SOURCE TEST REPORT
2019 SOURCE EVALUATION TESTING
MEDLINE INDUSTRIES
DESTRUCITON EFFICIENCY
HOWELL, MICHIGAN

Prepared For:

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For Submittal To:

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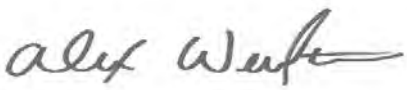
Test Date: **October 23, 2019**
Submittal Date: **February 7, 2020**

REVIEW AND CERTIFICATION

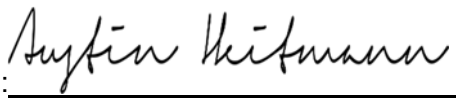
All work, calculations, and other activities and tasks performed and documented in this report were carried out by me or under my direction and supervision. I hereby certify that to the best of my knowledge, Montrose operated in conformance with the requirements of the Montrose Quality Manual and ASTM D7036-04 during this test project.

Name: Alex Webster, QSTI Title: Field Project Manager

Sign:  Date: 10/31/2019

I have reviewed, technically and editorially, details, calculations, results, conclusions, and other appropriate written materials contained herein. I hereby certify that to the best of my knowledge the presented material is authentic and accurate and conforms to the requirements of the Montrose Quality Manual and ASTM D7036-04.

Name: Austin Heitmann Title: Project Manager

Sign:  Date: 11/7/2019

Note: This report is a revision of the original test report dated November 12, 2019. The report has been revised to reflect reprocessed and validated FTIR data

Test Report Prepared by: Alex Webster

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1.0 INTRODUCTION AND SUMMARY

1.1 PROGRAM OBJECTIVES

Montrose Air Quality Services, LLC (Montrose) was contracted by Medline Industries, Inc. (Medline) to perform a series of air emission tests at their facility located in Howell, Michigan. The tests were conducted at the inlets and outlets of the dry bed and thermal oxidizer. Testing was performed to determine Destruction Removal Efficiency (DRE) and demonstrate compliance with the source testing limitations of the Michigan Department of Environmental, Great Lakes and Energy (EGLE) Permit No. 24-94B.

The testing was conducted by Alex Webster and Steve Ehresman, of Montrose on October 23, 2019. Jasper Titus of Medline coordinated the testing program. The tests were conducted according to a test protocol 928ET-647141-PP-10, dated September 23, 2019 that was submitted to the Michigan Department of Environmental, Great Lakes and Energy. Montrose performed the tests to measure the following emission parameters:

- Removal efficiency (%) of the dry bed
- Destruction efficiency (%) of the thermal oxidizer

This report presents the test results and supporting data, descriptions of the testing procedures, descriptions of the facility and sampling locations, and a summary of the quality assurance procedures used by Montrose. The average emission test results are summarized and compared to their respective permit limits in Table 1-1 and Table 1-2. Detailed results for individual test runs can be found in Section 5.0. All supporting data can be found in the appendices.

Both qualitative and quantitative factors contribute to field measurement uncertainty and should be taken into consideration when interpreting the results contained within this report. Whenever possible, Montrose personnel reduce the impact of these uncertainty factors by using approved and validated test methods. In addition, Montrose personnel perform routine instrument and equipment calibrations and ensure that the calibration standards, instruments, and equipment used during test events meet, at a minimum, test method specifications as well as the specifications of our Quality Manual and ASTM D 7036-04. The limitations of the various methods, instruments, equipment, and materials utilized during this test have been reasonably considered, but the ultimate impact of the cumulative uncertainty of this project is not fully identified within the results of this report.

TABLE 1-1
SUMMARY OF DRY BED REMOVAL EFFICIENCY RESULTS
HOWELL, MICHIGAN FACILITY
DRY BED
OCTOBER 23, 2019

	Run 1	Run 2	Run 3	Average
Start Time	06:22	07:51	09:14	
Stop Time	07:43	09:06	10:42	
DB Inlet Emissions				
EtO Concentration (ppm)	7.90	14.1	18.2	**13.4**
EtO Emission Rate (lb/hr)	0.338	0.593	0.721	**0.550**
DB Outlet Emissions				
EtO Concentration (ppm)	0.0350	0.0810	0.129	**0.0817**
EtO Emission Rate (lb/hr)	0.00146	0.00340	0.00541	**0.00343**
EtO REMOVAL EFFICIENCY (%)	**99.6**	**99.4**	**99.2**	**99.4**

TABLE 1-2
SUMMARY OF THERMAL OXIDIZER DESTRUCTION EFFICIENCY RESULTS
HOWELL, MICHIGAN FACILITY
THERMAL OXIDIZER
OCTOBER 23, 2019

	Run 2	Run 3	Average
Start Time	16:16	18:37	
Stop Time	17:16	19:37	
TO Inlet Emissions			
EtO Concentration (ppm)	88,661	112,866	**100,763**
EtO Emission Rate (lb/hr)	1,349	2,041	**1,695**
TO Outlet Emissions			
EtO Concentration (ppm)	0.647	0.445	**0.546**
EtO Emission Rate (lb/hr)	0.00985	0.00806	**0.00896**
EtO DESTRUCION EFFICIENCY (%)	**>99.9**	**>99.9**	**>99.9**

1.2 PROJECT CONTACTS

A list of project participants is included below:

Facility Information

Source Location:	Medline Industries Howell, MI facility 301 Catrell Dr Howell, MI 48843
Project Contact:	Jasper Titus
Role:	Director of Environmental Health and Safety
Company:	Medline
Telephone:	(847)937-2784
Email:	jtitus@medline.com

Agency Information

Regulatory Agency:	Michigan Department of Environmental Quality- Air Quality Division
Agency Contact:	Tom Gasloli
Telephone:	(517)284-6778
Email:	gaslolit@michigan.gov

Testing Company Information

Testing Firm:	Montrose Air Quality Services, LLC (Montrose)	
Contact:	Patrick Clark	Alex Webster
Title:	VP of Emerging Technology	Project Manager
Telephone:	(303)670-0530	(303)670-0530
Email:	pclark@montrose-env.com	awebster@montrose-env.com

2.0 SOURCE LOCATION INFORMATION

2.1 FACILITY DESCRIPTION

Medline Industries operates a three (3) chamber sterilization facility located at 301 Catrell Dr in Howell, Michigan. Products to be sterilized are placed in a sterilization chamber and are exposed to a sterilant gas, ethylene oxide (EtO), at a predetermined temperature, humidity level, and pressure. The EtO penetrates product packaging (e.g., cardboard shipping box, plastic shrink wrap, paper box, and product wrapping) and destroys bacteria and viruses on the product. The product remains sterile until use because bacteria and viruses cannot penetrate the product wrapping.

After the products have been loaded into the chamber the airtight door is sealed. The chamber temperature and relative humidity is adjusted to ensure proper sterilization. The EtO is introduced into the chamber to achieve the desired concentration of EtO. Following sufficient exposure time, an opening is introduced under negative pressure allowing fresh air to enter the chamber and the EtO is evacuated to emission control equipment. This post-cycle vacuum phase typically lasts about 30 minutes.

The high concentrations of EtO are evacuated from the sterilization chamber and vented to control equipment where it is destroyed. All areas of the plant where EtO is present are kept under negative pressure to prevent any fugitive emissions.

Following their removal from the sterilization chamber, the sterile products are placed in an aeration room and kept there for 24 hours. The purpose of aeration is to allow further diffusion of residual EtO from the products prior to shipping in order to comply with the FDA and EPA guidelines for residual EtO. It takes roughly 5 minutes for plant personnel to transfer the sterilized product to the aeration room. EtO concentrations were recorded during this time, but not included in the overall averages used in calculating the destruction efficiency. The aeration room is kept under a constant negative pressure, and fresh air is drawn into the room to “wash” the sterilized product. Nitrogen is injected into the aeration room to further wash the EtO from the product.

2.2 SAMPLING LOCATIONS

Information regarding the sampling locations is presented below:

The dry bed has two inlet ducts. Gaseous emissions sampling occurred at the merge of the two ducts. Flows were taken at both inlets ducts individually to meet Method 1 requirements.

Sample location ID:	Dry Bed Inlet 1 (Backflow vent)
Stack exit height:	Duct feeds into dry bed
Configuration:	Vertical, Circular
Dimensions:	21.75” Diameter
Port locations:	Meets Method 1 requirements
Port access:	Approximately 15 feet off the ground. Plant supplied lift for flow measurements.

Traverse point information is presented below:

- Velocity tests -16 points total, 8 from each of two ports located 90° apart from one another.

Sample location ID:	Dry Bed Inlet 2 (Aeration room)
Stack exit height:	Duct from Aeration room into dry bed
Configuration:	Horizontal, Circular
Dimensions:	21.75” Diameter
Port locations:	Meets Method 1 requirements
Port access:	Approximately 15 feet off the ground. Plant supplied lift for flow measurements.

Traverse point information is presented below:

- Velocity tests -16 points total, 8 from each of two ports located 90° apart from one another.

Sample location ID:	Dry Bed Outlet
Stack exit height:	1.5 feet off roof, roof 25 feet off the ground
Configuration:	Horizontal, Rectangular
Dimensions:	16.125” x 14.25”
Port locations:	Appx. 3’ upstream and 4’ downstream from any disturbances. Meets Method 1 requirements
Port access:	Ladder access to flat roof

Traverse point information is presented below:

- Velocity tests -18 points total, 6 from each of three ports located on top of rectangular duct.

Sample location ID:	Thermal Oxidizer
Stack exit height:	30 feet
Configuration:	Vertical, Circular
Dimensions:	44 Inches internal diameter
Port locations:	Port locations met method 1 requirements of at least 0.5 duct diameters upstream of any disturbances and 2 duct diameters downstream from any disturbance.
Port access:	Ladder leads to sampling platform, where permanent guardrails are in place.

Traverse point information is presented below:

- Velocity tests -16 points total, 8 from each of two ports located 90° apart from one another.

3.0 TEST DESCRIPTION

3.1 PROGRAM OBJECTIVES

There were two objectives of this test program. The primary objective was to determine the DRE of control equipment used to limit EtO emission. The inlets and outlets of the dry bed and thermal oxidizer were monitored simultaneously for EtO in determining DRE. EtO was also measured at the outlets to demonstrated compliance with the source testing conditions put forth by the EGLE. The permit limits are presented in Table 3-1.

TABLE 3-1
EMISSION LIMITS

Emission Parameter	Units of Measurement	Permit Limits	Emission Limit Reference
Ethylene Oxide	lb/hr	0.044	Permit No. 24-94B
Ethylene Oxide	lb/yr	263	Permit No. 24-94B
Destruction Efficiency	%	99.9	Permit No. 24-94B

3.2 TEST CONDITIONS

Emission tests were performed while the source units, and applicable abatement units, were operating at the conditions required by the permit. Tests were performed at conditions that reflect normal operating procedures. Plant personnel established the test conditions and collected all applicable unit-operating data.

3.3 TEST PROGRAM SCHEDULE

The test program schedule is presented in Table 3-3.

TABLE 3-3
TEST MATRIX AND SCHEDULE

Date	Source ID/ Activity	Sample Runs	Sample Duration
October 23, 2019	**Dry Bed**		
	EtO Inlet	1, 2, 3	Approximately 60 minutes
	EtO Outlet	1, 2, 3	Approximately 60 minutes
October 23, 2019	**Thermal Oxidizer**		
	EtO Inlet	2, 3	60 minutes
	EtO Outlet	2, 3	60 minutes

3.4 MONTROSE TEST PROCEDURES

The test procedures used for this test program are summarized in Table 3-4 below. Additional information regarding specific applications or modifications to standard procedures is presented in the following sub-sections.

TABLE 3-4
TEST PROCEDURES

Parameter	Measurement Principle	Reference Method
Gas Velocity	Pitot/temperature traverse	EPA 1, 2
O_2	Paramagnetism	EPA 3A
CO_2	FTIR	EPA 320
Moisture	FTIR	EPA 320
Ethylene Oxide	FTIR	EPA 320

3.4.1 EPA Method 1 – Traverse Points

EPA Method 1 is used to determine the suitability of each test location and to determine the traverse points used for the gas volumetric flow rate determinations. The test locations must conform to the minimum method requirements of being located at least two duct diameters downstream and at least 0.5 diameters upstream from the nearest flow disturbances, have a cross sectional area greater than 0.785 square feet (ft^2).

3.4.2 EPA Method 2 – Gas Velocity

EPA Method 2 is used to determine the gas velocity through each test location using an S-type pitot tube and a Fluke. The gauge is "zeroed" prior to each test run. The sample train is leak checked before and after each run by pressurizing the positive side, or "high" side, of the pitot tube and creating a pressure differential of at least three (3) inches H_2O. The leak check is considered valid if the gauge remains stable for at least fifteen (15) seconds. This procedure is repeated on the negative side by generating a vacuum of at least three (3) inches H_2O. The velocity head pressure (ΔP) and gas temperature (T_S) are then determined at each point specified in EPA Method 1. The static pressure of the stack (P_S) is measured using a water filled U-tube manometer. In addition, the barometric pressure (P_b) is measured and recorded.

3.4.3 EPA Methods 3/3A – Oxygen Concentration

Procedures found in EPA Methods 3 and 3A are used to measure the oxygen (O_2) concentrations in the gas stream. These values are used in the determination of the dry molecular weight of the stack gas. The balance of the stack gas is assumed to be nitrogen (N_2) for this calculation, since the other components in the gas are insignificant for the determination of dry molecular weight. The molecular weight is used, along with the values obtained from the EPA Methods 2 and 320 testing, to calculate the gas volumetric flow rate.

3.4.5 EPA Method 320- Emissions Measurement by FTIR

The EtO concentrations at each test location were determined using EPA Method 320. In Method 320, a sample of the gas stream was continuously withdrawn from the test location and analyzed using a continuous FTIR gas analysis system. This system meets the requirements of EPA methods for gaseous species.

The sample gas was withdrawn from each test location at a constant rate through a stainless-steel probe, a heated glass fiber filter and a heated Teflon sample line. The probe, filter and sample line were operated at a temperature of 200°F or greater to prevent the condensation of moisture. The hot, wet gas was then directed to the FTIR spectrometer gas cell through a heated line. Results from the analyzer were determined on a "wet" volume basis.

The FTIR gas analyzer that was used for monitoring the inlets was an MKS MultiGas FTIR analyzer. A schematic of the sampling system can be found in the Appendix. For the outlets of the dry bed and oxidizer, a MAX Analytical Starboost (optically enhanced) FTIR was used to measure EtO.

A sample spectrum was then recorded in succession. The peak to peak and RMS noise in the resultant spectrum in the wavelength region(s) to be used for the target compound analysis were measured and recorded.

Calibration Transfer Standards (CTS), ethylene and methane, was introduced into the system and two spectra were recorded at least two minutes apart. If the second spectrum was no greater than the first and within the uncertainty of the gas standard, it was used as the CTS spectrum. Otherwise an additional spectrum is created until the spectrum is no greater than the previous spectrum created.

A QA spike was performed by introducing a certified standard of EtO into the sampling system. First, some of the effluent gas was sampled to determine the native concentration of target analytes. The analyte spike calibration gas was then introduced to the FTIR gas cell only, and the results were determined using the analytical algorithm. Results from the calibration gas were recorded and compared to the certified value of the calibration gas. The analyte spike calibration gas was then directed through the entire sampling system and allowed to mix with the effluent gas sample at a known flow rate. The flow ratio of calibration gas to ambient air or source effluent was not greater than 1:10 (one-part calibration gas to ten parts total flow) for the determination of sample recovery. Spectra was recorded for three non-consecutive spiked samples and the concentration of the spike was calculated. The average spiked concentration was within 70% and 130% of the expected concentration. Dynamic spiking was performed for the straight extraction locations, yet due to the percent levels of EtO at the TO inlet, spikes could not be performed. Instead, several calibration gases were measured directly by FTIR, then the same calibration gas was sent through the dilution system. The average of all dilution ratios were used to calculate actual inlet concentrations of EtO.

After all the required pre-test procedures had been performed, stack gas was sampled continuously. Sample interferograms, processed absorbance spectra, background interferograms, CTS sample interferograms, and CTS absorbance spectra were recorded. Sample conditions, instrument settings, and test records were also recorded throughout the test. If signal transmittance changed by five (5) percent or more in any analytical spectral region, a new background spectrum was obtained. A new CTS spectrum was obtained after each sampling run. The post-test CTS spectrum was compared to the pre-test spectrum. For every run the peak absorbance from each spectrum was within five (5) percent of the mean value.

4.0 QUALITY ASSURANCE AND REPORTING

4.1 SAMPLING AND ANALYTICAL QA/QC

Montrose has instituted a rigorous QA/QC program for all of its air pollution testing. Quality assurance audits are performed as part of the test program to ensure that the final results are calculated from the highest quality data. The program ensures that the emission data reported are as accurate as possible. The procedures included in the cited reference methods were followed for all steps of preparation, sampling, calibration, and analysis. Montrose was responsible for preparation, calibration and cleaning of the sampling apparatus. Montrose also conducted the sampling and sample recovery, storage, and shipping.

4.2 QUALITY CONTROL PROCEDURES

Our Quality Assurance Program Summary, located in Appendix D, provides our equipment maintenance and calibration schedule, quality control acceptance limits, and any corrective action that may be needed. For additional quality control, Montrose followed the procedures outlined below and in the method write-ups in Section 3.4.

4.2.1 Equipment Inspection and Maintenance

Each critical piece of field equipment was assigned a unique identification number to allow tracking of its calibration history. All field equipment was visually inspected prior to testing and included pre-test calibration checks

4.2.2 Equipment Calibrations

Our equipment maintenance and calibration schedule is located in Appendix D.

4.3 DATA ANALYSIS, VALIDATION, AND UNCERTAINTY

4.3.1 Equipment Inspection and Maintenance

The raw data collected during the sampling and analysis procedures were used to calculate the results of the testing program. The analysis or reduction of the data to the final results followed these steps, where appropriate to the test method:

- Check field-sampling data for accuracy and calculate appropriate data averages (e.g., temperatures, pressures, volumes, etc.).
  - Double check calculation of the data averages.
  - Review all in-house and contract laboratory reports and ensure that appropriate and/or required QA/QC steps were followed.
  - Enter field to established and verified computer spreadsheets for calculation of volumetric flow rates, mass emission rates or other appropriate results.
  - Double-check all field data inputs.
  - Perform example calculations by hand using raw data on a single test run for each type of emission result reported.
  - Compile summary tables of results and review all table inputs.

This report includes copies of spreadsheet printouts (data input and results output) and example calculation checks. The field data sheets with average data calculations are also included. Standard conditions used for data reduction are 29.92 inches of mercury and 68 °F. All values found to be below the detection limit of the analytical method are reported as “less than” (“<”) either the full detection limit value, one-half of the detection limit, or zero based on the applicable method.

4.3.2 FTIR Data Validation

All FTIR data was submitted to Prism Analytical Technologies (a Montrose company) for reprocessing and validation. The reprocessed data can be found in Appendix A and is reflected in all tables and results. Data validations and other QA/QC including results of calibrations and spikes can be found in Appendix D.2.

5.0 DISCUSSION OF RESULTS

5.1 DETAILED DISCUSSION OF RESULTS

The average results are expressed in Tables 1-1 and 1-2 and more detailed results in Tables 5-2 and 5-3. The test results show that all of the emissions were within their respective permit compliance limits. Emissions have been reported in units consistent with those in the permits.

Additional information is included in the appendices. Appendix D presents the quality assurance information, including instrument calibration data. Raw field data sheets are included in Appendix B. Appendix C presents the general and specific equations used for the emissions calculations and computer spreadsheets.

Because, EtO concentrations at the inlet of the TO are very hazardous, a dilution system was used to transport the sample gas to the analyzer in a safe manner. To transport the sample gas safely, the sampling probe was secured to existing fittings at the oxidizer inlet. Due to the positive pressure and hazardous conditions of the oxidizer inlet, a proper flow traverse could not be conducted while the TO was operating. With the approval from EGLE, the flow was calculated at the outlet of the TO equal to the flow at the inlet.

During the DE testing of the thermal oxidizer, Run 1 was stopped prior to the 1 hour mark due to an equipment malfunction. The strong force of positive pressure of the inlet to the TO broke the glass, critical orifice used to dilute the sample. Due to the nature of the batch process, the orifice was swapped once the sterilization cycle was complete. The TO does not run for approximately 20-30 minutes until the next chamber is ready. During that down time, a new dilution system was installed that prevented orifice damage during the following runs. The results for Run 1 are expressed in the appendices but is not used in calculating the average DE of the TO.

5.2 OUTLET DETECTION LIMIT

The MAX Analytical Starboost FTIR was used in measuring the outlet EtO concentrations. According to ASTM D-6348, the detection limits are calculated as three times the noise equivalent absorbance. The minimum detectable concentration (MDC) for EtO at the outlet was 7.8 ppb. During the DE testing of the TO, several data points were below the detection limit (non-detect). For these data points the detection limit of 7.8 ppb was used in calculating the run average.

