300	ug/Sample		03/04/20 15:20	03/09/20 19:38	100
HFPO dimer, methyl ester as HFPO-DAF	ND		3400	3400	ug/Sample		03/04/20 15:20	03/09/20 19:38	100
2-MTP as HFPO	**97800**		3070	3070	ug/Sample		03/04/20 15:20	03/09/20 19:38	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		3520	3520	ug/Sample		03/04/20 15:20	03/09/20 19:38	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 19:38*	*100*
4-Bromofluorobenzene (Surr)	*95*		*57 - 152*	*03/04/20 15:20*	*03/09/20 19:38*	*100*
Dibromofluoromethane (Surr)	*93*		*62 - 134*	*03/04/20 15:20*	*03/09/20 19:38*	*100*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 19:38*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**33.0**		10.5	2.11	ug/Sample		03/05/20 09:21	03/07/20 16:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	*60*		*50 - 200*	*03/05/20 09:21*	*03/07/20 16:57*	*1*

Client Sample ID: Z-1351 R3 CPT TO_FEED LINE #1-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18367-18

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		8870	8870	ug/Sample		03/04/20 15:20	03/09/20 20:02	100

Client Sample ID: Z-1351 R3 CPT TO_FEED LINE #1-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18367-18

Date Collected: 02/29/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO dimer, methyl ester as HFPO-DAF	ND		2920	2920	ug/Sample		03/04/20 15:20	03/09/20 20:02	100
2-MTP as HFPO	**205000**		2650	2650	ug/Sample		03/04/20 15:20	03/09/20 20:02	100
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		3030	3030	ug/Sample		03/04/20 15:20	03/09/20 20:02	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:20*	*03/09/20 20:02*	*100*
4-Bromofluorobenzene (Surr)	*96*		*57 - 152*	*03/04/20 15:20*	*03/09/20 20:02*	*100*
Dibromofluoromethane (Surr)	*94*		*62 - 134*	*03/04/20 15:20*	*03/09/20 20:02*	*100*
Toluene-d8 (Surr)	*95*		*71 - 139*	*03/04/20 15:20*	*03/09/20 20:02*	*100*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**26.8**		12.1	2.43	ug/Sample		03/05/20 09:21	03/07/20 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*67*		*50 - 200*	*03/05/20 09:21*	*03/07/20 17:01*	*1*

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: TO CPT Inlet Line #1 - MM-18

Job ID: 140-18367-1

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

Prep: MeOH Prep

Analyte	RL	MDL	Units
2-MTP as HFPO	2.50	2.50	ug/Sample
Carbonyl Difluoride	10.0	10.0	ug/Sample
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	2.50	2.50	ug/Sample
HFPO dimer, methyl ester as HFPO-DAF	2.50	2.50	ug/Sample

Method: 8321A - PFOA and PFOS

Prep: None

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

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ANALYTICAL REPORT

Job Number: 140-18413-1

Job Description: TO CPT Line #2 - MM-18

Contract Number: LBIO-67048

For:
The Chemours Company FC, LLC
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
3/13/2020 3:06 PM

Courtney M Adkins, Project Manager II
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
03/13/2020

Table of Contents

Table of Contents

Definitions/Glossary

Client: The Chemours Company FC, LLC
Job ID: 140-18413-1
Project/Site: TO CPT Line #2 - MM-18

Qualifiers

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.
X	Surrogate recovery exceeds control limits

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: The Chemours Company FC, LLC
Project/Site: TO CPT Line #2 - MM-18

Job ID: 140-18413-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL KNX
8321A	PFOA and PFOS	SW846	TAL DEN
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: The Chemours Company FC, LLC
Project/Site: TO CPT Line #2 - MM-18

Job ID: 140-18413-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-18413-1	E-1134 R1 TO_FEED LINE #2-IMP #1 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-2	E-1135 R1 TO_FEED LINE #2-IMP #2 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-3	E-1136 R1 TO_FEED LINE #2-IMP #3 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-4	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-5	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-6	E-1139 R1 TO_FEED LINE #2-IMP #6 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-7	E-1140 R2 TO_FEED LINE #2-IMP #1 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-8	E-1141 R2 TO_FEED LINE #2-IMP #2 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-9	E-1142 R2 TO_FEED LINE #2-IMP #3 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-10	E-1143 R2 TO_FEED LINE #2-IMP #4 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-11	E-1144 R2 TO_FEED LINE #2-IMP #5 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-12	E-1145 R2 TO_FEED LINE #2-IMP #6 /MEOH RINSES	Air	02/28/20 00:00	03/01/20 07:00	
140-18413-13	E-1146 R3 TO_FEED LINE #2-IMP #1 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18413-14	E-1147 R3 TO_FEED LINE #2-IMP #2 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18413-15	E-1148 R3 TO_FEED LINE #2-IMP #3 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18413-16	E-1149 R3 TO_FEED LINE #2-IMP #4 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18413-17	E-1150 R3 TO_FEED LINE #2-IMP #5 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	
140-18413-18	E-1151 R3 TO_FEED LINE #2-IMP #6 /MEOH RINSES	Air	02/29/20 00:00	03/01/20 07:00	

Job Narrative
140-18413-1

Sample Receipt

The samples were received on March 1, 2020 at 7:00 AM in good condition and properly preserved. The temperatures of the 2 coolers at receipt time were 0.1º C and 0.6º 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.

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 samples were diluted due to the abundance of non-target analytes: E-1134 R1 TO_FEED LINE #2-IMP #1 /MEOH RINSES (140-18413-1), E-1135 R1 TO_FEED LINE #2-IMP #2 /MEOH RINSES (140-18413-2), E-1136 R1 TO_FEED LINE #2-IMP #3 /MEOH RINSES (140-18413-3), E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RINSES (140-18413-4), E-1140 R2 TO_FEED LINE #2-IMP #1 /MEOH RINSES (140-18413-7), E-1141 R2 TO_FEED LINE #2-IMP #2 /MEOH RINSES (140-18413-8), E-1142 R2 TO_FEED LINE #2-IMP #3 /MEOH RINSES (140-18413-9), E-1143 R2 TO_FEED LINE #2-IMP #4 /MEOH RINSES (140-18413-10), E-1146 R3 TO_FEED LINE #2-IMP #1 /MEOH RINSES (140-18413-13), E-1147 R3 TO_FEED LINE #2-IMP #2 /MEOH RINSES (140-18413-14), E-1148 R3 TO_FEED LINE #2-IMP #3 /MEOH RINSES (140-18413-15) and E-1149 R3 TO_FEED LINE #2-IMP #4 /MEOH RINSES (140-18413-16). Elevated reporting limits (RLs) are provided.

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

LCMS

Method 8321A: The Surrogate/Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: E-1134 R1 TO_FEED LINE #2-IMP #1 /MEOH RINSES (140-18413-1), E-1135 R1 TO_FEED LINE #2-IMP #2 /MEOH RINSES (140-18413-2), E-1136 R1 TO_FEED LINE #2-IMP #3 /MEOH RINSES (140-18413-3), E-1140 R2 TO_FEED LINE #2-IMP #1 /MEOH RINSES (140-18413-7), E-1141 R2 TO_FEED LINE #2-IMP #2 /MEOH RINSES (140-18413-8), E-1142 R2 TO_FEED LINE #2-IMP #3 /MEOH RINSES (140-18413-9), E-1146 R3 TO_FEED LINE #2-IMP #1 /MEOH RINSES (140-18413-13), E-1147 R3 TO_FEED LINE #2-IMP #2 /MEOH RINSES (140-18413-14) and E-1148 R3 TO_FEED LINE #2-IMP #3 /MEOH RINSES (140-18413-15). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

preparation batch 280-487617 and analytical batch 280-488043 HFPO

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

QC Association Summary

Client: The Chemours Company FC, LLC
Project/Site: TO CPT Line #2 - MM-18

Job ID: 140-18413-1

GC/MS VOA

Prep Batch: 38066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18413-1	E-1134 R1 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-2	E-1135 R1 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-3	E-1136 R1 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-4	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-5	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-6	E-1139 R1 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-7	E-1140 R2 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-8	E-1141 R2 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-9	E-1142 R2 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-10	E-1143 R2 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-11	E-1144 R2 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-12	E-1145 R2 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-13	E-1146 R3 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-14	E-1147 R3 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-15	E-1148 R3 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-16	E-1149 R3 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-17	E-1150 R3 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-18	E-1151 R3 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	MeOH Prep	
MB 140-38066/2-A	Method Blank	Total/NA	Air	MeOH Prep	
LCS 140-38066/1-A	Lab Control Sample	Total/NA	Air	MeOH Prep	
140-18413-4 MS	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-4 MSD	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-5 MS	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	MeOH Prep	
140-18413-5 MSD	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	MeOH Prep	

Analysis Batch: 38131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18413-1	E-1134 R1 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-2	E-1135 R1 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-3	E-1136 R1 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-4	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-5	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-6	E-1139 R1 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-7	E-1140 R2 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-8	E-1141 R2 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-9	E-1142 R2 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-10	E-1143 R2 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-11	E-1144 R2 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-12	E-1145 R2 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-13	E-1146 R3 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-14	E-1147 R3 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-15	E-1148 R3 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-16	E-1149 R3 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-17	E-1150 R3 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-18	E-1151 R3 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	8260B	38066
MB 140-38066/2-A	Method Blank	Total/NA	Air	8260B	38066
LCS 140-38066/1-A	Lab Control Sample	Total/NA	Air	8260B	38066
140-18413-4 MS	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-4 MSD	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-5 MS	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	8260B	38066
140-18413-5 MSD	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	8260B	38066

LCMS

Analysis Batch: 481729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-481729/13	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 487617

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18413-1	E-1134 R1 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	None	
140-18413-2	E-1135 R1 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	None	
140-18413-3	E-1136 R1 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	None	
140-18413-4	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	None	
140-18413-5	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	None	
140-18413-6	E-1139 R1 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	None	
140-18413-7	E-1140 R2 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	None	
140-18413-8	E-1141 R2 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	None	
140-18413-9	E-1142 R2 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	None	
140-18413-10	E-1143 R2 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	None	
140-18413-11	E-1144 R2 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	None	
140-18413-12	E-1145 R2 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	None	
140-18413-13	E-1146 R3 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	None	
140-18413-14	E-1147 R3 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	None	
140-18413-15	E-1148 R3 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	None	
140-18413-16	E-1149 R3 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	None	
140-18413-17	E-1150 R3 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	None	
140-18413-18	E-1151 R3 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	None	
MB 280-487617/14-A	Method Blank	Total/NA	Air	None	
MB 280-487617/1-A	Method Blank	Total/NA	Air	None	
LCS 280-487617/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-487617/3-A	Lab Control Sample Dup	Total/NA	Air	None	

Analysis Batch: 488043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18413-1	E-1134 R1 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-2	E-1135 R1 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-3	E-1136 R1 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-4	E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-5	E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-6	E-1139 R1 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-7	E-1140 R2 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-8	E-1141 R2 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-9	E-1142 R2 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-10	E-1143 R2 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-11	E-1144 R2 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-12	E-1145 R2 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-13	E-1146 R3 TO_FEED LINE #2-IMP #1 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-14	E-1147 R3 TO_FEED LINE #2-IMP #2 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-15	E-1148 R3 TO_FEED LINE #2-IMP #3 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-16	E-1149 R3 TO_FEED LINE #2-IMP #4 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-17	E-1150 R3 TO_FEED LINE #2-IMP #5 /MEOH RI	Total/NA	Air	8321A	487617
140-18413-18	E-1151 R3 TO_FEED LINE #2-IMP #6 /MEOH RI	Total/NA	Air	8321A	487617
MB 280-487617/14-A	Method Blank	Total/NA	Air	8321A	487617
MB 280-487617/1-A	Method Blank	Total/NA	Air	8321A	487617
LCS 280-487617/2-A	Lab Control Sample	Total/NA	Air	8321A	487617
LCSD 280-487617/3-A	Lab Control Sample Dup	Total/NA	Air	8321A	487617

