FLUOROMONOMERS
MANUFACTURING PROCESS
CARBON ADSORPTION BED
EMISSIONS TEST REPORT
TEST DATES: 21 AND 22 AUGUST 2018

THE CHEMOURS COMPANY
FAYETTEVILLE, NORTH CAROLINA

Prepared for:

THE CHEMOURS COMPANY
22828 NC Hwy 87 W
Fayetteville, North Carolina 28306

Prepared by:

WESTON SOLUTIONS, INC.
1400 Weston Way
P.O. Box 2653
West Chester, Pennsylvania 19380

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1. INTRODUCTION

1.1 FACILITY AND BACKGROUND INFORMATION

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

Chemours contracted Weston Solutions, Inc. (WESTON) to perform HFPO Dimer Acid Fluoride, captured as HFPO Dimer Acid emission testing on the Vinyl Ethers North (VE North) Carbon Bed. Testing was performed on 21 and 22 August 2018 and generally followed the "Emission Test Protocol" reviewed and approved by the North Carolina Department of Environmental Quality (NCDEQ). This report provides the results from the emission test program.

1.2 TEST OBJECTIVES

The specific objectives for this test program were as follows:

- Measure the emissions concentrations and mass emissions rates of HFPO Dimer Acid Fluoride from the VE North Carbon Bed inlet and outlet which are located in the Fluoromonomers processes.
- Calculate the carbon bed removal efficiency for HFPO Dimer Acid.
- Monitor and record process and emissions control data in conjunction with the test program.
- Provide representative emissions data.

1.3 TEST PROGRAM OVERVIEW

During the emissions test program, the concentrations and mass emissions rates of HFPO Dimer Acid Fluoride were measured on two sources.

Table 1-1 provides 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 C includes the summary reports for the laboratory analytical results. The full laboratory data packages are provided in electronic format and on CD with each hard copy.

Table 1-1
Sampling Plan for VE North Carbon Bed Periodic Testing

Sampling Point & Location	**VE North Carbon Bed**				
Number of Tests:	6 (3 inlet and 3 outlet)				
Parameters To Be Tested:	HFPO Dimer Acid (HFPO-DA)	Volumetric Flow Rate and Gas Velocity	Carbon Dioxide	Oxygen	Water Content
Sampling or Monitoring Method	EPA M-0010	EPA M1, M2, M3A, and M4 in conjunction with M-0010 tests	EPA M3/3A		EPA M4 in conjunction with M-0010 tests
Sample Extraction/ Analysis Method(s):	LC/MS/MS	NA[6]	NA		NA
Sample Size	≥ 1.5m^3	NA	NA	NA	NA
Total Number of Samples Collected[1]	6	6	6	6	6
Reagent Blanks (Solvents, Resins)[1]	1 set	0	0	0	0
Field Blank Trains[1]	1 per source	0	0	0	0
Proof Blanks[1]	1 per train	0	0	0	0
Trip Blanks[1,2]	1 set	0	0	0	
Lab Blanks	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Samples (LCS)	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Sample Duplicate (LCSD)	1 per fraction[3]	0	0	0	0
Media Blanks	1 set[4]	0	0	0	0
Isotope Dilution Internal Standard Spikes	Each sample	0	0	0	0
Total No. of Samples	10[5]	6	6	6	6

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.

[6] Not applicable.

2. SUMMARY OF TEST RESULTS

A total of three test runs were performed on the VE North carbon bed inlet and outlet. Table 2-1 provides a summary of the HFPO Dimer Acid carbon bed emissions test results and removal efficiency. Detailed test results summaries are provided in Section 6.

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

Table 2-1
Summary of HFPO Dimer Acid Carbon Bed Test Results

	Inlet		Outlet		Removal Efficiency
	g/sec	lb/hr	g/sec	lb/hr	%
VE North Carbon Bed					
R1	5.26E-03	4.18E-02	1.07E-04	8.53E-04	98.0
R2	6.51E-03	5.17E-02	1.14E-04	9.06E-04	98.2
R3	5.04E-03	4.00E-02	9.99E-05	7.94E-04	98.0
Average	5.60E-03	4.45E-02	1.07E-04	8.51E-04	98.1

3. PROCESS DESCRIPTIONS

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

3.1 FLUOROMONOMERS

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

The VEN building air systems are vented to the carbon bed and connected to the Tower Exhaust Blower. At the time of testing, process emissions were not vented to the VEN carbon bed.

3.2 PROCESS OPERATIONS AND PARAMETERS

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

Source	Operation/Product	Batch or Continuous
VE North	PPVE	Semi-continuous – Condensation is continuous Agitated Bed Reactor, Refining (ether column) is batch

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

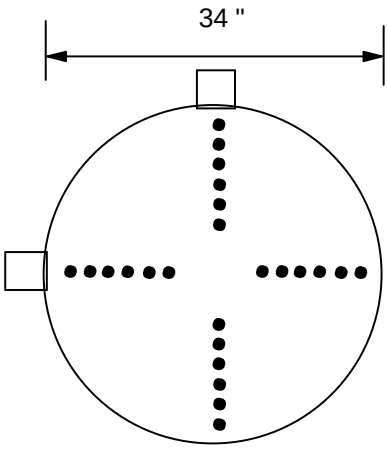
- Fluoromonomers Process
  - VEN Precurser Rate
  - VEN Condensation Rate
  - VEN ABR Rate

4. DESCRIPTION OF TEST LOCATIONS

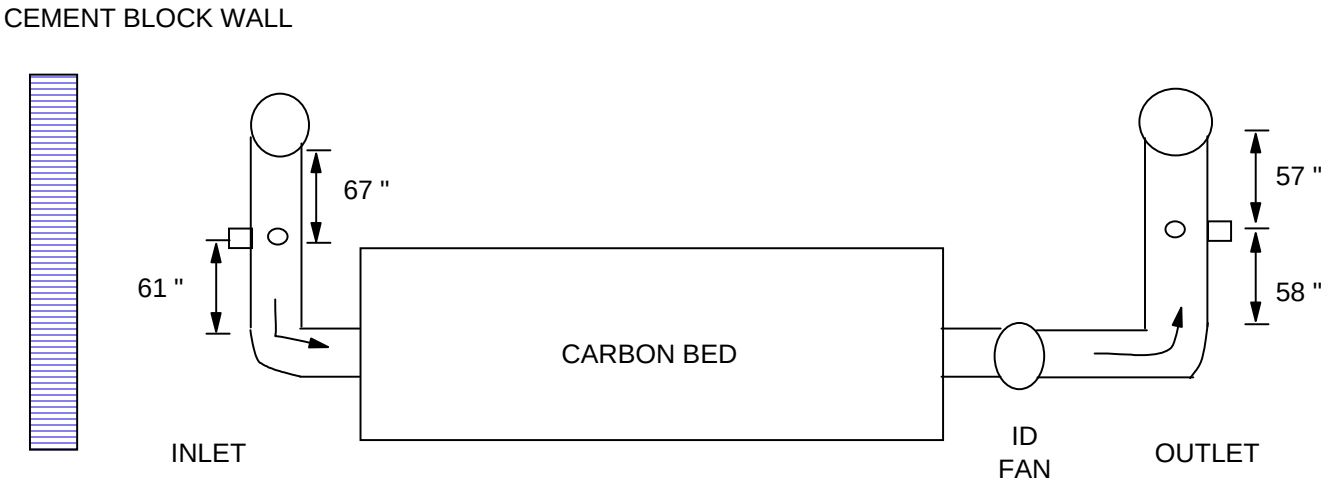
4.1 VINYL ETHERS NORTH CARBON BED

Each fiberglass reinforced plastic (FRP) duct at the inlet and outlet of the Division carbon bed is 34" ID. The test ports are located as shown below. Based on EPA Method 1, a total of 24 traverse points (12 per port) were required for HFPO Dimer Acid sampling at both locations. Figure 4-1 provides a schematic of the test port and traverse port locations.

Location	Distance from Flow Disturbance	
	Downstream (B)	Upstream (A)
Inlet	67 inches > 1.9 duct diameters	61 inches > 1.8 duct diameters
Outlet	58 inches > 1.7 duct diameters	57 inches > 1.5 duct diameters



TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	3/4
2	2 1/4
3	4
4	6
5	8 1/2
6	12 1/8
7	21 5/8
8	25 1/2
9	28
10	30
11	31 3/4
12	33 1/4



DRAWING NOT TO SCALE

FIGURE 4-1
VE NORTH PROCESS CARBON BED INLET AND OUTLET SCHEMATIC

IASDATA\CHEMOURS\15418.002.007\FIGURE 4-1 VE NORTH PROCESS SCHEMATIC

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 each 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 had been conducted at each test location. The cyclonic flow checks were negative (< 20°) verifying that both sources were 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 was an EPA Method 0010 train (see Figure 5-1). The Method 0010 consisted of a borosilicate nozzle that attached directly to a heated borosilicate probe. In order to minimize possible thermal degradation of the HFPO Dimer Acid, the probe and particulate filter were heated above stack temperature to minimize water vapor condensation before the filter. The probe was connected directly to a heated borosilicate filter holder containing a solvent extracted glass fiber filter.

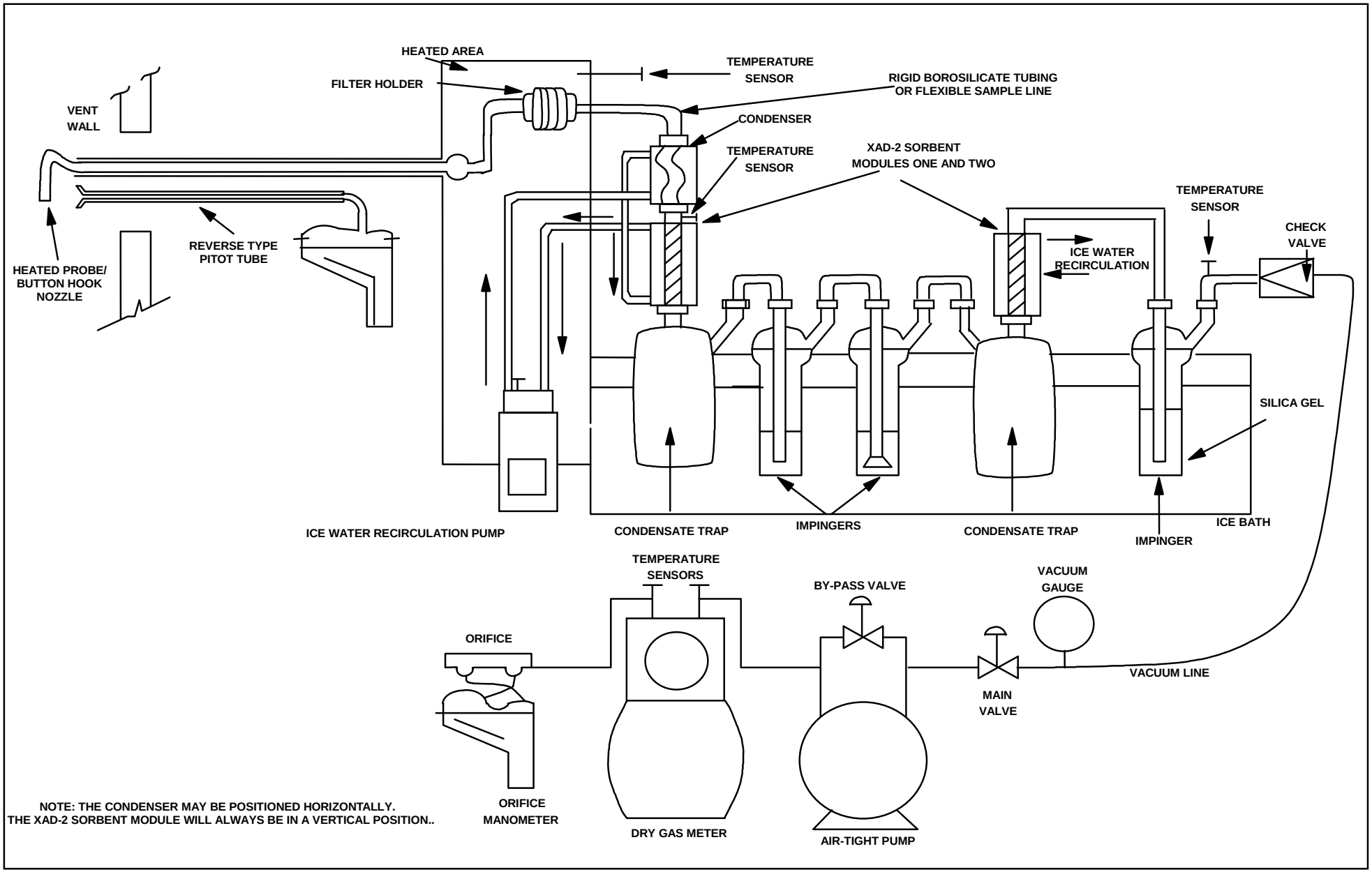


FIGURE 5-1
EPA METHOD 0010 SAMPLING TRAIN

IASDATA\CHEMOURS\15418.002.007\FIGURE 5-1 METHOD 0010

A section of borosilicate glass [or flexible polyethylene tubing (Division carbon bed inlet and outlet only)] connected the filter holder exit to a Grahm (spiral) type ice water-cooled condenser, an icewater-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-L 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 both XAD-2 modules to maintain method required temperature. A control console with a leakless vacuum pump, a calibrated orifice, and dual inclined manometers was connected to the final impinger via an umbilical cord to complete the sample train.

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

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

5.2.2 EPA Method 0010 Sample Recovery

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

A consistent procedure was employed for sample recovery:

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

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

3. The particulate adhering to the internal surfaces of the nozzle, probe and front half of the filter holder were rinsed with a solution of methanol and ammonium hydroxide into a polyethylene container while brushing a minimum of three times until no visible particulate remains. 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 the impingers one, two, and second condensate trap were measured, the values recorded, and sample was placed in the same container as step 4 above and sealed.

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

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

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

Each container was labeled to clearly identify its contents. The height of the fluid level was marked on the container of each liquid sample to provide a reference point for a leakage check during transport. All samples were maintained cool.

During each test campaign, a Method 0010 blank train was setup near the test location, leak checked and recovered along with the respective sample train. Following sample recovery, all samples were transported to the TestAmerica Inc. for sample extraction and analysis.

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

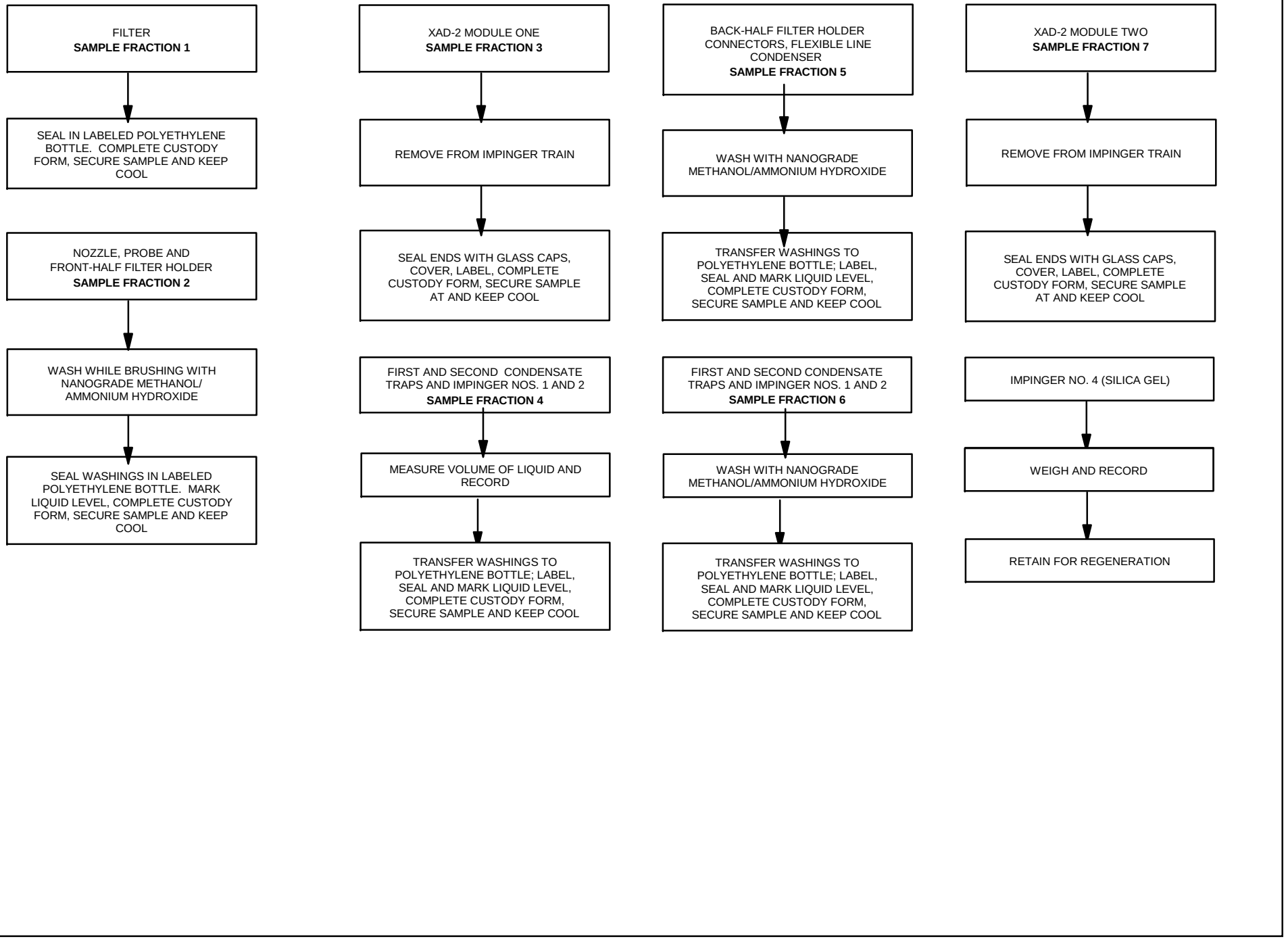


FIGURE 5-2
HFPO DIMER ACID SAMPLE RECOVERY PROCEDURES FOR METHOD 0010

IASDATA\CHEMOURS\15418.002.007\FIGURE 5-2 EPA 0010

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

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.

Test America developed detailed procedures for the sample extraction and analysis for HFPO Dimer Acid. These procedures were incorporated into the test protocol and are summarized in Appendix C.

5.3 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 5-3.

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

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

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

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

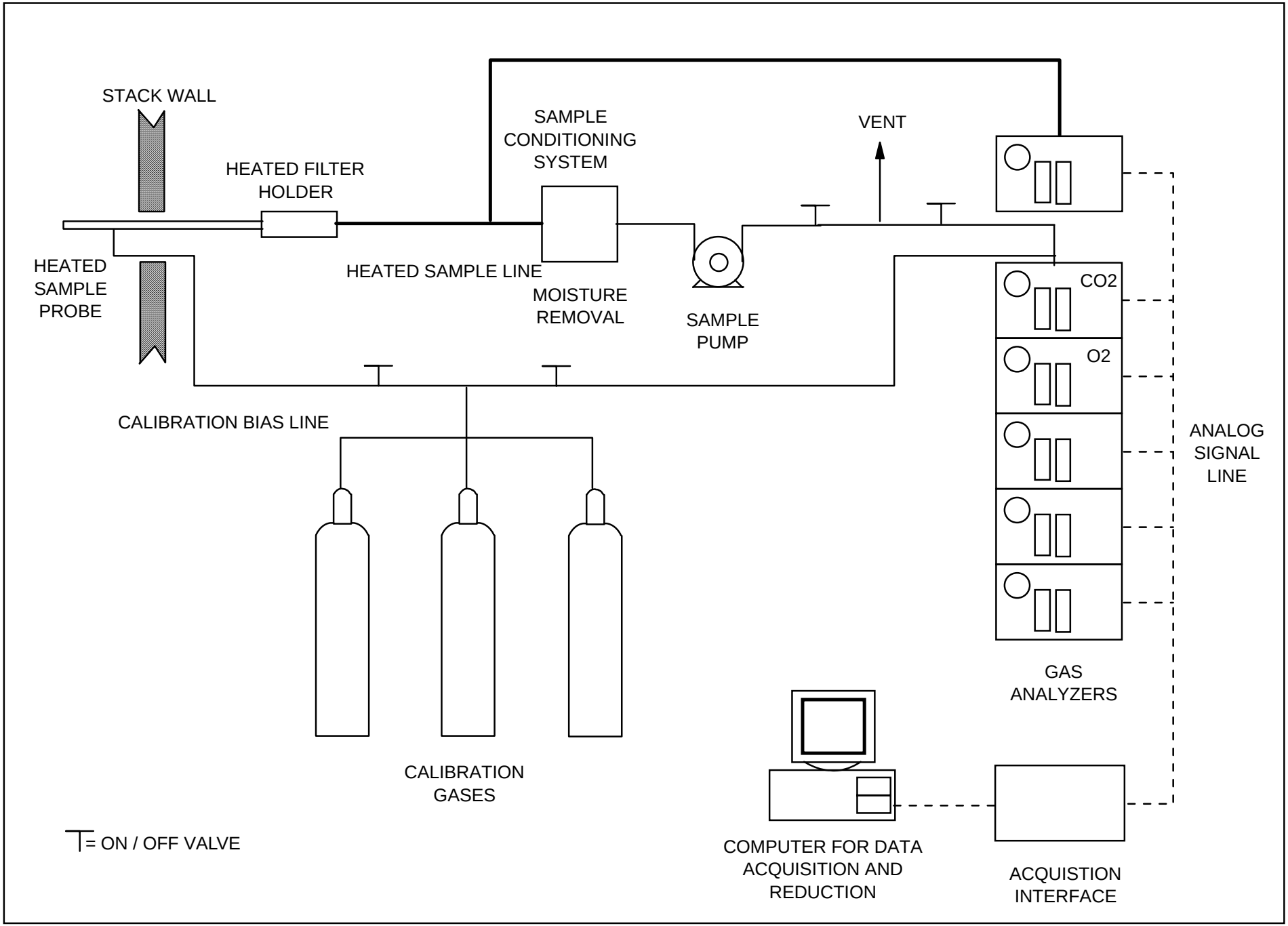


FIGURE 5-3
WESTON SAMPLING SYSTEM

IASDATA\CHEMOURS\15418.002.007\FIGURE 5-3 WESTON SAMPLING SYSTEM

6. DETAILED TEST RESULTS AND DISCUSSION

Preliminary testing of inlet samples to the carbon bed and the associated analytical results required significant sample dilution to bring the HFPO Dimer Acid concentration within instrument calibration, therefore, sample times and sample volumes were reduced for the formal test program. This was approved by the North Carolina Department of Environmental Quality (NCDEQ).

Each test was a minimum of 90 minutes in duration. A total of three test runs were performed on the Division carbon bed.

Tables 6-1 and 6-2 provide detailed test data and test results for the Division carbon bed.