TABLE 5-1
DETECTION LIMIT

File	Time	EtO Concentration (ppm)
ZERO SYSTEM_0000078.LAB	11:50	0.001
ZERO SYSTEM_0000079.LAB	11:51	0.000
ZERO SYSTEM_0000080.LAB	11:52	0.005
ZERO SYSTEM_0000081.LAB	11:53	0.002
ZERO SYSTEM_0000082.LAB	11:54	0.004
ZERO SYSTEM_0000083.LAB	11:55	0.003
ZERO SYSTEM_0000084.LAB	11:56	0.005
Noise Equivalent Absorbance (Standard Deviation)		0.002
Minimum Detectable Concentration (MDC)		0.0078

TABLE 5-2
RESULTS SUMMARY DRY BED ETHYLENE OXIDE EMISSIONS
MEDLINE – HOWELL, MI
DRY BED

Test Parameters	**Run 1**	**Run 2**	**Run 3**	**Average**
Date	10/23/2019	10/23/2019	10/23/2019	
Start Time	6:22	7:51	9:14	
Stop Time	7:43	9:06	10:42	
Inlet Gas Conditions				
Temperature (°F)	84.0	95.2	94.0	**91.1**
Volumetric Flow Rate (acfm)	6,720	6,740	6,330	**6,590**
Volumetric Flow Rate (scfm)	6,240	6,130	5,770	**6,050**
Volumetric Flow Rate (dscfm)	6,160	6,060	5,700	**5,980**
Inlet Emissions				
EtO Concentration (ppmwv)	7.90	14.1	18.2	**13.4**
EtO Emission Rate (lb/hr)	0.338	0.593	0.721	**0.550**
Outlet Gas Conditions				
Temperature (°F)	92.7	100	94.8	**96.0**
Volumetric Flow Rate (acfm)	6,590	6,710	6,660	**6,650**
Volumetric Flow Rate (scfm)	6,090	6,120	6,110	**6,100**
Volumetric Flow Rate (dscfm)	6,030	6,060	6,050	**6,040**
Outlet Emissions				
EtO Concentration (ppmwv)	0.0350	0.0810	0.129	**0.0817**
EtO Emission Rate (lb/hr)	0.00146	0.00340	0.00541	**0.00343**
EtO REMOVAL EFFICIENCY (%)	99.6	99.4	99.2	**99.4**

TABLE 5-3
RESULTS SUMMARY THERMAL OZIDIZER ETHYLENE OXIDE EMISSIONS
MEDLINE – HOWELL, MI
THERMAL OXIDIZER

Test Parameters	**Run 2**	**Run 3**	**Average**
Date	10/23/2019	10/23/2019	
Start Time	16:16	18:37	
Stop Time	17:16	19:37	
Inlet Emissions[1]			
EtO Concentration (ppmwv)	88,661	112,866	**100,763**
EtO Emission Rate(lb/hr)	1,349	2,041	**1,695**
Outlet Gas Conditions			
Temperature (^{o}F)	1,387	1,387	**1,387**
Volumetric Flow Rate (acfm)	8,100	9,620	**8,860**
Volumetric Flow Rate (scfm)	2,220	2,640	**2,430**
Volumetric Flow Rate (dscfm)	2,100	2,460	**2,280**
Outlet Emissions			
EtO Concentration (ppmwv)	0.647	0.445	**0.546**
EtO Emission Rate (lb/hr)	0.00985	0.00806	**0.00896**
EtO DESTRUCTION EFFICIENCY (%)	>99.9	>99.9	**>99.9**

[1] Due to the hazardous conditions at the TO inlet, a flow traverse could not be performed. Flows were taken at the outlet and assumed to be constant.

APPENDIX A
ANALYZER DATA

Dry Bed Inlet - Test Run 1

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_1_2855.LAB	10/23/2019	6:22:00	4.1	1.2	3.0	148.7	1.020
RUN_1_2856.LAB	10/23/2019	6:23:01	70.6	1.3	3.0	148.7	1.019
RUN_1_2857.LAB	10/23/2019	6:24:02	10.3	1.2	3.0	148.7	1.018
RUN_1_2858.LAB	10/23/2019	6:25:03	9.1	1.2	2.9	148.7	1.018
RUN_1_2859.LAB	10/23/2019	6:26:04	9.1	1.2	2.9	148.7	1.018
RUN_1_2860.LAB	10/23/2019	6:27:05	8.7	1.2	2.9	148.7	1.018
RUN_1_2861.LAB	10/23/2019	6:28:06	8.4	1.2	2.9	148.9	1.018
RUN_1_2862.LAB	10/23/2019	6:29:07	8.4	1.2	3.0	148.9	1.018
RUN_1_2863.LAB	10/23/2019	6:30:08	8.2	1.2	2.8	148.8	1.018
RUN_1_2864.LAB	10/23/2019	6:31:09	7.9	1.2	2.9	148.7	1.018
RUN_1_2865.LAB	10/23/2019	6:32:10	8.1	1.2	2.8	148.7	1.018
RUN_1_2866.LAB	10/23/2019	6:33:11	7.3	1.2	2.9	148.7	1.018
RUN_1_2867.LAB	10/23/2019	6:34:12	7.4	1.2	2.9	148.7	1.018
RUN_1_2868.LAB	10/23/2019	6:35:13	8.9	1.2	2.8	148.7	1.018
RUN_1_2869.LAB	10/23/2019	6:36:14	6.6	1.2	2.9	148.7	1.018
RUN_1_2870.LAB	10/23/2019	6:37:15	6.6	1.2	2.9	148.7	1.018
RUN_1_2871.LAB	10/23/2019	6:38:16	6.8	1.2	2.8	148.7	1.018
RUN_1_2872.LAB	10/23/2019	6:39:17	7.3	1.2	2.9	148.7	1.018
RUN_1_2873.LAB	10/23/2019	6:40:18	6.6	1.2	2.8	148.7	1.018
RUN_1_2874.LAB	10/23/2019	6:41:19	7.0	1.2	2.8	148.7	1.018
RUN_1_2875.LAB	10/23/2019	6:42:20	6.6	1.2	2.9	148.7	1.018
RUN_1_2876.LAB	10/23/2019	6:43:21	6.0	1.2	2.8	148.7	1.018
RUN_1_2877.LAB	10/23/2019	6:44:22	6.2	1.2	2.9	148.9	1.018
RUN_1_2878.LAB	10/23/2019	6:45:23	5.9	1.2	2.8	148.9	1.018
RUN_1_2879.LAB	10/23/2019	6:46:24	5.9	1.2	2.9	148.8	1.018
RUN_1_2880.LAB	10/23/2019	6:47:25	6.0	1.2	2.9	148.7	1.019
RUN_1_2881.LAB	10/23/2019	6:48:26	5.9	1.2	2.8	148.7	1.019
RUN_1_2882.LAB	10/23/2019	6:49:27	5.7	1.2	2.9	148.7	1.019
RUN_1_2883.LAB	10/23/2019	6:50:28	6.0	1.2	2.8	148.7	1.019
RUN_1_2884.LAB	10/23/2019	6:51:29	5.9	1.2	2.9	148.7	1.019
RUN_1_2885.LAB	10/23/2019	6:52:30	6.0	1.2	2.9	148.7	1.019
RUN_1_2886.LAB	10/23/2019	6:53:31	5.9	1.2	2.8	148.7	1.019
RUN_1_2887.LAB	10/23/2019	6:54:32	6.2	1.2	2.9	148.8	1.019
RUN_1_2888.LAB	10/23/2019	6:55:33	6.8	1.2	2.8	148.7	1.019
RUN_1_2889.LAB	10/23/2019	6:56:34	6.4	1.2	3.0	148.7	1.019
RUN_1_2890.LAB	10/23/2019	6:57:35	6.2	1.1	2.9	148.7	1.019
RUN_1_2891.LAB	10/23/2019	6:58:36	6.4	1.1	2.9	148.7	1.019
RUN_1_2892.LAB	10/23/2019	6:59:37	5.9	1.1	3.0	148.7	1.019
RUN_1_2893.LAB	10/23/2019	7:00:38	5.7	1.1	2.8	148.7	1.019
RUN_1_2894.LAB	10/23/2019	7:01:39	5.5	1.1	3.0	148.8	1.019
RUN_1_2895.LAB	10/23/2019	7:02:40	4.8	1.1	2.9	148.8	1.019
RUN_1_2896.LAB	10/23/2019	7:03:41	5.0	1.1	2.9	148.7	1.019
RUN_1_2897.LAB	10/23/2019	7:04:42	5.4	1.1	3.0	148.7	1.019
RUN_1_2898.LAB	10/23/2019	7:05:43	5.8	1.1	2.8	148.8	1.019
RUN_1_2899.LAB	10/23/2019	7:06:43	6.3	1.1	2.9	148.7	1.019
RUN_1_2900.LAB	10/23/2019	7:07:44	6.7	1.2	2.8	148.7	1.019
RUN_1_2901.LAB	10/23/2019	7:08:45	6.8	1.2	2.8	148.7	1.019
RUN_1_2902.LAB	10/23/2019	7:09:47	7.1	1.2	2.9	148.7	1.019
RUN_1_2903.LAB	10/23/2019	7:10:47	7.1	1.2	2.8	148.7	1.019
RUN_1_2904.LAB	10/23/2019	7:11:48	7.6	1.2	2.9	148.7	1.019
RUN_1_2905.LAB	10/23/2019	7:12:50	7.5	1.2	2.8	148.8	1.019
RUN_1_2906.LAB	10/23/2019	7:13:51	7.9	1.2	2.8	148.7	1.019
RUN_1_2907.LAB	10/23/2019	7:14:52	7.6	1.2	2.9	148.7	1.019
RUN_1_2908.LAB	10/23/2019	7:15:53	8.0	1.2	2.8	148.7	1.019
RUN_1_2909.LAB	10/23/2019	7:16:54	7.8	1.2	2.9	148.7	1.019
RUN_1_2910.LAB	10/23/2019	7:17:55	7.6	1.2	2.8	148.7	1.019
RUN_1_2911.LAB	10/23/2019	7:18:56	7.4	1.2	2.7	148.7	1.019
RUN_1_2912.LAB	10/23/2019	7:19:57	7.2	1.2	2.9	148.7	1.019
RUN_1_2913.LAB	10/23/2019	7:20:58	7.1	1.2	2.8	148.7	1.019
RUN_1_2914.LAB	10/23/2019	7:21:59	7.6	1.2	2.9	148.7	1.019
RUN_1_2915.LAB	10/23/2019	7:23:00	7.9	1.2	2.8	148.7	1.019
RUN_1_2916.LAB	10/23/2019	7:24:01	7.7	1.2	2.8	148.7	1.019
RUN_1_2917.LAB	10/23/2019	7:25:02	7.6	1.2	2.9	148.7	1.019

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_1_2918.LAB	10/23/2019	7:26:03	9.0	1.2	2.8	148.7	1.019
RUN_1_2919.LAB	10/23/2019	7:27:04	8.6	1.2	2.9	148.7	1.019
RUN_1_2920.LAB	10/23/2019	7:28:05	8.4	1.2	2.9	148.7	1.019
RUN_1_2921.LAB	10/23/2019	7:29:06	8.2	1.2	2.9	148.7	1.019
RUN_1_2922.LAB	10/23/2019	7:30:07	7.9	1.2	2.9	148.7	1.019
RUN_1_2923.LAB	10/23/2019	7:31:08	7.5	1.2	2.8	148.7	1.019
RUN_1_2924.LAB	10/23/2019	7:32:09	7.6	1.2	2.9	148.7	1.019
RUN_1_2925.LAB	10/23/2019	7:33:09	7.3	1.2	2.9	148.7	1.019
RUN_1_2926.LAB	10/23/2019	7:34:11	7.4	1.2	2.8	148.7	1.019
RUN_1_2927.LAB	10/23/2019	7:35:11	7.4	1.2	2.9	148.7	1.019
RUN_1_2928.LAB	10/23/2019	7:36:12	9.4	1.2	2.9	148.8	1.019
RUN_1_2929.LAB	10/23/2019	7:37:13	8.9	1.2	2.8	148.7	1.020
RUN_1_2930.LAB	10/23/2019	7:38:14	7.9	1.2	2.8	148.7	1.020
RUN_1_2931.LAB	10/23/2019	7:39:15	7.4	1.1	2.8	148.7	1.020
RUN_1_2932.LAB	10/23/2019	7:40:16	6.9	1.1	2.9	148.7	1.020
RUN_1_2933.LAB	10/23/2019	7:41:17	6.6	1.1	2.9	148.7	1.020
RUN_1_2934.LAB	10/23/2019	7:42:18	5.5	1.1	2.8	148.7	1.020
RUN_1_2935.LAB	10/23/2019	7:43:19	5.3	1.1	2.9	148.8	1.020
Dry Bed Inlet Test Run 1		**Minimum**	**4.1**	**1.1**	**2.7**		
6:22 - 7:43		**Maximum**	**70.6**	**1.3**	**3.0**		
10/23/2019		**Average**	**7.9**	**1.2**	**2.9**		

Dry Bed Inlet - Test Run 2

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_2_2966.LAB	10/23/2019	7:51:25	5.9	1.2	2.9	148.7	1.026
RUN_2_2967.LAB	10/23/2019	7:52:26	5.8	1.2	2.9	148.7	1.026
RUN_2_2968.LAB	10/23/2019	7:53:27	129.5	1.2	3.6	148.7	1.025
RUN_2_2969.LAB	10/23/2019	7:54:28	18.2	1.2	2.8	148.8	1.025
RUN_2_2970.LAB	10/23/2019	7:55:29	16.6	1.2	2.8	148.9	1.025
RUN_2_2971.LAB	10/23/2019	7:56:30	14.3	1.2	2.9	148.8	1.026
RUN_2_2972.LAB	10/23/2019	7:57:31	13.6	1.2	2.8	148.7	1.026
RUN_2_2973.LAB	10/23/2019	7:58:32	13.7	1.2	2.9	148.7	1.026
RUN_2_2974.LAB	10/23/2019	7:59:33	12.3	1.2	2.8	148.6	1.026
RUN_2_2975.LAB	10/23/2019	8:00:34	13.2	1.2	2.8	148.7	1.026
RUN_2_2976.LAB	10/23/2019	8:01:35	12.1	1.2	2.8	148.7	1.026
RUN_2_2977.LAB	10/23/2019	8:02:36	11.8	1.2	2.7	148.7	1.017
RUN_2_2978.LAB	10/23/2019	8:03:37	11.5	1.2	2.8	148.7	1.015
RUN_2_2979.LAB	10/23/2019	8:04:38	10.9	1.2	2.8	148.7	1.015
RUN_2_2980.LAB	10/23/2019	8:05:39	11.1	1.2	2.8	148.7	1.015
RUN_2_2981.LAB	10/23/2019	8:06:41	10.2	1.2	2.8	148.8	1.015
RUN_2_2982.LAB	10/23/2019	8:07:42	9.9	1.2	2.7	148.7	1.015
RUN_2_2983.LAB	10/23/2019	8:08:43	10.2	1.2	2.8	148.8	1.015
RUN_2_2984.LAB	10/23/2019	8:09:44	10.8	1.2	2.8	148.7	1.016
RUN_2_2985.LAB	10/23/2019	8:10:45	10.7	1.2	2.7	148.8	1.015
RUN_2_2986.LAB	10/23/2019	8:11:46	11.7	1.2	2.8	148.8	1.015
RUN_2_2987.LAB	10/23/2019	8:12:47	10.6	1.2	2.7	148.7	1.015
RUN_2_2988.LAB	10/23/2019	8:13:48	9.8	1.2	2.8	148.8	1.016
RUN_2_2989.LAB	10/23/2019	8:14:49	10.7	1.2	2.8	148.8	1.015
RUN_2_2990.LAB	10/23/2019	8:15:50	10.2	1.2	2.8	148.8	1.015
RUN_2_2991.LAB	10/23/2019	8:16:51	9.0	1.2	2.8	148.8	1.015
RUN_2_2992.LAB	10/23/2019	8:17:52	9.0	1.2	2.8	148.7	1.015
RUN_2_2993.LAB	10/23/2019	8:18:53	9.1	1.2	2.8	148.7	1.016
RUN_2_2994.LAB	10/23/2019	8:19:54	9.1	1.2	2.8	148.8	1.015
RUN_2_2995.LAB	10/23/2019	8:20:55	9.2	1.2	2.7	148.8	1.016
RUN_2_2996.LAB	10/23/2019	8:21:56	9.0	1.2	2.8	148.7	1.015
RUN_2_2997.LAB	10/23/2019	8:22:56	8.2	1.2	2.8	148.7	1.016
RUN_2_2998.LAB	10/23/2019	8:23:58	8.6	1.2	2.8	148.7	1.016
RUN_2_2999.LAB	10/23/2019	8:24:58	7.8	1.1	2.9	148.7	1.015
RUN_2_3000.LAB	10/23/2019	8:26:00	9.5	1.1	2.7	148.8	1.016
RUN_2_3001.LAB	10/23/2019	8:27:00	10.1	1.1	2.8	148.8	1.016
RUN_2_3002.LAB	10/23/2019	8:28:01	9.9	1.1	2.9	148.8	1.016
RUN_2_3003.LAB	10/23/2019	8:29:02	10.0	1.1	2.8	148.8	1.016
RUN_2_3004.LAB	10/23/2019	8:30:03	12.2	1.1	2.9	148.8	1.016

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_2_3005.LAB	10/23/2019	8:31:04	12.3	1.1	2.8	148.8	1.016
RUN_2_3006.LAB	10/23/2019	8:32:05	13.4	1.1	2.8	148.8	1.015
RUN_2_3007.LAB	10/23/2019	8:33:07	12.4	1.1	2.9	148.8	1.016
RUN_2_3008.LAB	10/23/2019	8:34:07	16.2	1.2	2.8	148.7	1.016
RUN_2_3009.LAB	10/23/2019	8:35:08	18.9	1.2	2.9	148.8	1.016
RUN_2_3010.LAB	10/23/2019	8:36:09	17.6	1.2	2.9	148.8	1.016
RUN_2_3011.LAB	10/23/2019	8:37:10	17.3	1.2	2.8	148.8	1.016
RUN_2_3012.LAB	10/23/2019	8:38:11	16.8	1.2	2.9	148.8	1.016
RUN_2_3013.LAB	10/23/2019	8:39:12	16.9	1.2	2.8	148.7	1.016
RUN_2_3014.LAB	10/23/2019	8:40:13	17.2	1.2	2.9	148.8	1.016
RUN_2_3015.LAB	10/23/2019	8:41:14	17.0	1.2	2.9	148.7	1.016
RUN_2_3016.LAB	10/23/2019	8:42:15	16.9	1.2	2.8	148.8	1.016
RUN_2_3017.LAB	10/23/2019	8:43:16	17.3	1.2	2.9	148.7	1.016
RUN_2_3018.LAB	10/23/2019	8:44:17	15.7	1.2	2.8	148.7	1.016
RUN_2_3019.LAB	10/23/2019	8:45:18	15.3	1.2	2.8	148.7	1.016
RUN_2_3020.LAB	10/23/2019	8:46:19	15.0	1.2	2.9	148.7	1.016
RUN_2_3021.LAB	10/23/2019	8:47:20	14.6	1.2	2.8	148.7	1.016
RUN_2_3022.LAB	10/23/2019	8:48:21	14.7	1.2	2.9	148.7	1.016
RUN_2_3023.LAB	10/23/2019	8:49:22	15.1	1.2	2.9	148.7	1.016
RUN_2_3024.LAB	10/23/2019	8:50:23	14.8	1.2	2.8	148.8	1.016
RUN_2_3025.LAB	10/23/2019	8:51:24	14.8	1.2	2.9	148.8	1.016
RUN_2_3026.LAB	10/23/2019	8:52:25	14.2	1.2	2.8	148.8	1.016
RUN_2_3027.LAB	10/23/2019	8:53:26	13.7	1.2	2.9	148.7	1.016
RUN_2_3028.LAB	10/23/2019	8:54:27	13.2	1.2	2.9	148.7	1.017
RUN_2_3029.LAB	10/23/2019	8:55:28	13.2	1.2	2.8	148.8	1.017
RUN_2_3030.LAB	10/23/2019	8:56:29	13.2	1.2	2.9	148.8	1.016
RUN_2_3031.LAB	10/23/2019	8:57:30	13.2	1.2	2.8	148.8	1.016
RUN_2_3032.LAB	10/23/2019	8:58:31	12.9	1.2	2.8	148.8	1.016
RUN_2_3033.LAB	10/23/2019	8:59:32	13.7	1.2	2.8	148.8	1.016
RUN_2_3034.LAB	10/23/2019	9:00:33	13.1	1.2	2.8	148.8	1.016
RUN_2_3035.LAB	10/23/2019	9:01:34	12.3	1.2	2.9	148.8	1.017
RUN_2_3036.LAB	10/23/2019	9:02:34	12.0	1.2	2.8	148.8	1.016
RUN_2_3037.LAB	10/23/2019	9:03:36	11.7	1.2	2.8	148.8	1.016
RUN_2_3038.LAB	10/23/2019	9:04:36	11.7	1.2	2.8	148.8	1.016
RUN_2_3039.LAB	10/23/2019	9:05:38	11.9	1.2	2.7	148.8	1.016
RUN_2_3040.LAB	10/23/2019	9:06:39	11.9	1.2	2.8	148.7	1.016
Dry Bed Inlet Test Run 2		**Minimum**	**5.8**	**1.1**	**2.7**		
7:51 - 9:06		**Maximum**	**129.5**	**1.2**	**3.6**		
10/23/2019		**Average**	**14.1**	**1.2**	**2.8**		

Dry Bed Inlet - Test Run 3

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_3_3067.LAB	10/23/2019	9:14:05	10.6	1.2	2.8	148.7	1.015
RUN_3_3068.LAB	10/23/2019	9:15:06	57.5	1.2	3.0	148.8	1.015
RUN_3_3069.LAB	10/23/2019	9:16:07	83.7	1.2	2.9	148.7	1.015
RUN_3_3070.LAB	10/23/2019	9:17:08	27.2	1.2	2.9	148.8	1.015
RUN_3_3071.LAB	10/23/2019	9:18:09	23.4	1.2	2.7	148.8	1.015
RUN_3_3072.LAB	10/23/2019	9:19:10	21.4	1.2	2.8	148.8	1.015
RUN_3_3073.LAB	10/23/2019	9:20:11	21.4	1.2	2.8	148.7	1.015
RUN_3_3074.LAB	10/23/2019	9:21:12	20.6	1.2	2.7	148.7	1.015
RUN_3_3075.LAB	10/23/2019	9:22:13	20.7	1.2	2.8	148.7	1.015
RUN_3_3076.LAB	10/23/2019	9:23:14	20.1	1.2	2.7	148.8	1.015
RUN_3_3077.LAB	10/23/2019	9:24:15	18.7	1.2	2.7	148.8	1.016
RUN_3_3078.LAB	10/23/2019	9:25:16	18.4	1.2	2.7	148.7	1.015
RUN_3_3079.LAB	10/23/2019	9:26:17	19.4	1.2	2.7	148.8	1.016
RUN_3_3080.LAB	10/23/2019	9:27:18	17.7	1.2	2.8	148.8	1.016
RUN_3_3081.LAB	10/23/2019	9:28:19	17.1	1.2	2.7	148.7	1.016
RUN_3_3082.LAB	10/23/2019	9:29:19	18.0	1.2	2.7	148.7	1.016
RUN_3_3083.LAB	10/23/2019	9:30:20	17.4	1.2	2.7	148.8	1.016
RUN_3_3084.LAB	10/23/2019	9:31:22	17.3	1.2	2.7	148.8	1.016
RUN_3_3085.LAB	10/23/2019	9:32:22	18.4	1.2	2.7	148.8	1.016
RUN_3_3086.LAB	10/23/2019	9:33:23	16.0	1.2	2.7	148.8	1.016
RUN_3_3087.LAB	10/23/2019	9:34:24	16.1	1.2	2.8	148.7	1.016