Client Sample ID: E-1134 R1 TO_FEED LINE #2-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18413-1

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		558	558	ug/Sample		03/04/20 15:14	03/06/20 13:29	1
HFPO dimer, methyl ester as HFPO-DAF	**235**		183	183	ug/Sample		03/04/20 15:14	03/06/20 13:29	1
2-MTP as HFPO	ND		166	166	ug/Sample		03/04/20 15:14	03/06/20 13:29	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**1010**		190	190	ug/Sample		03/04/20 15:14	03/06/20 13:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:14*	*03/06/20 13:29*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 13:29*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 13:29*	*1*
Toluene-d8 (Surr)	*99*		*71 - 139*	*03/04/20 15:14*	*03/06/20 13:29*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**44.2**		0.381	0.0761	ug/Sample		03/04/20 08:42	03/07/20 14:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*18*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 14:05*	*1*

Client Sample ID: E-1135 R1 TO_FEED LINE #2-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18413-2

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		271	271	ug/Sample		03/04/20 15:14	03/06/20 13:54	1
HFPO dimer, methyl ester as HFPO-DAF	**118**		89.3	89.3	ug/Sample		03/04/20 15:14	03/06/20 13:54	1
2-MTP as HFPO	ND		80.8	80.8	ug/Sample		03/04/20 15:14	03/06/20 13:54	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**248**		92.5	92.5	ug/Sample		03/04/20 15:14	03/06/20 13:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:14*	*03/06/20 13:54*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 13:54*	*1*
Dibromofluoromethane (Surr)	*93*		*62 - 134*	*03/04/20 15:14*	*03/06/20 13:54*	*1*
Toluene-d8 (Surr)	*100*		*71 - 139*	*03/04/20 15:14*	*03/06/20 13:54*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**18.7**		0.277	0.0555	ug/Sample		03/04/20 08:42	03/07/20 14:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*19*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 14:09*	*1*

Client Sample ID: E-1136 R1 TO_FEED LINE #2-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18413-3

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		125	125	ug/Sample		03/04/20 15:14	03/06/20 14:18	1
HFPO dimer, methyl ester as HFPO-DAF	**47.5**		41.3	41.3	ug/Sample		03/04/20 15:14	03/06/20 14:18	1
2-MTP as HFPO	ND		37.4	37.4	ug/Sample		03/04/20 15:14	03/06/20 14:18	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**54.7**		42.8	42.8	ug/Sample		03/04/20 15:14	03/06/20 14:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:14*	*03/06/20 14:18*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 14:18*	*1*
Dibromofluoromethane (Surr)	*93*		*62 - 134*	*03/04/20 15:14*	*03/06/20 14:18*	*1*
Toluene-d8 (Surr)	*100*		*71 - 139*	*03/04/20 15:14*	*03/06/20 14:18*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**8.16**		0.299	0.0599	ug/Sample		03/04/20 08:42	03/07/20 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*33*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 14:13*	*1*

Client Sample ID: E-1137 R1 TO_FEED LINE #2-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18413-4

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		129	129	ug/Sample		03/04/20 15:14	03/06/20 14:43	1
HFPO dimer, methyl ester as HFPO-DAF	ND		42.6	42.6	ug/Sample		03/04/20 15:14	03/06/20 14:43	1
2-MTP as HFPO	ND		38.5	38.5	ug/Sample		03/04/20 15:14	03/06/20 14:43	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		44.1	44.1	ug/Sample		03/04/20 15:14	03/06/20 14:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 160*	*03/04/20 15:14*	*03/06/20 14:43*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 14:43*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 14:43*	*1*
Toluene-d8 (Surr)	*100*		*71 - 139*	*03/04/20 15:14*	*03/06/20 14:43*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**2.82**		0.331	0.0661	ug/Sample		03/04/20 08:42	03/07/20 14:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*63*		*50 - 200*	*03/04/20 08:42*	*03/07/20 14:17*	*1*

Client Sample ID: E-1138 R1 TO_FEED LINE #2-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18413-5

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		80.6	80.6	ug/Sample		03/04/20 15:14	03/06/20 15:08	1
HFPO dimer, methyl ester as HFPO-DAF	ND		26.5	26.5	ug/Sample		03/04/20 15:14	03/06/20 15:08	1
2-MTP as HFPO	ND		24.0	24.0	ug/Sample		03/04/20 15:14	03/06/20 15:08	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		27.5	27.5	ug/Sample		03/04/20 15:14	03/06/20 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:14*	*03/06/20 15:08*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 15:08*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 15:08*	*1*
Toluene-d8 (Surr)	*100*		*71 - 139*	*03/04/20 15:14*	*03/06/20 15:08*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.784**		0.275	0.0550	ug/Sample		03/04/20 08:42	03/07/20 14:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*91*		*50 - 200*	*03/04/20 08:42*	*03/07/20 14:21*	*1*

Client Sample ID: E-1139 R1 TO_FEED LINE #2-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18413-6

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		89.4	89.4	ug/Sample		03/04/20 15:14	03/06/20 15:32	1
HFPO dimer, methyl ester as HFPO-DAF	ND		29.4	29.4	ug/Sample		03/04/20 15:14	03/06/20 15:32	1
2-MTP as HFPO	ND		26.6	26.6	ug/Sample		03/04/20 15:14	03/06/20 15:32	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		30.5	30.5	ug/Sample		03/04/20 15:14	03/06/20 15:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 160*	*03/04/20 15:14*	*03/06/20 15:32*	*1*
4-Bromofluorobenzene (Surr)	*95*		*57 - 152*	*03/04/20 15:14*	*03/06/20 15:32*	*1*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:14*	*03/06/20 15:32*	*1*
Toluene-d8 (Surr)	*99*		*71 - 139*	*03/04/20 15:14*	*03/06/20 15:32*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.305	0.0610	ug/Sample		03/04/20 08:42	03/07/20 14:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*102*		*50 - 200*	*03/04/20 08:42*	*03/07/20 14:25*	*1*

Client Sample ID: E-1140 R2 TO_FEED LINE #2-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18413-7

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		588	588	ug/Sample		03/04/20 15:14	03/06/20 15:57	1
HFPO dimer, methyl ester as HFPO-DAF	ND		193	193	ug/Sample		03/04/20 15:14	03/06/20 15:57	1
2-MTP as HFPO	ND		175	175	ug/Sample		03/04/20 15:14	03/06/20 15:57	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**802**		200	200	ug/Sample		03/04/20 15:14	03/06/20 15:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 160*	*03/04/20 15:14*	*03/06/20 15:57*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 15:57*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 15:57*	*1*
Toluene-d8 (Surr)	*98*		*71 - 139*	*03/04/20 15:14*	*03/06/20 15:57*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**30.8**		0.401	0.0801	ug/Sample		03/04/20 08:42	03/07/20 14:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*25*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 14:33*	*1*

Client Sample ID: E-1141 R2 TO_FEED LINE #2-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18413-8

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		252	252	ug/Sample		03/04/20 15:14	03/06/20 16:21	1
HFPO dimer, methyl ester as HFPO-DAF	**110**		82.9	82.9	ug/Sample		03/04/20 15:14	03/06/20 16:21	1
2-MTP as HFPO	ND		75.0	75.0	ug/Sample		03/04/20 15:14	03/06/20 16:21	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**182**		85.9	85.9	ug/Sample		03/04/20 15:14	03/06/20 16:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:14*	*03/06/20 16:21*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 16:21*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 16:21*	*1*
Toluene-d8 (Surr)	*99*		*71 - 139*	*03/04/20 15:14*	*03/06/20 16:21*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**24.1**		0.258	0.0516	ug/Sample		03/04/20 08:42	03/07/20 14:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*17*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 14:37*	*1*

Client Sample ID: E-1142 R2 TO_FEED LINE #2-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18413-9

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		119	119	ug/Sample		03/04/20 15:14	03/06/20 16:46	1
HFPO dimer, methyl ester as HFPO-DAF	ND		39.1	39.1	ug/Sample		03/04/20 15:14	03/06/20 16:46	1
2-MTP as HFPO	ND		35.4	35.4	ug/Sample		03/04/20 15:14	03/06/20 16:46	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**60.6**		40.5	40.5	ug/Sample		03/04/20 15:14	03/06/20 16:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:14*	*03/06/20 16:46*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 16:46*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 16:46*	*1*
Toluene-d8 (Surr)	*100*		*71 - 139*	*03/04/20 15:14*	*03/06/20 16:46*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**8.29**		0.283	0.0567	ug/Sample		03/04/20 08:42	03/07/20 14:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*37*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 14:40*	*1*

Client Sample ID: E-1143 R2 TO_FEED LINE #2-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18413-10

Date Collected: 02/28/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		115	115	ug/Sample		03/04/20 15:14	03/06/20 17:10	1
HFPO dimer, methyl ester as HFPO-DAF	ND		37.8	37.8	ug/Sample		03/04/20 15:14	03/06/20 17:10	1
2-MTP as HFPO	ND		34.2	34.2	ug/Sample		03/04/20 15:14	03/06/20 17:10	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		39.2	39.2	ug/Sample		03/04/20 15:14	03/06/20 17:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*70 - 160*	*03/04/20 15:14*	*03/06/20 17:10*	*1*
4-Bromofluorobenzene (Surr)	*98*		*57 - 152*	*03/04/20 15:14*	*03/06/20 17:10*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 17:10*	*1*
Toluene-d8 (Surr)	*100*		*71 - 139*	*03/04/20 15:14*	*03/06/20 17:10*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**1.59**		0.294	0.0588	ug/Sample		03/04/20 08:42	03/07/20 14:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*70*		*50 - 200*	*03/04/20 08:42*	*03/07/20 14:44*	*1*

Client Sample ID: E-1144 R2 TO_FEED LINE #2-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18413-11

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		89.4	89.4	ug/Sample		03/04/20 15:14	03/06/20 17:35	1
HFPO dimer, methyl ester as HFPO-DAF	ND		29.5	29.5	ug/Sample		03/04/20 15:14	03/06/20 17:35	1
2-MTP as HFPO	ND		26.7	26.7	ug/Sample		03/04/20 15:14	03/06/20 17:35	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		30.6	30.6	ug/Sample		03/04/20 15:14	03/06/20 17:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 160*	*03/04/20 15:14*	*03/06/20 17:35*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 17:35*	*1*
Dibromofluoromethane (Surr)	*90*		*62 - 134*	*03/04/20 15:14*	*03/06/20 17:35*	*1*
Toluene-d8 (Surr)	*98*		*71 - 139*	*03/04/20 15:14*	*03/06/20 17:35*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.155**	**J**	0.306	0.0612	ug/Sample		03/04/20 08:42	03/07/20 14:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*107*		*50 - 200*	*03/04/20 08:42*	*03/07/20 14:52*	*1*

Client Sample ID: E-1145 R2 TO_FEED LINE #2-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18413-12

Date Collected: 02/28/20 00:00
Matrix: Air
Date Received: 03/01/20 07:00
Sample Container: Plastic 250ml - unpreserved