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

The carbon bed removal efficiency was calculated based upon the HFPO Dimer Acid inlet and outlet mass emission rates in lb/hr.

TABLE 6-1
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
VE NORTH CARBON BED INLET

Test Data			
Run number	1	2	3
Location	VEN-CBed IN	VEN-CBed IN	VEN-CBed IN
Date	8/21/2018	8/21/2018	8/22/2018
Time period	0915-1115	1332-1532	0852-1047
SAMPLING DATA:			
Sampling duration, min.	96.0	96.0	96.0
Nozzle diameter, in.	0.218	0.218	0.218
Cross sectional nozzle area, sq.ft.	0.000259	0.000259	0.000259
Barometric pressure, in. Hg	30.04	30.02	29.93
Avg. orifice press. diff., in H_2O	1.46	1.40	1.41
Avg. dry gas meter temp., deg F	85.7	89.8	82.0
Avg. abs. dry gas meter temp., deg. R	546	550	542
Total liquid collected by train, ml	49.8	59.2	45.9
Std. vol. of H_2O vapor coll., cu.ft.	2.3	2.8	2.2
Dry gas meter calibration factor	1.0015	1.0015	1.0015
Sample vol. at meter cond., dcf	64.659	63.485	63.656
Sample vol. at std. cond., dscf [(1)]	63.106	61.455	62.311
Percent of isokinetic sampling	105.2	102.8	102.5
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.036	0.043	0.034
Mole fraction of dry gas	0.964	0.957	0.966
Molecular wt. of wet gas, lb/lb mole	28.45	28.37	28.47
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	-6.50	-6.50	-6.50
Absolute pressure, in. Hg	29.56	29.54	29.45
Avg. temperature, deg. F	93	96	86
Avg. absolute temperature, deg.R	553	556	546
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	24	24	24
Avg. gas stream velocity, ft./sec.	44.2	44.6	44.3
Stack/duct cross sectional area, sq.ft.	6.31	6.31	6.31
Avg. gas stream volumetric flow, wacf/min.	16722	16878	16754
Avg. gas stream volumetric flow, dscf/min.	15204	15146	15408

[(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
VE NORTH CARBON BED INLET

TEST DATA				
Run number	1	2	3	**AVG**
Location	VEN-CBed IN	VEN-CBed IN	VEN-CBed IN	
Date	8/21/2018	8/21/2018	8/22/2018	
Time period	0915-1115	1332-1532	0852-1047	
LABORATORY REPORT DATA, ug.				
HFPO Dimer Acid	1311.08	1587.00	1224.00	
EMISSION RESULTS, ug/dscm.				
HFPO Dimer Acid	733.53	911.76	693.55	**779.61**
EMISSION RESULTS, lb/dscf.				
HFPO Dimer Acid	4.58E-08	5.69E-08	4.33E-08	**4.87E-08**
EMISSION RESULTS, lb/hr.				
HFPO Dimer Acid	4.18E-02	5.17E-02	4.00E-02	**4.45E-02**
EMISSION RESULTS, g/sec.				
HFPO Dimer Acid	5.26E-03	6.51E-03	5.04E-03	**5.60E-03**

TABLE 6-2
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
VE NORTH CARBON BED OUTLET

Test Data			
Run number	1	2	3
Location	VEN-CBed Outlet	VEN-CBed Outlet	VEN-CBed Outlet
Date	8/21/2018	8/21/2018	8/22/2018
Time period	0915-1115	1332-1532	0852-1047
SAMPLING DATA:			
Sampling duration, min.	96.0	96.0	96.0
Nozzle diameter, in.	0.215	0.210	0.210
Cross sectional nozzle area, sq.ft.	0.000252	0.000241	0.000241
Barometric pressure, in. Hg	30.04	30.02	29.93
Avg. orifice press. diff., in H_2O	1.42	1.28	1.29
Avg. dry gas meter temp., deg F	83.9	90.4	81.6
Avg. abs. dry gas meter temp., deg. R	544	550	542
Total liquid collected by train, ml	43.8	55.7	46.4
Std. vol. of H_2O vapor coll., cu.ft.	2.1	2.6	2.2
Dry gas meter calibration factor	0.9850	0.9850	0.9850
Sample vol. at meter cond., dcf	65.177	62.620	62.216
Sample vol. at std. cond., dscf [(1)]	62.763	59.533	59.931
Percent of isokinetic sampling	102.1	101.3	101.0
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.032	0.042	0.035
Mole fraction of dry gas	0.968	0.958	0.965
Molecular wt. of wet gas, lb/lb mole	28.49	28.38	28.45
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	4.30	4.30	4.30
Absolute pressure, in. Hg	30.36	30.34	30.25
Avg. temperature, deg. F	99	99	95
Avg. absolute temperature, deg.R	559	559	555
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	24	24	24
Avg. gas stream velocity, ft./sec.	45.6	46.3	46.2
Stack/duct cross sectional area, sq.ft.	6.31	6.31	6.31
Avg. gas stream volumetric flow, wacf/min.	17261	17514	17460
Avg. gas stream volumetric flow, dscf/min.	16013	16049	16205

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

TABLE 6-2 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
VE NORTH CARBON BED OUTLET

TEST DATA			
Run number	1	2	3
Location	VEN-CBed Outlet	VEN-CBed Outlet	VEN-CBed Outlet
Date	8/21/2018	8/21/2018	8/22/2018
Time period	0915-1115	1332-1532	0852-1047
LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	25.26	25.40	22.20
EMISSION RESULTS, ug/dscm.			
HFPO Dimer Acid	14.21	15.07	13.08
EMISSION RESULTS, lb/dscf.			
HFPO Dimer Acid	8.87E-10	9.41E-10	8.16E-10
EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	8.53E-04	9.06E-04	7.94E-04
HFPO Dimer Acid (From Inlet Data)	4.18E-02	5.17E-02	4.00E-02
EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	1.07E-04	1.14E-04	9.99E-05
Carbon Bed Removal Efficiency, %	98.0	98.2	98.0

APPENDIX A
PROCESS OPERATIONS DATA

Date	**8/21/2018**
Time	800 900 1000 1100 1200 1300 1400 1500 1600
Stack Testing	915 - 1115 (RUN 1) 1332-1532 (RUN 2)
HFPO	
VEN Product	PPVE
VEN Precursor	
VEN Condensation (HFPO)	
VEN ABR	Burnout
VEN Refining	
Stripper Column Vent	
Division WGS Recirculation Flow	13500 kg/h
Division WGS Inlet Flow	50 kg/h

Date	**8/22/2018**
Time	800 900 1000 1100 1200 1300 1400 1500 1600
Stack Testing	852- 1047 (Run 3)
HFPO	
VEN Product	PPVE
VEN Precursor	
VEN Condensation (HFPO)	
VEN ABR	
VEN Refining	
Stripper Column Vent	
Division WGS Recirculation Flow	13000 kg/h
Division WGS Inlet Flow	54 kg/h

APPENDIX B
RAW AND REDUCED TEST DATA

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
VE NORTH CARBON BED INLET

Test Data

Run number	1	2	3
Location	VEN-CBed IN	VEN-CBed IN	VEN-CBed IN
Date	8/21/2018	8/21/2018	8/22/2018
Time period	0915-1115	1332-1532	0852-1047
Operator	KA/JL	KA/JL	KA/JL

Inputs For Calcs.

Sq. rt. delta P	0.75908	0.76308	0.76432
Delta H	1.4625	1.4042	1.4125
Stack temp. (deg.F)	93.0	95.5	86.0
Meter temp. (deg.F)	85.7	89.8	82.0
Sample volume (act.)	64.659	63.485	63.656
Barometric press. (in.Hg)	30.04	30.02	29.93
Volume H_2O imp. (ml)	29.5	39.4	27.6
Weight change sil. gel (g)	20.3	19.8	18.3
% CO_2	0.0	0.0	0.0
% O_2	20.9	20.9	20.9
% N_2	79.1	79.1	79.1
Area of stack (sq.ft.)	6.305	6.305	6.305
Sample time (min.)	96.0	96.0	96.0
Static pressure (in.H_2O)	-6.50	-6.50	-6.50
Nozzle dia. (in.)	0.218	0.218	0.218
Meter box cal.	1.0015	1.0015	1.0015
Cp of pitot tube	0.84	0.84	0.84
Traverse points	24	24	24

INLET

Sample and Velocity Traverse Point Data Sheet - Method 1

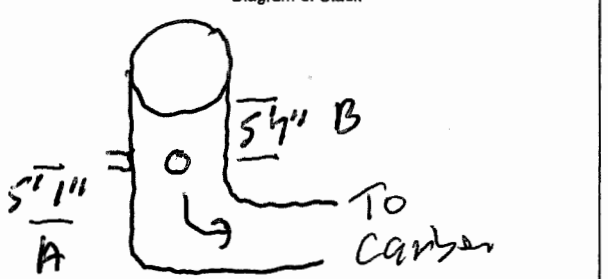
Client Chemours Operator AS
Loaction/Plant Fayetteville NC Date 6-13-13
Source VE Nort Carbon Inlet W.O. Number

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

Distance from far wall to outside of port (in.) = C	54 5/8"
Port Depth (in.) = D	20 5/8"
Depth of Duct, diameter (in.) = C-D	34"
Area of Duct (ft^2)	6.305
Total Traverse Points	24
Total Traverse Points per Port	12
Port Diameter (in.) ---(Flange-Threaded-Hole)	
Monorail Length	
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	X
Total Ports (rectangular duct only)	X
Equivalent Diameter = (2*L*W)/(L+W)	X

Flow Disturbances	
Upstream - A (ft)	5' 7"
Downstream - B (ft)	3' 1"
Upstream - A (duct diameters)	1.97
Downstream - B (duct diameters)	1.80

Diagram of Stack



Traverse Point Locations

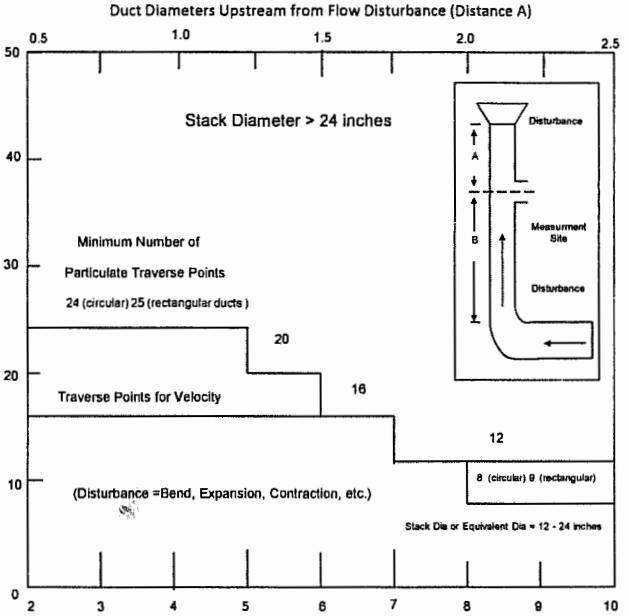
Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	.021	3/4	21 3/8
2	.067	2 1/4	22 1/8
3	.118	4	24 5/8
4	.177	6	26 5/8
5	.250	8 1/2	29 1/8
6	.356	12 1/8	32 3/4
7	.644	21 7/8	42 1/2
8	.750	25 1/2	46 1/8
9	.822	28	48 5/8
10	.882	30	50 5/8
11	.933	31 3/4	52 3/8
12	.979	33 1/4	53 1/8

CEM 3 Point(Long Measurment Line) Stratificaton Point Locations

1	0.167		
2	0.50		
3	0.833		

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

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

Traverse Point Location Percent of Stack -Rectangular

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

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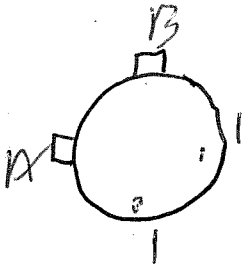
INLET

Determination of Stack Gas Velocity - Method 2



Client: Clemson | Operator: KA | Pitot Coeff (Cp): .842
Location/Plant: Fayetteville NC | Date: 6/13/18 | Stack Area, ft² (As): 6.305
Source: VE Wood Carbon Inlet | W.O. Number: | Pitot Tube/Thermo ID: P703

Run Number	2		
Time	1500		
Barometric Press, in Hg (Pb)	30.01		
Static Press, in H_2O (Pstatic)	-4.2		
Source Moisture, % (BWS)	~2.0		
O_2, %	20.9		
CO_2, %	0.0		

Cyclonic Flow Determination		Traverse Location		Leak Check good? (Y)/ N		Leak Check good? Y/ N		Leak Check good? Y/ N	
Delta P at 0°	Angle yeilding zero Delta P	Port	Point	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
0	0	A	1	.44	94				
0	0		2	.41	94				
0	0		3	.44	94				
0	0		4	.46	94				
0	0		5	.43	94				
0	0		6	.45	94				
0	0		7	.60	94				
0	0		8	.62	94				
0	0		9	.64	94				
0	0		10	.66	94				
.02	.02		11	.63	94				
0	0		12	.60	94				
0	0	B	1	.55	94				
0	0		2	.57	95				
0	0		3	.55	95				
0	0		4	.55	95				
0	0		5	.53	95				
.01	1		6	.53	95				
0	0		7	.53	95				
0	0		8	.49	95				
.02	2		9	.52	95				
ITA000	0		10	.51	95				
0	0		11	.52	95				
.01	0		12	.50	95				
Avg Angle		Avg Delta P & Temp		.53	94.5				
		avg √DeltaP		.72643					
Average gas stream velocity, ft/sec.					42.1				
Vol. flow rate @ actual conditions, wacf/min				15940					
Vol. flow rate at standard conditions, dscf/min				14760					

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

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

$Tsa = Ts + 460$

$Ps = Pb + (Pstatic/13.6)$

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

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

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

K = 2.38
.215 = 1.26

where:
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,
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

Comments _____

WESTON MANAGERS DESIGNERS/CONSULTANTS

Method2

ISOKINETIC FIELD DATA SHEET

EPA Method 0010- HFPO Dimer Acid

Page 1 of 1

		Stack Conditions	Assumed	Actual
Client	The Chemours Company	% Moisture	2	
W.O.#	15418.002.007	Impinger Vol (ml)		29.5
Project ID	Chemours	Silica gel (g)		20.3
Mode/Source ID	Carbon Bed IN	CO2, % by Vol	0	
Samp. Loc. ID	IN	O2, % by Vol	20.9	
Run No.ID	1	Temperature (°F)	90	93
Test Method ID	M0010	Meter Temp (°F)	92	85.708
Date ID	21AUG2018	Static Press (in H_2O)	-6.5	-6.5
Source/Location	VE North Carbon Bed INLET			
Sample Date	21 Aug 18			
Baro. Press (in Hg)	30.04			
Operator	KA/JL	Ambient Temp (°F)	79	

Meter Box ID	27		
Meter Box Y	1.0015		
Meter Box Del H	1.9588		
Probe ID / Length			
Probe Material	Boro		
Pitot / Thermocouple ID	P71		
Pitot Coefficient	0.84		
Nozzle ID	.218		
Nozzle Measurements	.218	.218	.218
Avg Nozzle Dia (in)	.218		
Area of Stack (ft^2)	6.305		
Sample Time	96 min		
Total Traverse Pts	24		

K Factor 2.65 2.50

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.012	0.009	0.004
Leak Check @ (in Hg)	15"	9"	9"
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	80		81
Reference Temp	79		82
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	915			12.388									
B 1	4		.43	1.1	14.8	88	81	113	113	66	3	60		
2	8		.45	1.1	17.3	90	82	113	114	64	3	40		
3	12		.46	1.2	19.7	91	82	113	113	63	3	39		
4	16		.48	1.2	22.1	91	82	113	112	60	3	41		
5	20		.49	1.2	24.7	92	83	113	114	61	3	40		
6	24		.52	1.3	27.0	91	83	113	115	62	3	41		
7	28		.57	1.4	29.6	92	83	113	113	62	4	41		
8	32		.62	1.6	32.5	92	84	113	113	63	5	40		32.112
9	36		.67	1.7	35.4	92	84	113	113	63	5	41		
10	40		.70	1.8	38.4	93	85	113	115	62	5	41		
11	44		.74	1.9	41.4	93	84	113	115	61	6	41		
12	48	1003	.74	1.9	44.500	93	85	113	114	63	6	41		
														44.713 (-.287)
A 1	52	1027	.62	1.6	47.5	92	86	120	122	65	5	58		
2	56		.60	1.5	50.3	94	86	120	120	65	5	43		
3	60		.60	1.5	53.0	94	87	119	120	63	5	48		
4	64		.57	1.4	55.9	94	88	119	121	63	5	48		✓
5	68		.54	1.4	58.3	95	88	120	117	64	5	49		
6	72		.54	1.4	61.1	95	88	120	118	61	5	48		32.547
7	76		.60	1.5	63.7	95	89	120	120	63	5	46		
8	80		.61	1.5	66.5	95	89	120	121	64	5	42		
9	84		.64	1.6	69.1	95	89	120	119	63	5	42		
10	88		.61	1.5	71.9	95	90	119	118	64	5	42		VV
11	92		.56	1.4	74.6	95	90	120	121	65	5	43		SMP
12	96	1115	.54	1.4	77.260	95 ✓	89 ✓	120	121	65	5	45		
			Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
			.75908	1.4625	64.585	93.0	85.708	113/120	112/122	66	6	39/60		
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
			.57917	1.20601	66.659 ✓									

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EPA Method 0010 from EPA SW-846

top .42 - .84 ✓
side .78 - .53

105.1 3.6 % M
15200 63.0

ISOKINETIC FIELD DATA SHEET

EPA Method 0010- HFPO Dimer Acid

Page 1 of 1

		Stack Conditions	Assumed	Actual
Client	The Chemours Company	% Moisture	2	
W.O.#	15418.002.007	Impinger Vol (ml)		39.4
Project ID	Chemours	Silica gel (g)		19.8
Mode/Source ID	Carbon Bed IN	CO2, % by Vol	0	
Samp. Loc. ID	IN	O2, % by Vol	20.9	
Run No.ID	2	Temperature (°F)	94	89.75
Test Method ID	M0010	Meter Temp (°F)	98	95.5
Date ID	21AUG2018	Static Press (in H_2O)	-6.5	-6.5
Source/Location	VE North Carbon Bed INLET			
Sample Date	21 Aug 18			
Baro. Press (in Hg)	~~30.04~~ 30.02 KA	Ambient Temp (°F)	83	
Operator	KA/JL			

Meter Box ID	27		
Meter Box Y	.0015		
Meter Box Del H	1.9588		
Probe ID / Length			Sample Train (ft^3)
Probe Material		Boro	Leak Check @ (in Hg)
Pitot / Thermocouple ID	P711		Pitot leak check good
Pitot Coefficient		0.84	Pitot Inspection good
Nozzle ID	.218		Method 3 System good
Nozzle Measurements	.218	.218 .218	**Temp Check**
Avg Nozzle Dia (in)	.218		Meter Box Temp
Area of Stack (ft^2)	6.305		Reference Temp
Sample Time	96		Pass/Fail (+/- 2°)
Total Traverse Pts	24		Temp Change Response ?

K Factor 2.4

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.004	0.002	.002
Leak Check @ (in Hg)	15"	8"	8"
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	83		84
Reference Temp	84		85
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	1332			77620									
B	1	4		.42	1.0	79.9	96	88	120	118	66	3	64		
	2	8		.44	1.1	82.2	96	88	121	119	64	3	45		
	3	12		.46	1.1	84.5	96	88	120	121	63	3	42		
	4	16		.48	1.2	87.0	96	88	120	122	63	3	42		
	5	20		.49	1.2	89.5	97	89	120	120	62	3	43		
	6	24		.52	1.2	91.9	96	89	120	118	63	3	45		
	7	28		.57	1.4	94.5	96	89	120	118	63	4	45		
	8	32		.61	1.5	97.3	95	90	120	119	64	5	46		31,347
	9	36		.66	1.6	100.1	95	89	120	121	64	5	47		
	10	40		.72	1.7	103.0	95	89	121	122	65	5	48		
	11	44		.72	1.7	106.0	95	89	120	118	65	5	49		
	12	48	1420	.73	1.8	108.962	95	90	120	117	64	5	46		
															0.00208*
A	1	52	1444	.64	1.5	112.0	95	89	120	117	66	5	60		109.281
	2	56		.64	1.5	114.7	95	90	120	121	63	5	42		-.319
	3	60		.60	1.4	117.3	95	90	120	119	57	4	41		
	4	64		.60	1.4	120.0	95	91	120	118	57	4	43		
	5	68		.55	1.3	122.8	96	91	120	120	58	4	43		
	6	72		.57	1.4	125.3	KP 95	91	120	119	60	4	43		32,143
	7	76		.65	1.6	128.0	95	91	120	119	60	4 5 KA	42		
	8	80		.62	1.5	130.8	95	91	120	119	59	5	43		
	9	84		.64	1.5	133.6	95	91	120	119	61	5	43		√
	10	88		.61	1.5	136.3	96	91	120	121	61	5	43		
	11	92		.56	1.3	138.9	96	91	120	120	62	4	43		
	12	96	1532	.55	1.3	141.424	96	91	120	118	60	4	44		
				Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
				.76308	1.404 1.17	63.485	95.5	89.75	120/121	117/122	66	5	41/64		
				Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
				.58542	1.182	√√	√√	√√							

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1.76308

√√ √√

EPA Method 0010 from EPA SW-846

102.8 15144

4.3% m

ISOKINETIC FIELD DATA SHEET

EPA Method 0010- HFPO Dimer Acid

Page 1 of 1

		Stack Conditions	Assumed	Actual
Client	The Chemours Company			
W.O.#	15418.002.007			
Project ID	Chemours	% Moisture	3	
Mode/Source ID	Carbon Bed IN	Impinger Vol (ml)		276
Samp. Loc. ID	IN	Silica gel (g)		18.3
Run No.ID	3	CO2, % by Vol	0	
Test Method ID	M0010	O2, % by Vol	20.9	
Date ID	21AUG2018	Temperature (°F)	90	82.042
Source/Location	VE North Carbon Bed INLE	Meter Temp (°F)	90	86
Sample Date	22 Aug 18	Static Press (in H_2O)	-6.5	-6.5
Baro. Press (in Hg)	29.93			
Operator	KA/JL	Ambient Temp (°F)	80	

Meter Box ID	27		Sample Train (ft^3)	0.001	0.003	0.004
Meter Box Y	1.0015		Leak Check @ (in Hg)	15"	9"	8"
Meter Box Del H	1.9588		Pitot leak check good	yes / no	yes / no	yes / no
Probe ID / Length			Pitot Inspection good	yes / no	yes / no	yes / no
Probe Material	Boro		Method 3 System good	yes / no	yes / no	yes / no
Pitot / Thermocouple ID	P711		**Temp Check**	Pre-Test Set		Post-Test Set
Pitot Coefficient	0.84		Meter Box Temp	79		81
Nozzle ID	.218		Reference Temp	81		82
Nozzle Measurements	.218	.218 .218	Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Avg Nozzle Dia (in)	.218		Temp Change Response ?	yes / no		yes / no
Area of Stack (ft^2)	6.305					
Sample Time	96 min					
Total Traverse Pts	24					