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_3_3088.LAB	10/23/2019	9:35:25	16.2	1.2	2.7	148.7	1.016
RUN_3_3089.LAB	10/23/2019	9:36:26	15.6	1.2	2.7	148.7	1.016
RUN_3_3090.LAB	10/23/2019	9:37:27	15.0	1.2	2.8	148.7	1.016
RUN_3_3091.LAB	10/23/2019	9:38:28	14.8	1.2	2.6	148.7	1.016
RUN_3_3092.LAB	10/23/2019	9:39:29	14.3	1.2	2.8	148.8	1.016
RUN_3_3093.LAB	10/23/2019	9:40:30	16.8	1.2	2.7	148.8	1.016
RUN_3_3094.LAB	10/23/2019	9:41:31	18.5	1.2	2.7	148.8	1.016
RUN_3_3095.LAB	10/23/2019	9:42:32	16.9	1.2	2.8	148.7	1.016
RUN_3_3096.LAB	10/23/2019	9:43:33	18.3	1.2	2.7	148.7	1.016
RUN_3_3097.LAB	10/23/2019	9:44:34	18.2	1.2	2.8	148.7	1.016
RUN_3_3098.LAB	10/23/2019	9:45:35	18.0	1.2	2.8	148.7	1.016
RUN_3_3099.LAB	10/23/2019	9:46:36	17.7	1.2	2.7	148.8	1.017
RUN_3_3100.LAB	10/23/2019	9:47:37	17.1	1.2	2.7	148.8	1.017
RUN_3_3101.LAB	10/23/2019	9:48:38	16.6	1.2	2.7	148.8	1.017
RUN_3_3102.LAB	10/23/2019	9:49:39	16.6	1.2	2.7	148.8	1.017
RUN_3_3103.LAB	10/23/2019	9:50:40	16.9	1.2	2.7	148.7	1.016
RUN_3_3104.LAB	10/23/2019	9:51:41	15.7	1.2	2.7	148.7	1.017
RUN_3_3105.LAB	10/23/2019	9:52:42	16.0	1.2	2.8	148.8	1.016
RUN_3_3106.LAB	10/23/2019	9:53:43	15.5	1.1	2.7	148.8	1.017
RUN_3_3107.LAB	10/23/2019	9:54:44	14.5	1.1	2.8	148.8	1.017
RUN_3_3108.LAB	10/23/2019	9:55:45	14.3	1.1	2.7	148.8	1.016
RUN_3_3109.LAB	10/23/2019	9:56:46	13.1	1.1	2.8	148.8	1.017
RUN_3_3110.LAB	10/23/2019	9:57:47	13.9	1.1	2.8	148.7	1.016
RUN_3_3111.LAB	10/23/2019	9:58:48	14.1	1.1	2.7	148.7	1.016
RUN_3_3112.LAB	10/23/2019	9:59:49	14.3	1.1	2.9	148.7	1.016
RUN_3_3113.LAB	10/23/2019	10:00:50	15.2	1.1	2.7	148.7	1.016
RUN_3_3114.LAB	10/23/2019	10:01:51	16.0	1.1	2.8	148.8	1.016
RUN_3_3115.LAB	10/23/2019	10:02:52	16.8	1.1	2.9	148.8	1.016
RUN_3_3116.LAB	10/23/2019	10:03:53	15.9	1.1	2.8	148.7	1.016
RUN_3_3117.LAB	10/23/2019	10:04:54	15.4	1.1	2.9	148.7	1.016
RUN_3_3118.LAB	10/23/2019	10:05:55	18.6	1.2	2.8	148.7	1.016
RUN_3_3119.LAB	10/23/2019	10:06:56	19.1	1.2	2.8	148.7	1.016
RUN_3_3120.LAB	10/23/2019	10:07:56	19.6	1.2	2.8	148.7	1.016
RUN_3_3121.LAB	10/23/2019	10:08:57	18.8	1.2	2.8	148.7	1.016
RUN_3_3122.LAB	10/23/2019	10:09:59	17.6	1.2	2.8	148.7	1.016
RUN_3_3123.LAB	10/23/2019	10:11:00	17.3	1.2	2.8	148.7	1.016
RUN_3_3124.LAB	10/23/2019	10:12:00	17.0	1.2	2.9	148.7	1.016
RUN_3_3125.LAB	10/23/2019	10:13:02	17.0	1.2	2.8	148.7	1.016
RUN_3_3126.LAB	10/23/2019	10:14:02	17.3	1.2	2.8	148.8	1.016
RUN_3_3127.LAB	10/23/2019	10:15:03	17.7	1.2	2.9	148.7	1.016
RUN_3_3128.LAB	10/23/2019	10:16:04	18.2	1.2	2.8	148.7	1.016
RUN_3_3129.LAB	10/23/2019	10:17:05	18.4	1.2	2.8	148.7	1.016
RUN_3_3130.LAB	10/23/2019	10:18:06	18.5	1.2	2.8	148.7	1.015
RUN_3_3131.LAB	10/23/2019	10:19:07	17.1	1.2	2.8	148.7	1.016
RUN_3_3132.LAB	10/23/2019	10:20:08	16.8	1.2	2.8	148.7	1.016
RUN_3_3133.LAB	10/23/2019	10:21:09	16.2	1.2	2.8	148.7	1.016
RUN_3_3134.LAB	10/23/2019	10:22:10	16.6	1.2	2.9	148.7	1.015
RUN_3_3135.LAB	10/23/2019	10:23:11	17.0	1.2	2.8	148.7	1.015
RUN_3_3136.LAB	10/23/2019	10:24:12	17.6	1.2	2.8	148.7	1.015
RUN_3_3137.LAB	10/23/2019	10:25:13	17.4	1.2	2.8	148.7	1.015
RUN_3_3138.LAB	10/23/2019	10:26:14	17.4	1.2	2.8	148.7	1.015
RUN_3_3139.LAB	10/23/2019	10:27:15	17.2	1.2	2.9	148.8	1.015
RUN_3_3140.LAB	10/23/2019	10:28:16	15.9	1.2	2.8	148.7	1.015
RUN_3_3141.LAB	10/23/2019	10:29:17	15.8	1.2	2.9	148.7	1.015
RUN_3_3142.LAB	10/23/2019	10:30:18	15.7	1.2	2.8	148.7	1.015
RUN_3_3143.LAB	10/23/2019	10:31:19	15.5	1.2	2.9	148.7	1.015
RUN_3_3144.LAB	10/23/2019	10:32:20	15.6	1.2	2.9	148.8	1.015
RUN_3_3145.LAB	10/23/2019	10:33:21	16.5	1.2	2.8	148.8	1.015
RUN_3_3146.LAB	10/23/2019	10:34:22	16.5	1.2	2.8	148.7	1.015
RUN_3_3147.LAB	10/23/2019	10:35:23	16.4	1.2	2.8	148.7	1.015
RUN_3_3148.LAB	10/23/2019	10:36:24	16.0	1.2	2.9	148.7	1.015
RUN_3_3149.LAB	10/23/2019	10:37:25	15.2	1.2	2.8	148.7	1.015
RUN_3_3150.LAB	10/23/2019	10:38:26	14.9	1.2	2.8	148.7	1.015
RUN_3_3151.LAB	10/23/2019	10:39:27	14.6	1.2	2.9	148.7	1.015

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_3_3152.LAB	10/23/2019	10:40:28	14.7	1.2	2.8	148.7	1.015
RUN_3_3153.LAB	10/23/2019	10:41:29	14.9	1.2	2.9	148.7	1.015
RUN_3_3154.LAB	10/23/2019	10:42:29	15.3	1.2	2.8	148.7	1.014
Dry Bed Inlet Test Run 3		**Minimum**	**10.6**	**1.1**	**2.6**		
9:14 - 10:42		**Maximum**	**83.7**	**1.2**	**3.0**		
10/23/2019		**Average**	**18.2**	**1.2**	**2.8**		

Thermal Oxidizer Inlet - Test Run 1

Spectrum	Date	Time	Diluted EtO (ppmv wet)	Dilution Factor	Corrected EtO (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_1_3656.LAB	10/23/2019	13:58:02	893.5	100	89347	148.8	1.000
RUN_1_3657.LAB	10/23/2019	13:59:03	2396.3	100	239627	148.9	1.000
RUN_1_3658.LAB	10/23/2019	14:00:04	2363.4	100	236345	148.9	1.000
RUN_1_3659.LAB	10/23/2019	14:01:05	2308.4	100	230836	148.9	1.000
RUN_1_3660.LAB	10/23/2019	14:02:06	2233.4	100	223338	148.9	1.000
RUN_1_3661.LAB	10/23/2019	14:03:07	2110.1	100	211008	148.8	1.000
RUN_1_3662.LAB	10/23/2019	14:04:08	1655.7	100	165575	148.9	1.000
RUN_1_3663.LAB	10/23/2019	14:05:09	1465.1	100	146506	148.9	1.000
RUN_1_3664.LAB	10/23/2019	14:06:10	1655.1	100	165506	149.0	1.000
RUN_1_3665.LAB	10/23/2019	14:07:11	1466.6	100	146656	149.0	1.000
RUN_1_3666.LAB	10/23/2019	14:08:12	1256.8	100	125682	149.0	1.000
RUN_1_3667.LAB	10/23/2019	14:09:13	557.8	100	55784	149.0	1.000
RUN_1_3668.LAB	10/23/2019	14:10:14	892.7	100	89273	148.9	1.000
RUN_1_3669.LAB	10/23/2019	14:11:15	518.6	100	51857	148.8	1.000
RUN_1_3670.LAB	10/23/2019	14:12:16	581.0	100	58104	148.8	1.001
RUN_1_3671.LAB	10/23/2019	14:13:17	676.9	100	67686	148.8	1.001
RUN_1_3672.LAB	10/23/2019	14:14:18	783.2	100	78322	148.8	1.000
RUN_1_3673.LAB	10/23/2019	14:15:19	893.6	100	89361	148.8	1.001
RUN_1_3674.LAB	10/23/2019	14:16:20	998.8	100	99882	148.8	1.000
RUN_1_3675.LAB	10/23/2019	14:17:21	1069.4	100	106938	148.8	1.001
RUN_1_3676.LAB	10/23/2019	14:18:22	1086.3	100	108629	148.8	1.000
RUN_1_3677.LAB	10/23/2019	14:19:23	1099.2	100	109923	148.8	1.001
RUN_1_3678.LAB	10/23/2019	14:20:23	993.5	100	99348	148.8	1.001
RUN_1_3679.LAB	10/23/2019	14:21:24	975.5	100	97553	148.9	1.001
RUN_1_3680.LAB	10/23/2019	14:22:25	961.7	100	96172	149.0	1.001
RUN_1_3681.LAB	10/23/2019	14:23:26	541.9	100	54189	148.9	1.001
RUN_1_3682.LAB	10/23/2019	14:24:27	337.2	100	33720	148.9	1.001
RUN_1_3683.LAB	10/23/2019	14:25:28	345.0	100	34503	148.9	1.008
Thermal Oxidizer Inlet Test Run 1		**Minimum**	**337.2**	**-**	**33720**		
13:58 - 14:25		**Maximum**	**2396.3**	**-**	**239627**		
10/23/2019		**Average**	**1182.7**	**-**	**118274**		

Thermal Oxidizer Inlet - Test Run 2

Spectrum	Date	Time	Diluted EtO (ppmv wet)	Dilution Factor	Corrected EtO (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_2_3870.LAB	10/23/2019	16:16:30	445.1	154.6	68809	148.5	0.998
RUN_2_3871.LAB	10/23/2019	16:17:32	1229.9	154.6	190134	148.5	0.998
RUN_2_3872.LAB	10/23/2019	16:18:32	1416.0	154.6	218896	148.5	0.998
RUN_2_3873.LAB	10/23/2019	16:19:33	1434.6	154.6	221774	148.5	0.998
RUN_2_3874.LAB	10/23/2019	16:20:34	1433.0	154.6	221524	148.5	0.998
RUN_2_3875.LAB	10/23/2019	16:21:35	1443.0	154.6	223066	148.5	0.998
RUN_2_3876.LAB	10/23/2019	16:22:36	1458.6	154.6	225486	148.5	0.998
RUN_2_3877.LAB	10/23/2019	16:23:37	1480.7	154.6	228893	148.5	0.998
RUN_2_3878.LAB	10/23/2019	16:24:38	1464.0	154.6	226324	148.5	0.998
RUN_2_3879.LAB	10/23/2019	16:25:39	1330.3	154.6	205649	148.5	0.998
RUN_2_3880.LAB	10/23/2019	16:26:40	1268.9	154.6	196164	148.5	0.998
RUN_2_3881.LAB	10/23/2019	16:27:41	1221.1	154.6	188767	148.5	0.998
RUN_2_3882.LAB	10/23/2019	16:28:42	813.6	154.6	125767	148.5	0.998
RUN_2_3883.LAB	10/23/2019	16:29:43	585.0	154.6	90436	148.5	0.998
RUN_2_3884.LAB	10/23/2019	16:30:44	560.6	154.6	86669	148.5	0.997
RUN_2_3885.LAB	10/23/2019	16:31:45	591.7	154.6	91469	148.6	0.997
RUN_2_3886.LAB	10/23/2019	16:32:46	626.5	154.6	96854	148.5	0.997
RUN_2_3887.LAB	10/23/2019	16:33:47	654.5	154.6	101177	148.6	0.997
RUN_2_3888.LAB	10/23/2019	16:34:48	690.5	154.6	106741	148.5	0.998

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_2_3889.LAB	10/23/2019	16:35:49	724.6	154.6	112017	148.6	0.997
RUN_2_3890.LAB	10/23/2019	16:36:50	758.1	154.6	117188	148.5	0.997
RUN_2_3891.LAB	10/23/2019	16:37:51	745.7	154.6	115281	148.5	0.997
RUN_2_3892.LAB	10/23/2019	16:38:52	712.9	154.6	110214	148.5	0.997
RUN_2_3893.LAB	10/23/2019	16:39:53	691.6	154.6	106913	148.5	0.997
RUN_2_3894.LAB	10/23/2019	16:40:54	622.4	154.6	96216	148.5	0.997
RUN_2_3895.LAB	10/23/2019	16:41:55	363.2	154.6	56140	148.5	0.997
RUN_2_3896.LAB	10/23/2019	16:42:56	312.5	154.6	48307	148.5	0.997
RUN_2_3897.LAB	10/23/2019	16:43:57	321.5	154.6	49706	148.6	0.997
RUN_2_3898.LAB	10/23/2019	16:44:58	347.9	154.6	53780	148.6	0.997
RUN_2_3899.LAB	10/23/2019	16:45:59	375.4	154.6	58026	148.6	0.997
RUN_2_3900.LAB	10/23/2019	16:47:00	399.6	154.6	61779	148.6	0.997
RUN_2_3901.LAB	10/23/2019	16:48:01	426.4	154.6	65910	148.5	0.997
RUN_2_3902.LAB	10/23/2019	16:49:02	451.1	154.6	69730	148.5	0.998
RUN_2_3903.LAB	10/23/2019	16:50:03	471.4	154.6	72875	148.5	0.998
RUN_2_3904.LAB	10/23/2019	16:51:04	455.0	154.6	70340	148.4	0.998
RUN_2_3905.LAB	10/23/2019	16:52:05	444.0	154.6	68633	148.5	0.997
RUN_2_3906.LAB	10/23/2019	16:53:06	433.4	154.6	66993	148.4	0.996
RUN_2_3907.LAB	10/23/2019	16:54:07	307.3	154.6	47506	148.4	0.996
RUN_2_3908.LAB	10/23/2019	16:55:08	205.0	154.6	31690	148.5	0.996
RUN_2_3909.LAB	10/23/2019	16:56:09	201.3	154.6	31115	148.5	0.996
RUN_2_3910.LAB	10/23/2019	16:57:10	215.6	154.6	33328	148.5	0.996
RUN_2_3911.LAB	10/23/2019	16:58:11	235.6	154.6	36421	148.5	0.996
RUN_2_3912.LAB	10/23/2019	16:59:12	253.8	154.6	39238	148.5	0.996
RUN_2_3913.LAB	10/23/2019	17:00:13	271.8	154.6	42013	148.5	0.996
RUN_2_3914.LAB	10/23/2019	17:01:14	290.1	154.6	44849	148.5	0.997
RUN_2_3915.LAB	10/23/2019	17:02:15	309.6	154.6	47859	148.5	0.997
RUN_2_3916.LAB	10/23/2019	17:03:16	301.7	154.6	46647	148.5	0.997
RUN_2_3917.LAB	10/23/2019	17:04:17	281.8	154.6	43564	148.5	0.997
RUN_2_3918.LAB	10/23/2019	17:05:18	272.9	154.6	42190	148.5	0.997
RUN_2_3919.LAB	10/23/2019	17:06:19	265.8	154.6	41083	148.5	0.997
RUN_2_3920.LAB	10/23/2019	17:07:19	260.3	154.6	40233	148.5	0.996
RUN_2_3921.LAB	10/23/2019	17:08:20	215.8	154.6	33357	148.5	0.996
RUN_2_3922.LAB	10/23/2019	17:09:21	136.0	154.6	21022	148.5	0.997
RUN_2_3923.LAB	10/23/2019	17:10:22	134.2	154.6	20749	148.5	0.997
RUN_2_3924.LAB	10/23/2019	17:11:23	142.5	154.6	22034	148.5	0.997
RUN_2_3925.LAB	10/23/2019	17:12:24	156.3	154.6	24169	148.5	0.997
RUN_2_3926.LAB	10/23/2019	17:13:25	167.6	154.6	25916	148.5	0.997
RUN_2_3927.LAB	10/23/2019	17:14:26	180.7	154.6	27929	148.5	0.997
RUN_2_3928.LAB	10/23/2019	17:15:27	193.7	154.6	29950	148.5	0.997
RUN_2_3929.LAB	10/23/2019	17:16:28	208.1	154.6	32166	148.5	0.997
Thermal Oxidizer Inlet Test Run 2		**Minimum**	**134.2**	**-**	**20749**		
16:16 - 17:16		**Maximum**	**1480.7**	**-**	**228893**		
10/23/2019		**Average**	**573.5**	**-**	**88661**		

Thermal Oxidizer Inlet - Test Run 3

Spectrum	Date	Time	Diluted EtO (ppmv wet)	Dilution Factor	Corrected EtO (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_3_4079.LAB	10/23/2019	18:37:30	300.2	154.5	46383	148.5	0.984
RUN_3_4080.LAB	10/23/2019	18:38:31	1387.1	154.5	214287	148.5	0.984
RUN_3_4081.LAB	10/23/2019	18:39:32	1724.3	154.5	266384	148.5	0.984
RUN_3_4082.LAB	10/23/2019	18:40:33	1771.6	154.5	273694	148.5	0.984
RUN_3_4083.LAB	10/23/2019	18:41:34	1738.6	154.5	268596	148.5	0.984
RUN_3_4084.LAB	10/23/2019	18:42:35	1722.8	154.5	266150	148.5	0.984
RUN_3_4085.LAB	10/23/2019	18:43:36	1731.4	154.5	267487	148.5	0.984
RUN_3_4086.LAB	10/23/2019	18:44:37	1745.3	154.5	269629	148.5	0.984
RUN_3_4087.LAB	10/23/2019	18:45:38	1785.0	154.5	275768	148.5	0.984
RUN_3_4088.LAB	10/23/2019	18:46:39	1801.6	154.5	278331	148.5	0.984
RUN_3_4089.LAB	10/23/2019	18:47:40	1710.6	154.5	264276	148.5	0.984
RUN_3_4090.LAB	10/23/2019	18:48:41	1650.9	154.5	255051	148.5	0.983
RUN_3_4091.LAB	10/23/2019	18:49:41	1605.5	154.5	248034	148.5	0.983
RUN_3_4092.LAB	10/23/2019	18:50:43	1076.2	154.5	166262	148.5	0.983
RUN_3_4093.LAB	10/23/2019	18:51:44	622.5	154.5	96166	148.5	0.983
RUN_3_4094.LAB	10/23/2019	18:52:45	563.3	154.5	87030	148.5	0.983