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		89.4	89.4	ug/Sample		03/04/20 15:14	03/06/20 17:59	1
HFPO dimer, methyl ester as HFPO-DAF	ND		29.4	29.4	ug/Sample		03/04/20 15:14	03/06/20 17:59	1
2-MTP as HFPO	ND		26.6	26.6	ug/Sample		03/04/20 15:14	03/06/20 17:59	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		30.5	30.5	ug/Sample		03/04/20 15:14	03/06/20 17:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:14*	*03/06/20 17:59*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 17:59*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 17:59*	*1*
Toluene-d8 (Surr)	*99*		*71 - 139*	*03/04/20 15:14*	*03/06/20 17:59*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.305	0.0610	ug/Sample		03/04/20 08:42	03/07/20 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*107*		*50 - 200*	*03/04/20 08:42*	*03/07/20 14:56*	*1*

Client Sample ID: E-1146 R3 TO_FEED LINE #2-IMP #1 /MEOH RINSES

Lab Sample ID: 140-18413-13

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		438	438	ug/Sample		03/04/20 15:14	03/06/20 18:24	1
HFPO dimer, methyl ester as HFPO-DAF	**205**		145	145	ug/Sample		03/04/20 15:14	03/06/20 18:24	1
2-MTP as HFPO	ND		131	131	ug/Sample		03/04/20 15:14	03/06/20 18:24	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**795**		150	150	ug/Sample		03/04/20 15:14	03/06/20 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*70 - 160*	*03/04/20 15:14*	*03/06/20 18:24*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 18:24*	*1*
Dibromofluoromethane (Surr)	*90*		*62 - 134*	*03/04/20 15:14*	*03/06/20 18:24*	*1*
Toluene-d8 (Surr)	*100*		*71 - 139*	*03/04/20 15:14*	*03/06/20 18:24*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**51.8**		0.299	0.0598	ug/Sample		03/04/20 08:42	03/07/20 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*13*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 15:00*	*1*

Client Sample ID: E-1147 R3 TO_FEED LINE #2-IMP #2 /MEOH RINSES

Lab Sample ID: 140-18413-14

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		266	266	ug/Sample		03/04/20 15:14	03/06/20 18:48	1
HFPO dimer, methyl ester as HFPO-DAF	ND		87.5	87.5	ug/Sample		03/04/20 15:14	03/06/20 18:48	1
2-MTP as HFPO	ND		79.2	79.2	ug/Sample		03/04/20 15:14	03/06/20 18:48	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**134**		90.7	90.7	ug/Sample		03/04/20 15:14	03/06/20 18:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*70 - 160*	*03/04/20 15:14*	*03/06/20 18:48*	*1*
4-Bromofluorobenzene (Surr)	*98*		*57 - 152*	*03/04/20 15:14*	*03/06/20 18:48*	*1*
Dibromofluoromethane (Surr)	*93*		*62 - 134*	*03/04/20 15:14*	*03/06/20 18:48*	*1*
Toluene-d8 (Surr)	*99*		*71 - 139*	*03/04/20 15:14*	*03/06/20 18:48*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**19.7**		0.272	0.0544	ug/Sample		03/04/20 08:42	03/07/20 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*28*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 15:08*	*1*

Client Sample ID: E-1148 R3 TO_FEED LINE #2-IMP #3 /MEOH RINSES

Lab Sample ID: 140-18413-15

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		125	125	ug/Sample		03/04/20 15:14	03/06/20 19:13	1
HFPO dimer, methyl ester as HFPO-DAF	ND		41.2	41.2	ug/Sample		03/04/20 15:14	03/06/20 19:13	1
2-MTP as HFPO	ND		37.3	37.3	ug/Sample		03/04/20 15:14	03/06/20 19:13	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	**91.3**		42.7	42.7	ug/Sample		03/04/20 15:14	03/06/20 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 160*	*03/04/20 15:14*	*03/06/20 19:13*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 19:13*	*1*
Dibromofluoromethane (Surr)	*90*		*62 - 134*	*03/04/20 15:14*	*03/06/20 19:13*	*1*
Toluene-d8 (Surr)	*99*		*71 - 139*	*03/04/20 15:14*	*03/06/20 19:13*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**11.7**		0.299	0.0598	ug/Sample		03/04/20 08:42	03/07/20 15:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*34*	*X*	*50 - 200*	*03/04/20 08:42*	*03/07/20 15:12*	*1*

Client Sample ID: E-1149 R3 TO_FEED LINE #2-IMP #4 /MEOH RINSES

Lab Sample ID: 140-18413-16

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		100	100	ug/Sample		03/04/20 15:14	03/06/20 19:38	1
HFPO dimer, methyl ester as HFPO-DAF	ND		33.0	33.0	ug/Sample		03/04/20 15:14	03/06/20 19:38	1
2-MTP as HFPO	ND		29.9	29.9	ug/Sample		03/04/20 15:14	03/06/20 19:38	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		34.2	34.2	ug/Sample		03/04/20 15:14	03/06/20 19:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*70 - 160*	*03/04/20 15:14*	*03/06/20 19:38*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 19:38*	*1*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:14*	*03/06/20 19:38*	*1*
Toluene-d8 (Surr)	*99*		*71 - 139*	*03/04/20 15:14*	*03/06/20 19:38*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**2.76**		0.256	0.0513	ug/Sample		03/04/20 08:42	03/07/20 15:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*59*		*50 - 200*	*03/04/20 08:42*	*03/07/20 15:16*	*1*

Client Sample ID: E-1150 R3 TO_FEED LINE #2-IMP #5 /MEOH RINSES

Lab Sample ID: 140-18413-17

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		87.2	87.2	ug/Sample		03/04/20 15:14	03/06/20 20:03	1
HFPO dimer, methyl ester as HFPO-DAF	ND		28.8	28.8	ug/Sample		03/04/20 15:14	03/06/20 20:03	1
2-MTP as HFPO	ND		26.0	26.0	ug/Sample		03/04/20 15:14	03/06/20 20:03	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		29.8	29.8	ug/Sample		03/04/20 15:14	03/06/20 20:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*70 - 160*	*03/04/20 15:14*	*03/06/20 20:03*	*1*
4-Bromofluorobenzene (Surr)	*97*		*57 - 152*	*03/04/20 15:14*	*03/06/20 20:03*	*1*
Dibromofluoromethane (Surr)	*91*		*62 - 134*	*03/04/20 15:14*	*03/06/20 20:03*	*1*
Toluene-d8 (Surr)	*99*		*71 - 139*	*03/04/20 15:14*	*03/06/20 20:03*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.263**	**J**	0.298	0.0596	ug/Sample		03/04/20 08:42	03/07/20 15:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*96*		*50 - 200*	*03/04/20 08:42*	*03/07/20 15:19*	*1*

Client Sample ID: E-1151 R3 TO_FEED LINE #2-IMP #6 /MEOH RINSES

Lab Sample ID: 140-18413-18

Date Collected: 02/29/20 00:00
Date Received: 03/01/20 07:00
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
Carbonyl Difluoride	ND		81.3	81.3	ug/Sample		03/04/20 15:14	03/06/20 20:27	1
HFPO dimer, methyl ester as HFPO-DAF	ND		26.7	26.7	ug/Sample		03/04/20 15:14	03/06/20 20:27	1
2-MTP as HFPO	ND		24.2	24.2	ug/Sample		03/04/20 15:14	03/06/20 20:27	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		27.7	27.7	ug/Sample		03/04/20 15:14	03/06/20 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*70 - 160*	*03/04/20 15:14*	*03/06/20 20:27*	*1*
4-Bromofluorobenzene (Surr)	*96*		*57 - 152*	*03/04/20 15:14*	*03/06/20 20:27*	*1*
Dibromofluoromethane (Surr)	*92*		*62 - 134*	*03/04/20 15:14*	*03/06/20 20:27*	*1*
Toluene-d8 (Surr)	*98*		*71 - 139*	*03/04/20 15:14*	*03/06/20 20:27*	*1*

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.277	0.0554	ug/Sample		03/04/20 08:42	03/07/20 15:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*106*		*50 - 200*	*03/04/20 08:42*	*03/07/20 15:23*	*1*

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: TO CPT Line #2 - MM-18

Job ID: 140-18413-1

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

Prep: MeOH Prep

Analyte	RL	MDL	Units
2-MTP as HFPO	2.50	2.50	ug/Sample
Carbonyl Difluoride	10.0	10.0	ug/Sample
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	2.50	2.50	ug/Sample
HFPO dimer, methyl ester as HFPO-DAF	2.50	2.50	ug/Sample

Method: 8321A - PFOA and PFOS

Prep: None

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

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ANALYTICAL REPORT

Job Number: 140-18425-1

Job Description: TO CPT - Process Samples

Contract Number: LBIO-67048

For:
The Chemours Company FC, LLC
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
3/17/2020 9:40 AM

Courtney M Adkins, Project Manager II
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
03/17/2020

Table of Contents

Table of Contents

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	ISTD response or retention time outside acceptable limits

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.

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: The Chemours Company FC, LLC
Project/Site: TO CPT - Process Samples

Job ID: 140-18425-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL KNX
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
5030B	Purge and Trap	SW846	TAL KNX

Protocol References:

EPA = US Environmental Protection Agency

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

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: The Chemours Company FC, LLC
Project/Site: TO CPT - Process Samples

Job ID: 140-18425-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-18425-1	T-1931 R1 CPT TO MAKEUP WATER	Water	02/28/20 00:00	03/01/20 07:00	
140-18425-3	T-1933 R1 CPT TO MAKEUP WATER	Waste	02/28/20 00:00	03/01/20 07:00	
140-18425-5	T-1934 R1 CPT TO RECIRC ACID STREAM	Water	02/28/20 00:00	03/01/20 07:00	
140-18425-7	T-1936 R1 CPT TO RECIRC ACID STREAM	Waste	02/28/20 00:00	03/01/20 07:00	
140-18425-9	T-1937 R1 CPT TO STAGE 4 PURGE	Water	02/28/20 00:00	03/01/20 07:00	
140-18425-11	T-1939 R1 CPT TO STAGE 4 PURGE	Waste	02/28/20 00:00	03/01/20 07:00	
140-18425-13	T-1940 R2 CPT TO MAKEUP WATER	Water	02/28/20 00:00	03/01/20 07:00	
140-18425-15	T-1942 R2 CPT TO MAKEUP WATER	Waste	02/28/20 00:00	03/01/20 07:00	
140-18425-17	T-1943 R2 CPT TO RECIRC ACID STREAM	Water	02/28/20 00:00	03/01/20 07:00	
140-18425-19	T-1945 R2 CPT TO RECIRC ACID STREAM	Waste	02/28/20 00:00	03/01/20 07:00	
140-18425-21	T-1946 R2 CPT TO STAGE 4 PURGE	Water	02/28/20 00:00	03/01/20 07:00	
140-18425-23	T-1948 R2 CPT TO STAGE 4 PURGE	Waste	02/28/20 00:00	03/01/20 07:00	
140-18425-25	T-1949 R3 CPT TO MAKEUP WATER	Water	02/29/20 00:00	03/01/20 07:00	
140-18425-27	T-1951 R3 CPT TO MAKEUP WATER	Waste	02/29/20 00:00	03/01/20 07:00	
140-18425-29	T-1952 R3 CPT TO RECIRC ACID STREAM	Water	02/29/20 00:00	03/01/20 07:00	
140-18425-31	T-1954 R3 CPT TO RECIRC ACID STREAM	Waste	02/29/20 00:00	03/01/20 07:00	
140-18425-33	T-1955 R3 CPT TO STAGE 4 PURGE	Water	02/29/20 00:00	03/01/20 07:00	
140-18425-35	T-1957 R3 CPT TO STAGE 4 PURGE	Waste	02/29/20 00:00	03/01/20 07:00	

Job Narrative
140-18425-1

Sample Receipt

The samples were received on March 1, 2020 at 7:00 AM in good condition and properly preserved. The temperatures of the 2 coolers at receipt time were 0.2º C and 0.5º C.