K Factor 2.4

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	0852			143.016									
B	1	4		.43	1.0	145.2	84	79	120	118	66	3	64		
	2	8		.45	1.1	147.6	84	80	120	121	64	3	44		
	3	12		.47	1.1	150.0	85	80	120	120	62	3	43		
	4	16		.49	1.2	152.5	85	80	120	119	62	3	43		
	5	20		.50	1.2	154.9	86	81	120	120	63	3	45		
	6	24		.51	1.2	157.3	86	81	120	121	62	3	46		
	7	28		.57	1.4	159.9	86	82	120	121	62	3	46		
	8	32		.62	1.5	162.7	86	82	120	119	61	KA 3 4	49		
	9	36		.65	1.6	165.5	87	83	120	119	63	4	50		
	10	40		.70	1.7	168.4	87	83	120	120	64	4	51		
	11	44		.72	1.7	171.3	87	83	120	120	65	4	47		
	12	48	0940	.72	1.7	174.253	86	83	120	118	64	4	45		
															.0030 @ 9"
A	1	52	0959	.62	1.5	177.2	84	82	120	121	66	4	62		174.429
	2	56		.65	1.6	180.0	86	82	120	120	63	4	43		-.176
	3	60		.61	1.5	182.7	86	82	120	119	59	4	42		
	4	64		.57	1.4	185.4	86	82	120	120	56	4	42		
	5	68		.56	1.3	187.9	86	83	120	118	58	4	44		
	6	72		.55	1.3	190.5	86	82	120	119	58	4	44		102.51
	7	76		.67	1.6	193.3	87	83	120	121	57	4	43		
	8	80		.65	1.6	196.1	87	83	120	119	58	4	42		2.4 %n
	9	84		.65	1.6	199.0	87	83	120	120	59	4	43		
	10	88		.62	1.5	201.8	86	82	120	121	60	4	45		
	11	92		.56	1.3	204.3	87	84	120	120	60	4	44		
	12	96	1047	.55	1.3	206.847	87	84	120	120	61	4	44		54.00
				Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
				.58708	1.41250	63.656	86.0	82.042	120/120	118/121	66	4	42/64		
				Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
				KA .764.764	1.18526										
				0.76432											

EPA Method 0010 from EPA SW-846

SAMPLE RECOVERY FIELD DATA

EPA Method 0010

Client	The Chemours Company	W.O. #	15418.002.007
Location/Plant	Fayetteville, NC	Source & Location	VE North Carbon Bed INLET

Run No. 1 — Sample Date 8/21/18 — Recovery Date 8/21/18

Sample I.D. Chemours - Carbon Bed IN - IN - 1 - M0010 - — Analyst DM/KS — Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty	XAD 2		XAD 3		Silica Gel	
Final	26	100	95	0	308.4		307.3		320.3	
Initial	0	100	100	0	300.0		307.2		300	
Gain	26	0	-5	0	8.4		0.1	29.5	20.3	49.8

Impinger Color all clear — Labeled? ✓

Silica Gel Condition blue 90% — Sealed? ✓

Run No. 2 — Sample Date 8/21/18 — Recovery Date 8/21/18

Sample I.D. Chemours - Carbon Bed IN - IN - 2 - M0010 - — Analyst DM/KS — Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty	XAD 2		XAD 3		Silica Gel	
Final	30	100	98	4	306.8		291.3		319.8	
Initial	0	100	100	0	299.4		292.2		300	
Gain	30	0	-2	4	7.4		-	39.4	19.8	59.2

Impinger Color all clear — Labeled? ✓

Silica Gel Condition blue 90% — Sealed? ✓

Run No. 3 — Sample Date 8/22/18 — Recovery Date 8/22/18

Sample I.D. Chemours - Carbon Bed IN - IN - 3 - M0010 - — Analyst DM/KS — Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty	XAD 2		XAD 3		Silica Gel	
Final	18	98	102	2	300.3		306.0		318.3	
Initial	0	100	100	0	293.0		305.7		300	
Gain	18	-2	2	2	7.3		0.3	27.6	18.3	35.9

Impinger Color all clear — Labeled? ✓

Silica Gel Condition — Sealed? ✓

Check COC for Sample IDs of Media Blanks

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
VE NORTH CARBON BED OUTLET

Test Data

Run number	1	2	3
Location	VEN-CBed Outlet	VEN-CBed Outlet	VEN-CBed Outlet
Date	8/21/2018	8/21/2018	8/22/2018
Time period	0915-1115	1332-1532	0852-1047
Operator	RS/AS	RS/AS	RS/AS

Inputs For Calcs.

Sq. rt. delta P	0.79044	0.79985	0.80062
Delta H	1.4179	1.2771	1.2888
Stack temp. (deg.F)	98.8	99.3	94.6
Meter temp. (deg.F)	83.9	90.4	81.6
Sample volume (act.)	65.177	62.620	62.216
Barometric press. (in.Hg)	30.04	30.02	29.93
Volume H_2O imp. (ml)	24.3	38.5	30.5
Weight change sil. gel (g)	19.5	17.2	15.9
% CO_2	0.0	0.0	0.0
% O_2	20.9	20.9	20.9
% N_2	79.1	79.1	79.1
Area of stack (sq.ft.)	6.305	6.305	6.305
Sample time (min.)	96.0	96.0	96.0
Static pressure (in.H_2O)	4.30	4.30	4.30
Nozzle dia. (in.)	0.215	0.210	0.210
Meter box cal.	0.9850	0.9850	0.9850
Cp of pitot tube	0.84	0.84	0.84
Traverse points	24	24	24

OUTLET

Sample and Velocity Traverse Point Data Sheet - Method 1

Client Chemours | Operator KG
Loaction/Plant Fayetteville NC | Date 6/13/18
Source VE North Carbon Outlet | W.O. Number

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	54 5/8
Port Depth (in.) = D	20 5/8
Depth of Duct, diameter (in.) = C-D	34
Area of Duct (ft²)	6.305
Total Traverse Points	24
Total Traverse Points per Port	12
Port Diameter (in.) ---(Flange-Threaded-Hole)	
Monorail Length	
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	
Equivalent Diameter = (2*L*W)/(L+W)	

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	.021	3/4	21 3/8
2	.067	2 1/4	22 7/8
3	.118	4	24 5/8
4	.177	6	26 5/8
5	.250	8 1/2	29 1/8
6	.356	12 1/8	32 3/4
7	.644	21 5/8	42 1/2
8	.75	25 1/2	~~46 1/8~~ 46 1/8
9	.823	28	~~50 5/8~~ 48 5/8
10	.882	30	50 5/8
11	.933	31 3/4	52 3/8
12	.979	33 1/4	53 7/8

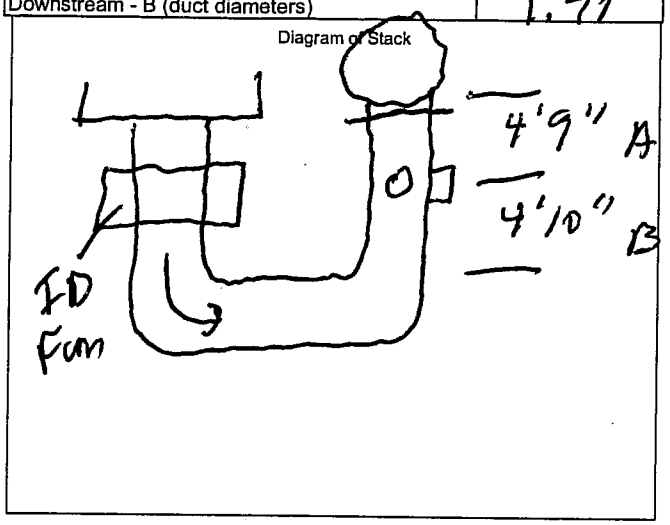
CEM 3 Point(Long Measurment Line) Stratificaton Point Locations

1	0.167		
2	0.50		
3	0.833		

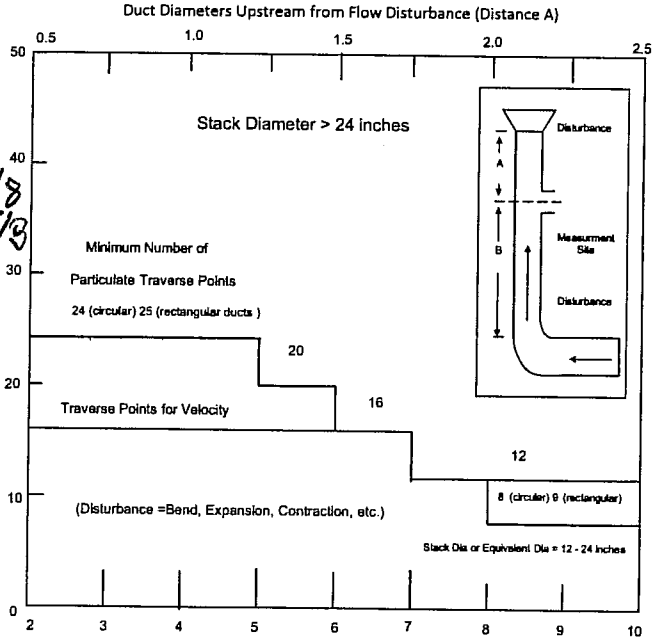
Note: If stack dia < 12 inch use EPA Method 1A
(Sample port upstream of pitot port)
Note: If stack dia >24" then adjust traverse point to 1 inch from wall
If stack dia <24" then adjust traverse point to 0.5 inch from wall

Flow Disturbances	
Upstream - A (ft)	4' 4"
Downstream - B (ft)	4' 10"
Upstream - A (duct diameters)	1.53
Downstream - B (duct diameters)	1.71

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

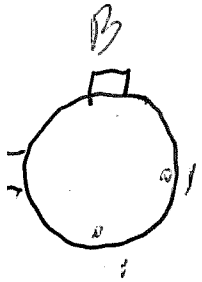
Traverse Point \ Number of Traverse Points	1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8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

Traverse Point Location Percent of Stack -Rectangular

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

OUTLET

Determination of Stack Gas Velocity - Method 2



Client Chemours | Operator AS | Pitot Coeff (Cp) .842

Location/Plant Fayetteville NC | Date 6/13/13 | Stack Area, ft² (As) 6.305

Source VE North Carbon Outlet | W.O. Number | Pitot Tube/Thermo ID P704

Run Number	1		
Time	1530		
Barometric Press, in Hg (Pb)	30.01		
Static Press, in H_2O (Pstatic)	4.3		
Source Moisture, % (BWS)	~20.0		
O_2, %	20.9		
CO_2, %	0.0		

Cyclonic Flow Determination		Traverse Location		Leak Check good ? Y / N		Leak Check good ? Y / N		Leak Check good ? Y / N	
Delta P at 0°	Angle yeilding zero Delta P	Port	Point	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)	Delta P	Source Temp, F° (Ts)
		A	1	.41	98				
.02	3		2	.42	98				
.01	2		3	.44	98				
.01	2		4	.46	98				
.02	3		5	.48	98				
.02	3		6	.53	98				
-.01	2		7	.77	98				
-.02	3		8	.85	98				
-.03	5		9	.89	98				
-.04	6		10	.95	98				
-.02	3		11	1.0	98				
-.05	9		12	.97	98				
-.02	4	B	1	.51	99				
-.03	5		2	.54	~~98~~ 98				
0	0		3	.57	98				
-.04	6		4	.56	98				
-.05	7		5	.58	98				
-.07	9		6	.59	98				
.05	7		7	.60	98				
.05	7		8	.61	98				
.03	5		9	.62	98				
.03	5		10	.64	98				
.03	5		11	.65	98				
.02	4		12	.65	98				
Avg Angle	<20	Avg Delta P & Temp		.636	98				
		avg √DeltaP		.79043					
Average gas stream velocity, ft/sec.				45.5					
Vol. flow rate @ actual conditions, wacf/min				17213					
Vol. flow rate at standard conditions, dscf/min				16176					

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

$MWs = (MWd * (1 - (BWS/100))) + (18 * (BWS/100))$ 2.4 K

$Tsa = Ts + 460$

$Ps = Pb + (Pstatic/13.6)$

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

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

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

where:
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,
Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min

Comments _____

WESTON MANAGERS DESIGNERS/CONSULTANTS

Method2

2.2

ISOKINETIC FIELD DATA SHEET

EPA Method 0010- HFPO Dimer Acid

			Stack Conditions	
Client	The Chemours Company		Assumed	Actual
W.O.#	15418.002.007	% Moisture	2	
Project ID	Chemours	Impinger Vol (ml)		24.3
Mode/Source ID	Carbon Bed OUT	Silica gel (g)		14.5
Samp. Loc. ID	OUT	CO2, % by Vol	0	0
Run No.ID	21 RS	O2, % by Vol	20.9	20.9
Test Method ID	M0010	Temperature (°F)	90	
Date ID	21AUG2018	Meter Temp (°F)	80	
Source/Location	VE North Carbon Bed OUTLE	Static Press (in H_2O)	4.3	+4.3
Sample Date	8-21-18			
Baro. Press (in Hg)	30.04			
Operator	RS / AS	Ambient Temp (°F)	79	

Meter Box ID	A012		
Meter Box Y	.985		
Meter Box Del H	1.785		
Probe ID / Length	P710		
Probe Material	(Boro)		
Pitot / Thermocouple ID	P710		
Pitot Coefficient	(0.84)		
Nozzle ID	.215		
Nozzle Measurements	.215	.215	.215
Avg Nozzle Dia (in)	.215		
Area of Stack (ft^2)	6.305		
Sample Time	96 min		
Total Traverse Pts	24		

K Factor 2.2

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.013	0.005	0.009
Leak Check @ (in Hg)	15"	6"	8"
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	80		81
Reference Temp	80.9		82
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	9:15			000.719									
B	1	4		.44	.97	3.0	97	80	121	121	66	4	44		
	2	8		.46	1.0	5.3	98	80	120	124	66	4	42		
	3	12		.50	1.1	7.7	98	80	119	122	62	4	42		
	4	16		.50	1.1	10.2	98	80	119	123	58	4	42		
	5	20		.55	1.2	12.8	99	81	121	121	59	4	42		
	6	24		.62	1.3	15.4	98	81	121	120	59	4.5	41		
	7	28		.68	1.5	18.3	98	82	120	120	59	5	42		
	8	32		.63	1.4	21.0	98	82	122	122	60	5	43		
	9	36		.63	1.4	23.7	98	82	122	120	60	5	44		24.690
	10	40		.63	1.4	26.4	98	82	119	121	61	5	43		
	11	44		.63	1.4	29.1	98	83	122	120	61	5	43		
	12	48	10:03	.63	1.4	31.917	98	83	119	119	60	5	42		
A	1	52	10:27	.35	.77	34.1	99	85	122	124	66	4	50		
	2	56		.36	.79	36.2	99	85	120	121	65	4	43		
	3	60		.38	.83	38.3	99	85	119	119	63	4	43		
	4	64		.40	.88	40.4	100	86	122	120	62	4	43		33.976
	5	68		.45	.99	42.7	100	86	123	121	63	4.5	44		
	6	72		.54	1.2	45.5	100	86	123	120	63	5	44		
	7	76		.90	2.0	48.6	100	87	121	121	61	6.5	43		
	8	80		1.0	2.2	52.0	100	87	120	119	59	7	42		
	9	84		1.0	2.2	55.4	100	87	123	121	59	7	42		
	10	88		1.0	2.2	58.9	100	88	121	119	60	7	43		
	11	92		1.1	2.4	62.3	100	88	123	123	63	7.5	43		
	12	96	11:15	1.1	2.4	66.019	99	88	122	122	63	7.5	42		
				Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
				0.64500	1.41792	65.177	98.83	83.916	119/123	119/124	66	7.5	41/50		
				Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
				0.79044	1.17196										

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

mid point leak check DGM 31.917 → 32.040 = -.123

102.1/130

3.2% Mn

16000 62.7

ISOKINETIC FIELD DATA SHEET

EPA Method 0010- HFPO Dimer Acid

			Stack Conditions	
Client	The Chemours Company		Assumed	Actual
W.O.#	15418.002.007	% Moisture	3.2	
Project ID	Chemours	Impinger Vol (ml)		38.5
Mode/Source ID	Carbon Bed OUT	Silica gel (g)		17.2
Samp. Loc. ID	OUT	CO2, % by Vol	0	0
Run No.ID	2 RS	O2, % by Vol	20.9	20.9
Test Method ID	M0010	Temperature (°F)	100	
Date ID	21AUG2018	Meter Temp (°F)	90	
Source/Location	VE North Carbon Bed OUTLET	Static Press (in H_2O)	4.3	4.3
Sample Date	8-21-18			
Baro. Press (in Hg)	30.04			
Operator	RS / AS	Ambient Temp (°F)	83	

Meter Box ID	A012		
Meter Box Y	.985		
Meter Box Del H	1.785		
Probe ID / Length	P710	Sample Train (ft^3)	
Probe Material	Boro	Leak Check @ (in Hg)	
Pitot / Thermocouple ID	P710	Pitot leak check good	yes / no
Pitot Coefficient	0.84	Pitot Inspection good	yes / no
Nozzle ID	.210	Method 3 System good	yes / no
Nozzle Measurements	.210 .215 .215 .215	Temp Check	
Avg Nozzle Dia (in)	.215 .210	Meter Box Temp	
Area of Stack (ft^2)	6.305	Reference Temp	
Sample Time	96 min.	Pass/Fail (+/- 2°)	Pass / Fail
Total Traverse Pts	24	Temp Change Response ?	yes / no

K Factor 1.95

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.810	0.003	0.005
Leak Check @ (in Hg)	15"	6"	8"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	yes / no	yes / no	yes / no
	Pre-Test Set		Post-Test Set
Meter Box Temp	83		85
Reference Temp	84		84
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT	NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
		0	13:32			66.672									
B	1	4		.47	.91	68.9	99	88	123	122	67	4	54		
	2	8		.48	.93	71.2	100	88	124	124	66	4	54		
	3	12		.52	1.0	73.5	100	88	123	121	66	4	53		
	4	16		.55	1.0	75.9	100	89	124	123	62	4	53		
	5	20		.60	1.2	78.5	100	89	122	120	61	4.5	56		
	6	24		.69	1.3	81.1	100	90	123	121	61	5	54		
	7	28		.65	1.3	83.8	100	89	122	122	61	5	54		
	8	32		.68	1.3	86.5	100	89	124	121	61	5	53		30,270
	9	36		.65	1.3	89.0	100	89	123	122	62	5.5	55		
	10	40		.62	1.2	91.8	99	89	124	124	63	5	53		
	11	44		.60	1.2	94.3	99	89	124	124	63	5	53		
	12	48	1420	.62	1.2	96.942	99	90	123	122	62	5	53		
A	1	52	14:44	.35	.68	99.0	99	91	124	121	67	4	56		
	2	56		.36	.70	101.0	99	92	123	120	65	4	55		
	3	60		.39	.76	103.1	99	92	122	121	64	4	55		
	4	64		.40	.78	105.2	99	92	121	120	64	4.5	57		
	5	68		.46	.89	107.4	99	92	121	120	62	4.5	56		32,350
	6	72		.55	1.0	109.7	99	92	122	121	63	5	56		
	7	76		.90	1.7	112.8	99	92	121	120	62	7	54		
	8	80		1.0	2.0	116.1	99	92	120	121	61	7.5	54		
	9	84		1.0	2.0	119.3	99	91	120	124	61	7.5	55		
	10	88		1.1	2.1	122.7	99	92	122	121	62	7.5	51		
	11	92		1.1	2.1	126.0	99	92	121	121	61	7.5	52		
	12	96	15:32	1.1	2.1	129.431	99	92	119	121	60	7.5	52		
				Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
				0.66008	1.27768	62.670	99.33	91.375	119/124	120/124	67	7.5	51/57		
				Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
				0.79985	1.11250										

EPA Method 0010 from EPA SW-846

Top - .50 - .74 Side .4 - 1.1

ΔP .50 - 1.1 mid point leak check

DGM - 96.942 → 97.081

$10^{1.35}$ 16050 4.22%w = .139

ISOKINETIC FIELD DATA SHEET

EPA Method 0010- HFPO Dimer Acid

		Stack Conditions	Assumed	Actual
Client	The Chemours Company			
W.O.#	15418.002.007	% Moisture	3.2	
Project ID	Chemours	Impinger Vol (ml)		30.5
Mode/Source ID	Carbon Bed OUT	Silica gel (g)		15.9
Samp. Loc. ID	OUT	CO2, % by Vol	0	0
Run No.ID	3	O2, % by Vol	20.9	20.9
Test Method ID	M0010	Temperature (°F)	100	
Date ID	22 21AUG2018	Meter Temp (°F)	85	
Source/Location	VE North Carbon Bed OUTLE	Static Press (in H_2O)	4.3	4.3
Sample Date	8-22-18			
Baro. Press (in Hg)	29.93			
Operator	RS / AS	Ambient Temp (°F)	80	

Meter Box ID	A012		
Meter Box Y	.985		
Meter Box Del H	1.785		
Probe ID / Length	P710		
Probe Material	Boro		
Pitot / Thermocouple ID	P710		
Pitot Coefficient	0.84		
Nozzle ID	.210		
Nozzle Measurements	.210	.210	.210
Avg Nozzle Dia (in)	.210		
Area of Stack (ft^2)	6.345		
Sample Time	96 min		
Total Traverse Pts	24		

	Initial	Mid-Point	Final
K Factor	1.95		
Sample Train (ft^3)	0.017	0.004	0.009
Leak Check @ (in Hg)	15"	7"	8"
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	79		81
Reference Temp	80.6		82
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	8:52			130.351 ~~129.251~~ RS									
B	1	4		.47	.91	132.5	94	79	119	123	65	3.5	46		
	2	8		.60	1.2	135.1	95	79	118	124	65	4.5	42		
	3	12		.70	1.3	137.7	95	79	120	122	63	4.5	42		
	4	16		.62	1.2	140.3	95	80	118	122	61	4.5	42		
	5	20		.52	1.0	142.7	95	80	117	119	61	4	42		
	6	24		.58	1.3	145.2	95	80	120	122	61	4.5	42		
	7	28		.58	1.3	147.9	95	81	119	123	61	4.5	42		
	8	32		.52	1.0	150.2	95	81	119	124	61	4	44		
	9	36		.64	1.2	152.8	95	81	120	123	62	4.5	44		
	10	40		.62	1.2	155.3	95	82	120	123	61	4.5	44		
	11	44		.63	1.2	157.9	95	82	120	122	62	5	44		
	12	48	9:40	.63	1.2	160.495	95	82	120	124	62	5	44		
A	1	52	9:59	.36	.70	162.5	94	82	121	123	64	3.5	46		
	2	56		.37	.72	164.5	94	82	120	124	63	3.5	42		
	3	60		.40	.78	166.6	94	82	120	122	63	4	41		
	4	64		.42	.81	168.7	95	82	120	123	61	4	41		
	5	68		.47	.91	170.9	95	82	121	121	61	4	43		10% / 1.50
	6	72		.55	1.1	173.3	95	82	119	120	61	5	42		
	7	76		.88	1.7	176.3	95	83	119	120	61	6	43		
	8	80		.48	1.9	179.5	94	83	120	120	61	6.5	43		3.5% / 2.18 in
	9	84		1.0	2.0	182.7	94	83	119	120	61	7	44		
	10	88		1.1	2.1	186.0	94	83	120	122	63	7	44		
	11	92		1.1	2.1	189.2	94	84	120	122	64	7	46		16700
	12	96	10:47	1.1	2.1	192.659	94	84	120	121	64	7	46		
				Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
				0.66000	1.28875	62.216	94.62	81.58	117/121	119/124	65	7	41/46		
				Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
				0.80062	1.11926										