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Water (%v)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
RUN_3_4095.LAB	10/23/2019	18:53:46	606.6	154.5	93719	148.5	0.983
RUN_3_4096.LAB	10/23/2019	18:54:47	674.2	154.5	104151	148.5	0.983
RUN_3_4097.LAB	10/23/2019	18:55:48	735.6	154.5	113637	148.5	0.983
RUN_3_4098.LAB	10/23/2019	18:56:49	783.4	154.5	121029	148.5	0.983
RUN_3_4099.LAB	10/23/2019	18:57:50	830.3	154.5	128276	148.5	0.983
RUN_3_4100.LAB	10/23/2019	18:58:51	878.2	154.5	135676	148.5	0.983
RUN_3_4101.LAB	10/23/2019	18:59:52	924.7	154.5	142855	148.6	0.983
RUN_3_4102.LAB	10/23/2019	19:00:52	924.2	154.5	142777	148.6	0.983
RUN_3_4103.LAB	10/23/2019	19:01:53	902.2	154.5	139383	148.5	0.983
RUN_3_4104.LAB	10/23/2019	19:02:54	881.3	154.5	136146	148.5	0.983
RUN_3_4105.LAB	10/23/2019	19:03:55	620.1	154.5	95793	148.5	0.984
RUN_3_4106.LAB	10/23/2019	19:04:56	350.7	154.5	54181	148.5	0.984
RUN_3_4107.LAB	10/23/2019	19:05:57	328.6	154.5	50769	148.5	0.984
RUN_3_4108.LAB	10/23/2019	19:06:58	359.2	154.5	55492	148.5	0.984
RUN_3_4109.LAB	10/23/2019	19:07:59	407.8	154.5	63001	148.5	0.984
RUN_3_4110.LAB	10/23/2019	19:09:00	456.0	154.5	70445	148.5	0.984
RUN_3_4111.LAB	10/23/2019	19:10:01	493.1	154.5	76172	148.5	0.983
RUN_3_4112.LAB	10/23/2019	19:11:02	529.1	154.5	81744	148.5	0.983
RUN_3_4113.LAB	10/23/2019	19:12:03	565.4	154.5	87352	148.5	0.983
RUN_3_4114.LAB	10/23/2019	19:13:04	599.1	154.5	92554	148.5	0.983
RUN_3_4115.LAB	10/23/2019	19:14:05	602.5	154.5	93074	148.5	0.983
RUN_3_4116.LAB	10/23/2019	19:15:06	590.6	154.5	91235	148.5	0.983
RUN_3_4117.LAB	10/23/2019	19:16:07	579.0	154.5	89453	148.5	0.983
RUN_3_4118.LAB	10/23/2019	19:17:07	395.7	154.5	61126	148.5	0.983
RUN_3_4119.LAB	10/23/2019	19:18:09	227.0	154.5	35067	148.6	0.983
RUN_3_4120.LAB	10/23/2019	19:19:09	220.5	154.5	34068	148.5	0.982
RUN_3_4121.LAB	10/23/2019	19:20:10	241.7	154.5	37347	148.5	0.982
RUN_3_4122.LAB	10/23/2019	19:21:11	275.6	154.5	42582	148.5	0.982
RUN_3_4123.LAB	10/23/2019	19:22:12	309.3	154.5	47777	148.5	0.982
RUN_3_4124.LAB	10/23/2019	19:23:13	337.0	154.5	52066	148.5	0.982
RUN_3_4125.LAB	10/23/2019	19:24:14	364.5	154.5	56316	148.5	0.982
RUN_3_4126.LAB	10/23/2019	19:25:15	391.1	154.5	60420	148.6	0.982
RUN_3_4127.LAB	10/23/2019	19:26:16	418.5	154.5	64660	148.5	0.982
RUN_3_4128.LAB	10/23/2019	19:27:18	406.7	154.5	62834	148.5	0.982
RUN_3_4129.LAB	10/23/2019	19:28:19	395.6	154.5	61121	148.6	0.982
RUN_3_4130.LAB	10/23/2019	19:29:20	388.0	154.5	59940	148.5	0.981
RUN_3_4131.LAB	10/23/2019	19:30:21	383.0	154.5	59173	148.5	0.981
RUN_3_4132.LAB	10/23/2019	19:31:22	374.3	154.5	57832	148.5	0.982
RUN_3_4133.LAB	10/23/2019	19:32:23	200.4	154.5	30960	148.5	0.981
RUN_3_4134.LAB	10/23/2019	19:33:24	158.6	154.5	24496	148.5	0.981
RUN_3_4135.LAB	10/23/2019	19:34:25	167.7	154.5	25913	148.5	0.981
RUN_3_4136.LAB	10/23/2019	19:35:26	184.2	154.5	28450	148.5	0.981
RUN_3_4137.LAB	10/23/2019	19:36:28	207.5	154.5	32052	148.6	0.981
RUN_3_4138.LAB	10/23/2019	19:37:29	228.5	154.5	35306	148.6	0.981
Thermal Oxidizer Inlet Test Run 3		**Minimum**	**158.6**	**-**	**24496**		
18:37 - 19:37		**Maximum**	**1801.6**	**-**	**278331**		
10/23/2019		**Average**	**730.6**	**-**	**112866**		

Dry Bed Outlet - Test Run 1

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000067.LAB	10/23/2019	6:22:25	0.613	1.08	2.72	150.5	0.973
SAMPLE_0000068.LAB	10/23/2019	6:23:23	0.287	1.07	2.69	150.5	0.977
SAMPLE_0000069.LAB	10/23/2019	6:24:22	0.066	1.07	2.72	150.5	0.987
SAMPLE_0000070.LAB	10/23/2019	6:25:21	0.064	1.06	2.64	150.5	1.012
SAMPLE_0000071.LAB	10/23/2019	6:26:20	0.052	1.08	2.73	150.5	1.012
SAMPLE_0000072.LAB	10/23/2019	6:27:19	0.062	1.09	2.69	150.5	1.007
SAMPLE_0000073.LAB	10/23/2019	6:28:18	0.057	1.07	2.67	150.5	1.009
SAMPLE_0000074.LAB	10/23/2019	6:29:16	0.050	1.07	2.72	150.8	1.008
SAMPLE_0000075.LAB	10/23/2019	6:30:15	0.052	1.06	2.65	150.9	1.011
SAMPLE_0000076.LAB	10/23/2019	6:31:14	0.051	1.05	2.67	150.7	1.011
SAMPLE_0000077.LAB	10/23/2019	6:32:13	0.041	1.04	2.68	150.5	1.011
SAMPLE_0000078.LAB	10/23/2019	6:33:12	0.049	1.04	2.64	150.5	1.009
SAMPLE_0000079.LAB	10/23/2019	6:34:10	0.044	1.03	2.70	150.4	1.010
SAMPLE_0000080.LAB	10/23/2019	6:35:09	0.050	1.04	2.67	150.5	1.007
SAMPLE_0000081.LAB	10/23/2019	6:36:08	0.042	1.04	2.66	150.4	1.009
SAMPLE_0000082.LAB	10/23/2019	6:37:07	0.034	1.05	2.69	150.4	1.010
SAMPLE_0000083.LAB	10/23/2019	6:38:06	0.038	1.05	2.65	150.5	1.008
SAMPLE_0000084.LAB	10/23/2019	6:39:05	0.040	1.05	2.69	150.7	1.013
SAMPLE_0000085.LAB	10/23/2019	6:40:03	0.042	1.05	2.65	150.5	1.011
SAMPLE_0000086.LAB	10/23/2019	6:41:02	0.037	1.05	2.64	150.5	1.009
SAMPLE_0000087.LAB	10/23/2019	6:42:01	0.033	1.04	2.68	150.7	1.010
SAMPLE_0000088.LAB	10/23/2019	6:43:00	0.035	1.04	2.64	150.5	1.008
SAMPLE_0000089.LAB	10/23/2019	6:43:59	0.031	1.03	2.68	150.5	1.013
SAMPLE_0000090.LAB	10/23/2019	6:44:58	0.034	1.04	2.67	150.5	1.010
SAMPLE_0000091.LAB	10/23/2019	6:45:56	0.033	1.04	2.64	150.7	1.012
SAMPLE_0000092.LAB	10/23/2019	6:46:55	0.031	1.05	2.70	150.7	1.011
SAMPLE_0000093.LAB	10/23/2019	6:47:54	0.033	1.05	2.65	150.5	1.009
SAMPLE_0000094.LAB	10/23/2019	6:48:53	0.028	1.05	2.68	150.5	1.010
SAMPLE_0000095.LAB	10/23/2019	6:49:52	0.026	1.05	2.69	150.5	1.008
SAMPLE_0000096.LAB	10/23/2019	6:50:50	0.021	1.04	2.65	150.4	1.009
SAMPLE_0000097.LAB	10/23/2019	6:51:49	0.024	1.03	2.71	150.5	1.010
SAMPLE_0000098.LAB	10/23/2019	6:52:48	0.024	1.03	2.66	150.5	1.009
SAMPLE_0000099.LAB	10/23/2019	6:53:47	0.022	1.03	2.67	150.5	1.008
SAMPLE_0000100.LAB	10/23/2019	6:54:46	0.024	1.03	2.70	150.5	1.011
SAMPLE_0000101.LAB	10/23/2019	6:55:45	0.024	1.04	2.75	150.5	1.009
SAMPLE_0000102.LAB	10/23/2019	6:56:43	0.016	1.04	2.94	150.5	1.009
SAMPLE_0000103.LAB	10/23/2019	6:57:42	0.023	1.04	2.78	150.4	1.007
SAMPLE_0000104.LAB	10/23/2019	6:58:41	0.022	1.03	2.82	150.4	1.008
SAMPLE_0000105.LAB	10/23/2019	6:59:40	0.016	1.02	2.89	150.4	1.012
SAMPLE_0000106.LAB	10/23/2019	7:00:39	0.027	1.01	2.72	150.4	1.010
SAMPLE_0000107.LAB	10/23/2019	7:01:38	0.010	1.01	2.92	150.4	1.009
SAMPLE_0000108.LAB	10/23/2019	7:02:36	0.019	0.99	2.81	150.5	1.012
SAMPLE_0000109.LAB	10/23/2019	7:03:35	0.025	0.98	2.73	150.5	1.009
SAMPLE_0000110.LAB	10/23/2019	7:04:34	0.015	0.98	2.92	150.7	1.012
SAMPLE_0000111.LAB	10/23/2019	7:05:33	0.027	0.98	2.72	150.7	1.008
SAMPLE_0000112.LAB	10/23/2019	7:06:32	0.019	0.98	2.78	150.5	1.009
SAMPLE_0000113.LAB	10/23/2019	7:07:30	0.013	0.98	2.84	150.7	1.010
SAMPLE_0000114.LAB	10/23/2019	7:08:29	0.018	0.98	2.71	150.7	1.010
SAMPLE_0000115.LAB	10/23/2019	7:09:28	0.010	0.98	2.87	150.5	1.012
SAMPLE_0000116.LAB	10/23/2019	7:10:27	0.011	0.98	2.74	150.5	1.012
SAMPLE_0000117.LAB	10/23/2019	7:11:26	0.007	0.99	2.77	150.7	1.011
SAMPLE_0000118.LAB	10/23/2019	7:12:25	0.012	1.00	2.86	150.5	1.009
SAMPLE_0000119.LAB	10/23/2019	7:13:23	0.007	1.00	2.69	150.5	1.010
SAMPLE_0000120.LAB	10/23/2019	7:14:22	0.007	1.01	2.85	150.7	1.010
SAMPLE_0000121.LAB	10/23/2019	7:15:21	0.010	1.01	2.77	150.7	1.010
SAMPLE_0000122.LAB	10/23/2019	7:16:20	0.012	1.01	2.71	150.4	1.007
SAMPLE_0000123.LAB	10/23/2019	7:17:19	0.001	1.00	2.87	150.5	1.012
SAMPLE_0000124.LAB	10/23/2019	7:18:18	0.010	1.00	2.71	150.5	1.010
SAMPLE_0000125.LAB	10/23/2019	7:19:16	0.009	1.00	2.74	150.7	1.010
SAMPLE_0000126.LAB	10/23/2019	7:20:15	0.010	1.00	2.80	150.5	1.009
SAMPLE_0000127.LAB	10/23/2019	7:21:14	0.005	1.00	2.67	150.5	1.012
SAMPLE_0000128.LAB	10/23/2019	7:22:13	0.010	1.01	2.82	150.5	1.012
SAMPLE_0000129.LAB	10/23/2019	7:23:12	0.011	1.04	2.73	150.5	1.011

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000130.LAB	10/23/2019	7:24:10	0.013	1.06	2.72	150.5	1.011
SAMPLE_0000131.LAB	10/23/2019	7:25:09	0.015	1.07	2.83	150.7	1.009
SAMPLE_0000132.LAB	10/23/2019	7:26:08	0.009	1.08	2.66	150.5	1.010
SAMPLE_0000133.LAB	10/23/2019	7:27:07	0.018	1.07	2.69	150.5	1.013
SAMPLE_0000134.LAB	10/23/2019	7:28:06	0.021	1.07	2.72	150.5	1.011
SAMPLE_0000135.LAB	10/23/2019	7:29:05	0.014	1.06	2.67	150.5	1.010
SAMPLE_0000136.LAB	10/23/2019	7:30:03	0.011	1.05	2.74	150.5	1.013
SAMPLE_0000137.LAB	10/23/2019	7:31:02	0.013	1.05	2.68	150.5	1.009
SAMPLE_0000138.LAB	10/23/2019	7:32:01	0.011	1.05	2.69	150.7	1.012
SAMPLE_0000139.LAB	10/23/2019	7:33:00	0.007	1.05	2.75	150.4	1.010
SAMPLE_0000140.LAB	10/23/2019	7:33:59	0.015	1.06	2.66	150.5	1.009
SAMPLE_0000141.LAB	10/23/2019	7:34:57	0.016	1.06	2.74	150.5	1.009
SAMPLE_0000142.LAB	10/23/2019	7:35:56	0.017	1.06	2.74	150.4	1.009
SAMPLE_0000143.LAB	10/23/2019	7:36:55	0.023	1.05	2.67	150.4	1.012
SAMPLE_0000144.LAB	10/23/2019	7:37:54	0.021	1.05	2.69	150.5	1.009
SAMPLE_0000145.LAB	10/23/2019	7:38:53	0.024	1.05	2.68	150.5	1.010
SAMPLE_0000146.LAB	10/23/2019	7:39:52	0.024	1.06	2.68	150.5	1.013
SAMPLE_0000147.LAB	10/23/2019	7:40:50	0.015	1.07	2.72	150.7	1.009
SAMPLE_0000148.LAB	10/23/2019	7:41:49	0.026	1.07	2.67	150.8	1.011
SAMPLE_0000149.LAB	10/23/2019	7:42:48	0.010	1.07	2.72	150.5	1.010
SAMPLE_0000150.LAB	10/23/2019	7:43:47	0.034	1.05	6.28	150.4	1.011
Dry Bed Outlet Test Run 1		**Minimum**	**0.001**	**0.98**	**2.64**		
6:22 - 7:43		**Maximum**	**0.613**	**1.09**	**6.28**		
10/23/2019		**Average**	**0.035**	**1.04**	**2.77**		

Dry Bed Outlet - Test Run 2

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000169.LAB	10/23/2019	7:51:49	0.014	1.03	2.73	150.4	1.013
SAMPLE_0000170.LAB	10/23/2019	7:52:48	0.905	1.04	2.66	150.4	1.012
SAMPLE_0000171.LAB	10/23/2019	7:53:47	0.939	1.05	2.78	150.5	1.010
SAMPLE_0000172.LAB	10/23/2019	7:54:45	0.163	1.05	2.66	150.7	1.011
SAMPLE_0000173.LAB	10/23/2019	7:55:44	0.135	1.05	2.69	150.7	1.012
SAMPLE_0000174.LAB	10/23/2019	7:56:43	0.120	1.06	2.70	150.8	1.008
SAMPLE_0000175.LAB	10/23/2019	7:57:42	0.113	1.05	2.62	150.7	1.010
SAMPLE_0000176.LAB	10/23/2019	7:58:41	0.109	1.03	2.70	150.5	1.011
SAMPLE_0000177.LAB	10/23/2019	7:59:40	0.100	1.02	2.63	150.5	1.013
SAMPLE_0000178.LAB	10/23/2019	8:00:38	0.096	1.02	2.62	150.5	1.012
SAMPLE_0000179.LAB	10/23/2019	8:01:37	0.097	1.02	2.69	150.5	1.010
SAMPLE_0000180.LAB	10/23/2019	8:02:36	0.085	1.03	2.60	150.4	1.011
SAMPLE_0000181.LAB	10/23/2019	8:03:35	0.090	1.03	2.65	150.5	1.013
SAMPLE_0000182.LAB	10/23/2019	8:04:34	0.086	1.03	2.66	150.5	1.010
SAMPLE_0000183.LAB	10/23/2019	8:05:32	0.082	1.02	2.59	150.5	1.013
SAMPLE_0000184.LAB	10/23/2019	8:06:31	0.080	1.02	2.68	150.5	1.011
SAMPLE_0000185.LAB	10/23/2019	8:07:30	0.076	1.02	2.61	150.4	1.011
SAMPLE_0000186.LAB	10/23/2019	8:08:29	0.070	1.02	2.61	150.7	1.010
SAMPLE_0000187.LAB	10/23/2019	8:09:28	0.075	1.02	2.69	150.5	1.010
SAMPLE_0000188.LAB	10/23/2019	8:10:27	0.079	1.03	2.59	150.5	1.011
SAMPLE_0000189.LAB	10/23/2019	8:11:25	0.072	1.03	2.65	150.7	1.012
SAMPLE_0000190.LAB	10/23/2019	8:12:24	0.069	1.03	2.66	150.5	1.011
SAMPLE_0000191.LAB	10/23/2019	8:13:23	0.070	1.02	2.59	150.4	1.012
SAMPLE_0000192.LAB	10/23/2019	8:14:22	0.066	1.02	2.67	150.3	1.011
SAMPLE_0000193.LAB	10/23/2019	8:15:21	0.060	1.02	2.63	150.7	1.012
SAMPLE_0000194.LAB	10/23/2019	8:16:19	0.063	1.02	2.60	150.4	1.012
SAMPLE_0000195.LAB	10/23/2019	8:17:18	0.058	1.02	2.70	150.5	1.012
SAMPLE_0000196.LAB	10/23/2019	8:18:17	0.059	1.02	2.61	150.7	1.009
SAMPLE_0000197.LAB	10/23/2019	8:19:16	0.064	1.03	2.66	150.5	1.010
SAMPLE_0000198.LAB	10/23/2019	8:20:15	0.062	1.03	2.70	150.4	1.013
SAMPLE_0000199.LAB	10/23/2019	8:21:14	0.064	1.03	2.59	150.5	1.014
SAMPLE_0000200.LAB	10/23/2019	8:22:12	0.058	1.03	2.66	150.5	1.012
SAMPLE_0000201.LAB	10/23/2019	8:23:11	0.055	1.02	2.65	150.4	1.012
SAMPLE_0000202.LAB	10/23/2019	8:24:10	0.052	1.01	2.59	150.5	1.012
SAMPLE_0000203.LAB	10/23/2019	8:25:09	0.056	1.01	2.73	150.4	1.011
SAMPLE_0000204.LAB	10/23/2019	8:26:08	0.064	1.01	2.61	150.5	1.010

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000205.LAB	10/23/2019	8:27:07	0.061	1.01	2.78	150.5	1.010
SAMPLE_0000206.LAB	10/23/2019	8:28:05	0.057	1.01	2.84	150.5	1.010
SAMPLE_0000207.LAB	10/23/2019	8:29:04	0.069	0.99	2.69	150.5	1.011
SAMPLE_0000208.LAB	10/23/2019	8:30:03	0.080	0.98	2.83	150.5	1.014
SAMPLE_0000209.LAB	10/23/2019	8:31:02	0.072	0.99	2.76	150.5	1.015
SAMPLE_0000210.LAB	10/23/2019	8:32:01	0.061	0.99	2.71	150.5	1.013
SAMPLE_0000211.LAB	10/23/2019	8:33:00	0.058	0.98	2.87	150.5	1.011
SAMPLE_0000212.LAB	10/23/2019	8:33:58	0.068	0.98	2.70	150.5	1.011
SAMPLE_0000213.LAB	10/23/2019	8:34:57	0.060	0.98	2.67	150.5	1.011
SAMPLE_0000214.LAB	10/23/2019	8:35:56	0.049	0.98	2.73	150.4	1.012
SAMPLE_0000215.LAB	10/23/2019	8:36:55	0.043	0.99	2.66	150.5	1.013
SAMPLE_0000216.LAB	10/23/2019	8:37:54	0.048	1.02	2.71	150.5	1.011
SAMPLE_0000217.LAB	10/23/2019	8:38:52	0.042	1.05	2.71	150.4	1.012
SAMPLE_0000218.LAB	10/23/2019	8:39:51	0.048	1.05	2.65	150.5	1.013
SAMPLE_0000219.LAB	10/23/2019	8:40:50	0.041	1.05	2.73	150.5	1.013
SAMPLE_0000220.LAB	10/23/2019	8:41:49	0.043	1.05	2.66	150.7	1.014
SAMPLE_0000221.LAB	10/23/2019	8:42:48	0.046	1.04	2.68	150.5	1.013
SAMPLE_0000222.LAB	10/23/2019	8:43:46	0.040	1.04	2.74	150.3	1.014
SAMPLE_0000223.LAB	10/23/2019	8:44:45	0.036	1.04	2.65	150.5	1.011
SAMPLE_0000224.LAB	10/23/2019	8:45:44	0.041	1.05	2.72	150.5	1.014
SAMPLE_0000225.LAB	10/23/2019	8:46:43	0.039	1.06	2.72	150.5	1.013
SAMPLE_0000226.LAB	10/23/2019	8:47:42	0.039	1.06	2.65	150.4	1.014
SAMPLE_0000227.LAB	10/23/2019	8:48:41	0.037	1.05	2.74	150.4	1.015
SAMPLE_0000228.LAB	10/23/2019	8:49:39	0.037	1.04	2.68	150.5	1.012
SAMPLE_0000229.LAB	10/23/2019	8:50:38	0.035	1.03	2.68	150.5	1.014
SAMPLE_0000230.LAB	10/23/2019	8:51:37	0.034	1.03	2.74	150.5	1.012
SAMPLE_0000231.LAB	10/23/2019	8:52:36	0.033	1.03	2.64	150.4	1.014
SAMPLE_0000232.LAB	10/23/2019	8:53:35	0.031	1.04	2.72	150.4	1.015
SAMPLE_0000233.LAB	10/23/2019	8:54:34	0.028	1.04	2.69	150.4	1.014
SAMPLE_0000234.LAB	10/23/2019	8:55:32	0.036	1.05	2.64	150.4	1.014
SAMPLE_0000235.LAB	10/23/2019	8:56:31	0.033	1.04	2.72	150.4	1.015
SAMPLE_0000236.LAB	10/23/2019	8:57:30	0.037	1.04	2.63	150.5	1.015
SAMPLE_0000237.LAB	10/23/2019	8:58:29	0.033	1.03	2.66	150.5	1.014
SAMPLE_0000238.LAB	10/23/2019	8:59:28	0.029	1.02	2.70	150.5	1.016
SAMPLE_0000239.LAB	10/23/2019	9:00:26	0.037	1.02	2.61	150.4	1.013
SAMPLE_0000240.LAB	10/23/2019	9:01:25	0.025	1.02	2.71	150.4	1.012
SAMPLE_0000241.LAB	10/23/2019	9:02:24	0.030	1.03	2.64	150.5	1.016
SAMPLE_0000242.LAB	10/23/2019	9:03:23	0.026	1.03	2.62	150.3	1.017
SAMPLE_0000243.LAB	10/23/2019	9:04:22	0.027	1.04	2.71	150.4	1.013
SAMPLE_0000244.LAB	10/23/2019	9:05:21	0.024	1.03	2.63	150.5	1.013
SAMPLE_0000245.LAB	10/23/2019	9:06:19	0.027	1.03	2.65	150.4	1.014
Dry Bed Outlet Test Run 2		**Minimum**	**0.014**	**0.98**	**2.59**		
7:51 - 9:06		**Maximum**	**0.939**	**1.06**	**2.87**		
10/23/2019		**Average**	**0.081**	**1.03**	**2.68**		