Receipt Exceptions

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. The COC list 6 containers per sample, only received 5 containers per sample.

GC/MS VOA

Waste Sample Preparation and Analysis: Waste sample was 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 methanol. A portion of the methanol extract is added to the purge water and spiking with 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.

Waste sample results were calculated using the following equation:

Concentration ug/g or mg/kg = (C × DF × W × Vt) / (Va × Ws)

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
Ws = Weight of sample extracted, g

Method 8260B: Internal standard (ISTD) 1,4-dichlorobenzene-d4 response for the method black associated with preparation batch 140-38088 and analytical batch 140-38090 was outside of acceptance limits. Nonetheless, there is no impact on the data, since none of the target analytes are quantitated by this internal standard.

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.

Organic Prep

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

QC Association Summary

Client: The Chemours Company FC, LLC
Project/Site: TO CPT - Process Samples

Job ID: 140-18425-1

GC/MS VOA

Prep Batch: 38088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18425-3	T-1933 R1 CPT TO MAKEUP WATER	Total/NA	Waste	5030B	
140-18425-7	T-1936 R1 CPT TO RECIRC ACID STREAM	Total/NA	Waste	5030B	
140-18425-11	T-1939 R1 CPT TO STAGE 4 PURGE	Total/NA	Waste	5030B	
140-18425-15	T-1942 R2 CPT TO MAKEUP WATER	Total/NA	Waste	5030B	
140-18425-19	T-1945 R2 CPT TO RECIRC ACID STREAM	Total/NA	Waste	5030B	
140-18425-23	T-1948 R2 CPT TO STAGE 4 PURGE	Total/NA	Waste	5030B	
140-18425-27	T-1951 R3 CPT TO MAKEUP WATER	Total/NA	Waste	5030B	
140-18425-31	T-1954 R3 CPT TO RECIRC ACID STREAM	Total/NA	Waste	5030B	
140-18425-35	T-1957 R3 CPT TO STAGE 4 PURGE	Total/NA	Waste	5030B	
MB 140-38088/2-A	Method Blank	Total/NA	Waste	5030B	
LCS 140-38088/1-A	Lab Control Sample	Total/NA	Waste	5030B	
140-18425-3 MS	T-1933 R1 CPT TO MAKEUP WATER	Total/NA	Waste	5030B	
140-18425-3 MSD	T-1933 R1 CPT TO MAKEUP WATER	Total/NA	Waste	5030B	
140-18425-7 MS	T-1936 R1 CPT TO RECIRC ACID STREAM	Total/NA	Waste	5030B	
140-18425-7 MSD	T-1936 R1 CPT TO RECIRC ACID STREAM	Total/NA	Waste	5030B	
140-18425-11 MS	T-1939 R1 CPT TO STAGE 4 PURGE	Total/NA	Waste	5030B	
140-18425-11 MSD	T-1939 R1 CPT TO STAGE 4 PURGE	Total/NA	Waste	5030B	

Analysis Batch: 38090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18425-3	T-1933 R1 CPT TO MAKEUP WATER	Total/NA	Waste	8260B	38088
140-18425-7	T-1936 R1 CPT TO RECIRC ACID STREAM	Total/NA	Waste	8260B	38088
140-18425-11	T-1939 R1 CPT TO STAGE 4 PURGE	Total/NA	Waste	8260B	38088
140-18425-15	T-1942 R2 CPT TO MAKEUP WATER	Total/NA	Waste	8260B	38088
140-18425-19	T-1945 R2 CPT TO RECIRC ACID STREAM	Total/NA	Waste	8260B	38088
140-18425-23	T-1948 R2 CPT TO STAGE 4 PURGE	Total/NA	Waste	8260B	38088
140-18425-27	T-1951 R3 CPT TO MAKEUP WATER	Total/NA	Waste	8260B	38088
140-18425-31	T-1954 R3 CPT TO RECIRC ACID STREAM	Total/NA	Waste	8260B	38088
140-18425-35	T-1957 R3 CPT TO STAGE 4 PURGE	Total/NA	Waste	8260B	38088
MB 140-38088/2-A	Method Blank	Total/NA	Waste	8260B	38088
LCS 140-38088/1-A	Lab Control Sample	Total/NA	Waste	8260B	38088
140-18425-3 MS	T-1933 R1 CPT TO MAKEUP WATER	Total/NA	Waste	8260B	38088
140-18425-3 MSD	T-1933 R1 CPT TO MAKEUP WATER	Total/NA	Waste	8260B	38088
140-18425-7 MS	T-1936 R1 CPT TO RECIRC ACID STREAM	Total/NA	Waste	8260B	38088
140-18425-7 MSD	T-1936 R1 CPT TO RECIRC ACID STREAM	Total/NA	Waste	8260B	38088
140-18425-11 MS	T-1939 R1 CPT TO STAGE 4 PURGE	Total/NA	Waste	8260B	38088
140-18425-11 MSD	T-1939 R1 CPT TO STAGE 4 PURGE	Total/NA	Waste	8260B	38088

LCMS

Prep Batch: 363013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18425-5	T-1934 R1 CPT TO RECIRC ACID STREAM	Total/NA	Water	3535	
140-18425-17	T-1943 R2 CPT TO RECIRC ACID STREAM	Total/NA	Water	3535	
140-18425-29	T-1952 R3 CPT TO RECIRC ACID STREAM	Total/NA	Water	3535	
MB 320-363013/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-363013/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-363013/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
140-18425-5 DU	T-1934 R1 CPT TO RECIRC ACID STREAM	Total/NA	Water	3535	

QC Association Summary

Client: The Chemours Company FC, LLC
Project/Site: TO CPT - Process Samples

Job ID: 140-18425-1

LCMS

Prep Batch: 363366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18425-1	T-1931 R1 CPT TO MAKEUP WATER	Total/NA	Water	3535	
140-18425-9	T-1937 R1 CPT TO STAGE 4 PURGE	Total/NA	Water	3535	
140-18425-13	T-1940 R2 CPT TO MAKEUP WATER	Total/NA	Water	3535	
140-18425-21	T-1946 R2 CPT TO STAGE 4 PURGE	Total/NA	Water	3535	
140-18425-25	T-1949 R3 CPT TO MAKEUP WATER	Total/NA	Water	3535	
140-18425-33	T-1955 R3 CPT TO STAGE 4 PURGE	Total/NA	Water	3535	
140-18425-1 DU	T-1931 R1 CPT TO MAKEUP WATER	Total/NA	Water	3535	
140-18425-9 DU	T-1937 R1 CPT TO STAGE 4 PURGE	Total/NA	Water	3535	

Analysis Batch: 364100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18425-1	T-1931 R1 CPT TO MAKEUP WATER	Total/NA	Water	537 (modified)	363366
140-18425-9	T-1937 R1 CPT TO STAGE 4 PURGE	Total/NA	Water	537 (modified)	363366
140-18425-13	T-1940 R2 CPT TO MAKEUP WATER	Total/NA	Water	537 (modified)	363366
140-18425-21	T-1946 R2 CPT TO STAGE 4 PURGE	Total/NA	Water	537 (modified)	363366
140-18425-25	T-1949 R3 CPT TO MAKEUP WATER	Total/NA	Water	537 (modified)	363366
140-18425-33	T-1955 R3 CPT TO STAGE 4 PURGE	Total/NA	Water	537 (modified)	363366
140-18425-1 DU	T-1931 R1 CPT TO MAKEUP WATER	Total/NA	Water	537 (modified)	363366
140-18425-9 DU	T-1937 R1 CPT TO STAGE 4 PURGE	Total/NA	Water	537 (modified)	363366

Analysis Batch: 364104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-18425-5	T-1934 R1 CPT TO RECIRC ACID STREAM	Total/NA	Water	537 (modified)	363013
140-18425-17	T-1943 R2 CPT TO RECIRC ACID STREAM	Total/NA	Water	537 (modified)	363013
140-18425-29	T-1952 R3 CPT TO RECIRC ACID STREAM	Total/NA	Water	537 (modified)	363013
MB 320-363013/1-A	Method Blank	Total/NA	Water	537 (modified)	363013
LCS 320-363013/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	363013
LCSD 320-363013/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	363013
140-18425-5 DU	T-1934 R1 CPT TO RECIRC ACID STREAM	Total/NA	Water	537 (modified)	363013

Client Sample ID: T-1931 R1 CPT TO MAKEUP WATER
Lab Sample ID: 140-18425-1
Date Collected: 02/28/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		3.92	1.47	ng/L		03/10/20 11:54	03/12/20 14:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*95*		*25 - 150*	*03/10/20 11:54*	*03/12/20 14:08*	*1*

Client Sample ID: T-1933 R1 CPT TO MAKEUP WATER
Lab Sample ID: 140-18425-3
Date Collected: 02/28/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		4.18	4.18	mg/Kg		03/05/20 11:04	03/05/20 19:51	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.32	1.32	mg/Kg		03/05/20 11:04	03/05/20 19:51	1
2-MTP as HFPO	ND		1.20	1.20	mg/Kg		03/05/20 11:04	03/05/20 19:51	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.37	1.37	mg/Kg		03/05/20 11:04	03/05/20 19:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*72 - 144*	*03/05/20 11:04*	*03/05/20 19:51*	*1*
4-Bromofluorobenzene (Surr)	*97*		*62 - 144*	*03/05/20 11:04*	*03/05/20 19:51*	*1*
Dibromofluoromethane (Surr)	*92*		*72 - 138*	*03/05/20 11:04*	*03/05/20 19:51*	*1*
Toluene-d8 (Surr)	*102*		*75 - 137*	*03/05/20 11:04*	*03/05/20 19:51*	*1*

Client Sample ID: T-1934 R1 CPT TO RECIRC ACID STREAM
Lab Sample ID: 140-18425-5
Date Collected: 02/28/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**1.81**	**J**	4.28	1.60	ng/L		03/09/20 11:06	03/12/20 16:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*83*		*25 - 150*	*03/09/20 11:06*	*03/12/20 16:28*	*1*

Client Sample ID: T-1936 R1 CPT TO RECIRC ACID STREAM
Lab Sample ID: 140-18425-7
Date Collected: 02/28/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		4.18	4.18	mg/Kg		03/05/20 11:04	03/05/20 20:15	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.32	1.32	mg/Kg		03/05/20 11:04	03/05/20 20:15	1
2-MTP as HFPO	ND		1.20	1.20	mg/Kg		03/05/20 11:04	03/05/20 20:15	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.37	1.37	mg/Kg		03/05/20 11:04	03/05/20 20:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*72 - 144*	*03/05/20 11:04*	*03/05/20 20:15*	*1*
4-Bromofluorobenzene (Surr)	*98*		*62 - 144*	*03/05/20 11:04*	*03/05/20 20:15*	*1*
Dibromofluoromethane (Surr)	*92*		*72 - 138*	*03/05/20 11:04*	*03/05/20 20:15*	*1*
Toluene-d8 (Surr)	*99*		*75 - 137*	*03/05/20 11:04*	*03/05/20 20:15*	*1*

Client Sample ID: T-1937 R1 CPT TO STAGE 4 PURGE
Lab Sample ID: 140-18425-9
Date Collected: 02/28/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		3.88	1.46	ng/L		03/10/20 11:54	03/12/20 14:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*93*		*25 - 150*	*03/10/20 11:54*	*03/12/20 14:28*	*1*