EPA Method 0010 from EPA SW-846

Top .50 - .74
Size .4 - 1.1

ΔP .50 + 1.1

mid point leak check
DGM – 160.495 → 160.587
= -.092

SAMPLE RECOVERY FIELD DATA

EPA Method 0010

Client	The Chemours Company	W.O. #	15418.002.007
Location/Plant	Fayetteville, NC	Source & Location	VE North Carbon Bed OUTLET

Run No. 1 — Sample Date 8/21/18 — Recovery Date 8/21/18

Sample I.D. Chemours - Carbon Bed OUT - OUT - 1 - M0010 - — Analyst JMD / KS — Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty	XAD-1		XAD-2		Silica Gel	
Final	14	100	92	8	305.0		305.2		319.5	
Initial	0	100	100	0	295.1		304.8		300	
Gain	14	0	-8	8	9.9		.4	24.3	19.5	43.8

Impinger Color all clear — Labeled? ✓ ✓ ✓

Silica Gel Condition blue 90% — Sealed? ✓

Run No. 2 — Sample Date 8/21/18 — Recovery Date 8/21/18

Sample I.D. Chemours - Carbon Bed OUT - OUT - 2 - M0010 - — Analyst JMD / KS — Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty	XAD-1		XAD-2		Silica Gel	
Final	18	100	104	4	313.7		312.6		317.2	
Initial	0	100	100	0	301.2		306.6		300	
Gain	18	0	4	4	12.5		0	38.5	17.2	55.7

Impinger Color all clear — Labeled? ✓

Silica Gel Condition blue 90% — Sealed? ✓

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

Sample I.D. Chemours - Carbon Bed OUT - OUT - 3 - M0010 - — Analyst _____ — Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20	Empty	XAD-1		XAD-2		Silica Gel	
Final	14	96	106	4	299.4		302.4		315.9	
Initial	0	100	100	0	289.4		301.9		300	
Gain	14	-4	6	4	10		0.5	30.5	15.9	46.4

Impinger Color all clear — Labeled? ✓

Silica Gel Condition blue 90% — Sealed? ✓

Check COC for Sample IDs of Media Blanks

SAMPLE RECOVERY FIELD DATA

EPA Method 0010

Client	The Chemours Company	W.O. #	15418.002.003
Location/Plant	Fayetteville, NC	Source & Loaction	VE North Carbon Bed Outlet

Run No. 1 Sample Date 8/21/19 Recovery Date 8/21/19

Sample I.D. Chemours - VE North Carbon Bed OUT - BT - 1 - M0010 - Analyst [illegible] Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20		XAD-1		XAD-2		Silica Gel	
Final	0	100	100	0	299.0		305.3		300	
Initial	0	100	100	0	299.1		305.2		300	
Gain	0	0	0	0	-1		0		0	0

Impinger Color all clear Labeled? ✓

Silica Gel Condition 100% Sealed? ✓

Run No. ___ Sample Date ___ Recovery Date ___

Sample I.D. Chemours - VE North Carbon Bed OUT - BT - 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. ___ Sample Date ___ Recovery Date ___

Sample I.D. Chemours - VE North Carbon Bed OUT - BT - 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

METHODS AND ANALYZERS

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Date: **20 Aug 2018**

File: C:\Users\Administrator.WSWCEQUIP2\Documents\Chemours Division Stack August 2018.cem
Program Version: 2.0, built 21 Feb 2015 **File Version:** 2.02
Computer: WSWCEQUIP2 **Trailer:**
Analog Input Device: MCC USB-1608G

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 1440, S/N 0144001**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**20.9**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 1440 S/N 0144001**
Full-Scale Output, mv	**1000**
Analyzer Range, %	**20.0**
Span Concentration, %	**16.3**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **VE North Carbon Bed**

Project Number: **15418.002.007.0001**
Operator: **Steve Dryden**
Date: **20 Aug 2018**

Start Time: 11:31

O_2

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

Calibration Standards

%	**Cylinder ID**
12.0	XC016060B
20.9	CC72346

Calibration Results

Zero	21 mv
Span, 20.9 %	853 mv

Curve Coefficients

Slope	**Intercept**
39.85	21

CO_2

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

Calibration Standards

%	**Cylinder ID**
8.9	XC016060B
16.3	CC72346

Calibration Results

Zero	20 mv
Span, 16.3 %	818 mv

Curve Coefficients

Slope	**Intercept**
49.05	20

CALIBRATION ERROR DATA

Number 1

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **20 Aug 2018**

Start Time: 11:31

O_2
Method: EPA 3A
Span Conc. 20.9 %
Slope 39.85 **Intercept** 21.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
20.9	20.9	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.3 %
Slope 49.05 **Intercept** 20.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.9	0.0	0.0	Pass
16.3	16.3	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **20 Aug 2018**

Start Time: 11:33

O_2
Method: EPA 3A
Span Conc. 20.9 %

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. 16.3 %

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

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **21 Aug 2018**

Start Time: 07:03

O_2
Method: EPA 3A
Span Conc. 20.9 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 16.3 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	9.0	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	9.0	0.1	0.6	Pass

*Bias No. 1

RUN DATA

Number 1

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **VE North Carbon Bed**
Calibration **1**
Project Number: **15418.002.007.0001**
Operator: **Steve Dryden**
Date: **21 Aug 2018**

Time	O_2 %	CO_2 %
	RUN 1	
09:16	20.9	0.0
09:17	20.8	0.0
09:18	19.7	0.0
09:19	20.0	0.0
09:20	20.7	0.0
09:21	20.8	0.0
09:22	20.9	0.2
09:23	20.9	0.2
09:24	20.8	0.2
09:25	20.9	0.2
09:26	20.9	0.2
09:27	20.9	0.2
09:28	20.9	0.2
09:29	20.9	0.2
09:30	20.9	0.2
09:31	20.9	0.2
09:32	20.9	0.2
09:33	20.9	0.1
09:34	20.9	0.0
09:35	20.9	0.0
09:36	20.9	0.0
09:37	20.9	0.0
09:38	20.9	0.0
09:39	20.9	0.0
09:40	20.9	0.0
09:41	20.9	0.0
09:42	20.9	0.0
09:43	20.9	0.0
09:44	20.9	0.0
09:45	20.9	0.0
09:46	20.9	0.1
09:47	20.9	0.1
09:48	20.9	0.1
09:49	20.9	0.1
09:50	20.9	0.1
09:51	20.9	0.1
09:52	20.9	0.1
09:53	20.9	0.1
09:54	20.9	0.1
09:55	20.9	0.1

RUN DATA

Number 1

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **21 Aug 2018**

Time	O_2 %	CO_2 %
09:56	20.9	0.1
09:57	20.9	0.1
09:58	20.9	0.0
09:59	20.9	0.0
10:00	20.9	0.0
10:01	20.9	0.0
10:02	20.9	0.0
10:03	20.9	0.0
Sample Port Change		
10:27	20.9	0.0
10:28	20.9	0.0
10:29	20.9	0.0
10:30	20.9	0.0
10:31	20.9	0.0
10:32	20.9	0.0
10:33	20.9	0.0
10:34	20.9	0.0
10:35	20.9	0.0
10:36	20.9	0.1
10:37	20.9	0.1
10:38	20.9	0.1
10:39	20.9	0.1
10:40	20.9	0.1
10:41	20.9	0.1
10:42	20.9	0.1
10:43	20.9	0.1
10:44	20.9	0.1
10:45	20.9	0.1
10:46	20.9	0.1
10:47	20.9	0.1
10:48	20.9	0.0
10:49	20.8	0.0
10:50	20.8	0.0
10:51	20.8	0.0
10:52	20.9	0.0
10:53	20.8	0.0
10:54	20.8	0.0
10:55	20.9	0.0
10:56	20.9	0.0
10:57	20.9	0.0
10:58	20.9	0.0

RUN DATA

Number 1

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **21 Aug 2018**

Time	O_2 %	CO_2 %
10:59	20.9	0.0
11:00	20.8	0.0
11:01	20.8	0.1
11:02	20.9	0.1
11:03	20.9	0.1
11:04	20.9	0.1
11:05	20.9	0.1
11:06	20.9	0.1
11:07	20.9	0.1
11:08	20.9	0.1
11:09	20.9	0.2
11:10	20.9	0.1
11:11	20.9	0.1
11:12	20.9	0.1
11:13	20.9	0.1
11:14	20.9	0.0
11:15	20.9	0.0
Avgs	**20.9**	**0.1**

RUN SUMMARY

Number 1

Client:	**Chemours**	Project Number:	**15418.002.007.0001**
Location:	**Fayetteville, NC**	Operator:	**Steve Dryden**
Source:	**VE North Carbon Bed**	Calibration **1**	Date: **21 Aug 2018**

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

Time: 09:15 to 11:15

Run Averages

20.9	0.1

Pre-run Bias at 07:03

Zero Bias	0.0	0.0
Span Bias	11.9	9.0
Span Gas	12.0	8.9

Post-run Bias at 11:18

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

Averages corrected for the average of the pre-run and post-run bias

20.9	0.1

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **21 Aug 2018**

Start Time: 11:18

O_2
Method: EPA 3A
Span Conc. 20.9 %

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	11.9	12.0	0.1	0.5	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 16.3 %

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

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	9.0	8.9	-0.1	-0.6	Pass

*Bias No. 2

RUN DATA

Number 2

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **21 Aug 2018**

Time	O_2 %	CO_2 %
	RUN 2	
13:33	20.9	0.1
13:34	20.9	0.1
13:35	20.9	0.1
13:36	20.9	0.1
13:37	20.9	0.2
13:38	20.9	0.2
13:39	20.9	0.1
13:40	20.9	0.0
13:41	20.9	0.0
13:42	20.9	0.0
13:43	20.9	0.0
13:44	20.9	0.0
13:45	20.9	0.0
13:46	20.9	0.0
13:47	20.9	0.0
13:48	20.9	0.0
13:49	20.9	0.0
13:50	20.9	0.0
13:51	20.9	0.0
13:52	20.9	0.1
13:53	20.9	0.1
13:54	20.9	0.1
13:55	20.9	0.1
13:56	20.9	0.1
13:57	20.9	0.1
13:58	20.9	0.1
13:59	20.9	0.1
14:00	20.9	0.1
14:01	20.9	0.1
14:02	20.9	0.1
14:03	20.9	0.1
14:04	20.9	0.0
14:05	20.9	0.0
14:06	20.9	0.0
14:07	20.9	0.0
14:08	20.9	0.0
14:09	20.9	0.0
14:10	20.9	0.0
14:11	20.9	0.0
14:12	20.9	0.0

RUN DATA

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **VE North Carbon Bed**
Calibration **1**
Project Number: **15418.002.007.0001**
Operator: **Steve Dryden**
Date: **21 Aug 2018**

Time	O_2 %	CO_2 %
14:13	20.9	0.0
14:14	20.9	0.0
14:15	20.9	0.0
14:16	20.9	0.1
14:17	20.9	0.1
14:18	20.9	0.1
14:19	20.9	0.1
14:20	20.9	0.1
Sample Port Change		
14:44	20.9	0.1
14:45	20.9	0.1
14:46	20.9	0.1
14:47	20.9	0.1
14:48	20.9	0.1
14:49	20.9	0.1
14:50	20.9	0.1
14:51	20.9	0.1
14:52	20.9	0.0
14:53	20.9	0.0
14:54	20.9	0.0
14:55	20.9	0.0
14:56	20.8	0.0
14:57	20.9	0.0
14:58	20.9	0.0
14:59	20.9	0.0
15:00	20.9	0.0
15:01	20.8	0.0
15:02	20.9	0.0
15:03	20.9	0.0
15:04	20.8	0.0
15:05	20.9	0.1
15:06	20.9	0.1
15:07	20.9	0.1
15:08	20.9	0.1
15:09	20.9	0.1
15:10	20.9	0.1
15:11	20.9	0.1
15:12	20.9	0.1
15:13	20.9	0.1
15:14	20.9	0.1
15:15	20.9	0.1

RUN DATA

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **VE North Carbon Bed**

Calibration **1**

Project Number: **15418.002.007.0001**
Operator: **Steve Dryden**
Date: **21 Aug 2018**

Time	O_2 %	CO_2 %
15:16	20.9	0.1
15:17	20.9	0.0
15:18	20.9	0.0
15:19	20.9	0.0
15:20	20.9	0.0
15:21	20.9	0.0
15:22	20.9	0.0
15:23	20.9	0.0
15:24	20.9	0.0
15:25	20.9	0.0
15:26	20.9	0.0
15:27	20.8	0.0
15:28	20.8	0.0
15:29	20.8	0.0
15:30	20.8	0.1
15:31	20.8	0.1
15:32	20.8	0.1
Avgs	**20.9**	**0.1**

RUN SUMMARY

Number 2

Client:	**Chemours**	Project Number:	**15418.002.007.0001**
Location:	**Fayetteville, NC**	Operator:	**Steve Dryden**
Source:	**VE North Carbon Bed**	Calibration **1**	Date: **21 Aug 2018**

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

Time: 13:32 to 15:32

Run Averages

20.9	0.1

Pre-run Bias at 11:18

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

Post-run Bias at 15:37

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

Averages corrected for the average of the pre-run and post-run bias

20.8	0.1

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **21 Aug 2018**

Start Time: 15:37

O_2
Method: EPA 3A
Span Conc. 20.9 %

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. 3

CO_2
Method: EPA 3A
Span Conc. 16.3 %

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

Calibration Drift

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

*Bias No. 3

CALIBRATION DATA

Number 2

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **VE North Carbon Bed**

Project Number: **15418.002.007.0001**
Operator: **Steve Dryden**
Date: **22 Aug 2018**

Start Time: 07:07

O_2

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

Calibration Standards

%	**Cylinder ID**
12.0	XC016060B
20.9	CC72346

Calibration Results

Zero	22 mv
Span, 20.9 %	854 mv

Curve Coefficients

Slope	**Intercept**
39.85	22

CO_2

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

Calibration Standards

%	**Cylinder ID**
8.9	XC016060B
16.3	CC72346

Calibration Results

Zero	16 mv
Span, 16.3 %	827 mv

Curve Coefficients

Slope	**Intercept**
49.85	16

CALIBRATION ERROR DATA

Number 2

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **1** | Date: **22 Aug 2018**

Start Time: 07:07

O_2
Method: EPA 3A
Span Conc. 20.9 %
Slope 39.85 **Intercept** 21.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
20.9	20.9	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.3 %
Slope 49.05 **Intercept** 20.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.9	0.0	0.0	Pass
16.3	16.3	0.0	0.0	Pass

BIAS AND CALIBRATION DRIFT

Number 5

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **2** | Date: **22 Aug 2018**

Start Time: 07:09

O_2
Method: EPA 3A
Span Conc. 20.9 %

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	-0.1	0.0	0.1	0.5	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 4

CO_2
Method: EPA 3A
Span Conc. 16.3 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	9.0	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	9.0	0.1	0.6	Pass

*Bias No. 4

RUN DATA

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **VE North Carbon Bed**
Calibration **2**
Project Number: **15418.002.007.0001**
Operator: **Steve Dryden**
Date: **22 Aug 2018**

Time	O_2 %	CO_2 %
	RUN 3	
08:53	21.0	0.0
08:54	21.0	0.0
08:55	21.0	0.0
08:56	21.0	0.0
08:57	21.0	0.0
08:58	21.0	0.0
08:59	21.0	0.0
09:00	21.0	0.0
09:01	21.0	0.0
09:02	21.0	0.0
09:03	21.0	0.0
09:04	21.0	0.0
09:05	21.0	0.1
09:06	21.0	0.1
09:07	21.0	0.1
09:08	21.0	0.1
09:09	21.0	0.1
09:10	21.0	0.1
09:11	21.0	0.1
09:12	21.0	0.1
09:13	21.0	0.1
09:14	21.0	0.1
09:15	21.0	0.1
09:16	21.0	0.1
09:17	21.0	0.0
09:18	21.0	0.0
09:19	21.0	0.0
09:20	21.0	0.0
09:21	21.0	0.0
09:22	21.0	0.0
09:23	21.0	0.0
09:24	21.0	0.0
09:25	21.0	0.0
09:26	21.0	0.0
09:27	21.0	0.0
09:28	21.0	0.0
09:29	21.0	0.0
09:30	21.0	0.0
09:31	21.0	0.1
09:32	21.0	0.1

RUN DATA

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **VE North Carbon Bed**
Calibration **2**
Project Number: **15418.002.007.0001**
Operator: **Steve Dryden**
Date: **22 Aug 2018**

Time	O_2 %	CO_2 %
09:33	21.0	0.1
09:34	21.0	0.1
09:35	21.0	0.1
09:36	21.0	0.1
09:37	21.0	0.1
09:38	21.0	0.1
09:39	21.0	0.1
09:40	21.0	0.1
Sample Port Change		
09:59	21.0	0.1
10:00	21.0	0.1
10:01	21.0	0.1
10:02	21.0	0.1
10:03	21.0	0.1
10:04	21.0	0.1
10:05	21.0	0.1
10:06	21.0	0.1
10:07	21.0	0.1
10:08	21.0	0.0
10:09	21.0	0.0
10:10	21.0	0.0
10:11	21.0	0.0
10:12	21.0	0.0
10:13	21.0	0.0
10:14	21.0	0.0
10:15	21.0	0.0
10:16	21.0	0.0
10:17	21.0	0.0
10:18	21.0	0.0
10:19	21.0	0.0
10:20	21.0	0.0
10:21	21.0	0.1
10:22	21.0	0.1
10:23	21.0	0.1
10:24	21.0	0.1
10:25	21.0	0.1
10:26	21.0	0.1
10:27	21.0	0.1
10:28	21.0	0.1
10:29	21.0	0.1
10:30	21.0	0.1

RUN DATA

Number 3

Client: **Chemours**
Location: **Fayetteville, NC**
Source: **VE North Carbon Bed**

Calibration **2**

Project Number: **15418.002.007.0001**
Operator: **Steve Dryden**
Date: **22 Aug 2018**

Time	O_2 %	CO_2 %
10:31	21.0	0.1
10:32	21.0	0.1
10:33	21.0	0.0
10:34	21.0	0.0
10:35	21.0	0.0
10:36	21.0	0.0
10:37	21.0	0.0
10:38	21.0	0.0
10:39	21.0	0.0
10:40	21.0	0.0
10:41	21.0	0.0
10:42	21.0	0.0
10:43	21.0	0.0
10:44	21.0	0.0
10:45	21.0	0.0
10:46	21.0	0.1
10:47	21.0	0.1
Avgs	**21.0**	**0.0**

RUN SUMMARY

Number 3

Client: **Chemours**		Project Number:	**15418.002.007.0001**
Location: **Fayetteville, NC**		Operator:	**Steve Dryden**
Source: **VE North Carbon Bed**	Calibration **2**	Date:	**22 Aug 2018**

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

Time: 08:52 to 10:47

Run Averages

21.0	0.0

Pre-run Bias at 07:09

Zero Bias	0.0	0.0
Span Bias	12.0	9.0
Span Gas	12.0	8.9

Post-run Bias at 10:54

Zero Bias	0.0	0.0
Span Bias	12.0	9.0
Span Gas	12.0	8.9

Averages corrected for the average of the pre-run and post-run bias

21.0	0.0

BIAS AND CALIBRATION DRIFT

Number 6

Client: **Chemours** | Project Number: **15418.002.007.0001**
Location: **Fayetteville, NC** | Operator: **Steve Dryden**
Source: **VE North Carbon Bed** | Calibration **2** | Date: **22 Aug 2018**

Start Time: 10:54

O_2
Method: EPA 3A
Span Conc. 20.9 %

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. 5

CO_2
Method: EPA 3A
Span Conc. 16.3 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	9.0	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	9.0	9.0	0.0	0.0	Pass

*Bias No. 5

APPENDIX C
LABORATORY ANALYTICAL DESCRIPTION AND ANALYTICAL REPORT

Note: The analytical report is included on the attached CD.

ANALYTICAL REPORT

Job Number: 140-12486-1

Job Description: Division Stack Carbon Bed Inlet

Contract Number: LBIO-67048

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

Attention: Michael Aucoin

Approved for release.
Courtney M Adkins
Project Manager I
9/25/2018 8:34 AM

Courtney M Adkins, Project Manager I
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
09/25/2018

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Qualifiers

LCMS

Qualifier	Qualifier Description
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Inlet

TestAmerica Job ID: 140-12486-1

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

Protocol References:

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

Laboratory References:

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

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Inlet

TestAmerica Job ID: 140-12486-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-12486-1	R-1947,1948 DIV VEN CARBON BED INLET R1 M0010 FH	Air	08/21/18 00:00	08/24/18 07:00
140-12486-2	R-1949,1950,1952 DIV VEN CARBON BED INLET R1 M0010 BI	Air	08/21/18 00:00	08/24/18 07:00
140-12486-3	R-1951 DIV VEN CARBON BED INLET R1 M0010 IMPINGERS 1,2&3 CONDENSATE	Air	08/21/18 00:00	08/24/18 07:00
140-12486-4	R-1953 DIV VEN CARBON BED INLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	08/21/18 00:00	08/24/18 07:00
140-12486-5	R-1954,1955 DIV VEN CARBON BED INLET R2 M0010 FH	Air	08/21/18 00:00	08/24/18 07:00
140-12486-6	R-1956,1957,1959 DIV VEN CARBON BED INLET R2 M0010 BI	Air	08/21/18 00:00	08/24/18 07:00
140-12486-7	R-1958 DIV VEN CARBON BED INLET R2 M0010 IMPINGERS 1,2&3 CONDENSATE	Air	08/21/18 00:00	08/24/18 07:00
140-12486-8	R-1960 DIV VEN CARBON BED INLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	08/21/18 00:00	08/24/18 07:00
140-12486-9	R-1961,1962 DIV VEN CARBON BED INLET R3 M0010 FH	Air	08/22/18 00:00	08/24/18 07:00
140-12486-10	R-1963,1964,1966 DIV VEN CARBON BED INLET R3 M0010 BI	Air	08/22/18 00:00	08/24/18 07:00
140-12486-11	R-1965 DIV VEN CARBON BED INLET R3 M0010 IMPINGERS 1,2&3 CONDENSATE	Air	08/22/18 00:00	08/24/18 07:00
140-12486-12	R-1967 DIV VEN CARBON BED INLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	08/22/18 00:00	08/24/18 07:00

Job Narrative
140-12486-1

Sample Receipt

The samples were received on August 24, 2018 at 7:00 AM in good condition and properly preserved. The temperature of the cooler at receipt was 2.9º C.