Dry Bed Outlet - Test Run 3

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000268.LAB	10/23/2019	9:14:33	0.023	1.00	2.73	150.4	1.014
SAMPLE_0000269.LAB	10/23/2019	9:15:32	2.738	1.00	2.64	150.5	1.014
SAMPLE_0000270.LAB	10/23/2019	9:16:31	0.632	1.00	2.71	150.4	1.012
SAMPLE_0000271.LAB	10/23/2019	9:17:30	0.361	1.00	2.70	150.5	1.014
SAMPLE_0000272.LAB	10/23/2019	9:18:28	0.310	1.03	2.62	150.5	1.016
SAMPLE_0000273.LAB	10/23/2019	9:19:27	0.272	1.06	2.66	150.5	1.015
SAMPLE_0000274.LAB	10/23/2019	9:20:26	0.250	1.06	2.62	150.4	1.012
SAMPLE_0000275.LAB	10/23/2019	9:21:25	0.231	1.04	2.58	150.5	1.016
SAMPLE_0000276.LAB	10/23/2019	9:22:24	0.214	1.03	2.63	150.5	1.013
SAMPLE_0000277.LAB	10/23/2019	9:23:22	0.208	1.02	2.55	150.5	1.014
SAMPLE_0000278.LAB	10/23/2019	9:24:21	0.192	1.02	2.60	150.5	1.012
SAMPLE_0000279.LAB	10/23/2019	9:25:20	0.185	1.01	2.58	150.4	1.012
SAMPLE_0000280.LAB	10/23/2019	9:26:19	0.185	1.01	2.56	150.5	1.014
SAMPLE_0000281.LAB	10/23/2019	9:27:18	0.168	1.01	2.63	150.5	1.013
SAMPLE_0000282.LAB	10/23/2019	9:28:17	0.164	1.02	2.56	150.4	1.015
SAMPLE_0000283.LAB	10/23/2019	9:29:15	0.158	1.02	2.58	150.5	1.013

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000284.LAB	10/23/2019	9:30:14	0.157	1.02	2.59	150.4	1.014
SAMPLE_0000285.LAB	10/23/2019	9:31:13	0.148	1.02	2.54	150.4	1.013
SAMPLE_0000286.LAB	10/23/2019	9:32:12	0.154	1.02	2.60	150.4	1.011
SAMPLE_0000287.LAB	10/23/2019	9:33:11	0.143	1.02	2.55	150.5	1.013
SAMPLE_0000288.LAB	10/23/2019	9:34:09	0.142	1.01	2.55	150.5	1.015
SAMPLE_0000289.LAB	10/23/2019	9:35:08	0.137	1.01	2.60	150.7	1.015
SAMPLE_0000290.LAB	10/23/2019	9:36:07	0.133	1.02	2.55	150.5	1.010
SAMPLE_0000291.LAB	10/23/2019	9:37:06	0.131	1.02	2.59	150.4	1.016
SAMPLE_0000292.LAB	10/23/2019	9:38:05	0.121	1.03	2.56	150.5	1.015
SAMPLE_0000293.LAB	10/23/2019	9:39:04	0.114	1.03	2.53	150.4	1.015
SAMPLE_0000294.LAB	10/23/2019	9:40:02	0.119	1.02	2.60	150.5	1.013
SAMPLE_0000295.LAB	10/23/2019	9:41:01	0.117	1.02	2.57	150.5	1.012
SAMPLE_0000296.LAB	10/23/2019	9:42:00	0.116	1.02	2.62	150.3	1.014
SAMPLE_0000297.LAB	10/23/2019	9:42:59	0.112	1.02	2.64	150.4	1.011
SAMPLE_0000298.LAB	10/23/2019	9:43:58	0.107	1.01	2.61	150.4	1.014
SAMPLE_0000299.LAB	10/23/2019	9:44:56	0.104	1.02	2.74	150.5	1.011
SAMPLE_0000300.LAB	10/23/2019	9:45:55	0.103	1.03	2.65	150.5	1.013
SAMPLE_0000301.LAB	10/23/2019	9:46:54	0.103	1.04	2.68	150.3	1.013
SAMPLE_0000302.LAB	10/23/2019	9:47:53	0.101	1.04	2.70	150.4	1.016
SAMPLE_0000303.LAB	10/23/2019	9:48:52	0.094	1.04	2.63	150.5	1.014
SAMPLE_0000304.LAB	10/23/2019	9:49:51	0.096	1.05	2.69	150.3	1.013
SAMPLE_0000305.LAB	10/23/2019	9:50:49	0.093	1.05	2.66	150.4	1.015
SAMPLE_0000306.LAB	10/23/2019	9:51:48	0.086	1.05	2.66	150.5	1.013
SAMPLE_0000307.LAB	10/23/2019	9:52:47	0.093	1.05	2.72	150.4	1.014
SAMPLE_0000308.LAB	10/23/2019	9:53:46	0.085	1.05	2.65	150.5	1.013
SAMPLE_0000309.LAB	10/23/2019	9:54:45	0.080	1.06	2.80	150.4	1.016
SAMPLE_0000310.LAB	10/23/2019	9:55:43	0.095	1.06	2.65	150.5	1.015
SAMPLE_0000311.LAB	10/23/2019	9:56:42	0.115	1.05	2.69	150.5	1.016
SAMPLE_0000312.LAB	10/23/2019	9:57:41	0.071	1.04	2.76	150.5	1.013
SAMPLE_0000313.LAB	10/23/2019	9:58:40	0.071	1.02	2.62	150.4	1.015
SAMPLE_0000314.LAB	10/23/2019	9:59:39	0.061	1.01	2.76	150.4	1.015
SAMPLE_0000315.LAB	10/23/2019	10:00:38	0.070	1.00	2.69	150.4	1.014
SAMPLE_0000316.LAB	10/23/2019	10:01:36	0.065	0.99	2.62	150.4	1.016
SAMPLE_0000317.LAB	10/23/2019	10:02:35	0.053	0.99	2.74	150.4	1.013
SAMPLE_0000318.LAB	10/23/2019	10:03:34	0.062	0.98	2.62	150.5	1.014
SAMPLE_0000319.LAB	10/23/2019	10:04:33	0.054	0.99	2.68	150.5	1.015
SAMPLE_0000320.LAB	10/23/2019	10:05:32	0.061	1.00	2.68	150.5	1.016
SAMPLE_0000321.LAB	10/23/2019	10:06:30	0.061	1.00	2.61	150.5	1.016
SAMPLE_0000322.LAB	10/23/2019	10:07:29	0.055	1.00	2.68	150.5	1.016
SAMPLE_0000323.LAB	10/23/2019	10:08:28	0.057	0.99	2.63	150.5	1.015
SAMPLE_0000324.LAB	10/23/2019	10:09:27	0.045	1.00	2.67	150.5	1.015
SAMPLE_0000325.LAB	10/23/2019	10:10:26	0.047	1.01	2.66	150.5	1.017
SAMPLE_0000326.LAB	10/23/2019	10:11:25	0.044	1.03	2.60	150.4	1.017
SAMPLE_0000327.LAB	10/23/2019	10:12:23	0.048	1.04	2.71	150.4	1.013
SAMPLE_0000328.LAB	10/23/2019	10:13:22	0.051	1.04	2.63	150.5	1.014
SAMPLE_0000329.LAB	10/23/2019	10:14:21	0.045	1.04	2.66	150.5	1.013
SAMPLE_0000330.LAB	10/23/2019	10:15:20	0.045	1.03	2.69	150.5	1.016
SAMPLE_0000331.LAB	10/23/2019	10:16:19	0.051	1.03	2.63	150.5	1.014
SAMPLE_0000332.LAB	10/23/2019	10:17:18	0.052	1.02	2.71	150.3	1.013
SAMPLE_0000333.LAB	10/23/2019	10:18:16	0.043	1.02	2.64	150.5	1.013
SAMPLE_0000334.LAB	10/23/2019	10:19:15	0.049	1.02	2.67	150.3	1.014
SAMPLE_0000335.LAB	10/23/2019	10:20:14	0.044	1.03	2.68	150.5	1.013
SAMPLE_0000336.LAB	10/23/2019	10:21:13	0.041	1.04	2.61	150.4	1.016
SAMPLE_0000337.LAB	10/23/2019	10:22:12	0.039	1.04	2.71	150.4	1.014
SAMPLE_0000338.LAB	10/23/2019	10:23:10	0.042	1.04	2.64	150.3	1.013
SAMPLE_0000339.LAB	10/23/2019	10:24:09	0.044	1.03	2.64	150.3	1.013
SAMPLE_0000340.LAB	10/23/2019	10:25:08	0.042	1.02	2.69	150.4	1.011
SAMPLE_0000341.LAB	10/23/2019	10:26:07	0.046	1.02	2.62	150.4	1.012
SAMPLE_0000342.LAB	10/23/2019	10:27:06	0.046	1.02	2.72	150.4	1.012
SAMPLE_0000343.LAB	10/23/2019	10:28:05	0.041	1.02	2.66	150.5	1.013
SAMPLE_0000344.LAB	10/23/2019	10:29:03	0.040	1.03	2.68	150.5	1.014
SAMPLE_0000345.LAB	10/23/2019	10:30:02	0.044	1.04	2.71	150.3	1.015
SAMPLE_0000346.LAB	10/23/2019	10:31:01	0.041	1.04	2.63	150.4	1.013
SAMPLE_0000347.LAB	10/23/2019	10:32:00	0.044	1.04	2.74	150.4	1.013

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000348.LAB	10/23/2019	10:32:59	0.044	1.03	2.66	150.3	1.012
SAMPLE_0000349.LAB	10/23/2019	10:33:57	0.049	1.02	2.69	150.5	1.013
SAMPLE_0000350.LAB	10/23/2019	10:34:56	0.045	1.02	2.70	150.5	1.012
SAMPLE_0000351.LAB	10/23/2019	10:35:55	0.041	1.02	2.66	150.5	1.013
SAMPLE_0000352.LAB	10/23/2019	10:36:54	0.039	1.02	2.74	150.4	1.013
SAMPLE_0000353.LAB	10/23/2019	10:37:53	0.043	1.03	2.64	150.3	1.013
SAMPLE_0000354.LAB	10/23/2019	10:38:52	0.037	1.04	2.69	150.5	1.016
SAMPLE_0000355.LAB	10/23/2019	10:39:50	0.040	1.05	2.67	150.4	1.012
SAMPLE_0000356.LAB	10/23/2019	10:40:49	0.036	1.04	2.64	150.3	1.014
SAMPLE_0000357.LAB	10/23/2019	10:41:48	0.044	1.04	2.73	150.5	1.014
SAMPLE_0000358.LAB	10/23/2019	10:42:47	0.040	1.03	2.64	150.4	1.015
Dry Bed Outlet Test Run 3		**Minimum**	**0.023**	**0.98**	**2.53**		
9:14 - 10:42		**Maximum**	**2.738**	**1.06**	**2.80**		
10/23/2019		**Average**	**0.129**	**1.02**	**2.65**		

Thermal Oxidizer Outlet - Test Run 1

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000147.LAB	10/23/2019	13:58:21	0.114	5.45	0.30	150.3	1.019
SAMPLE_0000148.LAB	10/23/2019	13:59:20	0.144	5.55	0.08	150.5	1.022
SAMPLE_0000149.LAB	10/23/2019	14:00:18	0.139	5.54	0.19	150.5	1.022
SAMPLE_0000150.LAB	10/23/2019	14:01:17	0.132	5.50	0.18	150.4	1.025
SAMPLE_0000151.LAB	10/23/2019	14:02:16	0.111	5.43	0.23	150.3	1.022
SAMPLE_0000152.LAB	10/23/2019	14:03:15	0.141	5.52	0.15	150.5	1.025
SAMPLE_0000153.LAB	10/23/2019	14:04:14	0.182	5.72	0.19	150.5	1.019
SAMPLE_0000154.LAB	10/23/2019	14:05:12	0.149	5.59	0.24	150.5	1.021
SAMPLE_0000155.LAB	10/23/2019	14:06:11	0.105	5.43	0.36	150.5	1.024
SAMPLE_0000156.LAB	10/23/2019	14:07:10	0.121	5.50	0.22	150.5	1.019
SAMPLE_0000157.LAB	10/23/2019	14:08:09	0.143	5.57	0.04	150.7	1.021
SAMPLE_0000158.LAB	10/23/2019	14:09:08	0.186	5.71	0.03	150.7	1.022
SAMPLE_0000159.LAB	10/23/2019	14:10:07	0.223	5.82	0.03	150.8	1.021
SAMPLE_0000160.LAB	10/23/2019	14:11:05	0.294	6.06	0.04	150.9	1.023
SAMPLE_0000161.LAB	10/23/2019	14:12:04	0.436	6.47	0.05	150.8	1.020
SAMPLE_0000162.LAB	10/23/2019	14:13:03	0.512	6.71	0.07	150.5	1.023
SAMPLE_0000163.LAB	10/23/2019	14:14:02	0.568	6.82	0.07	150.5	1.025
SAMPLE_0000164.LAB	10/23/2019	14:15:01	0.541	6.78	0.20	150.5	1.024
SAMPLE_0000165.LAB	10/23/2019	14:16:00	0.492	6.64	0.28	150.7	1.022
SAMPLE_0000166.LAB	10/23/2019	14:16:58	0.425	6.44	0.34	150.5	1.025
SAMPLE_0000167.LAB	10/23/2019	14:17:57	0.428	6.46	0.35	150.5	1.025
SAMPLE_0000168.LAB	10/23/2019	14:18:56	0.359	6.26	0.44	150.5	1.023
SAMPLE_0000169.LAB	10/23/2019	14:19:55	0.202	5.75	0.26	150.5	1.025
SAMPLE_0000170.LAB	10/23/2019	14:20:54	0.201	5.76	0.12	150.5	1.022
SAMPLE_0000171.LAB	10/23/2019	14:21:53	0.279	6.00	0.10	150.5	1.023
SAMPLE_0000172.LAB	10/23/2019	14:22:51	0.340	6.21	0.10	150.5	1.023
SAMPLE_0000173.LAB	10/23/2019	14:23:50	0.401	6.37	0.08	150.7	1.023
SAMPLE_0000174.LAB	10/23/2019	14:24:49	0.400	6.37	0.11	150.9	1.024

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000175.LAB	10/23/2019	14:25:48	0.408	6.41	0.11	150.5	1.021
Thermal Oxidizer Outlet Test Run 1		**Minimum**	**0.105**	**5.43**	**0.03**		
13:58 - 14:25		**Maximum**	**0.568**	**6.82**	**0.44**		
10/23/2019		**Average**	**0.282**	**6.00**	**0.17**		

Thermal Oxidizer Outlet - Test Run 2

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000334.LAB	10/23/2019	16:16:25	-0.028	2.58	0.60	150.7	1.015
SAMPLE_0000335.LAB	10/23/2019	16:17:23	0.010	2.57	0.66	150.7	1.013
SAMPLE_0000336.LAB	10/23/2019	16:18:22	0.012	2.56	0.63	150.7	1.016
SAMPLE_0000337.LAB	10/23/2019	16:19:21	0.003	2.56	0.62	150.5	1.015
SAMPLE_0000338.LAB	10/23/2019	16:20:20	0.004	2.56	0.61	150.5	1.016
SAMPLE_0000339.LAB	10/23/2019	16:21:19	0.002	2.56	0.54	150.4	1.013
SAMPLE_0000340.LAB	10/23/2019	16:22:18	-0.006	2.54	0.62	150.5	1.014
SAMPLE_0000341.LAB	10/23/2019	16:23:16	-0.009	2.52	0.57	150.5	1.015
SAMPLE_0000342.LAB	10/23/2019	16:24:15	-0.013	2.49	0.65	150.5	1.016
SAMPLE_0000343.LAB	10/23/2019	16:25:14	-0.014	2.47	0.58	150.5	1.015
SAMPLE_0000344.LAB	10/23/2019	16:26:13	-0.017	2.44	0.61	150.5	1.019
SAMPLE_0000345.LAB	10/23/2019	16:27:12	-0.018	2.42	0.44	150.5	1.016
SAMPLE_0000346.LAB	10/23/2019	16:28:11	-0.017	2.41	0.14	150.5	1.014
SAMPLE_0000347.LAB	10/23/2019	16:29:09	-0.014	2.38	0.09	150.5	1.017
SAMPLE_0000348.LAB	10/23/2019	16:30:08	-0.019	2.37	0.09	150.5	1.017
SAMPLE_0000349.LAB	10/23/2019	16:31:07	-0.013	2.37	0.17	150.7	1.015
SAMPLE_0000350.LAB	10/23/2019	16:32:06	-0.017	2.36	0.05	150.7	1.019
SAMPLE_0000351.LAB	10/23/2019	16:33:05	-0.020	2.37	0.25	150.5	1.017
SAMPLE_0000352.LAB	10/23/2019	16:34:04	-0.021	2.37	0.32	150.9	1.019
SAMPLE_0000353.LAB	10/23/2019	16:35:02	-0.010	2.39	0.39	150.8	1.019
SAMPLE_0000354.LAB	10/23/2019	16:36:01	-0.011	2.39	0.51	150.7	1.021
SAMPLE_0000355.LAB	10/23/2019	16:37:00	-0.014	2.41	0.57	150.5	1.020
SAMPLE_0000356.LAB	10/23/2019	16:37:59	-0.015	2.40	0.45	150.5	1.021
SAMPLE_0000357.LAB	10/23/2019	16:38:58	-0.014	2.40	0.38	150.7	1.020
SAMPLE_0000358.LAB	10/23/2019	16:39:57	-0.010	2.45	0.46	150.7	1.018
SAMPLE_0000359.LAB	10/23/2019	16:40:55	0.013	3.83	0.35	150.5	1.019
SAMPLE_0000360.LAB	10/23/2019	16:41:54	0.808	7.41	0.39	150.5	1.017
SAMPLE_0000361.LAB	10/23/2019	16:42:53	4.146	12.55	1.08	150.5	1.016
SAMPLE_0000362.LAB	10/23/2019	16:43:52	6.783	15.28	1.55	150.5	1.028
SAMPLE_0000363.LAB	10/23/2019	16:44:51	5.166	13.67	1.17	150.7	1.027
SAMPLE_0000364.LAB	10/23/2019	16:45:50	4.457	12.88	1.06	150.5	1.026
SAMPLE_0000365.LAB	10/23/2019	16:46:48	3.652	11.94	0.92	150.5	1.025
SAMPLE_0000366.LAB	10/23/2019	16:47:47	2.951	11.01	0.71	150.7	1.031
SAMPLE_0000367.LAB	10/23/2019	16:48:46	2.213	9.97	0.64	150.7	1.027
SAMPLE_0000368.LAB	10/23/2019	16:49:45	1.730	9.23	0.64	150.5	1.025
SAMPLE_0000369.LAB	10/23/2019	16:50:44	1.425	8.71	0.65	150.8	1.024
SAMPLE_0000370.LAB	10/23/2019	16:51:43	1.190	8.28	0.67	150.7	1.022
SAMPLE_0000371.LAB	10/23/2019	16:52:41	0.952	7.77	0.63	150.5	1.026
SAMPLE_0000372.LAB	10/23/2019	16:53:40	0.847	7.58	0.59	150.7	1.023
SAMPLE_0000373.LAB	10/23/2019	16:54:39	0.725	7.26	0.61	150.7	1.025
SAMPLE_0000374.LAB	10/23/2019	16:55:38	0.527	6.80	0.49	150.7	1.023
SAMPLE_0000375.LAB	10/23/2019	16:56:37	0.481	6.65	0.40	150.5	1.027
SAMPLE_0000376.LAB	10/23/2019	16:57:36	0.315	6.16	0.42	150.9	1.026
SAMPLE_0000377.LAB	10/23/2019	16:58:34	0.289	6.10	0.44	150.7	1.027
SAMPLE_0000378.LAB	10/23/2019	16:59:33	0.225	5.89	0.37	150.8	1.025
SAMPLE_0000379.LAB	10/23/2019	17:00:32	0.189	5.75	0.45	150.8	1.032
SAMPLE_0000380.LAB	10/23/2019	17:01:31	0.192	5.76	0.35	150.7	1.030
SAMPLE_0000381.LAB	10/23/2019	17:02:30	0.173	5.74	0.37	150.8	1.023
SAMPLE_0000382.LAB	10/23/2019	17:03:29	0.128	5.57	0.30	150.8	1.024
SAMPLE_0000383.LAB	10/23/2019	17:04:27	0.078	5.40	0.27	150.7	1.024
SAMPLE_0000384.LAB	10/23/2019	17:05:26	0.050	5.28	0.36	150.8	1.023
SAMPLE_0000385.LAB	10/23/2019	17:06:25	0.046	5.24	0.37	150.5	1.024
SAMPLE_0000386.LAB	10/23/2019	17:07:24	0.031	5.20	0.40	150.9	1.022
SAMPLE_0000387.LAB	10/23/2019	17:08:23	0.033	5.17	0.44	150.8	1.030
SAMPLE_0000388.LAB	10/23/2019	17:09:22	0.026	5.16	0.55	150.7	1.023
SAMPLE_0000389.LAB	10/23/2019	17:10:20	0.026	5.17	0.47	150.5	1.022