Client Sample ID: T-1939 R1 CPT TO STAGE 4 PURGE
Lab Sample ID: 140-18425-11
Date Collected: 02/28/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		3.96	3.96	mg/Kg		03/05/20 11:04	03/05/20 20:40	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.25	1.25	mg/Kg		03/05/20 11:04	03/05/20 20:40	1
2-MTP as HFPO	ND		1.14	1.14	mg/Kg		03/05/20 11:04	03/05/20 20:40	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.30	1.30	mg/Kg		03/05/20 11:04	03/05/20 20:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*72 - 144*	*03/05/20 11:04*	*03/05/20 20:40*	*1*
4-Bromofluorobenzene (Surr)	*100*		*62 - 144*	*03/05/20 11:04*	*03/05/20 20:40*	*1*
Dibromofluoromethane (Surr)	*92*		*72 - 138*	*03/05/20 11:04*	*03/05/20 20:40*	*1*
Toluene-d8 (Surr)	*99*		*75 - 137*	*03/05/20 11:04*	*03/05/20 20:40*	*1*

Client Sample ID: T-1940 R2 CPT TO MAKEUP WATER
Lab Sample ID: 140-18425-13
Date Collected: 02/28/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		4.00	1.50	ng/L		03/10/20 11:54	03/12/20 14:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*95*		*25 - 150*	*03/10/20 11:54*	*03/12/20 14:48*	*1*

Client Sample ID: T-1942 R2 CPT TO MAKEUP WATER
Lab Sample ID: 140-18425-15
Date Collected: 02/28/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		4.21	4.21	mg/Kg		03/05/20 11:04	03/05/20 21:04	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.33	1.33	mg/Kg		03/05/20 11:04	03/05/20 21:04	1
2-MTP as HFPO	ND		1.21	1.21	mg/Kg		03/05/20 11:04	03/05/20 21:04	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.38	1.38	mg/Kg		03/05/20 11:04	03/05/20 21:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*72 - 144*	*03/05/20 11:04*	*03/05/20 21:04*	*1*
4-Bromofluorobenzene (Surr)	*97*		*62 - 144*	*03/05/20 11:04*	*03/05/20 21:04*	*1*
Dibromofluoromethane (Surr)	*92*		*72 - 138*	*03/05/20 11:04*	*03/05/20 21:04*	*1*
Toluene-d8 (Surr)	*100*		*75 - 137*	*03/05/20 11:04*	*03/05/20 21:04*	*1*

Client Sample ID: T-1943 R2 CPT TO RECIRC ACID STREAM

Lab Sample ID: 140-18425-17
Date Collected: 02/28/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		4.36	1.64	ng/L		03/09/20 11:06	03/12/20 16:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*99*		*25 - 150*	*03/09/20 11:06*	*03/12/20 16:48*	*1*

Client Sample ID: T-1945 R2 CPT TO RECIRC ACID STREAM

Lab Sample ID: 140-18425-19
Date Collected: 02/28/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		4.12	4.12	mg/Kg		03/05/20 11:04	03/05/20 21:29	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.30	1.30	mg/Kg		03/05/20 11:04	03/05/20 21:29	1
2-MTP as HFPO	ND		1.18	1.18	mg/Kg		03/05/20 11:04	03/05/20 21:29	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.35	1.35	mg/Kg		03/05/20 11:04	03/05/20 21:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*72 - 144*	*03/05/20 11:04*	*03/05/20 21:29*	*1*
4-Bromofluorobenzene (Surr)	*97*		*62 - 144*	*03/05/20 11:04*	*03/05/20 21:29*	*1*
Dibromofluoromethane (Surr)	*92*		*72 - 138*	*03/05/20 11:04*	*03/05/20 21:29*	*1*
Toluene-d8 (Surr)	*100*		*75 - 137*	*03/05/20 11:04*	*03/05/20 21:29*	*1*

Client Sample ID: T-1946 R2 CPT TO STAGE 4 PURGE

Lab Sample ID: 140-18425-21
Date Collected: 02/28/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		3.84	1.44	ng/L		03/10/20 11:54	03/12/20 14:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*94*		*25 - 150*	*03/10/20 11:54*	*03/12/20 14:58*	*1*

Client Sample ID: T-1948 R2 CPT TO STAGE 4 PURGE

Lab Sample ID: 140-18425-23
Date Collected: 02/28/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		4.16	4.16	mg/Kg		03/05/20 11:04	03/05/20 21:54	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.31	1.31	mg/Kg		03/05/20 11:04	03/05/20 21:54	1
2-MTP as HFPO	ND		1.19	1.19	mg/Kg		03/05/20 11:04	03/05/20 21:54	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.36	1.36	mg/Kg		03/05/20 11:04	03/05/20 21:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*72 - 144*	*03/05/20 11:04*	*03/05/20 21:54*	*1*
4-Bromofluorobenzene (Surr)	*98*		*62 - 144*	*03/05/20 11:04*	*03/05/20 21:54*	*1*
Dibromofluoromethane (Surr)	*90*		*72 - 138*	*03/05/20 11:04*	*03/05/20 21:54*	*1*
Toluene-d8 (Surr)	*99*		*75 - 137*	*03/05/20 11:04*	*03/05/20 21:54*	*1*

Client Sample ID: T-1949 R3 CPT TO MAKEUP WATER
Lab Sample ID: 140-18425-25
Date Collected: 02/29/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		3.81	1.43	ng/L		03/10/20 11:54	03/12/20 15:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*94*		*25 - 150*	*03/10/20 11:54*	*03/12/20 15:08*	*1*

Client Sample ID: T-1951 R3 CPT TO MAKEUP WATER
Lab Sample ID: 140-18425-27
Date Collected: 02/29/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		4.14	4.14	mg/Kg		03/05/20 11:04	03/05/20 22:18	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.31	1.31	mg/Kg		03/05/20 11:04	03/05/20 22:18	1
2-MTP as HFPO	ND		1.19	1.19	mg/Kg		03/05/20 11:04	03/05/20 22:18	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.36	1.36	mg/Kg		03/05/20 11:04	03/05/20 22:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*72 - 144*	*03/05/20 11:04*	*03/05/20 22:18*	*1*
4-Bromofluorobenzene (Surr)	*96*		*62 - 144*	*03/05/20 11:04*	*03/05/20 22:18*	*1*
Dibromofluoromethane (Surr)	*91*		*72 - 138*	*03/05/20 11:04*	*03/05/20 22:18*	*1*
Toluene-d8 (Surr)	*100*		*75 - 137*	*03/05/20 11:04*	*03/05/20 22:18*	*1*

Client Sample ID: T-1952 R3 CPT TO RECIRC ACID STREAM
Lab Sample ID: 140-18425-29
Date Collected: 02/29/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**1.57**	**J**	4.14	1.55	ng/L		03/09/20 11:06	03/12/20 16:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*89*		*25 - 150*	*03/09/20 11:06*	*03/12/20 16:58*	*1*

Client Sample ID: T-1954 R3 CPT TO RECIRC ACID STREAM
Lab Sample ID: 140-18425-31
Date Collected: 02/29/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		4.07	4.07	mg/Kg		03/05/20 11:04	03/05/20 22:43	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.28	1.28	mg/Kg		03/05/20 11:04	03/05/20 22:43	1
2-MTP as HFPO	ND		1.16	1.16	mg/Kg		03/05/20 11:04	03/05/20 22:43	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.33	1.33	mg/Kg		03/05/20 11:04	03/05/20 22:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*72 - 144*	*03/05/20 11:04*	*03/05/20 22:43*	*1*
4-Bromofluorobenzene (Surr)	*98*		*62 - 144*	*03/05/20 11:04*	*03/05/20 22:43*	*1*
Dibromofluoromethane (Surr)	*93*		*72 - 138*	*03/05/20 11:04*	*03/05/20 22:43*	*1*
Toluene-d8 (Surr)	*99*		*75 - 137*	*03/05/20 11:04*	*03/05/20 22:43*	*1*

Client Sample ID: T-1955 R3 CPT TO STAGE 4 PURGE
Lab Sample ID: 140-18425-33
Date Collected: 02/29/20 00:00
Matrix: Water
Date Received: 03/01/20 07:00

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		3.81	1.43	ng/L		03/10/20 11:54	03/12/20 15:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*94*		*25 - 150*	*03/10/20 11:54*	*03/12/20 15:18*	*1*

Client Sample ID: T-1957 R3 CPT TO STAGE 4 PURGE
Lab Sample ID: 140-18425-35
Date Collected: 02/29/20 00:00
Matrix: Waste
Date Received: 03/01/20 07:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonyl Difluoride	ND		4.04	4.04	mg/Kg		03/05/20 11:04	03/05/20 23:07	1
HFPO dimer, methyl ester as HFPO-DAF	ND		1.28	1.28	mg/Kg		03/05/20 11:04	03/05/20 23:07	1
2-MTP as HFPO	ND		1.16	1.16	mg/Kg		03/05/20 11:04	03/05/20 23:07	1
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	ND		1.33	1.33	mg/Kg		03/05/20 11:04	03/05/20 23:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*72 - 144*	*03/05/20 11:04*	*03/05/20 23:07*	*1*
4-Bromofluorobenzene (Surr)	*97*		*62 - 144*	*03/05/20 11:04*	*03/05/20 23:07*	*1*
Dibromofluoromethane (Surr)	*91*		*72 - 138*	*03/05/20 11:04*	*03/05/20 23:07*	*1*
Toluene-d8 (Surr)	*99*		*75 - 137*	*03/05/20 11:04*	*03/05/20 23:07*	*1*

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: TO CPT - Process Samples

Job ID: 140-18425-1

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

Prep: 5030B

Analyte	RL	MDL	Units
2-MTP as HFPO	1.20	1.20	mg/Kg
Carbonyl Difluoride	5.00	5.00	mg/Kg
Heptafluoropropyl 1,2,2,2-tetrafluoroethyl ether	1.20	1.20	mg/Kg
HFPO dimer, methyl ester as HFPO-DAF	1.20	1.20	mg/Kg

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: 3535

Analyte	RL	MDL	Units
HFPO-DA	4.00	1.50	ng/L

Chemours – Fayetteville, NC
Thermal Oxidizer Feed Lines 1 & 2 (Monomer and Polymer) Impinger Sample Field QC Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
QF - 2290	QC/BT	Impinger Contents #1	602.6	602.6	0.0	5.0
QF - 2291	QC/BT	Impinger Contents #2	603.8	603.9	-0.1	5.0
QF - 2292	QC/BT	Impinger Contents #3	603.1	603.1	0.0	5.0
QF - 2293	QC/BT	Impinger Contents #4	601.6	601.6	0.0	5.0
QF - 2294	QC/BT	Impinger Contents #5	602.1	602.3	-0.2	5.0
QF - 2295	QC/BT	Impinger Contents #6	635.3	635.4	-0.1	5.0
				Net Weight Gain (g):	-0.4	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Abbreviations/Acronyms:
BT = Blank Train
QC = Quality Control

Chemours – Fayetteville, NC
Thermal Oxidizer Monomer Waste Gas Feed Line #1 Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
Z - 1334	1	Impinger Contents #1	700.6	599.2	101.4	0.0
Z - 1335	1	Impinger Contents #2	605.2	599.1	6.1	3.0
Z - 1336	1	Impinger Contents #3	600.1	597.6	2.5	3.0
Z - 1337	1	Impinger Contents #4	598.9	596.9	2.0	4.0
Z - 1338	1	Impinger Contents #5	603.5	595.9	7.6	4.0
Z - 1339	1	Impinger Contents #6	626.0	624.8	1.2	4.0
				Net Weight Gain (g):	**120.8**	

Notes:

Impinger #1 with rinses warmed slightly after placing it in the sample container.

Impinger #2 with rinses did not show any gas evolution or warm up.