Quality Control and Data Interpretation

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

Method 0010/Method 3542 Sampling Train Preparation

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

LCMS

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

Organic Prep

The following Condensate samples were prepared outside of preparation holding time: R-1951 DIV VEN CARBON BED INLET R1 M0010 IMPINGERS 1,2&3 CONDENSATE (140-12486-3), R-1958 DIV VEN CARBON BED INLET R2 M0010 IMPINGERS 1,2&3 CONDENSATE (140-12486-7) and R-1965 DIV VEN CARBON BED INLET R3 M0010 IMPINGERS 1,2&3 CONDENSATE (140-12486-11).

Front Half and Back Half fractions were extracted in Knoxville within the required holding time requirements.

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

Comments

Reporting Limits (RLs) and Method Detection Limits (MDLs) for the HFPO-DA used in this report were derived in Denver for reporting soils and water samples. Method 0010 sampling train matrix specific RLs and MDLs have not been established for HFPO-DA. The soil and water limits are expected to be reasonable approximations of the actual matrix specific limits, under these conditions.

The expanded deliverable section of the package is split into two sections: 8321A_HFPO_DU is specific to condensates, and Method DV-LC-0012 contains the XAD and Filter data. Both methods share the same calibration on 8/3/18. A single instance of this calibration and the associated detection limit check (DLCK) and Initial calibration verification (ICV) can be found in the 8321A_HFPO_DU section of the package as part of our automated package generation procedures.

LCMS

Analysis Batch: 424829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-424829/13	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 427809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-3	R-1951 DIV VEN CARBON BED INLET R1 M001	Total/NA	Air	None	
140-12486-7	R-1958 DIV VEN CARBON BED INLET R2 M001	Total/NA	Air	None	
140-12486-11	R-1965 DIV VEN CARBON BED INLET R3 M001	Total/NA	Air	None	
MB 280-427809/1-A	Method Blank	Total/NA	Air	None	
LCS 280-427809/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-427809/17-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-427809/18-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 428106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-1	R-1947,1948 DIV VEN CARBON BED INLET R1	Total/NA	Air	None	
140-12486-5	R-1954,1955 DIV VEN CARBON BED INLET R2	Total/NA	Air	None	
140-12486-9	R-1961,1962 DIV VEN CARBON BED INLET R3	Total/NA	Air	None	
MB 280-428106/1-A	Method Blank	Total/NA	Air	None	
LCS 280-428106/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 428378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-2	R-1949,1950,1952 DIV VEN CARBON BED INLE	Total/NA	Air	None	
140-12486-4	R-1953 DIV VEN CARBON BED INLET R1 M001	Total/NA	Air	None	
140-12486-6	R-1956,1957,1959 DIV VEN CARBON BED INLE	Total/NA	Air	None	
140-12486-8	R-1960 DIV VEN CARBON BED INLET R2 M001	Total/NA	Air	None	
MB 280-428378/1-A	Method Blank	Total/NA	Air	None	
LCS 280-428378/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 428542

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-10	R-1963,1964,1966 DIV VEN CARBON BED INLE	Total/NA	Air	None	
140-12486-12	R-1967 DIV VEN CARBON BED INLET R3 M001	Total/NA	Air	None	
MB 280-428542/1-A	Method Blank	Total/NA	Air	None	
LCS 280-428542/2-A	Lab Control Sample	Total/NA	Air	None	

Analysis Batch: 429055

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-1	R-1947,1948 DIV VEN CARBON BED INLET R1	Total/NA	Air	8321A	428106
140-12486-5	R-1954,1955 DIV VEN CARBON BED INLET R2	Total/NA	Air	8321A	428106
140-12486-9	R-1961,1962 DIV VEN CARBON BED INLET R3	Total/NA	Air	8321A	428106
MB 280-428106/1-A	Method Blank	Total/NA	Air	8321A	428106
LCS 280-428106/2-A	Lab Control Sample	Total/NA	Air	8321A	428106

Analysis Batch: 429056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-3	R-1951 DIV VEN CARBON BED INLET R1 M001	Total/NA	Air	8321A	427809
140-12486-7	R-1958 DIV VEN CARBON BED INLET R2 M001	Total/NA	Air	8321A	427809
140-12486-11	R-1965 DIV VEN CARBON BED INLET R3 M001	Total/NA	Air	8321A	427809
MB 280-427809/1-A	Method Blank	Total/NA	Air	8321A	427809
LCS 280-427809/2-A	Lab Control Sample	Total/NA	Air	8321A	427809

LCMS (Continued)

Analysis Batch: 429056 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 280-427809/17-A	Lab Control Sample Dup	Total/NA	Air	8321A	427809
LLCS 280-427809/18-A	Lab Control Sample	Total/NA	Air	8321A	427809

Analysis Batch: 429341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-2	R-1949,1950,1952 DIV VEN CARBON BED INLE	Total/NA	Air	8321A	428378
140-12486-6	R-1956,1957,1959 DIV VEN CARBON BED INLE	Total/NA	Air	8321A	428378
MB 280-428378/1-A	Method Blank	Total/NA	Air	8321A	428378
LCS 280-428378/2-A	Lab Control Sample	Total/NA	Air	8321A	428378

Analysis Batch: 429343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-10	R-1963,1964,1966 DIV VEN CARBON BED INLE	Total/NA	Air	8321A	428542
MB 280-428542/1-A	Method Blank	Total/NA	Air	8321A	428542
LCS 280-428542/2-A	Lab Control Sample	Total/NA	Air	8321A	428542

Analysis Batch: 429344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-4	R-1953 DIV VEN CARBON BED INLET R1 M001	Total/NA	Air	8321A	428378
140-12486-8	R-1960 DIV VEN CARBON BED INLET R2 M001	Total/NA	Air	8321A	428378

Analysis Batch: 429346

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12486-12	R-1967 DIV VEN CARBON BED INLET R3 M001	Total/NA	Air	8321A	428542

Client Sample ID: R-1947,1948 DIV VEN CARBON BED INLET R1 M0010 FH

Lab Sample ID: 140-12486-1

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	225		6.25	0.675	ug/Sample		08/30/18 10:19	09/07/18 10:30	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*169*	*D*	*50 - 200*	*08/30/18 10:19*	*09/07/18 10:30*	*50*

Client Sample ID: R-1949,1950,1952 DIV VEN CARBON BED INLET R1 M0010 BH

Lab Sample ID: 140-12486-2

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	727	H	13.8	2.75	ug/Sample		09/04/18 04:27	09/11/18 11:27	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*166*	*D*	*50 - 200*	*09/04/18 04:27*	*09/11/18 11:27*	*50*

Client Sample ID: R-1951 DIV VEN CARBON BED INLET R1 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12486-3

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	359	H	2.52	0.129	ug/Sample		09/06/18 21:47	09/07/18 12:02	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*116*	*D*	*50 - 200*	*09/06/18 21:47*	*09/07/18 12:02*	*50*

Client Sample ID: R-1953 DIV VEN CARBON BED INLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12486-4

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0767	J H	0.200	0.0400	ug/Sample		09/04/18 04:27	09/11/18 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*128*		*50 - 200*	*09/04/18 04:27*	*09/11/18 14:35*	*1*

Client Sample ID: R-1954,1955 DIV VEN CARBON BED INLET R2 M0010 FH

Lab Sample ID: 140-12486-5

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	186		5.00	0.540	ug/Sample		08/30/18 10:19	09/07/18 10:34	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*147*	*D*	*50 - 200*	*08/30/18 10:19*	*09/07/18 10:34*	*50*

Client Sample ID: R-1956,1957,1959 DIV VEN CARBON BED INLET R2 M0010 BH

Lab Sample ID: 140-12486-6

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1140	H	12.5	2.50	ug/Sample		09/04/18 04:27	09/11/18 11:33	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*110*	*D*	*50 - 200*	*09/04/18 04:27*	*09/11/18 11:33*	*50*

Client Sample ID: R-1958 DIV VEN CARBON BED INLET R2 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12486-7

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	261	H	2.52	0.129	ug/Sample		09/06/18 21:47	09/07/18 12:05	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*134*	*D*	*50 - 200*	*09/06/18 21:47*	*09/07/18 12:05*	*50*

Client Sample ID: R-1960 DIV VEN CARBON BED INLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12486-8

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND	H	0.200	0.0400	ug/Sample		09/04/18 04:27	09/11/18 14:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*130*		*50 - 200*	*09/04/18 04:27*	*09/11/18 14:38*	*1*

Client Sample ID: R-1961,1962 DIV VEN CARBON BED INLET R3 M0010 FH

Lab Sample ID: 140-12486-9

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	185		6.25	0.675	ug/Sample		08/30/18 10:19	09/07/18 10:37	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*120*	*D*	*50 - 200*	*08/30/18 10:19*	*09/07/18 10:37*	*50*

Client Sample ID: R-1963,1964,1966 DIV VEN CARBON BED INLET R3 M0010 BH

Lab Sample ID: 140-12486-10

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	795	H	11.3	2.25	ug/Sample		09/05/18 01:57	09/11/18 13:40	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*158*	*D*	*50 - 200*	*09/05/18 01:57*	*09/11/18 13:40*	*50*

Client Sample ID: R-1965 DIV VEN CARBON BED INLET R3 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12486-11

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	244	H	2.50	0.128	ug/Sample		09/06/18 21:47	09/07/18 12:09	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*116*	*D*	*50 - 200*	*09/06/18 21:47*	*09/07/18 12:09*	*50*

Client Sample ID: R-1967 DIV VEN CARBON BED INLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12486-12

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND	H	0.200	0.0400	ug/Sample		09/05/18 01:57	09/11/18 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*148*		*50 - 200*	*09/05/18 01:57*	*09/11/18 15:39*	*1*

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Inlet

TestAmerica Job ID: 140-12486-1

Method: 8321A - HFPO-DA

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.00250	0.00128	ug/Sample	8321A

Method: 8321A - PFOA and PFOS

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.0250	0.00270	ug/Sample	8321A
HFPO-DA	0.100	0.0200	ug/Sample	8321A

Surrogate Summary

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Inlet

TestAmerica Job ID: 140-12486-1

Method: 8321A - HFPO-DA

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-12486-3	R-1951 DIV VEN CARBON BED	116 D
140-12486-7	R-1958 DIV VEN CARBON BED	134 D
140-12486-11	R-1965 DIV VEN CARBON BED	116 D
LCS 280-427809/2-A	Lab Control Sample	108
LCSD 280-427809/17-A	Lab Control Sample Dup	114
LLCS 280-427809/18-A	Lab Control Sample	113
MB 280-427809/1-A	Method Blank	108

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - PFOA and PFOS

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-12486-1	R-1947,1948 DIV VEN CARBON	169 D
140-12486-2	R-1949,1950,1952 DIV VEN CA	166 D
140-12486-4	R-1953 DIV VEN CARBON BED	128
140-12486-5	R-1954,1955 DIV VEN CARBON	147 D
140-12486-6	R-1956,1957,1959 DIV VEN CA	110 D
140-12486-8	R-1960 DIV VEN CARBON BED	130
140-12486-9	R-1961,1962 DIV VEN CARBON	120 D
140-12486-10	R-1963,1964,1966 DIV VEN CA	158 D
140-12486-12	R-1967 DIV VEN CARBON BED	148
DLCK 280-424829/13	Lab Control Sample	99
LCS 280-428106/2-A	Lab Control Sample	98
LCS 280-428378/2-A	Lab Control Sample	122
LCS 280-428542/2-A	Lab Control Sample	141
MB 280-428106/1-A	Method Blank	99
MB 280-428378/1-A	Method Blank	121
MB 280-428542/1-A	Method Blank	147

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - HFPO-DA

Lab Sample ID: MB 280-427809/1-A
Matrix: Air
Analysis Batch: 429056

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 427809

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		09/06/18 21:47	09/07/18 11:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*108*		*50 - 200*	*09/06/18 21:47*	*09/07/18 11:16*	*1*

Lab Sample ID: LCS 280-427809/2-A
Matrix: Air
Analysis Batch: 429056

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427809

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0500	0.04903		ug/Sample		98	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*108*		*50 - 200*

Lab Sample ID: LCSD 280-427809/17-A
Matrix: Air
Analysis Batch: 429056

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 427809

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0500	0.04943		ug/Sample		99	50 - 150	1	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*114*		*50 - 200*

Lab Sample ID: LLCS 280-427809/18-A
Matrix: Air
Analysis Batch: 429056

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427809

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.00500	0.004718		ug/Sample		94	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*113*		*50 - 200*

Method: 8321A - PFOA and PFOS

Lab Sample ID: DLCK 280-424829/13
Matrix: Air
Analysis Batch: 424829

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	DLCK Result	DLCK Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.250	0.2532		ug/L		101	70 - 130		

Surrogate	*DLCK %Recovery*	*DLCK Qualifier*	*Limits*
13C3 HFPO-DA	*99*		*50 - 200*

Method: 8321A - PFOA and PFOS (Continued)

Lab Sample ID: MB 280-428106/1-A
Matrix: Air
Analysis Batch: 429055

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428106

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00270	ug/Sample		08/30/18 10:19	09/07/18 10:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*99*		*50 - 200*	*08/30/18 10:19*	*09/07/18 10:24*	*1*

Lab Sample ID: LCS 280-428106/2-A
Matrix: Air
Analysis Batch: 429055

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428106

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.500	0.4095		ug/Sample		82	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*98*		*50 - 200*

Lab Sample ID: MB 280-428378/1-A
Matrix: Air
Analysis Batch: 429341

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428378

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		09/04/18 04:27	09/11/18 11:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*121*		*50 - 200*	*09/04/18 04:27*	*09/11/18 11:20*	*1*

Lab Sample ID: LCS 280-428378/2-A
Matrix: Air
Analysis Batch: 429341

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428378

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			4.00	3.208		ug/Sample		80	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*122*		*50 - 200*

Lab Sample ID: MB 280-428542/1-A
Matrix: Air
Analysis Batch: 429343

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428542

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		09/05/18 01:57	09/11/18 12:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*147*		*50 - 200*	*09/05/18 01:57*	*09/11/18 12:54*	*1*

Method: 8321A - PFOA and PFOS (Continued)

Lab Sample ID: LCS 280-428542/2-A
Matrix: Air
Analysis Batch: 429343

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428542

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			4.00	3.333		ug/Sample		83	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*141*		*50 - 200*

Client Sample ID: R-1947,1948 DIV VEN CARBON BED INLET R1 M0010 FH

Lab Sample ID: 140-12486-1

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	250 mL	428106	08/30/18 10:19		TAL DEN
Total/NA	Analysis	8321A		50			429055	09/07/18 10:30	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1949,1950,1952 DIV VEN CARBON BED INLET R1 M0010 BH

Lab Sample ID: 140-12486-2

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	550 mL	428378	09/04/18 04:27		TAL DEN
Total/NA	Analysis	8321A		50			429341	09/11/18 11:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1951 DIV VEN CARBON BED INLET R1 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12486-3

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.04955 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		50			429056	09/07/18 12:02	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1953 DIV VEN CARBON BED INLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12486-4

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	428378	09/04/18 04:27		TAL DEN
Total/NA	Analysis	8321A		1			429344	09/11/18 14:35	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1954,1955 DIV VEN CARBON BED INLET R2 M0010 FH

Lab Sample ID: 140-12486-5

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	200 mL	428106	08/30/18 10:19		TAL DEN

Client Sample ID: R-1954,1955 DIV VEN CARBON BED INLET R2 M0010 FH

Lab Sample ID: 140-12486-5

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		50			429055	09/07/18 10:34	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1956,1957,1959 DIV VEN CARBON BED INLET R2 M0010 BH

Lab Sample ID: 140-12486-6

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	500 mL	428378	09/04/18 04:27		TAL DEN
Total/NA	Analysis	8321A		50			429341	09/11/18 11:33	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1958 DIV VEN CARBON BED INLET R2 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12486-7

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.04957 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		50			429056	09/07/18 12:05	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1960 DIV VEN CARBON BED INLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12486-8

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	428378	09/04/18 04:27		TAL DEN
Total/NA	Analysis	8321A		1			429344	09/11/18 14:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1961,1962 DIV VEN CARBON BED INLET R3 M0010 FH

Lab Sample ID: 140-12486-9

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	250 mL	428106	08/30/18 10:19		TAL DEN

Client Sample ID: R-1961,1962 DIV VEN CARBON BED INLET R3 M0010 FH

Lab Sample ID: 140-12486-9

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		50			429055	09/07/18 10:37	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1963,1964,1966 DIV VEN CARBON BED INLET R3 M0010 BH

Lab Sample ID: 140-12486-10

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	450 mL	428542	09/05/18 01:57		TAL DEN
Total/NA	Analysis	8321A		50			429343	09/11/18 13:40	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1965 DIV VEN CARBON BED INLET R3 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12486-11

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		50			429056	09/07/18 12:09	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: R-1967 DIV VEN CARBON BED INLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12486-12

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	428542	09/05/18 01:57		TAL DEN
Total/NA	Analysis	8321A		1			429346	09/11/18 15:39	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-427809/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429056	09/07/18 11:16	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-428106/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	428106	08/30/18 10:19		TAL DEN
Total/NA	Analysis	8321A		1			429055	09/07/18 10:24	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-428378/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	428378	09/04/18 04:27		TAL DEN
Total/NA	Analysis	8321A		1			429341	09/11/18 11:20	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank
Lab Sample ID: MB 280-428542/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	428542	09/05/18 01:57		TAL DEN
Total/NA	Analysis	8321A		1			429343	09/11/18 12:54	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: DLCK 280-424829/13

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			424829	08/03/18 12:14	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-427809/2-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429056	09/07/18 11:20	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-428106/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	428106	08/30/18 10:19		TAL DEN
Total/NA	Analysis	8321A		1			429055	09/07/18 10:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-428378/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	428378	09/04/18 04:27		TAL DEN
Total/NA	Analysis	8321A		1			429341	09/11/18 11:24	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 280-428542/2-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	428542	09/05/18 01:57		TAL DEN
Total/NA	Analysis	8321A		1			429343	09/11/18 12:57	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 280-427809/17-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429056	09/07/18 11:23	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample
Lab Sample ID: LLCS 280-427809/18-A
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429056	09/07/18 11:26	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

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

Accreditation/Certification Summary

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Inlet

TestAmerica Job ID: 140-12486-1

Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	
ANAB	DoD ELAP		L2311	02-13-19
Arkansas DEQ	State Program	6	88-0688	06-16-19
California	State Program	9	2423	06-30-19
Colorado	State Program	8	TN00009	02-28-19
Connecticut	State Program	1	PH-0223	09-30-19
Florida	NELAP	4	E87177	06-30-19
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-19
Kansas	NELAP	7	E-10349	10-31-18
Kentucky (DW)	State Program	4	90101	12-31-18
Louisiana	NELAP	6	83979	06-30-19
Louisiana (DW)	NELAP	6	LA160005	12-31-18
Maryland	State Program	3	277	03-31-19
Michigan	State Program	5	9933	04-13-20
Nevada	State Program	9	TN00009	07-31-19
New Jersey	NELAP	2	TN001	06-30-19
New York	NELAP	2	10781	03-31-19
North Carolina (DW)	State Program	4	21705	07-31-19
North Carolina (WW/SW)	State Program	4	64	12-31-18
Ohio VAP	State Program	5	CL0059	08-28-20
Oklahoma	State Program	6	9415	08-31-19
Oregon	NELAP	10	TNI0189	01-01-19
Pennsylvania	NELAP	3	68-00576	12-31-18
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-19
US Fish & Wildlife	Federal		LE-058448-0	07-31-19
USDA	Federal		P330-16-00262	08-20-19
Utah	NELAP	8	TN00009	07-31-18 *
Virginia	NELAP	3	460176	09-14-18
Washington	State Program	10	C593	01-19-19
West Virginia (DW)	State Program	3	9955C	12-31-18
West Virginia DEP	State Program	3	345	04-30-19
Wisconsin	State Program	5	998044300	08-31-19

Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	01-08-19
Arizona	State Program	9	AZ0713	12-20-18
California	State Program	9	2513	01-18-19
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-19
Georgia	State Program	4	N/A	01-08-19 *
Illinois	NELAP	5	200017	04-30-19
Iowa	State Program	7	370	12-01-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica Denver (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kansas	NELAP	7	E-10166	04-30-19
Louisiana	NELAP	6	02096	06-30-19
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-18
Nevada	State Program	9	CO0026	07-31-19
New Hampshire	NELAP	1	205310	04-28-19
New Jersey	NELAP	2	CO004	06-30-19
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-08-19
Oklahoma	State Program	6	8614	08-31-19
Oregon	NELAP	10	4025	01-08-19
Pennsylvania	NELAP	3	68-00664	07-31-19
South Carolina	State Program	4	72002001	01-08-19
Texas	NELAP	6	T104704183-17-14	09-30-18
US Fish & Wildlife	Federal			07-31-19
USDA	Federal			03-26-21
Utah	NELAP	8	CO00026	07-31-19
Virginia	NELAP	3	460232	06-14-19
Washington	State Program	10	C583	08-03-19
West Virginia DEP	State Program	3	354	12-31-18
Wisconsin	State Program	5	999615430	08-31-19 *
Wyoming (UST)	A2LA	8	2907.01	10-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

ANALYTICAL REPORT

Job Number: 140-12484-1

Job Description: Division Stack Carbon Bed Outlet & QC

Contract Number: LBIO-67048

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

Attention: Michael Aucoin

Approved for release.
Courtney M Adkins
Project Manager I
9/25/2018 8:20 AM

Courtney M Adkins, Project Manager I
5815 Middlebrook Pike, Knoxville, TN, 37921
(865)291-3000
courtney.adkins@testamericainc.com
09/25/2018

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Qualifiers

LCMS

Qualifier	Qualifier Description
D	Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples.
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Method Summary

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Outlet & QC

TestAmerica Job ID: 140-12484-1

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

Protocol References:

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

Laboratory References:

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

Sample Summary

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Outlet & QC

TestAmerica Job ID: 140-12484-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-12484-1	Q-1847,1848 DIV VEN CARBON BED OUTLET R1 M0010 FH	Air	08/21/18 00:00	08/24/18 07:00
140-12484-2	Q-1849,1850,1852 DIV VEN CARBON BED OUTLET R1 M0010 BH	Air	08/21/18 00:00	08/24/18 07:00
140-12484-3	Q-1851 DIV VEN CARBON BED OUTLET R1 M0010 IMPINGER 1,2&3 CONDENSATE	Air	08/21/18 00:00	08/24/18 07:00
140-12484-4	Q-1853 DIV VEN CARBON BED OUTLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	08/21/18 00:00	08/24/18 07:00
140-12484-5	Q-1854,1855 DIV VEN CARBON BED OUTLET R2 M0010 FH	Air	08/22/18 00:00	08/24/18 07:00
140-12484-6	Q-1856,1857,1859 DIV VEN CARBON BED OUTLET R2 M0010 BH	Air	08/22/18 00:00	08/24/18 07:00
140-12484-7	Q-1858 DIV VEN CARBON BED OUTLET R2 M0010 IMPINGER 1,2&3 CONDENSATE	Air	08/22/18 00:00	08/24/18 07:00
140-12484-8	Q-1860 DIV VEN CARBON BED OUTLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	08/22/18 00:00	08/24/18 07:00
140-12484-9	Q-1861,1862 DIV VEN CARBON BED OUTLET R3 M0010 FH	Air	08/22/18 00:00	08/24/18 07:00
140-12484-10	Q-1863,1864,1866 DIV VEN CARBON BED OUTLET R3 M0010 BH	Air	08/22/18 00:00	08/24/18 07:00
140-12484-11	Q-1865 DIV VEN CARBON BED OUTLET R3 M0010 IMPINGER 1,2&3 CONDENSATE	Air	08/22/18 00:00	08/24/18 07:00
140-12484-12	Q-1867 DIV VEN CARBON BED OUTLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	08/22/18 00:00	08/24/18 07:00
140-12484-13	E-2896,2897 DIV QC CARBON BED M0010 FH BT	Air	08/21/18 00:00	08/24/18 07:00
140-12484-14	E-2898,2899,2901 DIV QC CARBON BED M0010 BH BT	Air	08/21/18 00:00	08/24/18 07:00
140-12484-15	E-2900 DIV QC CARBON BED M0010 IMPINGERS 1,2&3 CONDENSATE BT	Air	08/21/18 00:00	08/24/18 07:00
140-12484-16	E-2902 DIV QC CARBON BED M0010 BREAKTHROUGH XAD-RESIN TUBE BT	Air	08/21/18 00:00	08/24/18 07:00
140-12484-17	E-2903 DIV QC CARBON BED M0010 DI WATER RB	Air	08/20/18 00:00	08/24/18 07:00
140-12484-18	E-2904 DIV QC CARBON BED M0010 MEOH WITH 5% NH4OH RB	Air	08/20/18 00:00	08/24/18 07:00
140-12484-19	E-2905 DIV QC CARBON BED M0010 XAD-2 RESIN TUBE RB	Air	08/20/18 00:00	08/24/18 07:00
140-12484-20	E-2906 DIV QC CARBON BED M0010 MEOH WITH 5% NH4OH TB	Air	08/20/18 00:00	08/24/18 07:00
140-12484-21	E-2907 DIV QC CARBON BED M0010 XAD-2 RESIN TUBE TB	Air	08/20/18 00:00	08/24/18 07:00
140-12484-22	E-2908 DIV QC CARBON BED M0010 COMBINED GLASSWAR RINSES (MEOH/5% NH4OH) PB	Air	08/20/18 00:00	08/24/18 07:00
140-12484-23	A-6529 MEDIA CHECK XAD	Air	08/20/18 00:00	08/24/18 07:00
140-12484-24	A-6530 MEDIA CHECK FILTER	Air	08/20/18 00:00	08/24/18 07:00

Job Narrative
140-12484-1

Sample Receipt

The samples were received on August 24, 2018 at 7:00 AM in good condition and properly preserved. The temperatures of the 2 coolers at receipt time were 2.9º C and 3.2º C.

Quality Control and Data Interpretation

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

Method 0010/Method 3542 Sampling Train Preparation

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

LCMS

Method 8321A: 140-12484-15 appears to have been double spiked with IS/Surrogate standard. The prep batch has been corrected to reflect the 2x IS/Surrogate addition.

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

Organic Prep

The following Condensate samples were prepared outside of preparation holding time: Q-1851 DIV VEN CARBON BED OUTLET R1 M0010 IMPINGERS 1,2&3 CONDENSATE (140-12484-3), Q-1858 DIV VEN CARBON BED OUTLET R2 M0010 IMPINGERS 1,2&3 CONDENSATE (140-12484-7), Q-1865 DIV VEN CARBON BED OUTLET R3 M0010 IMPINGERS 1,2&3 CONDENSATE (140-12484-11), E-2900 DIV QC CARBON BED M0010 IMPINGERS 1,2&3 CONDENSATE BT (140-12484-15) and E-2903 DIV QC CARBON BED M0010 DI WATER RB (140-12484-17).

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

Comments

Reporting Limits (RLs) and Method Detection Limits (MDLs) for the HFPO-DA used in this report were derived in Denver for reporting soils and water samples. Method 0010 sampling train matrix specific RLs and MDLs have not been established for HFPO-DA. The soil and water limits are expected to be reasonable approximations of the actual matrix specific limits, under these conditions.

The expanded deliverable section of the package is split into two sections: 8321A_HFPO_DU is specific to condensates, and Method DV-LC-0012 contains the XAD and Filter data. Both methods share the same calibration on 8/3/18. A single instance of this calibration and the associated detection limit check (DLCK) and Initial calibration verification (ICV) can be found in the 8321A_HFPO_DU section of the package as part of our automated package generation procedures.

LCMS

Analysis Batch: 424829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
DLCK 280-424829/13	Lab Control Sample	Total/NA	Air	8321A	

Prep Batch: 427809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12484-3	Q-1851 DIV VEN CARBON BED OUTLET R1 MC	Total/NA	Air	None	
140-12484-7	Q-1858 DIV VEN CARBON BED OUTLET R2 MC	Total/NA	Air	None	
140-12484-11	Q-1865 DIV VEN CARBON BED OUTLET R3 MC	Total/NA	Air	None	
140-12484-15	E-2900 DIV QC CARBON BED M0010 IMPINGE	Total/NA	Air	None	
140-12484-17	E-2903 DIV QC CARBON BED M0010 DI WATEI	Total/NA	Air	None	
MB 280-427809/1-A	Method Blank	Total/NA	Air	None	
LCS 280-427809/2-A	Lab Control Sample	Total/NA	Air	None	
LCSD 280-427809/17-A	Lab Control Sample Dup	Total/NA	Air	None	
LLCS 280-427809/18-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 427945

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12484-2	Q-1849,1850,1852 DIV VEN CARBON BED OUT	Total/NA	Air	None	
140-12484-4	Q-1853 DIV VEN CARBON BED OUTLET R1 MC	Total/NA	Air	None	
140-12484-6	Q-1856,1857,1859 DIV VEN CARBON BED OUT	Total/NA	Air	None	
140-12484-8	Q-1860 DIV VEN CARBON BED OUTLET R2 MC	Total/NA	Air	None	
140-12484-10	Q-1863,1864,1866 DIV VEN CARBON BED OUT	Total/NA	Air	None	
140-12484-12	Q-1867 DIV VEN CARBON BED OUTLET R3 MC	Total/NA	Air	None	
140-12484-14	E-2898,2899,2901 DIV QC CARBON BED M001(	Total/NA	Air	None	
140-12484-16	E-2902 DIV QC CARBON BED M0010 BREAKTH	Total/NA	Air	None	
140-12484-18	E-2904 DIV QC CARBON BED M0010 MEOH W	Total/NA	Air	None	
140-12484-19	E-2905 DIV QC CARBON BED M0010 XAD-2 RE	Total/NA	Air	None	
140-12484-20	E-2906 DIV QC CARBON BED M0010 MEOH W	Total/NA	Air	None	
140-12484-21	E-2907 DIV QC CARBON BED M0010 XAD-2 RE	Total/NA	Air	None	
140-12484-22	E-2908 DIV QC CARBON BED M0010 COMBINE	Total/NA	Air	None	
140-12484-23	A-6529 MEDIA CHECK XAD	Total/NA	Air	None	
MB 280-427945/1-A	Method Blank	Total/NA	Air	None	
LCS 280-427945/2-A	Lab Control Sample	Total/NA	Air	None	

Prep Batch: 428106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12484-1	Q-1847,1848 DIV VEN CARBON BED OUTLET F	Total/NA	Air	None	
140-12484-5	Q-1854,1855 DIV VEN CARBON BED OUTLET F	Total/NA	Air	None	
140-12484-9	Q-1861,1862 DIV VEN CARBON BED OUTLET F	Total/NA	Air	None	
140-12484-13	E-2896,2897 DIV QC CARBON BED M0010 FH I	Total/NA	Air	None	
140-12484-24	A-6530 MEDIA CHECK FILTER	Total/NA	Air	None	
MB 280-428106/1-A	Method Blank	Total/NA	Air	None	
LCS 280-428106/2-A	Lab Control Sample	Total/NA	Air	None	

Analysis Batch: 429055

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 280-428106/1-A	Method Blank	Total/NA	Air	8321A	428106
LCS 280-428106/2-A	Lab Control Sample	Total/NA	Air	8321A	428106

Analysis Batch: 429056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 280-427809/1-A	Method Blank	Total/NA	Air	8321A	427809

LCMS (Continued)

Analysis Batch: 429056 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-427809/2-A	Lab Control Sample	Total/NA	Air	8321A	427809
LCSD 280-427809/17-A	Lab Control Sample Dup	Total/NA	Air	8321A	427809
LLCS 280-427809/18-A	Lab Control Sample	Total/NA	Air	8321A	427809

Analysis Batch: 429059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12484-2	Q-1849,1850,1852 DIV VEN CARBON BED OUT	Total/NA	Air	8321A	427945
140-12484-4	Q-1853 DIV VEN CARBON BED OUTLET R1 MC	Total/NA	Air	8321A	427945
140-12484-6	Q-1856,1857,1859 DIV VEN CARBON BED OUT	Total/NA	Air	8321A	427945
140-12484-8	Q-1860 DIV VEN CARBON BED OUTLET R2 MC	Total/NA	Air	8321A	427945
140-12484-10	Q-1863,1864,1866 DIV VEN CARBON BED OUT	Total/NA	Air	8321A	427945
140-12484-12	Q-1867 DIV VEN CARBON BED OUTLET R3 MC	Total/NA	Air	8321A	427945
140-12484-14	E-2898,2899,2901 DIV QC CARBON BED M001(	Total/NA	Air	8321A	427945
140-12484-16	E-2902 DIV QC CARBON BED M0010 BREAKTH	Total/NA	Air	8321A	427945
140-12484-18	E-2904 DIV QC CARBON BED M0010 MEOH W	Total/NA	Air	8321A	427945
140-12484-19	E-2905 DIV QC CARBON BED M0010 XAD-2 RE	Total/NA	Air	8321A	427945
140-12484-20	E-2906 DIV QC CARBON BED M0010 MEOH W	Total/NA	Air	8321A	427945
140-12484-21	E-2907 DIV QC CARBON BED M0010 XAD-2 RE	Total/NA	Air	8321A	427945
140-12484-22	E-2908 DIV QC CARBON BED M0010 COMBINE	Total/NA	Air	8321A	427945
140-12484-23	A-6529 MEDIA CHECK XAD	Total/NA	Air	8321A	427945
MB 280-427945/1-A	Method Blank	Total/NA	Air	8321A	427945
LCS 280-427945/2-A	Lab Control Sample	Total/NA	Air	8321A	427945

Analysis Batch: 429060

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12484-1	Q-1847,1848 DIV VEN CARBON BED OUTLET F	Total/NA	Air	8321A	428106
140-12484-5	Q-1854,1855 DIV VEN CARBON BED OUTLET F	Total/NA	Air	8321A	428106
140-12484-9	Q-1861,1862 DIV VEN CARBON BED OUTLET F	Total/NA	Air	8321A	428106
140-12484-13	E-2896,2897 DIV QC CARBON BED M0010 FH I	Total/NA	Air	8321A	428106
140-12484-24	A-6530 MEDIA CHECK FILTER	Total/NA	Air	8321A	428106

Analysis Batch: 429061

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-12484-3	Q-1851 DIV VEN CARBON BED OUTLET R1 MC	Total/NA	Air	8321A	427809
140-12484-7	Q-1858 DIV VEN CARBON BED OUTLET R2 MC	Total/NA	Air	8321A	427809
140-12484-11	Q-1865 DIV VEN CARBON BED OUTLET R3 MC	Total/NA	Air	8321A	427809
140-12484-15	E-2900 DIV QC CARBON BED M0010 IMPINGE	Total/NA	Air	8321A	427809
140-12484-17	E-2903 DIV QC CARBON BED M0010 DI WATEI	Total/NA	Air	8321A	427809

Client Sample ID: Q-1847,1848 DIV VEN CARBON BED OUTLET R1 M0010 FH

Lab Sample ID: 140-12484-1

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	23.8		0.250	0.0270	ug/Sample		08/30/18 10:19	09/07/18 14:29	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*125*	*D*	*50 - 200*	*08/30/18 10:19*	*09/07/18 14:29*	*2*

Client Sample ID: Q-1849,1850,1852 DIV VEN CARBON BED OUTLET R1 M0010 BH

Lab Sample ID: 140-12484-2

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.00		0.300	0.0600	ug/Sample		08/29/18 10:42	09/07/18 13:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*113*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:36*	*1*

Client Sample ID: Q-1851 DIV VEN CARBON BED OUTLET R1 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12484-3

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.461	H	0.0514	0.00262	ug/Sample		09/06/18 21:47	09/07/18 14:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*107*		*50 - 200*	*09/06/18 21:47*	*09/07/18 14:55*	*1*

Client Sample ID: Q-1853 DIV VEN CARBON BED OUTLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12484-4

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 13:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*109*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:40*	*1*

Client Sample ID: Q-1854,1855 DIV VEN CARBON BED OUTLET R2 M0010 FH

Lab Sample ID: 140-12484-5

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	24.4		0.375	0.0405	ug/Sample		08/30/18 10:19	09/07/18 14:32	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*118*	*D*	*50 - 200*	*08/30/18 10:19*	*09/07/18 14:32*	*5*

Client Sample ID: Q-1856,1857,1859 DIV VEN CARBON BED OUTLET R2 M0010 BH

Lab Sample ID: 140-12484-6

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.837		0.275	0.0550	ug/Sample		08/29/18 10:42	09/07/18 13:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*117*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:43*	*1*

Client Sample ID: Q-1858 DIV VEN CARBON BED OUTLET R2 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12484-7

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.166	H	0.0509	0.00260	ug/Sample		09/06/18 21:47	09/07/18 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*113*		*50 - 200*	*09/06/18 21:47*	*09/07/18 14:58*	*1*

Client Sample ID: Q-1860 DIV VEN CARBON BED OUTLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12484-8

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 13:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:46*	*1*

Client Sample ID: Q-1861,1862 DIV VEN CARBON BED OUTLET R3 M0010 FH

Lab Sample ID: 140-12484-9

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	21.3		0.200	0.0216	ug/Sample		08/30/18 10:19	09/07/18 14:35	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*128*	*D*	*50 - 200*	*08/30/18 10:19*	*09/07/18 14:35*	*2*

Client Sample ID: Q-1863,1864,1866 DIV VEN CARBON BED OUTLET R3 M0010 BH

Lab Sample ID: 140-12484-10

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.689		0.225	0.0450	ug/Sample		08/29/18 10:42	09/07/18 13:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:49*	*1*

Client Sample ID: Q-1865 DIV VEN CARBON BED OUTLET R3 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12484-11

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.206	H	0.0495	0.00253	ug/Sample		09/06/18 21:47	09/07/18 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*115*		*50 - 200*	*09/06/18 21:47*	*09/07/18 15:01*	*1*

Client Sample ID: Q-1867 DIV VEN CARBON BED OUTLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12484-12

Date Collected: 08/22/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 13:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:53*	*1*

Client Sample ID: E-2896,2897 DIV QC CARBON BED M0010 FH BT

Lab Sample ID: 140-12484-13

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.100	0.0108	ug/Sample		08/30/18 10:19	09/07/18 14:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*126*		*50 - 200*	*08/30/18 10:19*	*09/07/18 14:38*	*1*

Client Sample ID: E-2898,2899,2901 DIV QC CARBON BED M0010 BH BT

Lab Sample ID: 140-12484-14

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.195**	**J**	0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 13:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*108*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:56*	*1*

Client Sample ID: E-2900 DIV QC CARBON BED M0010 IMPINGERS 1,2&3 CONDENSATE BT

Lab Sample ID: 140-12484-15

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.00166**	**J H**	0.00250	0.000128	ug/Sample		09/06/18 21:47	09/07/18 15:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*115*		*50 - 200*	*09/06/18 21:47*	*09/07/18 15:05*	*1*

Client Sample ID: E-2902 DIV QC CARBON BED M0010 BREAKTHROUGH XAD-2 RESIN TUBE BT

Lab Sample ID: 140-12484-16

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 13:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*113*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:59*	*1*

Client Sample ID: E-2903 DIV QC CARBON BED M0010 DI WATER RB

Lab Sample ID: 140-12484-17

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND	H	0.00250	0.000128	ug/Sample		09/06/18 21:47	09/07/18 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*115*		*50 - 200*	*09/06/18 21:47*	*09/07/18 15:08*	*1*

Client Sample ID: E-2904 DIV QC CARBON BED M0010 MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-12484-18

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0360	0.00720	ug/Sample		08/29/18 10:42	09/07/18 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*119*		*50 - 200*	*08/29/18 10:42*	*09/07/18 14:06*	*1*

Client Sample ID: E-2905 DIV QC CARBON BED M0010 XAD-2 RESIN TUBE RB

Lab Sample ID: 140-12484-19

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 14:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*114*		*50 - 200*	*08/29/18 10:42*	*09/07/18 14:09*	*1*

Client Sample ID: E-2906 DIV QC CARBON BED M0010 MEOH WITH 5% NH4OH TB

Lab Sample ID: 140-12484-20

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00500	ug/Sample		08/29/18 10:42	09/07/18 14:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*126*		*50 - 200*	*08/29/18 10:42*	*09/07/18 14:12*	*1*

Client Sample ID: E-2907 DIV QC CARBON BED M0010 XAD-2 RESIN TUBE TB

Lab Sample ID: 140-12484-21

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 14:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*116*		*50 - 200*	*08/29/18 10:42*	*09/07/18 14:16*	*1*

Client Sample ID: E-2908 DIV QC CARBON BED M0010 COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB

Lab Sample ID: 140-12484-22

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0244	J	0.0250	0.00500	ug/Sample		08/29/18 10:42	09/07/18 14:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*117*		*50 - 200*	*08/29/18 10:42*	*09/07/18 14:19*	*1*

Client Sample ID: A-6529 MEDIA CHECK XAD

Lab Sample ID: 140-12484-23

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 14:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*50 - 200*	*08/29/18 10:42*	*09/07/18 14:22*	*1*

Client Sample ID: A-6530 MEDIA CHECK FILTER

Lab Sample ID: 140-12484-24

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00
Sample Container: Air Train

Matrix: Air

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00270	ug/Sample		08/30/18 10:19	09/07/18 14:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*116*		*50 - 200*	*08/30/18 10:19*	*09/07/18 14:42*	*1*

Default Detection Limits

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Outlet & QC

TestAmerica Job ID: 140-12484-1

Method: 8321A - HFPO-DA

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.00250	0.00128	ug/Sample	8321A

Method: 8321A - PFOA and PFOS

Prep: None

Analyte	RL	MDL	Units	Method
HFPO-DA	0.0250	0.00270	ug/Sample	8321A
HFPO-DA	0.100	0.0200	ug/Sample	8321A

Surrogate Summary

Client: Chemours Company FC, LLC The
Project/Site: Division Stack Carbon Bed Outlet & QC

TestAmerica Job ID: 140-12484-1

Method: 8321A - HFPO-DA

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-12484-3	Q-1851 DIV VEN CARBON BED	107
140-12484-7	Q-1858 DIV VEN CARBON BED	113
140-12484-11	Q-1865 DIV VEN CARBON BED	115
140-12484-15	E-2900 DIV QC CARBON BED I	115
140-12484-17	E-2903 DIV QC CARBON BED I	115
LCS 280-427809/2-A	Lab Control Sample	108
LCSD 280-427809/17-A	Lab Control Sample Dup	114
LLCS 280-427809/18-A	Lab Control Sample	113
MB 280-427809/1-A	Method Blank	108

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - PFOA and PFOS

Matrix: Air **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	HFPODA (50-200)
140-12484-1	Q-1847,1848 DIV VEN CARBON	125 D
140-12484-2	Q-1849,1850,1852 DIV VEN CA	113
140-12484-4	Q-1853 DIV VEN CARBON BED	109
140-12484-5	Q-1854,1855 DIV VEN CARBON	118 D
140-12484-6	Q-1856,1857,1859 DIV VEN CA	117
140-12484-8	Q-1860 DIV VEN CARBON BED	112
140-12484-9	Q-1861,1862 DIV VEN CARBON	128 D
140-12484-10	Q-1863,1864,1866 DIV VEN CA	112
140-12484-12	Q-1867 DIV VEN CARBON BED	112
140-12484-13	E-2896,2897 DIV QC CARBON	126
140-12484-14	E-2898,2899,2901 DIV QC CAR	108
140-12484-16	E-2902 DIV QC CARBON BED I	113
140-12484-18	E-2904 DIV QC CARBON BED I	119
140-12484-19	E-2905 DIV QC CARBON BED I	114
140-12484-20	E-2906 DIV QC CARBON BED I	126
140-12484-21	E-2907 DIV QC CARBON BED I	116
140-12484-22	E-2908 DIV QC CARBON BED I	117
140-12484-23	A-6529 MEDIA CHECK XAD	112
140-12484-24	A-6530 MEDIA CHECK FILTER	116
DLCK 280-424829/13	Lab Control Sample	99
LCS 280-427945/2-A	Lab Control Sample	111
LCS 280-428106/2-A	Lab Control Sample	98
MB 280-427945/1-A	Method Blank	107
MB 280-428106/1-A	Method Blank	99

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 8321A - HFPO-DA

Lab Sample ID: MB 280-427809/1-A
Matrix: Air
Analysis Batch: 429056

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 427809

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00250	0.000128	ug/Sample		09/06/18 21:47	09/07/18 11:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*108*		*50 - 200*	*09/06/18 21:47*	*09/07/18 11:16*	*1*

Lab Sample ID: LCS 280-427809/2-A
Matrix: Air
Analysis Batch: 429056

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427809

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0500	0.04903		ug/Sample		98	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*108*		*50 - 200*

Lab Sample ID: LCSD 280-427809/17-A
Matrix: Air
Analysis Batch: 429056

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 427809

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0500	0.04943		ug/Sample		99	50 - 150	1	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*114*		*50 - 200*

Lab Sample ID: LLCS 280-427809/18-A
Matrix: Air
Analysis Batch: 429056

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427809

Analyte			Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.00500	0.004718		ug/Sample		94	50 - 150		