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000390.LAB	10/23/2019	17:11:19	0.056	5.27	0.44	150.7	1.023
SAMPLE_0000391.LAB	10/23/2019	17:12:18	0.076	5.35	0.48	150.5	1.025
SAMPLE_0000392.LAB	10/23/2019	17:13:17	0.080	5.37	0.40	150.5	1.024
SAMPLE_0000393.LAB	10/23/2019	17:14:16	0.086	5.40	0.46	150.7	1.024
SAMPLE_0000394.LAB	10/23/2019	17:15:15	0.085	5.40	0.48	150.7	1.025
SAMPLE_0000395.LAB	10/23/2019	17:16:13	0.104	5.45	0.38	150.8	1.027
Thermal Oxidizer Outlet Test Run 2		**Minimum**	**-0.028**	**2.36**	**0.05**		
16:16 - 17:16		**Maximum**	**6.783**	**15.28**	**1.55**		
10/23/2019		**Average**	**0.647**	**5.35**	**0.51**		

Thermal Oxidizer Outlet - Test Run 3

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000501.LAB	10/23/2019	18:37:16	0.029	5.09	0.45	150.9	1.026
SAMPLE_0000502.LAB	10/23/2019	18:38:15	0.021	5.08	0.45	150.7	1.024
SAMPLE_0000503.LAB	10/23/2019	18:39:14	0.127	5.50	0.34	150.8	1.025
SAMPLE_0000504.LAB	10/23/2019	18:40:13	0.185	5.75	0.29	150.5	1.025
SAMPLE_0000505.LAB	10/23/2019	18:41:12	0.153	5.63	0.41	150.7	1.029
SAMPLE_0000506.LAB	10/23/2019	18:42:11	0.133	5.57	0.43	150.5	1.026
SAMPLE_0000507.LAB	10/23/2019	18:43:09	0.170	5.71	0.10	150.7	1.025
SAMPLE_0000508.LAB	10/23/2019	18:44:08	0.202	5.80	0.07	150.7	1.029
SAMPLE_0000509.LAB	10/23/2019	18:45:07	0.257	6.01	0.03	150.5	1.029
SAMPLE_0000510.LAB	10/23/2019	18:46:06	0.348	6.29	0.04	150.7	1.027
SAMPLE_0000511.LAB	10/23/2019	18:47:05	0.378	6.40	0.04	150.7	1.025
SAMPLE_0000512.LAB	10/23/2019	18:48:04	0.352	6.33	0.03	150.5	1.026
SAMPLE_0000513.LAB	10/23/2019	18:49:02	0.346	6.28	0.03	150.7	1.027
SAMPLE_0000514.LAB	10/23/2019	18:50:01	0.360	6.37	0.02	150.5	1.025
SAMPLE_0000515.LAB	10/23/2019	18:51:00	0.390	6.44	0.03	150.5	1.028
SAMPLE_0000516.LAB	10/23/2019	18:51:59	0.395	6.47	0.04	150.5	1.027
SAMPLE_0000517.LAB	10/23/2019	18:52:58	0.431	6.56	0.03	150.7	1.026
SAMPLE_0000518.LAB	10/23/2019	18:53:57	0.412	6.51	0.03	150.5	1.028
SAMPLE_0000519.LAB	10/23/2019	18:54:55	0.423	6.55	0.03	150.5	1.028
SAMPLE_0000520.LAB	10/23/2019	18:55:54	0.444	6.60	0.04	150.5	1.025
SAMPLE_0000521.LAB	10/23/2019	18:56:53	0.455	6.64	0.03	150.5	1.025
SAMPLE_0000522.LAB	10/23/2019	18:57:52	0.476	6.69	0.02	150.5	1.026
SAMPLE_0000523.LAB	10/23/2019	18:58:51	0.498	6.74	0.02	150.5	1.024
SAMPLE_0000524.LAB	10/23/2019	18:59:50	0.531	6.84	0.04	150.5	1.027
SAMPLE_0000525.LAB	10/23/2019	19:00:48	0.573	6.96	0.04	150.8	1.026
SAMPLE_0000526.LAB	10/23/2019	19:01:47	0.570	6.96	0.02	150.7	1.024
SAMPLE_0000527.LAB	10/23/2019	19:02:46	0.575	6.97	0.04	150.9	1.023
SAMPLE_0000528.LAB	10/23/2019	19:03:45	0.604	7.03	0.04	150.9	1.024
SAMPLE_0000529.LAB	10/23/2019	19:04:44	0.595	7.00	0.04	150.8	1.024
SAMPLE_0000530.LAB	10/23/2019	19:05:43	0.579	6.94	0.04	150.9	1.030
SAMPLE_0000531.LAB	10/23/2019	19:06:41	0.558	6.92	0.03	150.8	1.025
SAMPLE_0000532.LAB	10/23/2019	19:07:40	0.548	6.89	0.03	150.9	1.025
SAMPLE_0000533.LAB	10/23/2019	19:08:39	0.544	6.86	0.04	150.8	1.025
SAMPLE_0000534.LAB	10/23/2019	19:09:38	0.511	6.78	0.02	150.9	1.024
SAMPLE_0000535.LAB	10/23/2019	19:10:37	0.508	6.77	0.03	150.8	1.026
SAMPLE_0000536.LAB	10/23/2019	19:11:36	0.487	6.73	0.03	150.9	1.025
SAMPLE_0000537.LAB	10/23/2019	19:12:35	0.468	6.65	0.03	150.7	1.027
SAMPLE_0000538.LAB	10/23/2019	19:13:33	0.409	6.52	0.02	150.5	1.024
SAMPLE_0000539.LAB	10/23/2019	19:14:32	0.371	6.39	0.02	150.7	1.024
SAMPLE_0000540.LAB	10/23/2019	19:15:31	0.332	6.28	0.00	150.5	1.026
SAMPLE_0000541.LAB	10/23/2019	19:16:30	0.341	6.31	0.02	150.8	1.024
SAMPLE_0000542.LAB	10/23/2019	19:17:29	0.343	6.27	0.00	150.5	1.031
SAMPLE_0000543.LAB	10/23/2019	19:18:28	0.363	6.35	0.02	150.7	1.029
SAMPLE_0000544.LAB	10/23/2019	19:19:26	0.369	6.40	0.02	150.8	1.023
SAMPLE_0000545.LAB	10/23/2019	19:20:25	0.348	6.34	0.02	150.5	1.025
SAMPLE_0000546.LAB	10/23/2019	19:21:24	0.337	6.32	0.01	150.7	1.024
SAMPLE_0000547.LAB	10/23/2019	19:22:23	0.366	6.40	0.01	150.5	1.023
SAMPLE_0000548.LAB	10/23/2019	19:23:22	0.384	6.45	0.01	150.4	1.025
SAMPLE_0000549.LAB	10/23/2019	19:24:21	0.408	6.48	0.01	150.5	1.028
SAMPLE_0000550.LAB	10/23/2019	19:25:19	0.409	6.51	0.01	150.5	1.026
SAMPLE_0000551.LAB	10/23/2019	19:26:18	0.437	6.61	0.02	150.5	1.024

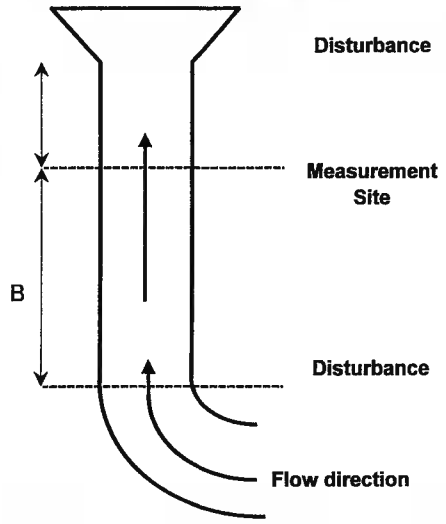
Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
SAMPLE_0000552.LAB	10/23/2019	19:27:17	0.548	6.90	0.02	150.5	1.022
SAMPLE_0000553.LAB	10/23/2019	19:28:16	0.535	6.87	0.03	150.7	1.024
SAMPLE_0000554.LAB	10/23/2019	19:29:15	0.548	6.88	0.02	150.5	1.025
SAMPLE_0000555.LAB	10/23/2019	19:30:14	0.587	7.00	0.03	150.5	1.027
SAMPLE_0000556.LAB	10/23/2019	19:31:12	0.673	7.19	0.03	150.8	1.027
SAMPLE_0000557.LAB	10/23/2019	19:32:11	0.748	7.37	0.05	150.5	1.028
SAMPLE_0000558.LAB	10/23/2019	19:33:10	0.811	7.55	0.06	150.7	1.023
SAMPLE_0000559.LAB	10/23/2019	19:34:09	0.853	7.59	0.05	150.5	1.029
SAMPLE_0000560.LAB	10/23/2019	19:35:08	0.858	7.63	0.06	150.7	1.027
SAMPLE_0000561.LAB	10/23/2019	19:36:07	0.819	7.54	0.05	150.7	1.026
SAMPLE_0000562.LAB	10/23/2019	19:37:05	0.776	7.44	0.06	150.5	1.026
Thermal Oxidizer Outlet Test Run 3		**Minimum**	**0.021**	**5.08**	**0.00**		
18:37 - 19:37		**Maximum**	**0.858**	**7.63**	**0.45**		
10/23/2019		**Average**	**0.445**	**6.56**	**0.07**		

APPENDIX B
DATA SHEETS

EPA METHOD 1

Project No.	92PET-647141	**Date**	10/22/19
Client / Facility	Medline Havell, Mi		
Source / Location	Dry Bed Inlets	**Data taken by**	AW, SE

Duct Measurements	
Type of duct (circular, rectangular, elliptical)	Circular
Far wall to outside of port distance, in.: M1	21.75"
Port length, in. (confirm flush with inside wall): M2	0.0"
Duct inner diameter, in. (M1 - M2)	21.75"
Duct ID using adjacent, 90° port (for elliptical ducts)	—
Upstream distance (A), in.	1'
Downstream distance (B), in.	4'
Number of ports (for circular, must be 90° to each other)	2
Internal width (for rectangular ducts only), in. *	—
Port inner diameter, in.	3"



Duct Parameters	
Material (steel, fiberglass, PVC)	Steel
Type of port (flange, npt nipple, etc.)	Hole
Orientation (vertical, horizontal, if diagonal specify angle)	Vert + horiz
Elevation of ports above ground, ft.	~ 10'

Cyclonic flow expected?	No
Pitot ID	AE2-2-2
Pitot C_P	0.84
Manometer ID	Fluke2
Angle finder / protractor ID	

Traverse point	Outside port distance (in.)	ΔP at 0 Degrees (in. H_2O)	Null angle, α (Degrees)
1-1	0.70"	0.0	NA
2	2.28"	0.0	
3	4.22"	0.0	
4	7.03"	0.0	
5	14.72"	0.0	
6	17.53"	0.0	
7	19.47"	0.0	
8	21.05"	0.0	
2-1		0.0	
2		0.0	
3		0.0	
4		0.0	
5		0.0	
6		0.0	
7		0.0	
8		0.0	
Average of absolute α			0.0

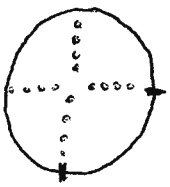
Diagram of duct and sampling location

Equivalent Duct Diameters for Rectangular Ducts

$$D_E = \frac{2(l \times w)}{(l + w)}$$

where:
- D_E = Equivalent duct diameter
- l = Inside duct length
- w = Inside duct width (height)

Cross-section sketch with port locations and numbering
Label the port number 1, 2, etc.
north direction or other landmark
flow direction - ⊗ into page ⊙ out of page



*If schematics are unavailable, internal width can be estimated by measuring the portion of the port length not visible on the outside of the duct, which would be an estimate of the insulation thickness. Double this distance and subtract it from the outside width.

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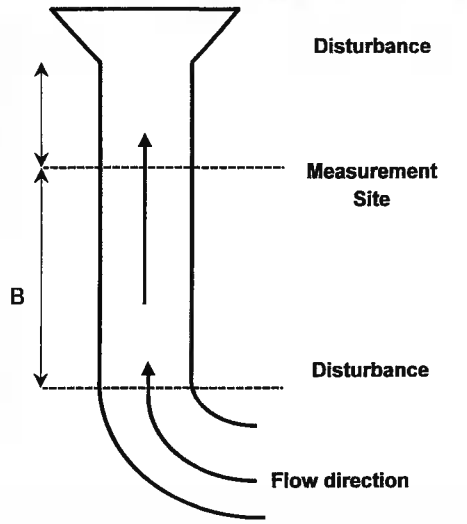
EPA METHOD 1

Project No.	928ET-647141	**Date**	10/22/19
Client / Facility	Medline Howell, Mi.		
Source / Location	Dry Bed	**Data taken by**	AW, SE

Duct Measurements	
Type of duct (circular, rectangular, elliptical)	Rectangle
Far wall to outside of port distance, in.: M1	16 1/8"
Port length, in. (confirm flush with inside wall): M2	0
Duct inner diameter, in. (M1 - M2)	16 1/8"
Duct ID using adjacent, 90° port (for elliptical ducts)	—
Upstream distance (A), in.	3 feet
Downstream distance (B), in.	4 feet
Number of ports (for circular, must be 90° to each other)	3
Internal width (for rectangular ducts only), in. *	14 1/4"
Port inner diameter, in.	16 1/8" x 14 1/4"



Duct Parameters	
Material (steel, fiberglass, PVC)	Steel
Type of port (flange, npt nipple, etc.)	Hole
Orientation (vertical, horizontal, if diagonal specify angle)	horizontal
Elevation of ports above ground, ft.	25'

Cyclonic flow expected?	
Pitot ID	AE2-2-2
Pitot C_P	0.84
Manometer ID	Fluke 2
Angle finder / protractor ID	

Traverse point	Outside port distance (in.)	ΔP at 0 Degrees (in. H_2O)	Null angle, α (Degrees)
1-1	1.35"	0.00	—
2	4.05"	0.00	—
3	6.75"	0.01	12.8
4	9.45"	0.00	—
5	12.15"	0.00	—
6	14.85"	-0.01	8.3
2-1		0.00	—
2		0.00	—
3		0.00	—
4		0.00	—
5		0.01	10.1
6		0.00	—
3-1		0.01	7.2
2		0.00	—
3		0.00	—
4		0.00	—
5		0.00	—
6		0.00	—
Average of absolute α			2.1°

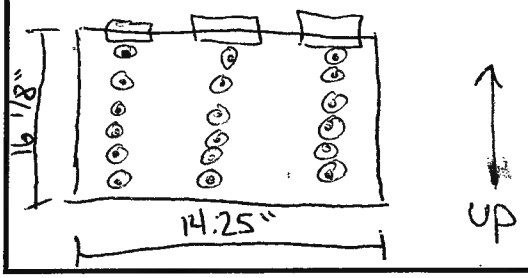
Diagram of duct and sampling location

Equivalent Duct Diameters for Rectangular Ducts

$$D_E = \frac{2(l \times w)}{(l + w)}$$

where:
- D_E = Equivalent duct diameter
- l = Inside duct length
- w = Inside duct width (height)

Cross-section sketch with port locations and numbering
Label the port number 1, 2, etc.
north direction or other landmark
flow direction - ⊗ into page ⊙ out of page



*If schematics are unavailable, internal width can be estimated by measuring the portion of the port length not visible on the outside of the duct, which would be an estimate of the insulation thickness. Double this distance and subtract it from the outside width.

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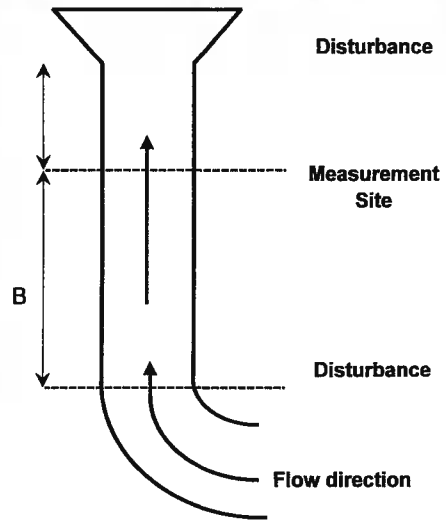
EPA METHOD 1

Project No.	928E T-647141	**Date**	10/22/19
Client / Facility	Medline Howell, Mi.		
Source / Location	T.O. outlet	**Data taken by**	AW, SE

Duct Measurements	
Type of duct (circular, rectangular, elliptical)	Circle
Far wall to outside of port distance, in.: M1	53"
Port length, in. (confirm flush with inside wall): M2	9"
Duct inner diameter, in. (M1 - M2)	44"
Duct ID using adjacent, 90° port (for elliptical ducts)	
Upstream distance (A), in.	>22"
Downstream distance (B), in.	>88"
Number of ports (for circular, must be 90° to each other)	2
Internal width (for rectangular ducts only), in. *	
Port inner diameter, in.	4"

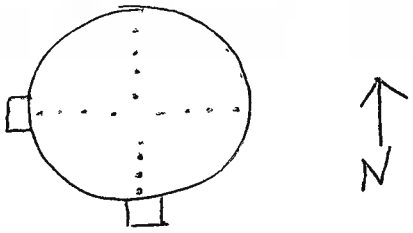


Duct Parameters	
Material (steel, fiberglass, PVC)	Steel
Type of port (flange, npt nipple, etc.)	Nipple
Orientation (vertical, horizontal, if diagonal specify angle)	Verticle
Elevation of ports above ground, ft.	~30ft

Cyclonic flow expected?	No
Pitot ID	AE2-2
Pitot C_P	0.84
Manometer ID	Fluke 2
Angle finder / protractor ID	

Traverse point	Outside port distance (in.)	ΔP at 0 Degrees (in. H_2O)	Null angle, α (Degrees)
1	10.42	0.00	NA
2	13.61	0.00	NA
3	17.53	0.00	NA
4	23.22	0.00	NA
5	38.78	0.00	NA
6	44.47	0.00	NA
7	48.39	0.00	NA
8	51.58	0.00	NA
1		0.00	NA
2		0.00	NA
3		0.00	NA
4		0.00	NA
5		0.00	NA
6		0.00	NA
7		0.00	NA
8		0.00	NA
Average of absolute α			0.00

Diagram of duct and sampling location



Equivalent Duct Diameters for Rectangular Ducts

$$D_E = \frac{2(l \times w)}{(l + w)}$$

where:
- D_E = Equivalent duct diameter
- l = Inside duct length
- w = Inside duct width (height)

Cross-section sketch with port locations and numbering
Label the port number 1, 2, etc.
north direction or other landmark
flow direction - ⊗ into page ⊙ out of page

*If schematics are unavailable, internal width can be estimated by measuring the portion of the port length not visible on the outside of the duct, which would be an estimate of the insulation thickness. Double this distance and subtract it from the outside width.