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Chemours – Fayetteville, NC
Thermal Oxidizer Monomer Waste Gas Feed Line #1 Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
Z - 1340	2	Impinger Contents #1	737.1	620.9	116.2	0.0
Z - 1341	2	Impinger Contents #2	615.8	606.4	9.4	3.0
Z - 1342	2	Impinger Contents #3	603.4	607.4	-4.0	4.0
Z - 1343	2	Impinger Contents #4	604.7	601.9	2.8	4.0
Z - 1344	2	Impinger Contents #5	606.1	603.7	2.4	4.0
Z - 1345	2	Impinger Contents #6	631.0	628.2	2.8	5.0
				Net Weight Gain (g):	**129.6**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Chemours – Fayetteville, NC
Thermal Oxidizer Monomer Waste Gas Feed Line #1 Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
Z - 1346	3	Impinger Contents #1	775.5	605.4	170.1	0.0
Z - 1347	3	Impinger Contents #2	607.3	596.8	10.5	3.0
Z - 1348	3	Impinger Contents #3	596.9	593.9	3.0	4.0
Z - 1349	3	Impinger Contents #4	599.2	596.9	2.3	4.0
Z - 1350	3	Impinger Contents #5	600.2	598.6	1.6	4.0
Z - 1351	3	Impinger Contents #6	635.2	632.9	2.3	5.0
				Net Weight Gain (g):	**189.8**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Chemours – Fayetteville, NC
Thermal Oxidizer Polymer Waste Gas Feed Line #2 Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
E - 1134	1	Impinger Contents #1	604.1	603.4	0.7	5.0
E - 1135	1	Impinger Contents #2	596.5	596.1	0.4	5.0
E - 1136	1	Impinger Contents #3	597.5	597.3	0.2	5.0
E - 1137	1	Impinger Contents #4	613.1	612.9	0.2	5.0
E - 1138	1	Impinger Contents #5	604.0	604.0	0.0	5.0
E - 1139	1	Impinger Contents #6	625.9	625.9	0.0	5.0
				Net Weight Gain (g):	**1.5**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Chemours – Fayetteville, NC
Thermal Oxidizer Polymer Waste Gas Feed Line #2 Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
E - 1140	2	Impinger Contents #1	630.1	614.6	15.5	5.0
E - 1141	2	Impinger Contents #2	595.6	606.5	-10.9	5.0
E - 1142	2	Impinger Contents #3	607.5	609.9	-2.4	5.0
E - 1143	2	Impinger Contents #4	607.8	607.4	0.4	5.0
E - 1144	2	Impinger Contents #5	604.2	603.9	0.3	5.0
E - 1145	2	Impinger Contents #6	637.4	637.5	-0.1	5.0
				Net Weight Gain (g):	**2.8**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Chemours – Fayetteville, NC
Thermal Oxidizer Polymer Waste Gas Feed Line #2 Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
E - 1146	3	Impinger Contents #1	597.8	594.9	2.9	5.0
E - 1147	3	Impinger Contents #2	599.5	599.1	0.4	5.0
E - 1148	3	Impinger Contents #3	598.3	597.9	0.4	5.0
E - 1149	3	Impinger Contents #4	603.8	603.5	0.3	5.0
E - 1150	3	Impinger Contents #5	603.9	603.8	0.1	5.0
E - 1151	3	Impinger Contents #6	623.5	623.4	0.1	5.0
				Net Weight Gain (g):	**4.2**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Chemours – Fayetteville, NC
Thermal Oxidizer Stack Gas Impinger Field QC Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
D - 1734	QC/BT	Impinger Contents #1	604.0	604.1	-0.1	5.0
D - 1735	QC/BT	Impinger Contents #2	612.7	612.8	-0.1	5.0
D - 1736	QC/BT	Impinger Contents #3	609.0	609.0	0.0	5.0
D - 1737	QC/BT	Impinger Contents #4	609.0	609.1	-0.1	5.0
D - 1738	QC/BT	Impinger Contents #5	608.4	608.3	0.1	5.0
D - 1739	QC/BT	Impinger Contents #6	607.5	607.5	0.0	5.0
D - 1740	QC/BT	Impinger Contents #7	633.5	633.6	-0.1	5.0
				Net Weight Gain (g):	**-0.3**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Abbreviations/Acronyms:

BT = Blank Train
QC = Quality Control

Chemours – Fayetteville, NC
Thermal Oxidizer Stack Gas Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
G - 2764	1	Impinger Contents #1	594.0	607.5	-13.5	5.0
G - 2765	1	Impinger Contents #2	624.3	615.1	9.2	5.0
G - 2766	1	Impinger Contents #3	613.1	609.4	3.7	5.0
G - 2767	1	Impinger Contents #4	609.7	607.8	1.9	5.0
G - 2768	1	Impinger Contents #5	609.3	608.0	1.3	5.0
G - 2769	1	Impinger Contents #6	607.9	607.2	0.7	5.0
G - 2770	1	Impinger Contents #7	634.2	633.6	0.6	5.0
				Net Weight Gain (g):	**3.9**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Chemours – Fayetteville, NC
Thermal Oxidizer Stack Gas Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
G - 2771	2	Impinger Contents #1	593.0	604.9	-11.9	5.0
G - 2772	2	Impinger Contents #2	619.4	610.8	8.6	5.0
G - 2773	2	Impinger Contents #3	610.8	606.6	4.2	5.0
G - 2774	2	Impinger Contents #4	609.4	607.9	1.5	5.0
G - 2775	2	Impinger Contents #5	613.1	612.0	1.1	5.0
G - 2776	2	Impinger Contents #6	607.1	606.5	0.6	5.0
G - 2777	2	Impinger Contents #7	632.0	632.0	0.0	5.0
				Net Weight Gain (g):	**4.1**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

Chemours – Fayetteville, NC
Thermal Oxidizer Stack Gas Impinger Samples
Modified Method 18 Trains for Target Analytes
Field Sheet for Individual Impinger Weights excluding Methanol Rinses
February 2020 CPT

Field Sample No.	Run No.	Sample Description	Final Weight (g)	Initial Weight(1) (g)	Sample Weight (g)	pH(2)
G - 2778	3	Impinger Contents #1	592.8	607.1	-14.3	5.0
G - 2779	3	Impinger Contents #2	626.4	613.9	12.5	5.0
G - 2780	3	Impinger Contents #3	607.5	606.5	1.0	5.0
G - 2781	3	Impinger Contents #4	611.6	609.3	2.3	5.0
G - 2782	3	Impinger Contents #5	608.7	606.7	2.0	5.0
G - 2783	3	Impinger Contents #6	632.3	608.9	23.4	5.0
G - 2784	3	Impinger Contents #7	612.7	634.8	-22.1	5.0
				Net Weight Gain (g):	**4.8**	

Notes:

(1) *Please place 100 mLs of MeOH in each impinger to start the test run, add several boiling chips and record the weight. MeOH impingers are to be post-weighed prior to rinses being added.*

(2) *Note that pH strips should be wetted prior to pH tests, and post weights and train rinses should be performed before pH measurements are performed. Strips should not be directly dipped into MM-18 Train samples, but treated with drops of the impinger samples to prevent contamination of the samples with materials on the strips.*

The Target Analyte List (TAL) is as follows:

HFPO-DA
HFPO-DAF
Fluoroether E-1
HFPO
Carbonyl Di-fluoride
Perfluoroacetyl fluoride (PAF)
pH
Total Fluorine
HF

APPENDIX D
SAMPLE CALCULATIONS

TARGET PFAS COMPOUND CONTROL EFFICIENCY CALCULATIONS FOR TABLE 2-1

Inlet (Sum of Monomer and Polymer lines)

	R1	R2	R3	
EMISSION RESULTS, lb/hr.				
HFPO-DAF	0.000808901	0.000218029	0.000410109	
HFPO Monomer	2.540608283	1.915436675	1.94275063	
Fluoroether E-1	0.002651298	0.002070482	0.002041144	
HFPO Dimer Acid	0.003369391	0.008782517	0.009158596	
Carbonyl Difluoride	88.01731449	76.34748853	93.51627359	
	9.06E+01	**7.83E+01**	**9.55E+01**	8.81E+01

Stack

	R1	R2	R3	
EMISSION RESULTS, lb/hr.				
HFPO-DAF	< 3.87655E-05	< 4.80372E-05	< 3.22472E-05	
HFPO Monomer	< 1.75203E-06	< 2.17732E-06	< 1.45746E-06	
HFPO Dimer Acid	1.17445E-06	8.69515E-07	6.31961E-07	
Carbonyl Difluoride	< 0.000117952	< 0.000146289	< 9.7868E-05	
Fluoroether E-1	< 2.00725E-06	< 2.49031E-06	< 1.66868E-06	
	1.62E-04	**2.00E-04**	**1.34E-04**	1.65E-04
CONTROL EFFICIENCY	99.9998215	99.9997447	99.99985978	99.9998086

Notes:

The Stack compounds denoted with < were not detected in the samples. Therefore, the Reporting Limit (RL) for the first impinger was used for the input values to calculate the total PFAS target compounds.

The following Inlet compounds were not detected in the inlet samples and therefore, a value of zero (0) was used for the input values to calculate the total PFAS target compounds: Monomer Line - HFPO-DAF and Fluoroether E-1 R1, R2 and R3; Polymer Line - HFPO Monomer and COF2 R1, R2 and R3

SAMPLE CALCULATIONS FOR
HFPO DIMER ACID (METHOD 0010)

Client: Chemours | **Plant: Fayetteville, NC**
Test Number: Run 3 | **Test Date: 2/29/2020**
Test Location: Thermal Oxidizer Stack | **Test Period: 0915-1232**

1. HFPO Dimer Acid concentration, lbs/dscf.

$$Conc1 = \frac{W \times 2.2046 \times 10^{-9}}{Vm(std)}$$

$$Conc1 = \frac{0.1 \times 2.2046 \times 10\text{-}9}{130.162}$$

Conc1 = 2.16E-12

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 = 0.1 / (130.162 x 0.02832)

Conc2 = 3.46E-02

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

$MR1_{(Outlet)}$ = 2.16E-12 x 5320 x 60

$MR1_{(Outlet)}$ = 6.90E-07

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

$MR2_{(Outlet)}$ = 6.90E-07 x 453.59 /3600

$MR2_{(Outlet)}$ = 8.68E-08

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.

EXAMPLE CALCULATIONS FOR
VOLUMETRIC FLOW AND MOISTURE AND ISOKINETICS

Client: Chemours	Facility: Fayetteville, NC
Test Number: Run 3	Test Date: 2/29/2020
Test Location: Thermal Oxidizer Stack	Test Period: 0915-1232

1. Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 \times Y \times Vm \times \left(Pb + \frac{\text{delta H}}{13.6} \right)}{(Tm + 460)}$$

$$Vm(std) = \frac{17.64 \times 1.0013 \times 124.676 \times \left(30.05 + \frac{2.068}{13.6} \right)}{50.97 + 460} = 130.162$$

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.

$$Vw(std) = (0.04707 \times Vwc) + (0.04715 \times Wwsg)$$

$$Vw(std) = (0.04707 \times 8.0) + (0.04715 \times 24.1) = 1.51$$

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

$$bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

$$bws = \frac{1.51}{1.51 + 130.162} = 0.011$$

Where:

bws = Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

Md = 1 - bws

Md = 1 - 0.011 = 0.989

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 x 2.2) + (0.320 x 17.3) + (0.280 x (80.5 + 0.00))

MWd = 29.04

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 x Md) + (18 x (1 - Md))

MWs = (29.04 x 0.989) +(18 (1 - 0.989)) = 28.92

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.

$$Vs = 85.49 \times Cp \times ((\text{delt } p)^{1/2})avg \times \left(\frac{Ts\ (avg)}{Ps \times MWs} \right)^{1/2}$$

$$Vs = 85.49 \times 0.84 \times 0.89416 \times \left(\frac{518}{30.10 \times 28.92} \right)^{\wedge}1/2 = 49.6$$

Where:

Vs = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, $\frac{\text{ft/sec} \times \sqrt{(\text{lb/lb-mole})(\text{in. Hg})}}{\sqrt{(\text{deg R})(\text{in } H_2O)}}$

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.

$$Qs(act) = 60 \times Vs \times As$$

$$Qs(act) = 60 \times 49.6 \times 1.77 = 5253$$

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.

$$Qs(std) = 17.64 \times Md \times \frac{Ps}{Ts} \times Qs(act)$$

$$Qs(std) = 17.64 \times 0.989 \times \frac{30.10}{518.4} \times 5253$$

$$Qs(std) = 5320$$

Where:

Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min.

10. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.327 \times Ts \times Vm(std)}{Vs \times O \times Ps \times Md \times (Dn)^2}$$

$$I = \frac{17.327 \times 518 \times 130.162}{49.6 \times 180 \times 30.10 \times 0.989 \times (0.210)^{\wedge}2} = 99.9$$

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), $\frac{(\text{in. Hg})(\text{in}^2)(\text{min})}{(\text{deg R})(\text{ft}^2)(\text{sec})}$

APPENDIX E
EQUIPMENT CALIBRATION RECORDS

INTERFERENCE CHECK

Date: 12/4/14-12/5/14
Analyzer Type: Servomex - O_2
Model No: 4900
Serial No: 49000-652921
Calibration Span: 21.09 %
Pollutant: 21.09% O_2 - CC418692

INTERFERENT GAS	ANALYZER RESPONSE		% OF CALIBRATION SPAN[(a)]
	INTERFERENT GAS RESPONSE (%)	INTERFERENT GAS RESPONSE, WITH BACKGROUND POLLUTANT (%)	
CO_2 (30.17% CC199689)	0.00 .	-0.01	0.00
NO (445 ppm CC346681)	0.00	0.02	0.11
NO_2 (23.78 ppm CC500749)	NA	NA	NA
N_2O (90.4 ppm CC352661)	0.00	0.05	0.24
CO (461.5 ppm XC006064B)	0.00	0.02	0.00
SO_2 (451.2 ppm CC409079)	0.00	0.05	0.23
CH_4 (453.1 ppm SG901795)	NA	NA	NA
H_2 (552 ppm ALM048043)	0.00	0.09	0.44
HCl (45.1 ppm CC17830)	0.00	0.03	0.14
NH_3 (9.69 ppm CC58181)	0.00	0.01	0.03
TOTAL INTERFERENCE RESPONSE			**1.20**
METHOD SPECIFICATION			**< 2.5%**

[(a)] The larger of the absolute values obtained for the interferent tested with and without the pollutant present was used in summing the interferences.

Chad Walker

INTERFERENCE CHECK

Date: 12/4/14-12/5/14
Analyzer Type: Servomex - CO_2
Model No: 4900
Serial No: 49000-652921
Calibration Span: 16.65%
Pollutant: 16.65% CO_2 - CC418692

INTERFERENT GAS	ANALYZER RESPONSE		% OF CALIBRATION SPAN[(a)]
	INTERFERENT GAS RESPONSE (%)	INTERFERENT GAS RESPONSE, WITH BACKGROUND POLLUTANT (%)	
CO_2 (30.17% CC199689)	NA .	NA	NA
NO (445 ppm CC346681)	0.00	0.02	0.10
NO_2 (23.78 ppm CC500749)	0.00	0.00	0.02
N_2O (90.4 ppm CC352661)	0.00	0.01	0.04
CO (461.5 ppm XC006064B)	0.00	0.01	0.00
SO_2 (451.2 ppm CC409079)	0.00	0.11	0.64
CH_4 (453.1 ppm SG901795)	0.00	0.07	0.44
H_2 (552 ppm ALM048043)	0.00	0.04	0.22
HCl (45.1 ppm CC17830)	0.10	0.06	0.60
NH_3 (9.69 ppm CC58181)	0.00	0.02	0.14
TOTAL INTERFERENCE RESPONSE			**2.19**
METHOD SPECIFICATION			**< 2.5%**

[(a)] The larger of the absolute values obtained for the interferent tested with and without the pollutant present was used in summing the interferences.

Chad Walker

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 1
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI79E15A00E4	Reference Number:	160-401643970-1
Cylinder Number:	EB0109777	Cylinder Volume:	150.5 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2015 PSIG
PGVP Number:	A12019	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Nov 04, 2019

Expiration Date: Nov 04, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	9.000 %	9.108 %	G1	+/- 0.5% NIST Traceable	11/04/2019
OXYGEN	12.00 %	12.00 %	G1	+/- 0.3% NIST Traceable	11/04/2019
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	102505	K025852	7.016 % CARBON DIOXIDE/NITROGEN	+/- 0.5%	Jan 13, 2022
NTRM	120620	CC367413	22.883 % OXYGEN/NITROGEN	+/- 0.2%	May 14, 2026

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
HORIBA VA5011 T5V6VU9P NDIR CO2	NDIR	Oct 10, 2019
SIEMENS OXYMAT 6 - W5951 - O2	PARAMAGNETIC	Oct 22, 2019

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
630 United Drive
Durham, NC 27713
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI79E15A0099	Reference Number:	122-401303401-1
Cylinder Number:	XC008031B	Cylinder Volume:	146.2 CF
Laboratory:	124 - Durham (SAP) - NC	Cylinder Pressure:	2015 PSIG
PGVP Number:	B22018	Valve Outlet:	590
Gas Code:	O2,BALN	Certification Date:	Sep 17, 2018

Expiration Date: Sep 17, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	20.90 %	20.78 %	G1	+/- 0.4% NIST Traceable	09/17/2018
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	08010202	1D003076	23.20 % OXYGEN/NITROGEN	+/- 0.4%	Jun 01, 2024

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba MPA510 O2 41499150042	Paramagnetic	Aug 22, 2018

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 1
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI62E15A0224	Reference Number:	160-401596463-1
Cylinder Number:	XC021800B	Cylinder Volume:	157.2 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2015 PSIG
PGVP Number:	A12019	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Sep 16, 2019

Expiration Date: Sep 16, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	17.00 %	17.29 %	G1	+/- 0.5% NIST Traceable	09/16/2019
OXYGEN	21.00 %	20.99 %	G1	+/- 0.3% NIST Traceable	09/16/2019
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	120101	K021622	17.97 % CARBON DIOXIDE/NITROGEN	+/-0.5%	Jan 11, 2024
NTRM	120620	CC367413	22.883 % OXYGEN/NITROGEN	+/- 0.2%	May 14, 2026

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
HORIBA VA5011 T5V6VU9P NDIR CO2	NDIR	Aug 19, 2019
SIEMENS OXYMAT 6 - W5951 - O2	PARAMAGNETIC	Aug 27, 2019

Triad Data Available Upon Request

Signature on file
Approved for Release

Long Cal and Temperature Cal Datasheet for Standard Dry Gas Meter Console

Calibrator: MDW | Meter Box Number: 23 | Ambient Temp: 72

Date: 15-Jan-20 | Wet Test Meter Number: P-2952 | Temp Reference Source: Thermocouple Simulator (Accuracy +/- 1°F)

Dry Gas Meter Number: 17087349

Baro Press, in Hg (Pb)	29.96

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)	Average, °F (Td)	Time, min (O)	Y	ΔH
0.5	5.0	960.880	72.0	76.00	76.0	13.9	1.0083	2.1589
		965.870		76.00				
		4.990		76.00				
1.0	5.0	967.850	70.0	75.00	75.0	10.1	1.0058	2.2668
		972.856		75.00				
		5.006		75.00				
1.5	10.0	973.858	70.0	75.00	75.0	16.8	0.9985	2.3519
		983.930		75.00				
		10.072		75.00				
2.0	10.0	984.942	70.0	76.00	76.0	14.6	1.0001	2.3640
		995.005		76.00				
		10.063		76.00				
3.0	10.0	996.068	70.0	77.00	77.5	11.9	0.9936	2.3491
		1006.200		78.00				
		10.132		77.50				
						Average	**1.0013**	**2.2982**

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 - differential across orifice
Y - ratio 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: Select Temperature ○ °C ◉ °F	Temperature Reading from Individual Thermocouple Input [1]						Average Temperature Reading	Temp Difference [2] (%)
	Channel Number							
	1	2	3	4	5	6		
32	32	32	32	32	32		32.0	0.0%
212	213	212	212	212	212		212.2	0.0%
932	933	933	933	932	932		932.6	0.0%
1832	1833	1832	1832	1833	1832		1832.4	0.0%

1 - Channel Temps must agree with +/- 5°F or 3°C

2 - Acceptable Temperature Difference less than 1.5 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(°F) + 460) - (\text{Test Temp}(°F) + 460)}{\text{Reference Temp}(°F) + 460}\right]$$

Y Factor Calibration Check Calculation

MODIFIED METHOD 0010 TEST TRAIN

DIVISION STACK

METER BOX NO. 23

2/8/2020 & 2/29/2020

	Run 1	Run 2	Run 3
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.	2.2	2.3	2.2
% O_2 = Percent oxygen by volume, dry basis.	17.3	17.2	17.3

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWd = (0.32 * 17.3) + (0.44 * 2.2) + (0.28 * (100 - (2.2 + 17.3)))$$

$$MWd = (5.54) + (0.97) + (22.54)$$

MWd =	29.04	29.06	29.04

Tma = Source Temperature, absolute(^oR)			
Tm = Average dry gas meter temperature , deg F.	50.3	56.3	51.0

$$Tma = Ts + 460$$

$$Tma = 50.33 + 460$$

Tma =	510.33	516.28	510.97

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	1.96	1.90	2.07
Pb = Barometric Pressure, in Hg.	30.07	29.88	30.05

$$Pm = Pb + (delta\ H / 13.6)$$

$$Pm = 30.07 + (1.96194444444445 / 13.6)$$

Pm =	30.21	30.02	30.20

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.	121.755	119.570	124.676
Y = Dry gas meter calibration factor (based on full calibration)	1.0013	1.0013	1.0013
Delta H@ = Dry Gas meter orifice calibration coefficient, in. H2O.	2.2982	2.2982	2.2982
avg SQRT Delta H = Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	1.3885	1.3697	1.4272
O = Total sampling time, minutes.	180	180	180

$$Yqa = (O / Vm) * SQRT (0.0319 * Tma * 29) / (Delta\ H@ * Pm * MWd) * avg\ SQRT\ Delta\ H$$

$$Yqa = (180.00 / 121.76) * SQRT (0.0319 * 510.33 * 29) / (2.30 * 30.21 * 29.04) * 1.39$$

$$Yqa = 1.478 * SQRT\ 472.109 / 2{,}016.485 * 1.39$$

Yqa =	0.9932	1.0065	0.9978

Diff = Absolute difference between Yqa and Y	0.81	0.52	0.35

$$Diff = ((Y - Yqa) / Y) * 100$$

$$Diff = ((1.0013 - 0.993) / 1.0013) * 100$$

Average Diff = 0.56

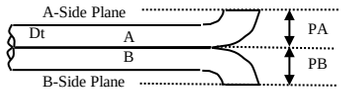
Allowable = 5.0

Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-562**

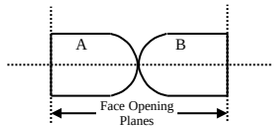
Inspection Date 1/14/20 Individual Conducting Inspection NG

If all Criteria PASS
Cp is equal to 0.84

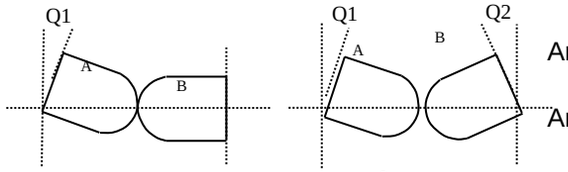


		PASS/FAIL
Distance to A Plane (PA) - inches	0.472	PASS
Distance to B Plane (PB) - inches	0.472	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