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C3 HFPO-DA	*113*		*50 - 200*

Method: 8321A - PFOA and PFOS

Lab Sample ID: DLCK 280-424829/13
Matrix: Air
Analysis Batch: 424829

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	DLCK Result	DLCK Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.250	0.2532		ug/L		101	70 - 130		

Surrogate	*DLCK %Recovery*	*DLCK Qualifier*	*Limits*
13C3 HFPO-DA	*99*		*50 - 200*

Method: 8321A - PFOA and PFOS (Continued)

Lab Sample ID: MB 280-427945/1-A
Matrix: Air
Analysis Batch: 429059

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 427945

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		08/29/18 10:42	09/07/18 13:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*107*		*50 - 200*	*08/29/18 10:42*	*09/07/18 13:30*	*1*

Lab Sample ID: LCS 280-427945/2-A
Matrix: Air
Analysis Batch: 429059

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427945

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	4.00	3.219		ug/Sample		80	50 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*111*		*50 - 200*

Lab Sample ID: MB 280-428106/1-A
Matrix: Air
Analysis Batch: 429055

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428106

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.0250	0.00270	ug/Sample		08/30/18 10:19	09/07/18 10:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*99*		*50 - 200*	*08/30/18 10:19*	*09/07/18 10:24*	*1*

Lab Sample ID: LCS 280-428106/2-A
Matrix: Air
Analysis Batch: 429055

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428106

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.500	0.4095		ug/Sample		82	50 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*98*		*50 - 200*

Client Sample ID: Q-1847,1848 DIV VEN CARBON BED OUTLET R1 M0010 FH

Lab Sample ID: 140-12484-1

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	250 mL	428106	08/30/18 10:19		TAL DEN
Total/NA	Analysis	8321A		2			429060	09/07/18 14:29	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1849,1850,1852 DIV VEN CARBON BED OUTLET R1 M0010 BH

Lab Sample ID: 140-12484-2

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	600 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:36	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1851 DIV VEN CARBON BED OUTLET R1 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12484-3

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.04867 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429061	09/07/18 14:55	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1853 DIV VEN CARBON BED OUTLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12484-4

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:40	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1854,1855 DIV VEN CARBON BED OUTLET R2 M0010 FH

Lab Sample ID: 140-12484-5

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	150 mL	428106	08/30/18 10:19		TAL DEN

Client Sample ID: Q-1854,1855 DIV VEN CARBON BED OUTLET R2 M0010 FH

Lab Sample ID: 140-12484-5

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		5			429060	09/07/18 14:32	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1856,1857,1859 DIV VEN CARBON BED OUTLET R2 M0010 BH

Lab Sample ID: 140-12484-6

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	550 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:43	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1858 DIV VEN CARBON BED OUTLET R2 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12484-7

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.04911 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429061	09/07/18 14:58	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1860 DIV VEN CARBON BED OUTLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12484-8

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:46	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1861,1862 DIV VEN CARBON BED OUTLET R3 M0010 FH

Lab Sample ID: 140-12484-9

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	200 mL	428106	08/30/18 10:19		TAL DEN

Client Sample ID: Q-1861,1862 DIV VEN CARBON BED OUTLET R3 M0010 FH

Lab Sample ID: 140-12484-9

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		2			429060	09/07/18 14:35	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1863,1864,1866 DIV VEN CARBON BED OUTLET R3 M0010 BH

Lab Sample ID: 140-12484-10

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	450 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:49	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1865 DIV VEN CARBON BED OUTLET R3 M0010 IMPINGERS 1,2&3 CONDENSATE

Lab Sample ID: 140-12484-11

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.05046 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429061	09/07/18 15:01	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Q-1867 DIV VEN CARBON BED OUTLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-12484-12

Date Collected: 08/22/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:53	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2896,2897 DIV QC CARBON BED M0010 FH BT

Lab Sample ID: 140-12484-13

Date Collected: 08/21/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	200 mL	428106	08/30/18 10:19		TAL DEN

Client Sample ID: E-2896,2897 DIV QC CARBON BED M0010 FH BT

Lab Sample ID: 140-12484-13

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			429060	09/07/18 14:38	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2898,2899,2901 DIV QC CARBON BED M0010 BH BT

Lab Sample ID: 140-12484-14

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:56	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2900 DIV QC CARBON BED M0010 IMPINGERS 1,2&3 CONDENSATE BT

Lab Sample ID: 140-12484-15

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429061	09/07/18 15:05	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2902 DIV QC CARBON BED M0010 BREAKTHROUGH XAD-2 RESIN TUBE BT

Lab Sample ID: 140-12484-16

Date Collected: 08/21/18 00:00
Date Received: 08/24/18 07:00

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:59	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2903 DIV QC CARBON BED M0010 DI WATER RB

Lab Sample ID: 140-12484-17

Date Collected: 08/20/18 00:00
Date Received: 08/24/18 07:00

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429061	09/07/18 15:08	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2904 DIV QC CARBON BED M0010 MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-12484-18

Date Collected: 08/20/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	72 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 14:06	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2905 DIV QC CARBON BED M0010 XAD-2 RESIN TUBE RB

Lab Sample ID: 140-12484-19

Date Collected: 08/20/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 14:09	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2906 DIV QC CARBON BED M0010 MEOH WITH 5% NH4OH TB

Lab Sample ID: 140-12484-20

Date Collected: 08/20/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 14:12	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2907 DIV QC CARBON BED M0010 XAD-2 RESIN TUBE TB

Lab Sample ID: 140-12484-21

Date Collected: 08/20/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 14:16	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: E-2908 DIV QC CARBON BED M0010 COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB

Lab Sample ID: 140-12484-22

Date Collected: 08/20/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	427945	08/29/18 10:42		TAL DEN

Client Sample ID: E-2908 DIV QC CARBON BED M0010 COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB

Lab Sample ID: 140-12484-22

Date Collected: 08/20/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			429059	09/07/18 14:19	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: A-6529 MEDIA CHECK XAD

Lab Sample ID: 140-12484-23

Date Collected: 08/20/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 14:22	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: A-6530 MEDIA CHECK FILTER

Lab Sample ID: 140-12484-24

Date Collected: 08/20/18 00:00
Matrix: Air
Date Received: 08/24/18 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	428106	08/30/18 10:19		TAL DEN
Total/NA	Analysis	8321A		1			429060	09/07/18 14:42	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-427809/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429056	09/07/18 11:16	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank

Lab Sample ID: MB 280-427945/1-A

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:30	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Method Blank — Lab Sample ID: MB 280-428106/1-A

Date Collected: N/A — **Matrix: Air**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	428106	08/30/18 10:19		TAL DEN
Total/NA	Analysis	8321A		1			429055	09/07/18 10:24	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample — Lab Sample ID: DLCK 280-424829/13

Date Collected: N/A — **Matrix: Air**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8321A		1			424829	08/03/18 12:14	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 280-427809/2-A

Date Collected: N/A — **Matrix: Air**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429056	09/07/18 11:20	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 280-427945/2-A

Date Collected: N/A — **Matrix: Air**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	400 mL	427945	08/29/18 10:42		TAL DEN
Total/NA	Analysis	8321A		1			429059	09/07/18 13:33	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample — Lab Sample ID: LCS 280-428106/2-A

Date Collected: N/A — **Matrix: Air**
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	428106	08/30/18 10:19		TAL DEN
Total/NA	Analysis	8321A		1			429055	09/07/18 10:27	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 280-427809/17-A

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429056	09/07/18 11:23	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Client Sample ID: Lab Control Sample

Lab Sample ID: LLCS 280-427809/18-A

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	5 mL	427809	09/06/18 21:47	KSA	TAL DEN
Total/NA	Analysis	8321A		1			429056	09/07/18 11:26	AGCM	TAL DEN
	Instrument ID: LC_LCMS7									

Laboratory References:

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

Accreditation/Certification Summary

Client: Chemours Company FC, LLC The
TestAmerica Job ID: 140-12484-1
Project/Site: Division Stack Carbon Bed Outlet & QC

Laboratory: TestAmerica Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
	AFCEE		N/A	
ANAB	DoD ELAP		L2311	02-13-19
Arkansas DEQ	State Program	6	88-0688	06-16-19
California	State Program	9	2423	06-30-19
Colorado	State Program	8	TN00009	02-28-19
Connecticut	State Program	1	PH-0223	09-30-19
Florida	NELAP	4	E87177	06-30-19
Georgia	State Program	4	906	04-13-20
Hawaii	State Program	9	N/A	04-13-19
Kansas	NELAP	7	E-10349	10-31-18
Kentucky (DW)	State Program	4	90101	12-31-18
Louisiana	NELAP	6	83979	06-30-19
Louisiana (DW)	NELAP	6	LA160005	12-31-18
Maryland	State Program	3	277	03-31-19
Michigan	State Program	5	9933	04-13-20
Nevada	State Program	9	TN00009	07-31-19
New Jersey	NELAP	2	TN001	06-30-19
New York	NELAP	2	10781	03-31-19
North Carolina (DW)	State Program	4	21705	07-31-19
North Carolina (WW/SW)	State Program	4	64	12-31-18
Ohio VAP	State Program	5	CL0059	08-28-20
Oklahoma	State Program	6	9415	08-31-19
Oregon	NELAP	10	TNI0189	01-01-19
Pennsylvania	NELAP	3	68-00576	12-31-18
Tennessee	State Program	4	2014	04-13-20
Texas	NELAP	6	T104704380-16-9	08-31-19
US Fish & Wildlife	Federal		LE-058448-0	07-31-19
USDA	Federal		P330-16-00262	08-20-19
Utah	NELAP	8	TN00009	07-31-18 *
Virginia	NELAP	3	460176	09-14-18
Washington	State Program	10	C593	01-19-19
West Virginia (DW)	State Program	3	9955C	12-31-18
West Virginia DEP	State Program	3	345	04-30-19
Wisconsin	State Program	5	998044300	08-31-19

Laboratory: TestAmerica Denver

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-19
A2LA	ISO/IEC 17025		2907.01	10-31-19
Alabama	State Program	4	40730	09-30-12 *
Alaska (UST)	State Program	10	UST-30	01-08-19
Arizona	State Program	9	AZ0713	12-20-18
California	State Program	9	2513	01-18-19
Connecticut	State Program	1	PH-0686	09-30-18
Florida	NELAP	4	E87667	06-30-19
Georgia	State Program	4	N/A	01-08-19 *
Illinois	NELAP	5	200017	04-30-19
Iowa	State Program	7	370	12-01-18

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica Denver (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Kansas	NELAP	7	E-10166	04-30-19
Louisiana	NELAP	6	02096	06-30-19
Maine	State Program	1	CO0002	03-03-19
Minnesota	NELAP	5	8-999-405	12-31-18
Nevada	State Program	9	CO0026	07-31-19
New Hampshire	NELAP	1	205310	04-28-19
New Jersey	NELAP	2	CO004	06-30-19
New York	NELAP	2	11964	04-01-19
North Carolina (WW/SW)	State Program	4	358	12-31-18
North Dakota	State Program	8	R-034	01-08-19
Oklahoma	State Program	6	8614	08-31-19
Oregon	NELAP	10	4025	01-08-19
Pennsylvania	NELAP	3	68-00664	07-31-19
South Carolina	State Program	4	72002001	01-08-19
Texas	NELAP	6	T104704183-17-14	09-30-18
US Fish & Wildlife	Federal			07-31-19
USDA	Federal			03-26-21
Utah	NELAP	8	CO00026	07-31-19
Virginia	NELAP	3	460232	06-14-19
Washington	State Program	10	C583	08-03-19
West Virginia DEP	State Program	3	354	12-31-18
Wisconsin	State Program	5	999615430	08-31-19 *
Wyoming (UST)	A2LA	8	2907.01	10-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

APPENDIX D
SAMPLE CALCULATIONS

EXAMPLE CALCULATION FOR
BIAS CORRECTION OF OXYGEN AND CARBON DIOXIDE.

1. Bias corrected value of Oxygen and Carbon Dioxide, dry basis (%).

$$Cd = \frac{(AVG - Zbias)}{(Sbias - Zbias)} \times SPAN\ GAS$$

Where:

Cd = $O_{2\ and}$ CO_2 concentration measured on a dry basis (percent by volume), bias corrected.

AVG = Average O_2 and CO_2 concentration for the test run.

Zbias = The average of pre and post test zero bias checks.

Sbias = The average of pre and post test span bias check.

SPAN GAS = The calibration gas closest to the gas stream concentration, was used for the BIAS check.

EXAMPLE CALCULATIONS FOR
VOLUMETRIC FLOW AND MOISTURE AND ISOKINETICS

Client: Chemours	Facility: Fayetteville, NC
Test Number: Run 1	Test Date: 8/21/2018
Test Location: VE North Carbon Bed Inlet	Test Period: 0915-1115

1. Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 \times Y \times Vm \times \left(Pb + \frac{\text{delta H}}{13.6} \right)}{(Tm + 460)}$$

$$Vm(std) = \frac{17.64 \times 1.0015 \times 64.659 \times \left(30.04 + \frac{1.4625}{13.6} \right)}{85.7 + 460} = 63.106$$

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.

$$Vw(std) = (0.04707 \times Vwc) + (0.04715 \times Wwsg)$$

$$Vw(std) = (0.04707 \times 29.5) + (0.04715 \times 20.3) = 2.35$$

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

$$bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

$$bws = \frac{2.35}{2.35 + 63.106} = 0.036$$

Where:

bws = Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

$$Md = 1 - bws$$

$$Md = 1 - 0.036 = 0.964$$

Where:

Md = Mole fraction of dry gas, dimensionless.

5. Dry molecular weight of gas stream, lb/lb-mole.

$$MWd = (0.440 \times \%\ CO_2) + (0.320 \times \%\ O_2) + (0.280 \times (\%\ N_2 + \%\ CO))$$

$$MWd = (0.440 \times 0.0) + (0.320 \times 20.9) + (0.280 \times (79.1 + 0.00))$$

$$MWd = 28.84$$

Where:

MWd = Dry molecular weight , lb/lb-mole.
% CO2 = Percent carbon dioxide by volume, dry basis.
$\%\ O_2$ = Percent oxygen by volume, dry basis.
$\%\ N_2$ = Percent nitrogen by volume, dry basis.
% CO = Percent carbon monoxide by volume, dry basis.
0.440 = Molecular weight of carbon dioxide, divided by 100.
0.320 = Molecular weight of oxygen, divided by 100.
0.280 = Molecular weight of nitrogen or carbon monoxide, divided by 100.

6. Actual molecular weight of gas stream (wet basis), lb/lb-mole.

$$MWs = (MWd \times Md) + (18 \times (1 - Md))$$

$$MWs = (28.84 \times 0.964) +(18 (1 - 0.964)) = 28.45$$

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.

$$Vs = 85.49 \times Cp \times ((\text{delt } p)^{1/2})avg \times \left(\frac{Ts\ (avg)}{Ps \times MWs} \right)^{1/2}$$

$$Vs = 85.49 \times 0.84 \times 0.75908 \times \left(\frac{553}{29.56 \times 28.45} \right)^{\wedge}1/2 = 44.2$$

Where:

Vs = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, ft/sec $\times \frac{(lb/lb\text{-}mole)(in.\ Hg)^{1/2}}{(deg\ R)(in\ H_2O)}$

Cp = Pitot tube coefficient, dimensionless.

Ts = Absolute gas stream temperature, deg R = Ts, deg F + 460.

Ps = Absolute gas stack pressure, in. Hg. = $Pb + \frac{P(static)}{13.6}$

delt p = Velocity head of stack, in. H_2O.

8. Average gas stream volumetric flow rate at actual conditions, wacf/min.

$$Qs(act) = 60 \times Vs \times As$$

$$Qs(act) = 60 \times 44.2 \times 6.31 = 16722$$

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.

$$Qs(std) = 17.64 \times Md \times \frac{Ps}{Ts} \times Qs(act)$$

$$Qs(std) = 17.64 \times 0.964 \times \frac{29.56}{553.0} \times 16722$$

$$Qs(std) = 15204$$

Where:

Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min.

10. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.327 \times Ts \times Vm(std)}{Vs \times O \times Ps \times Md \times (Dn)^2}$$

$$I = \frac{17.327 \times 553 \times 63.106}{44.2 \times 96 \times 29.56 \times 0.964 \times (0.218)^{\wedge}2} = 105.2$$

Where:

I =	Percent of isokinetic sampling.
O =	Total sampling time, minutes.
Dn =	Diameter of nozzle, inches.
17.327 =	Factor which includes standard temperature (528 deg R), standard pressure (29.92 in. Hg), the formula for calculating area of circle $D^{2/4}$, conversion of square feet to square inches (144), conversion of seconds to minutes (60), and conversion to percent (100), $\frac{(\text{in. Hg})(\text{in}^2)(\text{min})}{(\text{deg R})(\text{ft}^2)(\text{sec})}$

SAMPLE CALCULATIONS FOR
HFPO DIMER ACID (METHOD 0010)

Client: Chemours | **Plant: Fayetteville, NC**
Test Number: Run 1 | **Test Date: 8/21/2018**
Test Location: VEN-CBed IN | **Test Period: 0915-1115**

1. HFPO Dimer Acid concentration, lbs/dscf.

$$Conc1 = \frac{W \times 2.2046 \times 10^{-9}}{Vm(std)}$$

$$Conc1 = \frac{1311.1 \times 2.2046 \times 10\text{-}9}{63.106}$$

Conc1 = 4.58E-08

Where:

W = Weight of HFPO Dimer Acid collected in sample in ug.

Conc1 = 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 = 1311.1 / (63.106 x 0.02832)

Conc2 = 733.5

Where:

Conc2 = 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.

$MR1_{(Inlet)}$ = Conc1 x Qs(std) x 60 min/hr

$MR1_{(Inlet)}$ = 4.58E-08 x 15204 x 60

$MR1_{(Inlet)}$ = 4.18E-02

Where:

$MR1_{(Inlet)}$ = HFPO Dimer Acid mass emission rate, lbs/hr.

4. HFPO Dimer Acid mass emission rate, g/sec.

$MR2_{(Inlet)}$ = $MR1_{(Inlet)}$ x 453.59 / 3600

$MR2_{(Inlet)}$ = 4.18E-02 x 453.59 /3600

$MR2_{(Inlet)}$ = 5.26E-03

Where:

$MR2_{(Inlet)}$ = HFPO Dimer Acid mass emission rate, g/sec.

453.59 = Conversion factor from pounds to grams.

3600 = Conversion factor from hours to seconds.

5. HFPO Dimer Acid Removal Efficiency, %

$$RE = \frac{MR1_{(Inlet)} - MR1_{(Outlet)}}{MR1_{(Inlet)}}$$

$$RE = \frac{(4.18E\text{-}2) - (8.53E\text{-}4)}{4.18E\text{-}02}$$

RE = 98.0

Where:

RE = Carbon Bed Removal Efficiency.

$MR1_{(Inlet)}$ = Carbon Bed Inlet HFPO Dimer Acid mass rate, lbs/hr.

$MR1_{(Outlet)}$ = Carbon Bed Outlet HFPO Dimer Acid mass rate, lbs/hr.

SAMPLE CALCULATIONS FOR
HFPO DIMER ACID (METHOD 0010)

Client: Chemours | **Plant: Fayetteville, NC**
Test Number: Run 1 | **Test Date: 7/19/18**
Test Location: VEN-CBed Outlet | **Test Period: 0915-1115**

1. HFPO Dimer Acid concentration, lbs/dscf.

$$C_1 = \frac{W \times 2.2046 \times 10^{-9}}{Vm(std)}$$

$$C_1 = \frac{25.3 \times 2.2046 \times 10\text{-}9}{62.763}$$

$$= < 8.87E\text{-}10$$

Where:

W = Weight of HFPO Dimer Acid collected in sample in ug.

C_1 = HFPO Dimer Acid concentration, lbs/dscf.

2.2046×10^{-9} = Conversion factor from ug to lbs.

2. HFPO Dimer Acid concentration, ug/dscm.

$C_2 = W / (Vm(std) \times 0.02832)$

$C_2 = 25.3 / (62.763 \times 0.02832)$

$= 1.42E+01$

Where:

C_2 = 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.

PMR1 = C_1 x Qs(std) x 60 min/hr

PMR1 = 8.87E-10 x 16013 x 60

= 8.53E-04

Where:

PMR1 = HFPO Dimer Acid mass emission rate, lbs/hr.

4. HFPO Dimer Acid mass emission rate, g/sec.

PMR2 = PMR1 x 453.59 / 3600

PMR2 = 8.53E-04 x 453.59 /3600

= 1.07E-04

Where:

PMR2 = HFPO Dimer Acid mass emission rate, g/sec.

453.6 = Conversion factor from pounds to grams.

3600 = Conversion factor from hours to seconds.