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EPA Method 2 Datasheet

Project Code	928ET-647141	Operator(s):	SE, AW
Client:	Medline	Date:	10/23/19
Facility:	Howell, Mi	Barometric Pressure ("Hg):	28.69
Source:	DB. Inlet (Backvent)	Meterbox ID:	NA, Fluke 2
O_2 (%):	20.9	Pitot ID:	AE 2-2-2
CO_2 (%):	0.0	Pitot Coefficient:	0.84

Run #		1
Start Time		6:44
Stop Time		6:54
Static Pressure ("H_2O):		-.76
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	67	0.087
2	67	0.082
3	67	0.074
4	67	0.074
5	67	0.061
6	67	0.058
7	67	0.096
8	67	0.089
2-1	67	0.064
2	67	0.071
3	67	0.074
4	67	0.075
5	67	0.067
6	67	0.061
7	67	0.051
8	67	0.050
Total	Average (0.0)	Avg √Δp (0.0000)

Run #		2
Start Time		7:54
Stop Time		8:05
Static Pressure ("H_2O):		-0.80
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	68	0.078
2	68	0.072
3	68	0.074
4	68	0.077
5	67	0.068
6	68	0.067
7	67	0.063
8	67	0.061
2-1	68	0.079
2	68	0.073
3	68	0.071
4	68	0.070
5	68	0.074
6	68	0.073
7	68	0.071
8	68	0.071
Total	Average (0.0)	Avg √Δp (0.0000)

Run #		3
Start Time		9:23
Stop Time		9:31
Static Pressure ("H_2O):		-0.85
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	65	0.050
2	65	0.048
3	66	0.048
4	66	0.046
5	66	0.045
6	66	0.056
7	66	0.070
8	66	0.088
2-1	69	0.054
2	68	0.052
3	68	0.052
4	68	0.049
5	69	0.047
6	69	0.045
7	69	0.042
8	69	0.040
Total	Average (0.0)	Avg √Δp (0.0000)

EPA Method 2 Datasheet

Project Code	928ET-647141	**Operator(s):**	SE, AW
Client:	Medline	**Date:**	10/23/19
Facility:	Howell, Mi	**Barometric Pressure ("Hg):**	28.69
Source:	DB Inlet (Aeration Room)	**Meterbox ID:**	NA Fluke 2
O_2 (%):	20.9%	**Pitot ID:**	AE 2-2-2
CO_2 (%):	0.0%	**Pitot Coefficient:**	0.84

Run #	1
Start Time	6:30
Stop Time	6:40
Static Pressure ("H_2O):	-0.89
Post Test Leak Check:	✓

Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	84	0.154
2	84	0.281
3	84	0.279
4	84	0.257
5	84	0.229
6	84	0.221
7	84	0.174
8	84	0.168
2-1	84	0.179
2	84	0.178
3	84	0.251
4	84	0.254
5	84	0.267
6	84	0.260
7	84	0.340
8	84	0.343
Total	Average (0.0)	Avg √Δp (0.0000)

Run #	2
Start Time	8:07
Stop Time	8:16
Static Pressure ("H_2O):	-0.88
Post Test Leak Check:	✓

Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	94	0.111
2	94	0.280
3	96	0.264
4	96	0.249
5	95	0.233
6	95	0.238
7	95	0.221
8	95	0.168
2-1	95	0.184
2	95	0.196
3	95	0.233
4	95	0.272
5	95	0.273
6	95	0.324
7	95	0.327
8	95	0.186
Total	Average (0.0)	Avg √Δp (0.0000)

Run #	3
Start Time	9:35
Stop Time	9:45
Static Pressure ("H_2O):	-0.92
Post Test Leak Check:	✓

Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	93	0.139
2	94	0.278
3	94	0.283
4	94	0.247
5	94	0.259
6	94	0.233
7	94	0.198
8	94	0.204
2-1	94	0.156
2	94	0.178
3	94	0.195
4	94	0.210
5	94	0.250
6	94	0.269
7	94	0.282
8	94	0.281
Total	Average (0.0)	Avg √Δp (0.0000)

Reviewed: FPM_____CPM_____

EPA Method 2 Datasheet

Project Code	928ET-647141	Operator(s):	AW, SE
Client:	Medline	Date:	10/23/19
Facility:	Howell, MI	Barometric Pressure ("Hg):	28.69"
Source:	Dry Bed Outlet	Meterbox ID:	NA, Fluke-2
O_2 (%):	20.9%	Pitot ID:	AE2-2-2
CO_2 (%):	0.0%	Pitot Coefficient:	0.84

Run #		1
Start Time		7:09
Stop Time		7:26
Static Pressure ("H_2O):		+3.6
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	93	1.340
2	93	1.464
3	93	1.395
4	93	1.371
5	93	1.425
6	93	1.382
2-1	93	0.973
2	93	1.161
3	93	1.208
4	93	1.183
5	93	1.209
6	93	1.262
3-1	93	1.631
2	93	1.687
3	93	1.768
4	93	1.647
5	93	1.621
6	93	1.280
Total	Average (0.0)	Avg √Δp (0.0000)

Run #		2
Start Time		8:40
Stop Time		8:51
Static Pressure ("H_2O):		+3.4
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	101	1.664
2	101	1.752
3	101	1.623
4	101	1.548
5	101	1.544
6	100	1.328
2-1	100	1.504
2	100	1.389
3	101	1.350
4	101	1.300
5	101	1.257
6	100	1.283
3-1	100	1.067
2	100	1.353
3	100	1.381
4	100	1.418
5	100	1.442
6	100	1.337
Total	Average (0.0)	Avg √Δp (0.0000)

Run #		3
Start Time		10:04
Stop Time		10:14
Static Pressure ("H_2O):		+3.4
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	96	1.553
2	96	1.728
3	96	1.654
4	96	1.557
5	96	1.579
6	96	1.595
2-1	95	1.315
2	95	1.363
3	95	1.348
4	95	1.303
5	95	1.280
6	95	1.268
3-1	94	1.250
2	94	1.320
3	94	1.354
4	95	1.333
5	95	1.242
6	95	1.255
Total	Average (0.0)	Avg √Δp (0.0000)

AW MONROE

Reviewed: FPM_____CPM_____

EPA Method 2 Datasheet

Project Code	928ET-647141	Operator(s):	SE, AW
Client:	Medline	Date:	10/23/19
Facility:	Howell, Mi.	Barometric Pressure ("Hg):	28.69"
Source:	TO Outlet	Meterbox ID:	NA, Fluke-2
O_2 (%):	20.9%	Pitot ID:	~~Fluke~~ AE 2-2-2
CO_2 (%):	0.0%	Pitot Coefficient:	0.84

Run #		1
Start Time		14:09
Stop Time		14:35
Static Pressure ("H_2O):		-0.05
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	1298	0.014
2	1297	0.014
3	1298	0.013
4	1301	0.013
5	1304	0.012
6	1304	0.012
7	1303	0.010
8	1303	0.010
2-1	1388	0.010
2	1389	0.011
3	1394	0.012
4	1400	0.012
5	1407	0.013
6	1391	0.012
7	1321	0.010
8	1208	0.006
Total	Average (0.0)	Avg √Δp (0.0000)

Run #		2
Start Time		16:28
Stop Time		16:40
Static Pressure ("H_2O):		-0.08
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	1390	0.015
2	1387	0.015
3	1394	0.016
4	1399	0.017
5	1401	0.016
6	1411	0.013
7	1404	0.014
8	1303	0.015
2-1	1395	0.016
2	1396	0.015
3	1394	0.014
4	1394	0.015
5	1386	0.013
6	1381	0.012
7	1378	0.010
8	1378	0.008
Total	Average (0.0)	Avg √Δp (0.0000)

Run #		3
Start Time		18:46
Stop Time		18:54
Static Pressure ("H_2O):		-0.07
Post Test Leak Check:		✓
Traverse Point	Stack Temp (°F)	Velocity Δp ("H_2O)
1-1	1387	0.020
2	1389	0.020
3	1405	0.021
4	1408	0.020
5	1409	0.020
6	1373	0.018
7	1372	0.018
8	1345	0.017
2-1	1386	0.020
2	1388	0.018
3	1387	0.019
4	1389	0.020
5	1394	0.020
6	1397	0.021
7	1398	0.021
8	1366	0.020
Total	Average (0.0)	Avg √Δp (0.0000)

MONTROSE

Reviewed: FPM_____CPM_____

APPENDIX C
CALCULATIONS

Appendix C.1
General Emission Calculations

Sample Calculations for Run 1, TO Stack

Area of Sample Location (Round Duct)

$$A_s = \pi \times \left(\frac{d_s}{2 \times 12} \right)^2$$

$$A_s = \pi \times \left(\frac{44.0}{2 \times 12} \right)^2$$

$$A_s = 10.6\, ft^2$$

where:

A_s	= area of sample location (ft^2)
d_s	= diameter of sample location (in)
12	= conversion factor (in/ft)
2	= conversion factor (radius/diameter)

Stack Pressure Absolute

$$P_a = P_b + \frac{P_s}{13.6}$$

$$P_a = 28.69 + \frac{-0.1}{13.6}$$

$$P_a = 28.69 in.Hg$$

where:

P_a	= stack pressure absolute (in. Hg)
P_b	= barometric pressure (in. Hg)
P_s	= static pressure (in. H_2O)
13.6	= conversion factor (in. H_2O/in Hg)

Molecular Weight of Dry Gas Stream[2]

$$M_d = \left(44 \times \frac{\%CO_2}{100}\right) + \left(32 \times \frac{\%O_2}{100}\right) + \left(28 \times \frac{(\%CO + \%N_2)}{100}\right)$$

$$M_d = \left(44 \times \frac{0.0}{100}\right) + \left(32 \times \frac{20.9}{100}\right) + \left(28 \times \frac{(79.1)}{100}\right)$$

$$M_d = 28.84 lb / lb - mole$$

where:

M_d	= molecular weight of the dry gas stream (lb/lb-mole)
$\%CO_2$	= carbon dioxide content of the dry gas stream (%)
44	= molecular weight of carbon dioxide (lb/lb-mole)
$\%O_2$	= oxygen content of the dry gas stream (%)
32	= molecular weight of oxygen (lb/lb-mole)
%CO	= carbon monoxide content of the dry gas stream (%)
$\%N_2$	= nitrogen content of the dry gas stream (%)
28	= molecular weight of nitrogen (lb/lb-mole)
100	= conversion factor

[2] The remainder of the gas stream after subtracting carbon dioxide and oxygen is assumed to be nitrogen.

Molecular Weight of Wet Gas Stream

$$M_s = \left(M_d \times \left(1 - \frac{B_{wo}}{100} \right) \right) + \left(18 \times \frac{B_{wo}}{100} \right)$$

$$M_s = \left(28.84 \times \left(1 - \frac{5.35}{100} \right) \right) + \left(18 \times \frac{5.35}{100} \right)$$

$$M_s = 28.26 lb / lb - mole$$

where:

M_s	= molecular weight of the wet gas stream (lb/lb-mole)
M_d	= molecular weight of the dry gas stream (lb/lb-mole)
B_{wo}	= moisture content of the gas stream (%)
18	= molecular weight of water (lb/lb-mole)
100	= conversion factor

Velocity of Gas Stream

$$V_s = 85.49 \left(C_p \right) \left(\sqrt{\overline{\Delta P}} \right) \sqrt{\frac{\left(T_s + 460 \right)}{\left(M_s \right) \left(P_b + \frac{P_s}{13.6} \right)}}$$

$$V_s = 85.49 \left(0.84 \right) \left(0.118 \right) \sqrt{\frac{\left(1387 + 460 \right)}{\left(28.26 \right) \left(28.69 + \frac{-0.1}{13.6} \right)}}$$

$$V_s = 12.8 \, ft / s$$

where:

V_s	= average velocity of the gas stream (ft/sec)
C_p	= pitot tube coefficient (dimensionless)
$\sqrt{\Delta P}$	= average square root of velocity pressures (in. H_2O)$^{1/2}$
T_s	= average stack temperature (^oF)
M_s	= molecular weight of the wet gas stream (lb/lb-mole)
P_b	= barometric pressure (in. Hg)
P_s	= static pressure of gas stream (in. H_2O)
85.49	= pitot tube constant (ft/sec)([(lb/lbmole)(in. Hg)]/[(^oR)(in. H_2O)]) $^{1/2}$
460	= conversion (^oF to ^oR)
13.6	= conversion factor (in. H_2O/in Hg)

Volumetric Flow of Gas Stream - Actual Conditions

$$Q_a = 60(V_s)(A_s)$$
$$Q_a = 60(12.8)(10.6)$$
$$Q_a = 8,095 acfm$$

where:

Q_a	= volumetric flow rate of the gas stream at actual conditions (acfm)
V_s	= average velocity of the gas stream (ft/sec)
A_s	= area of duct or stack (ft^2)
60	= conversion factor (sec/min)

Volumetric Flow of Gas Stream - Standard Conditions

$$Q_{std} = \frac{17.64(Q_a)\left(P_b + \frac{P_s}{13.6}\right)}{(T_s + 460)}$$
$$Q_{std} = \frac{17.64(8,095)\left(28.69 + \frac{-0.1}{13.6}\right)}{(1387 + 460)}$$
$$Q_{std} = 2,218 scfm$$

where:

Q_{std}	= volumetric flow rate of the gas stream at standard conditions (scfm)
Q_a	= volumetric flow rate of the gas stream at actual conditions (acfm)
T_s	= average stack temperature (^oF)
P_b	= barometric pressure (in. Hg)
P_s	= static pressure of gas stream (in. H_2O)
13.6	= conversion factor (in. H_2O/in Hg)
17.64	= ratio of standard temperature over standard pressure (^oR/in.Hg)
460	= conversion (^oF to ^oR)

Volumetric Flow of Gas Stream - Standard Conditions - Dry Basis

$$Q_{dstd} = Q_{std}\left(1-\frac{B_{wo}}{100}\right)$$

$$Q_{dstd} = 2,218\left(1-\frac{5.35}{100}\right)$$

$$Q_{dstd} = 2,100 dscfm$$

where:

Q_{dstd}	= volumetric flow rate of the gas stream at standard conditions, on a dry basis (dscfm)
Q_{std}	= volumetric flow rate of the gas stream at standard conditions (scfm)
B_{wo}	= moisture content of the gas stream (%)
100	= conversion factor

EtO Emission Rate (lb/hr)

$$E_{lb/hr} = \frac{(C_d)(MW)(Q_{std})(60)}{385.3\times10^6}$$

$$E_{lb/hr} = \frac{(0.647)(44.05)(2,218)(60)}{385.3\times10^6}$$

$$E_{lb/hr} = 0.00985 lb/hr$$

where:

$E_{lb/hr}$	= EtO emission rate (lb/hr)
C_d	= EtO concentration (ppmwv)
MW	= molecular weight of pollutant (lb/lbmole)
Q_{std}	= volumetric flow rate of the gas stream at standard conditions (scfm)
60	= conversion factor (min/hr)
385.3	= volume occupied by one pound of gas at standard conditions (scf/lbmole)
10^6	= conversion factor (fraction to ppm)

Appendix C.2
Gaseous Emissions Spreadsheets

Medline Industries **EPA Method 1-4 Parameters** **Project No. 928ET-647141**
Dry Bed **Back Vent**

Parameters	Run 1	Run 2	Run 3
Date	10/23/2019	10/23/2019	10/23/2019
Start Time	6:44	7:54	9:23
Stop Time	6:54	8:05	9:31
Dimensions of Sample Location, D_s (in)	21.7	21.7	21.7
Velocity Pressure, $\Delta P^{1/2}$ avg (in. $H_2O^{1/2}$)	0.265	0.267	0.227
Barometric Pressure, P_b (Inches Hg)	28.69	28.69	28.69
Static Pressure, P_s (Inches H_2O)	-0.8	-0.8	-0.8
Pitot Coefficient, C_p	0.84	0.84	0.84
Sample Location Temperature, T_s (^oF)	66.5	67.8	67.0
Carbon Dioxide (% dry)	0.0	0.0	0.0
Oxygen (% dry)	20.9	20.9	20.9
RESULTS			
Area of Sample Location, A_s (ft^2)	2.57	2.57	2.57
Stack Pressure Absolute (inches Hg)	28.63	28.63	28.63
Percent Moisture, B_{ws} (%)	1.00	1.00	1.00
Moisture Saturation Point, B_{wsat} (%)	2.26	2.37	2.31
Dry Molecular Weight, M_d (lbs/lb mole)	28.84	28.84	28.84
Wet Molecular Weight, M_s (lbs/lb mole)	28.73	28.73	28.73
Gas Velocity, V_s (ft/sec)	15.2	15.4	13.0
Average Flowrate, Q_a (acfm)	2,345	2,365	2,008
Standard Flowrate, Q_{std} (scfm)	2,250	2,263	1,924
Dry Standard Flowrate, Q_{dstd} (dscfm)	2,228	2,241	1,906

Parameters	Run 1	Run 2	Run 3
Date	10/23/2019	10/23/2019	10/23/2019
Start Time	6:22	7:51	9:14
Stop Time	7:43	9:06	10:42
Dimensions of Sample Location, D_s (in)	21.7	21.7	21.7
Velocity Pressure, $\Delta P^{1/2}$ avg (in. $H_2O^{1/2}$)	0.486	0.481	0.476
Barometric Pressure, P_b (Inches Hg)	28.69	28.69	28.69
Static Pressure, P_s (Inches H_2O)	-0.9	-0.9	-0.5
Pitot Coefficient, C_p	0.84	0.84	0.84
Sample Location Temperature, T_s (^oF)	84.0	95.2	94.0
Carbon Dioxide (% dry)	0.0	0.0	0.0
Oxygen (% dry)	20.9	20.9	20.9
Run Time, θ (minutes)	60.0	60.0	60.0
RESULTS			
Area of Sample Location, A_s (ft^2)	2.57	2.57	2.57
Stack Pressure Absolute (inches Hg)	28.62	28.63	28.65
Percent Moisture, B_{ws} (%)	1.2	1.2	1.2
Dry Molecular Weight, M_d (lbs/lb mole)	28.84	28.84	28.84
Wet Molecular Weight, M_s (lbs/lb mole)	28.71	28.71	28.71
Gas Velocity, V_s (ft/sec)	28.4	28.4	28.0
Average Flowrate, Q_a (acfm)	6,720	6,736	6,326
Standard Flowrate, Q_{std} (scfm)	6,237	6,127	5,772
Dry Standard Flowrate, Q_{dstd} (dscfm)	6,165	6,055	5,705
EtO Concentration (ppmw)	7.90	14.1	18.2
EtO Emission Rate (lb/hr)	0.338	0.593	0.721

Parameters	Run 1	Run 2	Run 3
Date	10/23/2019	10/23/2019	10/23/2019
Start Time	6:22	7:51	9:14
Stop Time	7:43	9:06	10:42
Dimensions of Sample Location, D_s (in)	Rectangular	Rectangular	Rectangular
Velocity Pressure, $\Delta P^{1/2}$ avg (in. $H_2O^{1/2}$)	1.175	1.189	1.184
Barometric Pressure, P_b (Inches Hg)	28.69	28.69	28.69
Static Pressure, P_s (Inches H_2O)	3.6	3.4	2.0
Pitot Coefficient, C_p	0.84	0.84	0.84
Sample Location Temperature, T_s (^oF)	92.7	100	94.8
Carbon Dioxide (% dry)	0.0	0.0	0.0
Oxygen (% dry)	20.9	20.9	20.9
Run Time, θ (minutes)	60	60	60
RESULTS			
Area of Sample Location, A_s (ft^2)	1.6	1.6	1.6
Stack Pressure Absolute (inches Hg)	28.95	28.94	28.84
Percent Moisture, B_{ws} (%)	1.04	1.03	1.02
Dry Molecular Weight, M_d (lbs/lb mole)	28.84	28.84	28.84
Wet Molecular Weight, M_s (lbs/lb mole)	28.72	28.72	28.73
Gas Velocity, V_s (ft/sec)	68.8	70.1	69.6
Average Flowrate, Q_a (acfm)	6,588	6,713	6,661
Standard Flowrate, Q_{std} (scfm)	6,088	6,116	6,107
Dry Standard Flowrate, Q_{dstd} (dscfm)	6,027	6,055	6,047
EtO Concentration (ppmw)	0.035	0.081	0.129
EtO Emission Rate (lb/hr)	0.00146	0.00340	0.00541

Parameters	Run 1	Run 2	Run 3
Date	10/23/2019	10/23/2019	10/23/2019
Start Time	13:58	16:16	18:37
Stop Time	14:26	17:16	19:37
Run Time, θ (minutes)	60.0	60.0	60.0
RESULTS			
Standard Flowrate, Q_{std} (scfm)	2,043	2,218	2,636
Dry Standard Flowrate, Q_{dstd} (dscfm)	1,921	2,100	2,465
EtO Concentration (ppmw)	118,274	88,661	112,866
EtO Emission Rate (lb/hr)	1,657	1,349	2,041

Parameters	**Run 1**	**Run 2**	**Run 3**
Date	10/23/2019	10/23/2019	10/23/2019
Start Time	13:58	16:16	18:37
Stop Time	14:26	17:16	19:37
Dimensions of Sample Location, D_s (in)	44.0	44.0	44.0
Velocity Pressure, $\Delta P^{1/2}$ avg (in. $H_2O^{1/2}$)	0.107	0.118	0.140
Barometric Pressure, P_b (Inches Hg)	28.69	28.69	28.69
Static Pressure, P_s (Inches H_2O)	-0.1	-0.1	-0.1
Pitot Coefficient, C_p	0.84	0.84	0.84
Sample Location Temperature, T_s (^oF)	1,332	1,387	1,387
Gas Meter Correction Factor, Y_d	NA	NA	NA
Carbon Dioxide (% dry)	0.0	0.0	0.0
Oxygen (% dry)	20.9	20.9	20.9
Run Time, θ (minutes)	60	60	60
RESULTS			
Area of Sample Location, A_s (ft^2)	10.6	10.6	10.6
Stack Pressure Absolute (inches Hg)	28.69	28.68	28.68
Percent Moisture, B_{ws} (%)	6.00	5.35	6.56
Moisture Saturation Point, B_{wsat} (%)	100	100	100
Dry Molecular Weight, M_d (lbs/lb mole)	28.84	28.84	28.84
Gas Velocity, V_s (ft/sec)	11.4	12.8	15.2
Average Flowrate, Q_a (acfm)	7,233	8,095	9,624
Standard Flowrate, Q_{std} (scfm)	2,043	2,218	2,636
Dry Standard Flowrate, Q_{dstd} (dscfm)	1,921	2,100	2,465
EtO Concentration (ppmw)	0.282	0.647	0.445
EtO Emission Rate (lb/hr)	0.00396	0.00985	0.00806

APPENDIX D
QUALITY ASSURANCE AND QUALITY CONTROL

Appendix D.1
ASTM D-7036 Accreditation

STAC STACK TESTING ACCREDITATION COUNCIL

A2LA American Association for Laboratory Accreditation

Accredited Air Emission Testing Body

A2LA has accredited

MONTROSE AIR QUALITY SERVICES

In recognition of the successful completion of the joint A2LA and Stack Testing Accreditation Council (STAC) evaluation process, this laboratory is accredited to perform testing activities in compliance with ASTM D7036:2004 - Standard Practice for Competence of Air Emission Testing Bodies.

Presented this 5th day of March 2018.

President and CEO
For the Accreditation Council
Certificate Number 3925.01
Valid to February 29, 2020

This accreditation program is not included under the A2LA ILAC Mutual Recognition Arrangement.