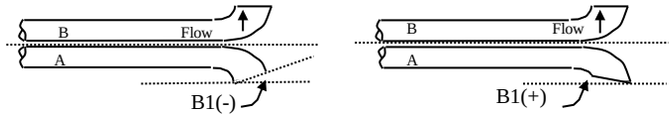


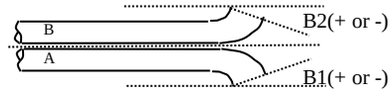
Are Open Faces Aligned Perpendicular to the Tube Axis — (●) YES ( ) NO — PASS



Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS

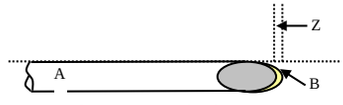
Q1 and Q2 must be $\leq 10^o$





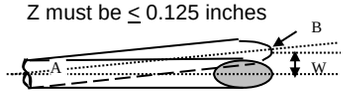
Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	1	PASS

B1 or B2 must be $\leq 5^o$



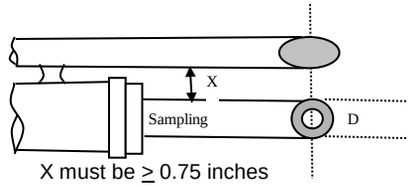
Z must be ≤ 0.125 inches

Horizontal offset between A and B Tubes (Z) - inches	0.012	PASS



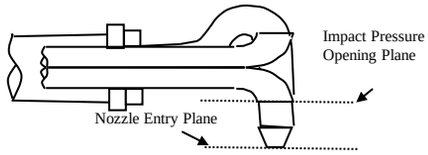
W must be ≤ 0.03125 inches

Vertical offset between A and B Tubes (W) - inches	0.016	PASS

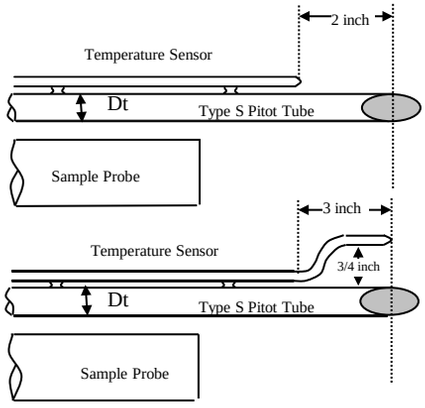


X must be ≥ 0.75 inches

Distance between Sample Nozzle and Pitot (X) - inches	0.945	PASS



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

UNI-VOS Console Calibration

Quality - Service - Reliability

ENVIRONMENTAL SUPPLY COMPANY
VOST 9

Console Model Number :	UNI-VOS-ACD
Console Serial Number :	1720-D

Calibration Date : March 26, 2019

DGM Model Number :	Actaris ACD G1.6
DGM Serial Number :	0000317

Digital Counter	
Model Number :	Red Lion Cub 5000
Scale Factor :	1.8709
CPL:	534.5

Standard Pressure (in Hg)	Standard Temperature (°K)
29.92	293

Reference Meter	
Model Number :	Shinagawa W-NK-1A
Serial Number :	538789
Y_c :	1.000

	Digital Volume UNI-VOS Console							Reference Meter							
				DGM Temperatures											
Flow Rate (lpm)	DGM Counter	Volume (liters)	Volume (std liters)	Initial (°C)	Final (°C)	AVG (°C)	DGM Pressure (in H_2O)	Volume Initial (liters)	Volume Final (liters)	Volume Total (liters)	Temp (°C)	Bar. Pressure (in Hg)	Y_c	Y_c Avg	% deviation
2.00	4323	8.088	8.078	20.6	20.7	20.6	2.40	571.917	580.047	8.130	20.3	29.77	1.000	1.000	0.0
	4325	8.092	8.079	20.7	20.7	20.7	2.40	580.047	588.179	8.132	20.4	29.77	1.000		0.0
	4324	8.090	8.075	20.8	20.9	20.8	2.40	588.179	596.307	8.128	20.4	29.77	1.000		0.0
1.00	4490	8.400	8.366	20.9	21.0	20.9	1.20	596.724	605.183	8.459	20.4	29.80	1.006	1.003	-0.3
	4547	8.507	8.469	21.0	21.1	21.0	1.20	605.183	613.649	8.466	20.5	29.80	0.994		0.9
	4490	8.400	8.359	21.2	21.2	21.2	1.20	613.649	622.123	8.474	20.5	29.80	1.008		-0.5
0.50	4374	8.183	8.132	21.2	21.2	21.2	0.75	622.298	630.439	8.141	20.5	29.80	0.995	0.997	0.2
	4395	8.223	8.168	21.3	21.4	21.3	0.75	630.439	638.605	8.166	20.5	29.80	0.994		0.3
	4366	8.168	8.113	21.4	21.4	21.4	0.75	638.605	646.783	8.178	20.5	29.80	1.002		-0.5

Y_c Avg	1.000

signature

03/26/19
date

Post Test Calibration

Calibrator MDW | **Box Number** 9 | **Client** Chemours

Date 17-Mar-20 | **Wet Test Meter Number** 10BB-1 | **Location/Plant** Fayetteville, NC

Dry Gas Meter Number 317 | **PreTest Y** 1.0000

Setting			Gas Volume		Temperatures				Baro Press, in Hg (Pb)	29.76
Liters per minute	Roto-meter	Orifice Manometer in H_20 (ΔH)	Wet Test Meter liters (Vw)	Dry gas Meter liters (Vd)	Wet Test Meter °F (Tw)	Dry Gas Meter (Outlet) Start, °F (Td_o)	End, °F (Td_o)	Average, °F (Td)	Time, min (O)	Results Y
1.50	1.50	1.80	15.00	0.000 15.085 15.085	72.0	70.00	69.00	69.5	10.1	0.9853
1.50	1.50	1.80	15.00	0.000 15.070 15.070	72.0	68.00	69.00	68.5	10.0	0.9844
1.50	1.50	1.80	15.00	0.000 15.085 15.085	72.0	69.00	69.00	69.0	10.1	0.9844
									Average	**0.9847**
									Difference[1]	**0.0153**

1 - Tolerance for Y is less than 0.0500

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
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

$$Y = \frac{Vw * Pb * (td + 460)}{Vd * \left[Pb + \frac{(\Delta H)}{13.6} \right] * (tw + 460)}$$

$$\Delta H = \left[\frac{0.0317 * \Delta H}{Pb * (td + 460)} \right] * \left[\frac{(tw + 460) * O}{Vw} \right]^2$$

Long Cal and Temperature Cal Datasheet for VOST Dry Gas Meter Console

Calibrator MDW **VOST Box Number** VOST 5 **Ambient Temp** 72

Date 17-Nov-19 **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)	30.7
			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	10.0	0.000	68.0	20.00	20.00	68.0	10.2	1.0038
				9.951		20.00	20.00			
				9.951		20.00	20.00			
1.00	1.20	0.85	10.0	0.000	72.5	20.50	20.50	69.5	10.0	1.0000
				9.923		21.00	21.00			
				9.923		20.75	22.80			
1.5	1.7	1.2	15.0	0.000	72.5	22.20	22.20	72.0	11.0	0.9982
				14.970		22.20	22.20			
				14.970		22.20	22.20			
2.0	2.3	2.0	20.0	0.000	72.5	22.80	22.80	73.0	20.0	0.9962
				20.000		22.80	22.80			
				20.000		22.80	22.80			
									Average	**0.9996**

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 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(^\circ F) + 460) - (\text{Test Temp}(^\circ F) + 460)}{\text{Reference Temp}(^\circ F) + 460} \right]$$

Post Test Wet Test Meter Calibration Datasheet for VOST Dry Gas Meter Console

Calibrator MDW | **VOST** **Box Number** 5 | **Client** Chemours

Date 17-Mar-20 | **Wet Test Meter Number** 10BB-1 | **Location/Plant** Fayetteville,NC

Dry Gas Meter Number 3605443 | **PreTest Y** 0.9996

Setting			Gas Volume		Temperatures				Baro Press, in Hg (Pb)	29.96
Liters per minute	Roto-meter	Orifice Manometer in H_20 (ΔH)	Wet Test Meter liters (Vw)	Dry gas Meter liters (Vd)	Wet Test Meter °F (Tw)	Dry Gas Meter Outlet, °F (Td_o)		Dry Gas Meter Average, °F (Td)	Time, min (O)	Results Y
0.50	0.50	1.20	5.0	0.000 5.100 5.100	72.0	70.00	70.00	70.0	9.0	0.9738
0.50	0.50	1.20	5.0	0.000 5.000 5.000	72.0	70.00	70.00	70.0	9.0	0.9933
0.50	0.50	1.20	5.0	0.000 4.950 4.950	72.0	72.00	71.00	71.5	9.0	1.0062
									Average	**0.9911**
									Difference[1]	**0.0085**

1 - Tolerance for Y is less than 0.0500

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

$$Y = \frac{Vw * Pb * (td + 460)}{Vd * \left[Pb + \frac{(\Delta H)}{13.6} \right] * (tw + 460)}$$

$$\Delta H = \left[\frac{0.0317 * \Delta H}{Pb * (td + 460)} \right] * \left[\frac{(tw + 460) * O}{Vw} \right]^2$$

No Long Calibration Required

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 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(^\circ F) + 460) - (\text{Test Temp}(^\circ F) + 460)}{\text{Reference Temp}(^\circ F) + 460} \right]$$

Post Test Calibration

Calibrator MDW | **Box Number** 8 | **Client** Chemours

Date 16-Mar-20 | **Wet Test Meter Number** 10BB-1 | **Location/Plant** Fayetteville, NC

Dry Gas Meter Number 3602380 | **PreTest Y** 1.0088

Setting			Gas Volume		Temperatures				Baro Press, in Hg (Pb)	30.27
Liters per minute	Roto-meter	Orifice Manometer in H_20 (ΔH)	Wet Test Meter liters (Vw)	Dry gas Meter liters (Vd)	Wet Test Meter °F (Tw)	Dry Gas Meter (Outlet) Start, °F (Td_o)	End, °F (Td_o)	Average, °F (Td)	Time, min (O)	Results Y
0.50	0.50	1.00	5.00	0.000 4.840 4.840	72.0	71.00	72.00	71.5	8.0	1.0296
0.50	0.50	1.00	5.00	0.000 5.010 5.010	70.5	72.00	73.00	72.5	7.9	0.9993
0.50	0.50	1.00	5.00	0.000 4.928 4.928	70.5	73.00	73.00	73.0	7.9	1.0169
									Average	**1.0153**
									Difference[1]	**0.0065**

1 - Tolerance for Y is less than 0.0500

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
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

$$Y = \frac{Vw * Pb * (td + 460)}{Vd * \left[Pb + \frac{(\Delta H)}{13.6} \right] * (tw + 460)}$$

$$\Delta H = \left[\frac{0.0317 * \Delta H}{Pb * (td + 460)} \right] * \left[\frac{(tw + 460) * O}{Vw} \right]^2$$

APPENDIX F
LIST OF PROJECT PARTICIPANTS

The following WESTON employees participated in this project.

Paul Meeter	Senior Project Manager
Wes Fritz	Senior Project Manager
Jeff O'Neill	Senior Project Manager
Kyle Schweitzer	Team Member
Matt Winkeler	Team Member
Steve Rathfon	Team Member
Nick Guarino	Team Member
Jack Mills	Team Member
Chris Hartsky	Team Member
Austin Squires	Team Member