APPENDIX E
EQUIPMENT CALIBRATION RECORDS

Long Cal and Temperature Cal Datasheet for Standard Dry Gas Meter Console

Calibrator: PM | Meter Box Number: 27 | Ambient Temp: 72

Date: 4-Feb-18 | Wet Test Meter Number: P-2952 | Temp Reference Source: Thermocouple Simulator (Accuracy +/- 1°F)

Dry Gas Meter Number: 16787479

Baro Press, in Hg (Pb)	29.41

Setting	Gas Volume		Temperatures					Calibration Results	
Orifice Manometer	Wet Test Meter	Dry gas Meter	Wet Test Meter	Dry Gas Meter					
in H_20 (ΔH)	ft^3 (Vw)	ft^3 (Vd)	°F (Tw)	Outlet, °F (Td_o)	Inlet, °F (Td_i)	Average, °F (Td)	Time, min (O)	Y	ΔH
0.5	5.0	544.389	70.0	71.00	71.00	71.5	12.9	1.0014	1.8959
		549.390		72.00	72.00				
		5.001		71.50	71.50				
1.0	7.0	549.390	70.0	72.00	72.00	72.0	12.8	1.0047	1.9030
		556.366		72.00	72.00				
		6.976		72.00	72.00				
1.5	11.00	556.366	70.0	72.00	72.00	73.0	16.9	1.0030	2.0113
		567.354		74.00	74.00				
		10.988		73.00	73.00				
2.0	11.0	567.354	70.0	74.00	74.00	74.5	14.5	1.0033	1.9686
		578.356		75.00	75.00				
		11.002		74.50	74.50				
3.0	10.0	578.356	70.0	75.00	75.00	75.5	10.9	0.9953	2.0153
		588.432		76.00	76.00				
		10.076		75.50	75.50				
							Average	1.0015	1.9588

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	31	31		31.6	0.1%
212	212	212	212	211	211		211.6	0.1%
932	932	932	932	931	931		931.6	0.0%
1832	1831	1831	1831	1830	1830		1830.6	0.1%

1 - Channel Temps must agree with +/- 5°F or 3°C

2 - Acceptable Temperature Difference less than 1.5 %

$$\text{Temp Diff} = \left[\frac{(\text{Reference Temp}(^\circ F) + 460) - (\text{Test Temp}(^\circ F) + 460)}{\text{Reference Temp}(^\circ F) + 460} \right]$$

Y Factor Calibration Check Calculation

MODIFIED METHOD 0010 TEST TRAIN
VE NORTH CARBON BED INLET
METER BOX NO. 27
8/21/2018 +8/22/2018

	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.	0.0	0.0	0.0
% O_2 = Percent oxygen by volume, dry basis.	20.9	20.9	20.9

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

$$MWd = (0.32 * 20.9) + (0.44 * 0) + (0.28 * (100 - (0 + 20.9)))$$

$$MWd = (6.69) + (0.00) + (22.15)$$

MWd =	28.84	28.84	28.84

Tma = Source Temperature, absolute(^oR)			
Tm = Average dry gas meter temperature , deg F.	85.7	89.8	82.0

$$Tma = Ts + 460$$

$$Tma = 85.71 + 460$$

Tma =	545.71	549.75	542.04

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	1.46	1.40	1.41
Pb = Barometric Pressure, in Hg.	30.04	30.02	29.93

$$Pm = Pb + (delta\ H / 13.6)$$

$$Pm = 30.04 + (1.4625 / 13.6)$$

Pm =	30.15	30.12	30.03

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.	64.659	63.485	63.656
Y = Dry gas meter calibration factor (based on full calibration)	1.0015	1.0015	1.0015
Delta H@ = Dry Gas meter orifice calibration coefficient, in. H2O.	1.9588	1.9588	1.9588
avg SQRT Delta H = Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	1.2060	1.1819	1.1853
O = Total sampling time, minutes.	96	96	96

$$Yqa = (O / Vm) * SQRT (0.0319 * Tma * 29) / (Delta\ H@ * Pm * MWd) * avg\ SQRT\ Delta\ H$$

$$Yqa = (96.00 / 64.66) * SQRT (0.0319 * 545.71 * 29) / (1.96 * 30.15 * 28.84) * 1.21$$

$$Yqa = 1.485 * SQRT\ 504.835 / 1{,}702.991 * 1.21$$

Yqa =	0.9749	0.9771	0.9719

Diff = Absolute difference between Yqa and Y	2.66	2.44	2.96

$$Diff = ((Y - Yqa) / Y) * 100$$

$$Diff = ((1.0015 - 0.975) / 1.0015) * 100$$

Average Diff = 2.69

Allowable = 5.0

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

Integrated Air Services

1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record readings in colored boxes below, other columns are automatically calculated.

DATE: 11/30/17 | METER SERIAL #: 6847410 | BAROMETRIC PRESSURE (in Hg): INITIAL 29.23, FINAL 29.20, AVG (P_{bar}) 29.22

METER PART #: AO12 | CRITICAL ORIFICE SET SERIAL #: 1515s & 1651 | Calibrated by: ST

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	FINAL	NET (V_m)	AMBIENT F°	DGM F° INITIAL	FINAL	Avg DGM F° T_m	ELAPSED TIME (MIN) θ	DGM ΔH ($in H_2O$)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	(4) $\Delta H_@$
8	1	0.2142	25	225.182	230.550	5.368	71	69	70	70	19	0.22	5.231	5.161	0.987	1.636
11	2	0.2869	23	209.320	215.029	5.709	70	66	67	67	15	0.42	5.597	5.463	0.976	1.749
15	3	0.4199	22	215.735	223.965	8.230	70	68	69	69	15	0.90	8.048	7.995	0.993	1.747
21	4	0.5677	19	246.040	257.291	11.251	72	70	71	71	15	1.70	10.983	10.789	0.982	1.813
26	5	0.7089	17	231.536	245.491	13.955	71	70	70	70	15	2.70	13.670	13.485	0.987	1.854
31	6	0.8627	15	257.970	274.906	16.936	72	71	72	72	15	4.10	16.601	16.396	0.988	1.912
														AVG =	0.985	1.785

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

Individual Y's .02 from average? **PASS**

Individual $\Delta H_@$ values 0.15 from average? **PASS**

Average Y value +/-.02 of 1.000? **PASS**

(1) $V_m(std) = K_1 V_m \frac{P_{bar} + (\Delta H/13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions

K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)

T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr}(std) = K' \sqrt{\frac{P_{bar}\,\theta}{T_{amb}}}$ = Volume of gas sample passed through the critical orifice, corrected to standard conditions

T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)

K' = Average K' factor from Critical Orifice Calibration

(3) $Y = \frac{V_{cr}(std)}{V_m(std)}$ = DGM calibration factor

Next Calibration Due By:	11/30/2018

(4) $\Delta H_@ = \frac{\Delta H\ 0.0319\ T_m\ \theta^2}{P_{bar}\ Y^2\ V_m^2}$

Y Factor Calibration Check Calculation

MODIFIED METHOD 0010 TEST TRAIN
VE NORTH CARBON BED OUTLET
METER BOX NO. AO12
8/21/2018 +8/22/2018

	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.	0.0	0.0	0.0
% O_2 = Percent oxygen by volume, dry basis.	20.9	20.9	20.9

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

$$MWd = (0.32 * 20.9) + (0.44 * 0) + (0.28 * (100 - (0 + 20.9)))$$

$$MWd = (6.69) + (0.00) + (22.15)$$

MWd =	28.84	28.84	28.84

Tma = Source Temperature, absolute(°R)			
Tm = Average dry gas meter temperature , deg F.	83.9	90.4	81.6

$$Tma = Ts + 460$$

$$Tma = 83.92 + 460$$

Tma =	543.92	550.38	541.58

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	1.42	1.28	1.29
Pb = Barometric Pressure, in Hg.	30.04	30.02	29.93

$$Pm = Pb + (delta\ H / 13.6)$$

$$Pm = 30.04 + (1.41791666666667 / 13.6)$$

Pm =	30.14	30.11	30.02

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.	65.177	62.620	62.216
Y = Dry gas meter calibration factor (based on full calibration)	0.9850	0.9850	0.9850
Delta H@ = Dry Gas meter orifice calibration coefficient, in. H2O.	1.7850	1.7850	1.7850
avg SQRT Delta H = Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	1.1720	1.1125	1.1193
O = Total sampling time, minutes.	96	96	96

$$Yqa = (O / Vm) * SQRT (0.0319 * Tma * 29) / (Delta\ H@ * Pm * MWd) * avg\ SQRT\ Delta\ H$$

$$Yqa = (96.00 / 65.18) * SQRT (0.0319 * 543.92 * 29) / (1.79 * 30.14 * 28.84) * 1.17$$

$$Yqa = 1.473 * SQRT\ 503.177 / 1{,}551.374 * 1.17$$

Yqa =	0.9831	0.9776	0.9834

Diff = Absolute difference between Yqa and Y	0.19	0.75	0.16

$$Diff = ((Y - Yqa) / Y) * 100$$

$$Diff = ((0.985 - 0.983) / 0.985) * 100$$

Average Diff = 0.37

Allowable = 5.0

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI79E15A00E4	Reference Number:	82-124627728-1
Cylinder Number:	XC016060B	Cylinder Volume:	150.5 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Jul 10, 2017

Expiration Date: Jul 10, 2025

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 volume/volume 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 %	8.942 %	G1	+/- 0.7% NIST Traceable	07/10/2017
OXYGEN	12.00 %	11.99 %	G1	+/- 0.4% NIST Traceable	07/10/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061336	CC360792	11.002 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2018
NTRMplus	09060208	CC262337	9.961 % OXYGEN/NITROGEN	+/- 0.3%	Nov 08, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Jun 30, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Jul 07, 2017

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI62E15A0224	Reference Number:	82-124617628-1A
Cylinder Number:	CC72346	Cylinder Volume:	157.2 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	May 15, 2017

Expiration Date: May 15, 2025

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 volume/volume 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 %	16.27 %	G1	+/- 0.7% NIST Traceable	05/15/2017
OXYGEN	21.00 %	20.88 %	G1	+/- 1% NIST Traceable	05/15/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061547	CC354845	19.87 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 27, 2018
NTRM	09061419	CC273614	22.53 % OXYGEN/NITROGEN	+/- 0.4%	Mar 08, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801933 CO2	FTIR	May 04, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	May 11, 2017

Triad Data Available Upon Request

Signature on file

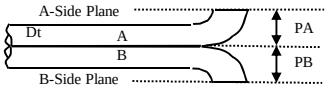
Approved for Release

Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-710**

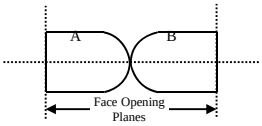
If all Criteria PASS Cp is equal to 0.84

Inspection Date 5/30/18 Individual Conducting Inspection SR

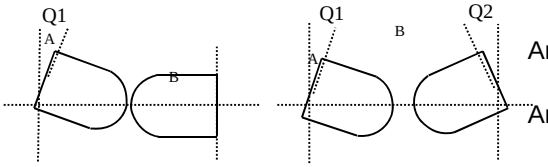


		PASS/FAIL
Distance to A Plane (PA) - inches	0.453	PASS
Distance to B Plane (PB) - inches	0.453	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

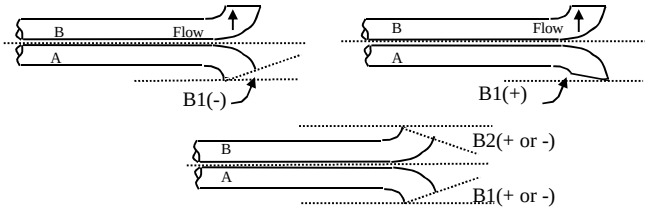


Are Open Faces Aligned Perpendicular to the Tube Axis: (●) YES ( ) NO — PASS



Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS

Q1 and Q2 must be $\leq 10^o$

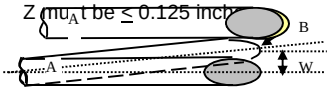


Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

B1 or B2 must be $\leq 5^o$

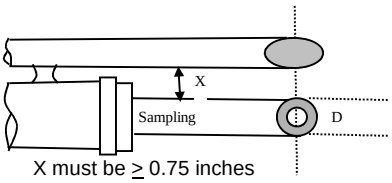
Horizontal offset between A and B Tubes (Z) - inches	0.012	PASS

Z must be $\leq$ 0.125 inches



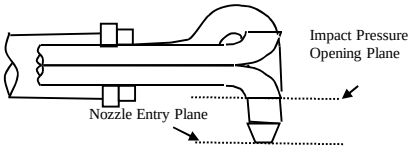
Vertical offset between A and B Tubes (W) - inches	0.022	PASS

W must be $\leq$ 0.03125 inches

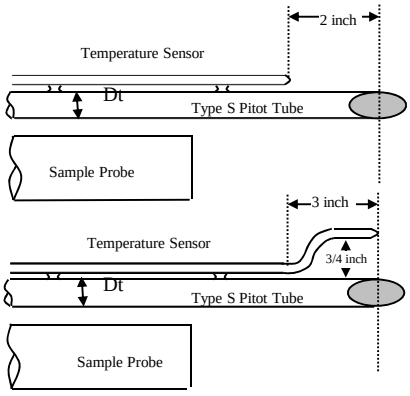


Distance between Sample Nozzle and Pitot (X) - inches	0.87	PASS

X must be $\geq$ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane: (●) YES ( ) NO ( ) NA



Thermocouple meets the Distance Criteria in the adjacent figure: (●) YES ( ) NO ( ) NA

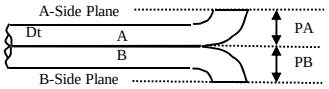
Thermocouple meets the Distance Criteria in the adjacent figure: ( ) YES ( ) NO (●) NA

Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-711**

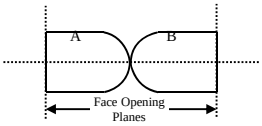
If all Criteria PASS Cp is equal to 0.84

Inspection Date 5/30/18 Individual Conducting Inspection SR

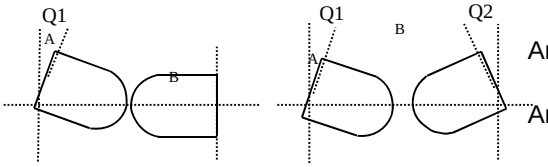


		PASS/FAIL
Distance to A Plane (PA) - inches	0.458	PASS
Distance to B Plane (PB) - inches	0.458	PASS
Pitot OD (D_t) - inches	0.375	

$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

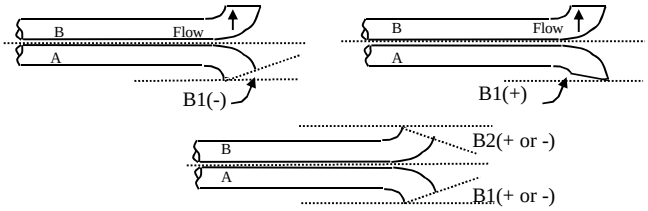


Are Open Faces Aligned Perpendicular to the Tube Axis — (●) YES ( ) NO — PASS



Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS

Q1 and Q2 must be $\leq 10^o$

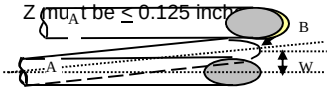


Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

B1 or B2 must be $\leq 5^o$

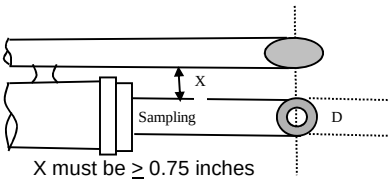
Horizontal offset between A and B Tubes (Z) - inches	0.009	PASS

Z must be $\leq$ 0.125 inches



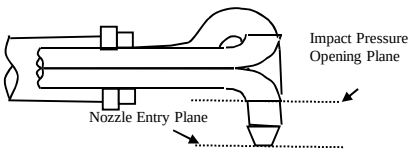
Vertical offset between A and B Tubes (W) - inches	0.026	PASS

W must be $\leq$ 0.03125 inches

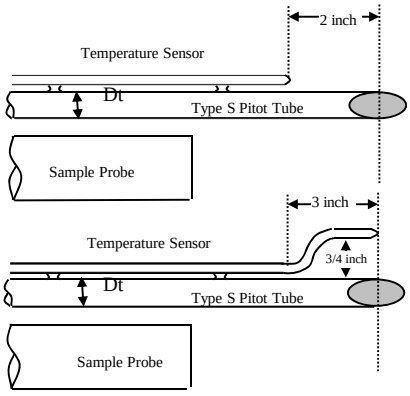


Distance between Sample Nozzle and Pitot (X) - inches	0.87	PASS

X must be $\geq$ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane — (●) YES ( ) NO ( ) NA



Thermocouple meets the Distance Criteria in the adjacent figure — (●) YES ( ) NO ( ) NA

Thermocouple meets the Distance Criteria in the adjacent figure — ( ) YES ( ) NO (●) NA

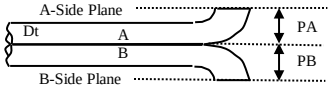
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-703**

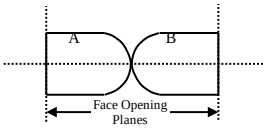
Inspection Date 5/30/18 Individual Conducting Inspection SR

If all Criteria PASS Cp is equal to 0.84

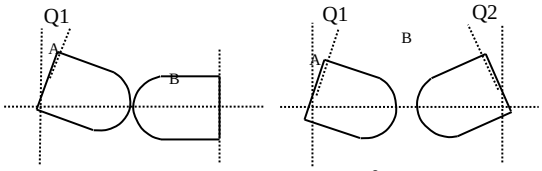
		PASS/FAIL
Distance to A Plane (PA) - inches	0.453	PASS
Distance to B Plane (PB) - inches	0.453	PASS
Pitot OD (D_t) - inches	0.375	



$1.05\ D_t < P < 1.5\ D_t$ PA must Equal PB

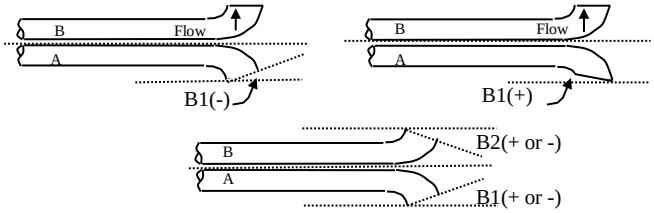


Are Open Faces Aligned Perpendicular to the Tube Axis: (●) YES ( ) NO — PASS



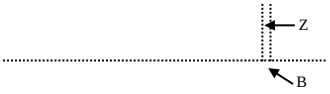
Q1 and Q2 must be ≤ 10°

Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS



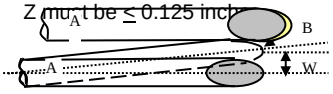
Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

B1 or B2 must be ≤ 5°



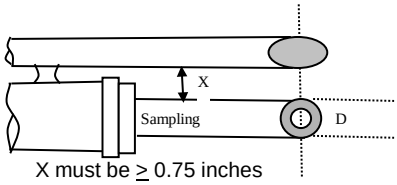
Z must be ≤ 0.125 inch

Horizontal offset between A and B Tubes (Z) - inches	0.006	PASS



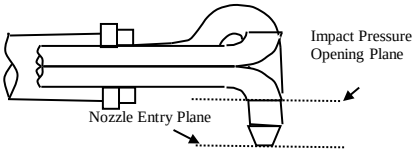
W must be ≤ 0.03125 inches

Vertical offset between A and B Tubes (W) - inches	0.022	PASS

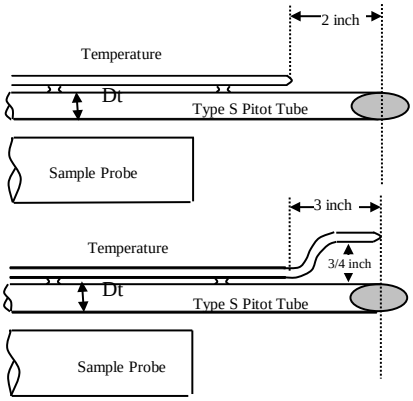


X must be ≥ 0.75 inches

Distance between Sample Nozzle and Pitot (X) - inches	0.84	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

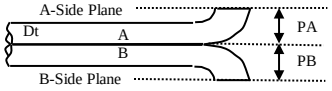
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-704**

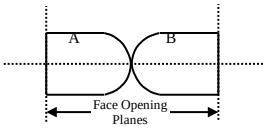
Inspection Date 5/30/18 Individual Conducting Inspection SR

If all Criteria PASS Cp is equal to 0.84

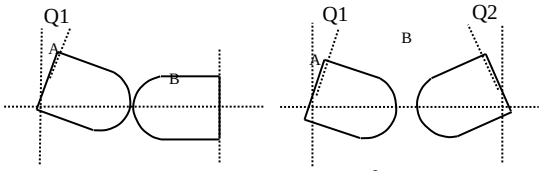
		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	



1.05 D_t < P < 1.5 D_t PA must Equal PB

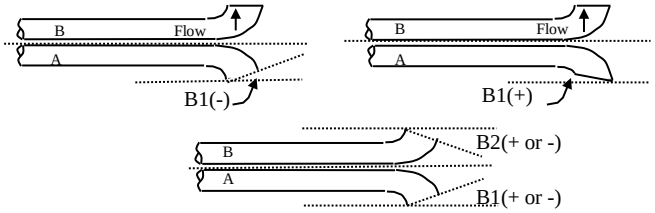


Are Open Faces Aligned Perpendicular to the Tube Axis: (●) YES ( ) NO — PASS



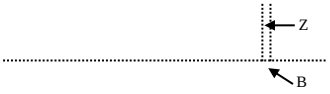
Angle of Q1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of Q2 from vertical B Tube- degrees (absolute)	0	PASS

Q1 and Q2 must be ≤ 10°



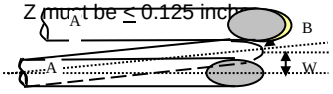
Angle of B1 from vertical A Tube- degrees (absolute)	0	PASS
Angle of B1 from vertical B Tube- degrees (absolute)	0	PASS

B1 or B2 must be ≤ 5°



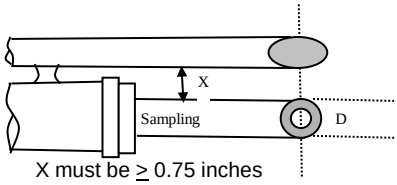
Z must be ≤ 0.125 inch

Horizontal offset between A and B Tubes (Z) - inches	0.015	PASS



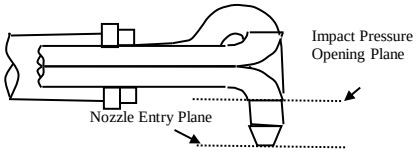
Vertical offset between A and B Tubes (W) - inches	0.025	PASS

W must be ≤ 0.03125 inches

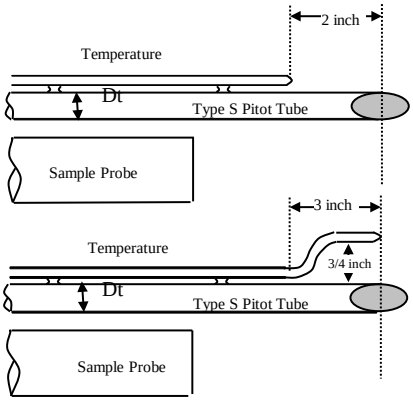


Distance between Sample Nozzle and Pitot (X) - inches	0.79	PASS

X must be ≥ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane: (●) YES ( ) NO ( ) NA



Thermocouple meets the Distance Criteria in the adjacent figure: (●) YES ( ) NO ( ) NA

Thermocouple meets the Distance Criteria in the adjacent figure: ( ) YES ( ) NO (●) NA

SAMPLE RECOVERY FIELD DATA

EPA Method 0010

Client	The Chemours Company	W.O. #	15418.002.003
Location/Plant	Fayetteville, NC	Source & Loaction	VE North Carbon Bed Outlet

Run No. 1 Sample Date 8/21/19 Recovery Date 8/21/19

Sample I.D. Chemours - VE North Carbon Bed OUT - BT - 1 - M0010 - Analyst [illegible] Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20		XAD-1		XAD-2		Silica Gel	
Final	0	100	100	0	299.0		305.3		300	
Initial	0	100	100	0	299.1		305.2		300	
Gain	0	0	0	0	-1		0		0	0

Impinger Color all clear Labeled? ✓

Silica Gel Condition 100% Sealed? ✓

Run No. ___ Sample Date ___ Recovery Date ___

Sample I.D. Chemours - VE North Carbon Bed OUT - BT - 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. ___ Sample Date ___ Recovery Date ___

Sample I.D. Chemours - VE North Carbon Bed OUT - BT - 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

APPENDIX F
LIST OF PROJECT PARTICIPANTS

The following WESTON employees participated in this project.

Paul Meeter	Senior Project Manager
Jeff O'Neill	Senior Project Manager
Kris Ansley	Team Member
Jacob Little	Team Member
Austin Squires	Team Member
Steve Dryden	Team Member
Robert Scroggins	Team Member