Appendix D.2
Analyzer Calibration Data

Zero Gas (Nitogen) Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
N2_DIR_2004BKG.LAB	10/22/2019	9:03:35	0.0	0.0	0.00	0.0	0.0	0.00	149.7	0.957
N2_DIR_2005.LAB	10/22/2019	9:03:53	0.0	-0.2	0.00	0.0	0.0	0.00	149.7	0.958
N2_DIR_2006.LAB	10/22/2019	9:04:02	0.1	-0.1	0.00	0.0	0.0	0.00	149.7	0.957
N2_DIR_2007.LAB	10/22/2019	9:04:12	0.0	0.1	0.00	-0.1	0.0	0.00	149.6	0.958
N2_DIR_2008.LAB	10/22/2019	9:04:22	0.0	0.0	-0.01	0.0	0.0	0.00	149.7	0.957
N2_DIR_2009.LAB	10/22/2019	9:04:32	0.0	-0.1	0.01	0.0	0.0	0.00	149.6	0.958
N2_DIR_2010.LAB	10/22/2019	9:04:42	0.0	-0.1	-0.01	0.0	0.0	0.00	149.7	0.958
N2_DIR_2011.LAB	10/22/2019	9:04:51	0.0	-0.1	0.01	0.0	0.0	0.00	149.6	0.958
N2_DIR_2012.LAB	10/22/2019	9:05:01	-0.1	0.0	0.00	0.0	0.0	0.00	149.7	0.957

CTS, 99.95 ppm Ethylene Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Ethylene Recovery (%)
CTS_DIR_2023.LAB	10/22/2019	9:13:19	-0.1	0.0	0.01	101.2	0.0	-0.03	149.6	0.994	101.3%
CTS_DIR_2024.LAB	10/22/2019	9:13:28	-0.2	-0.1	0.02	101.3	0.0	-0.03	149.5	0.994	101.4%
CTS_DIR_2025.LAB	10/22/2019	9:13:38	-0.2	-0.1	0.01	101.2	0.0	-0.03	149.6	0.994	101.2%
CTS_DIR_2026.LAB	10/22/2019	9:13:48	-0.1	0.0	0.02	101.0	0.0	-0.03	149.6	0.995	101.1%
CTS_DIR_2027.LAB	10/22/2019	9:13:58	-0.2	0.0	0.02	101.1	0.0	-0.03	149.6	0.994	101.1%
CTS_DIR_2028.LAB	10/22/2019	9:14:07	-0.1	0.0	0.01	101.0	0.0	-0.03	149.6	0.995	101.0%
CTS_DIR_2029.LAB	10/22/2019	9:14:17	-0.1	0.2	0.02	101.0	0.0	-0.03	149.5	0.994	101.0%
CTS_DIR_2030.LAB	10/22/2019	9:14:27	-0.1	0.1	0.02	100.9	0.0	-0.03	149.5	0.995	100.9%
		Average				**101.1**					

CTS, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Ethylene Recovery (%)
CTS_SYS_2052.LAB	10/22/2019	9:19:35	-0.2	-0.1	0.02	101.5	0.0	-0.03	149.3	1.019	100.4%
CTS_SYS_2053.LAB	10/22/2019	9:19:45	-0.1	0.0	0.01	101.2	0.0	-0.03	149.2	1.018	100.2%
CTS_SYS_2054.LAB	10/22/2019	9:19:55	-0.1	0.2	0.01	101.0	0.0	-0.03	149.3	1.018	99.9%
CTS_SYS_2055.LAB	10/22/2019	9:20:04	-0.1	0.1	0.02	101.0	0.0	-0.03	149.3	1.018	99.9%
CTS_SYS_2056.LAB	10/22/2019	9:20:14	-0.2	0.0	0.02	101.0	0.0	-0.03	149.3	1.018	99.9%
CTS_SYS_2057.LAB	10/22/2019	9:20:24	-0.1	0.0	0.02	101.0	0.0	-0.03	149.4	1.018	99.9%
CTS_SYS_2058.LAB	10/22/2019	9:20:34	-0.2	0.1	0.01	101.3	0.0	-0.03	149.4	1.018	100.2%
CTS_SYS_2059.LAB	10/22/2019	9:20:44	-0.1	0.1	0.01	101.1	0.0	-0.03	149.4	1.018	100.0%

4.984 ppm Ethylene Oxide / 5.031 ppm SF6 Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	EtO Recovery (%)
ETO_DIR_2087.LAB	10/22/2019	9:26:05	4.6	-0.2	0.01	7.6	0.0	5.36	149.4	1.003	92.7%
ETO_DIR_2088.LAB	10/22/2019	9:26:15	4.7	-0.1	0.01	7.6	0.0	5.35	149.4	1.003	94.2%
ETO_DIR_2089.LAB	10/22/2019	9:26:24	4.7	-0.2	0.01	7.4	0.0	5.35	149.4	1.002	95.2%
ETO_DIR_2090.LAB	10/22/2019	9:26:34	4.8	0.0	-0.01	7.5	0.0	5.35	149.4	1.002	95.9%
ETO_DIR_2091.LAB	10/22/2019	9:26:44	4.9	-0.1	0.01	7.5	0.0	5.35	149.4	1.002	97.3%
ETO_DIR_2092.LAB	10/22/2019	9:26:54	4.8	-0.1	0.01	7.5	0.0	5.35	149.4	1.002	97.1%
ETO_DIR_2093.LAB	10/22/2019	9:27:04	4.8	0.0	0.01	7.4	0.0	5.35	149.4	1.002	95.9%
ETO_DIR_2094.LAB	10/22/2019	9:27:14	4.9	0.0	0.00	7.4	0.0	5.36	149.4	1.002	98.4%
		Average	**4.8**					**5.35**			

4.984 ppm Ethylene Oxide / 5.031 ppm SF6 System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	EtO Recovery (%)
ETO_SYS_2108.LAB	10/22/2019	9:30:10	4.4	-0.1	0.02	7.2	0.0	5.35	149.4	0.995	92.2%
ETO_SYS_2109.LAB	10/22/2019	9:30:20	4.5	-0.1	0.01	7.3	0.0	5.35	149.4	0.995	94.9%
ETO_SYS_2110.LAB	10/22/2019	9:30:30	4.4	0.0	0.00	7.2	0.0	5.36	149.4	0.995	92.5%
ETO_SYS_2111.LAB	10/22/2019	9:30:39	4.5	0.0	0.00	7.3	0.0	5.36	149.5	0.995	94.2%
ETO_SYS_2112.LAB	10/22/2019	9:30:49	4.5	-0.1	0.00	7.2	0.0	5.36	149.4	0.995	94.2%
ETO_SYS_2113.LAB	10/22/2019	9:30:59	4.5	-0.2	0.00	7.3	0.0	5.37	149.4	0.995	93.9%
ETO_SYS_2114.LAB	10/22/2019	9:31:09	4.5	-0.2	0.01	7.3	0.0	5.37	149.4	0.995	94.2%
ETO_SYS_2115.LAB	10/22/2019	9:31:19	4.6	-0.1	0.00	7.3	0.0	5.37	149.4	0.995	96.6%

Dry Bed Intlet, Prior to Analyte Spike

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
NAT_1_2176.LAB	10/22/2019	9:51:19	4.9	2.1	0.09	-0.1	1.5	0.00	148.6	0.990
NAT_1_2177.LAB	10/22/2019	9:51:30	4.8	2.2	0.08	-0.1	1.5	0.00	148.5	0.989
NAT_1_2178.LAB	10/22/2019	9:51:39	4.7	2.1	0.08	-0.1	1.4	0.00	148.6	0.989
NAT_1_2179.LAB	10/22/2019	9:51:49	4.5	2.2	0.08	-0.1	1.5	0.00	148.6	0.989
NAT_1_2180.LAB	10/22/2019	9:51:59	4.8	2.1	0.09	0.0	1.5	0.00	148.6	0.989
NAT_1_2181.LAB	10/22/2019	9:52:09	4.9	2.2	0.09	-0.1	1.5	0.00	148.6	0.989
NAT_1_2182.LAB	10/22/2019	9:52:18	4.9	2.2	0.08	-0.1	1.4	0.00	148.5	0.989
NAT_1_2183.LAB	10/22/2019	9:52:28	4.8	2.1	0.09	-0.1	1.4	0.00	148.6	0.989
NAT_1_2184.LAB	10/22/2019	9:52:38	4.7	2.1	0.09	-0.1	1.4	0.00	148.6	0.989
NAT_1_2185.LAB	10/22/2019	9:52:48	4.6	2.2	0.09	-0.1	1.4	0.00	148.6	0.989
NAT_1_2186.LAB	10/22/2019	9:52:58	4.9	2.2	0.09	-0.1	1.4	0.00	148.6	0.989
		Average	**4.8**					**0.00**		

Dry Bed Intlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor	EtO Recovery (%)
SP_1_2187.LAB	10/22/2019	9:54:25	4.7	2.1	0.07	0.5	1.3	0.41	148.6	1.012	0.076	98.5%
SP_1_2188.LAB	10/22/2019	9:54:35	4.6	2.1	0.07	0.5	1.3	0.41	148.6	1.013	0.076	97.2%
SP_1_2189.LAB	10/22/2019	9:54:44	4.7	1.9	0.07	0.5	1.3	0.41	148.6	1.013	0.076	97.6%
SP_1_2190.LAB	10/22/2019	9:54:54	4.6	1.9	0.08	0.5	1.3	0.41	148.5	1.013	0.076	96.9%
SP_1_2191.LAB	10/22/2019	9:55:04	4.7	2.0	0.08	0.6	1.3	0.47	148.6	1.013	0.088	97.9%
SP_1_2192.LAB	10/22/2019	9:55:14	4.8	1.9	0.08	0.7	1.3	0.52	148.5	1.013	0.097	99.8%
SP_1_2193.LAB	10/22/2019	9:55:24	4.7	1.8	0.07	0.7	1.3	0.52	148.5	1.013	0.098	98.5%
SP_1_2194.LAB	10/22/2019	9:55:34	4.9	2.0	0.07	0.7	1.3	0.52	148.5	1.012	0.098	102.2%
SP_1_2195.LAB	10/22/2019	9:55:43	4.8	1.9	0.08	0.7	1.3	0.52	148.5	1.013	0.098	100.3%
SP_1_2196.LAB	10/22/2019	9:55:53	4.8	1.9	0.07	0.7	1.3	0.53	148.5	1.012	0.099	99.6%
		Average	**4.8**					**0.53**			**0.098**	**100.0%**

Dry Bed Inlet, Prior to Analyte Spike

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
NAT_2_2212.LAB	10/22/2019	9:58:59	4.7	2.0	0.09	-0.1	1.4	0.00	148.5	1.013
NAT_2_2213.LAB	10/22/2019	9:59:09	4.8	2.1	0.08	-0.1	1.4	0.00	148.5	1.012
NAT_2_2214.LAB	10/22/2019	9:59:19	4.8	2.2	0.08	-0.1	1.4	0.00	148.5	1.013
NAT_2_2215.LAB	10/22/2019	9:59:29	4.7	2.1	0.08	-0.1	1.4	0.00	148.5	1.012
NAT_2_2216.LAB	10/22/2019	9:59:38	4.8	2.1	0.09	-0.1	1.4	0.00	148.5	1.012
NAT_2_2217.LAB	10/22/2019	9:59:48	4.7	2.2	0.08	-0.1	1.4	0.00	148.5	1.012
NAT_2_2218.LAB	10/22/2019	9:59:58	4.8	2.1	0.09	0.0	1.4	0.00	148.4	1.012
NAT_2_2219.LAB	10/22/2019	10:00:08	4.7	2.1	0.09	-0.1	1.4	0.00	148.4	1.012
NAT_2_2220.LAB	10/22/2019	10:00:18	4.8	2.1	0.08	-0.1	1.4	0.00	148.4	1.012
NAT_2_2221.LAB	10/22/2019	10:00:27	4.8	2.2	0.08	-0.1	1.4	0.00	148.5	1.012
		Average	**4.8**					**0.00**		

Dry Bed Intlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor	EtO Recovery (%)
SP_2_2223.LAB	10/22/2019	10:01:10	4.8	1.9	0.07	0.6	1.2	0.52	148.5	1.012	0.096	100.8%
SP_2_2224.LAB	10/22/2019	10:01:20	4.7	1.9	0.08	0.6	1.2	0.52	148.5	1.012	0.097	98.5%
SP_2_2225.LAB	10/22/2019	10:01:30	4.7	1.9	0.07	0.7	1.2	0.52	148.5	1.013	0.097	97.8%
SP_2_2226.LAB	10/22/2019	10:01:39	4.7	1.8	0.07	0.7	1.2	0.52	148.5	1.012	0.097	98.9%
SP_2_2227.LAB	10/22/2019	10:01:49	4.5	1.8	0.07	0.7	1.2	0.52	148.5	1.012	0.097	93.9%
SP_2_2228.LAB	10/22/2019	10:01:59	4.6	1.9	0.07	0.7	1.2	0.52	148.5	1.012	0.097	96.5%
SP_2_2229.LAB	10/22/2019	10:02:09	4.6	1.8	0.07	0.7	1.2	0.52	148.5	1.013	0.097	97.0%
SP_2_2230.LAB	10/22/2019	10:02:19	4.8	1.9	0.07	0.7	1.2	0.52	148.5	1.013	0.097	101.2%
SP_2_2231.LAB	10/22/2019	10:02:28	4.6	2.0	0.07	0.7	1.2	0.52	148.5	1.012	0.097	96.7%
SP_2_2232.LAB	10/22/2019	10:02:38	4.7	2.0	0.07	0.7	1.2	0.52	148.5	1.012	0.097	99.3%
		Average	**4.7**					**0.52**			**0.097**	**98.1%**

Dry Bed Inlet, Prior to Analyte Spike

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
NAT_3_2424.LAB	10/22/2019	10:35:13	4.4	2.0	0.09	-0.1	1.4	0.00	148.6	1.012
NAT_3_2425.LAB	10/22/2019	10:35:23	4.4	2.1	0.08	-0.1	1.4	0.00	148.5	1.013
NAT_3_2426.LAB	10/22/2019	10:35:33	4.2	2.0	0.09	0.0	1.4	0.00	148.5	1.012
NAT_3_2427.LAB	10/22/2019	10:35:43	4.3	2.0	0.08	-0.1	1.4	0.00	148.5	1.012
NAT_3_2428.LAB	10/22/2019	10:35:52	4.3	2.1	0.10	-0.1	1.4	0.00	148.5	1.012
NAT_3_2429.LAB	10/22/2019	10:36:02	4.2	2.0	0.09	-0.1	1.4	0.00	148.6	1.012
NAT_3_2430.LAB	10/22/2019	10:36:12	4.3	2.1	0.09	-0.1	1.4	0.00	148.6	1.012
NAT_3_2431.LAB	10/22/2019	10:36:22	4.2	2.1	0.08	0.0	1.4	0.00	148.6	1.013
NAT_3_2432.LAB	10/22/2019	10:36:32	4.3	2.1	0.08	0.0	1.4	0.00	148.5	1.012
NAT_3_2433.LAB	10/22/2019	10:36:42	4.3	2.1	0.09	-0.1	1.4	0.00	148.5	1.012
		Average	**4.3**					**0.00**		

Dry Bed Intlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor	EtO Recovery (%)
SP_3_2434.LAB	10/22/2019	10:37:14	4.1	1.8	0.07	0.6	1.3	0.51	148.5	1.012	0.095	95.5%
SP_3_2435.LAB	10/22/2019	10:37:23	4.1	1.9	0.08	0.6	1.3	0.51	148.6	1.012	0.096	95.4%
SP_3_2436.LAB	10/22/2019	10:37:33	4.5	1.8	0.07	0.7	1.3	0.52	148.5	1.011	0.097	102.8%
SP_3_2437.LAB	10/22/2019	10:37:43	4.4	1.9	0.08	0.7	1.2	0.52	148.6	1.012	0.098	101.6%
SP_3_2438.LAB	10/22/2019	10:37:53	4.3	1.9	0.08	0.7	1.2	0.52	148.6	1.012	0.098	98.7%
SP_3_2439.LAB	10/22/2019	10:38:03	4.2	1.8	0.08	0.7	1.2	0.52	148.6	1.012	0.098	96.6%
SP_3_2440.LAB	10/22/2019	10:38:12	4.1	1.8	0.08	0.7	1.2	0.52	148.5	1.012	0.098	93.9%
SP_3_2441.LAB	10/22/2019	10:38:22	4.2	1.9	0.08	0.7	1.2	0.52	148.6	1.012	0.097	97.7%
SP_3_2442.LAB	10/22/2019	10:38:32	4.3	1.8	0.09	0.6	1.2	0.52	148.5	1.012	0.098	99.5%
SP_3_2443.LAB	10/22/2019	10:38:42	4.3	1.9	0.08	0.7	1.2	0.52	148.6	1.012	0.098	99.6%
		Average	**4.3**					**0.52**			**0.097**	**98.1%**

StarBoost Exhaust - 4.984 ppm Ethylene Oxide / 5.031 ppm SF6 Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
STARBST_ETO_DIR_2527.LAB	10/22/2019	13:26:05	5.1	-0.2	0.01	7.2	0.0	5.34	149.8	0.993
STARBST_ETO_DIR_2528.LAB	10/22/2019	13:26:15	5.1	-0.2	0.01	7.1	0.0	5.34	149.7	0.993
STARBST_ETO_DIR_2529.LAB	10/22/2019	13:26:25	5.1	-0.2	0.00	7.0	0.0	5.35	149.7	0.975
STARBST_ETO_DIR_2530.LAB	10/22/2019	13:26:35	5.1	-0.2	0.00	6.6	0.0	5.30	149.7	0.963
STARBST_ETO_DIR_2531.LAB	10/22/2019	13:26:45	5.0	-0.1	-0.01	6.7	0.0	5.31	149.7	0.962
STARBST_ETO_DIR_2532.LAB	10/22/2019	13:26:54	5.0	-0.1	0.00	6.7	0.0	5.31	149.7	0.962
STARBST_ETO_DIR_2533.LAB	10/22/2019	13:27:04	4.9	-0.1	0.02	6.7	0.0	5.31	149.8	0.962
STARBST_ETO_DIR_2534.LAB	10/22/2019	13:27:14	4.9	-0.2	0.01	6.6	0.0	5.30	149.8	0.964
		Average						**5.32**		

StarBoost Exhaust - Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
STARBST_N2_SYS_2587.LAB	10/22/2019	13:36:19	0.4	-0.3	0.01	0.0	0.0	0.00	149.7	1.005
STARBST_N2_SYS_2588.LAB	10/22/2019	13:36:29	0.4	-0.2	0.01	-0.1	0.0	0.00	149.7	1.005
STARBST_N2_SYS_2589.LAB	10/22/2019	13:36:39	0.5	-0.2	0.01	-0.1	0.0	0.00	149.7	1.005
STARBST_N2_SYS_2590.LAB	10/22/2019	13:36:49	0.3	-0.2	0.00	-0.1	0.0	0.00	149.6	1.005
STARBST_N2_SYS_2591.LAB	10/22/2019	13:36:58	0.4	-0.2	0.01	-0.1	0.0	0.00	149.6	1.005
STARBST_N2_SYS_2592.LAB	10/22/2019	13:37:08	0.3	-0.2	0.01	-0.1	0.0	0.00	149.7	1.005
STARBST_N2_SYS_2593.LAB	10/22/2019	13:37:18	0.4	-0.2	0.00	-0.1	0.0	0.00	149.7	1.005
STARBST_N2_SYS_2594.LAB	10/22/2019	13:37:28	0.4	-0.2	0.01	-0.1	0.0	0.00	149.6	1.004
STARBST_N2_SYS_2595.LAB	10/22/2019	13:37:38	0.4	-0.2	0.01	-0.1	0.0	0.00	149.6	1.005
STARBST_N2_SYS_2596.LAB	10/22/2019	13:37:48	0.4	-0.2	0.01	-0.1	0.0	0.00	149.6	1.005

StarBoost Exhaust - 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
STARBST_CTS_SYS_2597.LAB	10/22/2019	13:44:31	0.3	102.7	0.00	-0.1	0.0	0.00	149.6	1.004	102.7%
STARBST_CTS_SYS_2598.LAB	10/22/2019	13:44:40	0.3	102.9	0.01	0.0	0.0	0.00	149.7	1.004	102.9%
STARBST_CTS_SYS_2599.LAB	10/22/2019	13:44:50	0.3	102.8	0.00	0.0	0.0	0.00	149.7	1.004	102.8%
STARBST_CTS_SYS_2600.LAB	10/22/2019	13:45:00	0.3	102.9	0.00	-0.1	0.0	0.00	149.7	1.004	102.9%
STARBST_CTS_SYS_2601.LAB	10/22/2019	13:45:10	0.3	102.8	0.01	-0.1	0.0	0.00	149.6	1.004	102.8%
STARBST_CTS_SYS_2602.LAB	10/22/2019	13:45:20	0.3	102.9	0.00	0.0	0.0	0.00	149.7	1.004	102.9%
STARBST_CTS_SYS_2603.LAB	10/22/2019	13:45:29	0.4	102.8	0.01	-0.1	0.0	0.00	149.7	1.004	102.8%
STARBST_CTS_SYS_2604.LAB	10/22/2019	13:45:39	0.3	102.9	0.01	0.0	0.0	0.00	149.6	1.004	102.9%
STARBST_CTS_SYS_2605.LAB	10/22/2019	13:45:49	0.3	103.0	0.01	-0.1	0.0	0.00	149.7	1.004	103.0%
STARBST_CTS_SYS_2606.LAB	10/22/2019	13:45:59	0.4	102.9	0.01	-0.1	0.0	0.00	149.6	1.004	102.9%
STARBST_CTS_SYS_2607.LAB	10/22/2019	13:46:09	0.3	102.9	0.01	-0.1	0.0	0.00	149.6	1.004	102.9%

StarBoost Exhaust - Dry Bed Outlet, Prior to Analyte Spike, using the StarBoost Sampling System

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
STARBST_NAT_1_2621.LAB	10/22/2019	13:53:35	0.3	2.3	0.09	-0.1	1.3	0.00	149.9	0.961
STARBST_NAT_1_2622.LAB	10/22/2019	13:53:44	0.3	2.3	0.09	-0.1	1.3	0.00	149.9	0.961
STARBST_NAT_1_2623.LAB	10/22/2019	13:53:54	0.3	2.3	0.09	-0.1	1.3	0.00	149.9	0.960
STARBST_NAT_1_2624.LAB	10/22/2019	13:54:04	0.3	2.2	0.08	-0.1	1.3	0.00	149.9	0.960
STARBST_NAT_1_2625.LAB	10/22/2019	13:54:14	0.4	2.2	0.09	-0.1	1.3	0.00	150.0	0.961
STARBST_NAT_1_2626.LAB	10/22/2019	13:54:24	0.3	2.3	0.09	-0.1	1.3	-0.01	149.9	0.960
STARBST_NAT_1_2627.LAB	10/22/2019	13:54:34	0.3	2.4	0.08	-0.1	1.3	0.00	150.0	0.960
STARBST_NAT_1_2628.LAB	10/22/2019	13:54:43	0.3	2.2	0.09	0.0	1.3	0.00	149.9	0.961
STARBST_NAT_1_2629.LAB	10/22/2019	13:54:54	0.3	2.2	0.09	-0.2	1.3	0.00	149.9	0.960
STARBST_NAT_1_2630.LAB	10/22/2019	13:55:03	0.4	2.5	0.08	-0.1	1.3	0.00	150.0	0.961
		Average						**0.00**		

StarBoost Exhaust - Dry Bed Outlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6, using the StarBoost System to Determine Dilution Factor

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
STARBST_SP_1_2649.LAB	10/22/2019	14:01:43	0.8	2.1	0.08	0.5	1.2	0.44	150.0	1.012	0.083
STARBST_SP_1_2650.LAB	10/22/2019	14:01:53	0.8	2.2	0.07	0.5	1.2	0.44	150.0	1.013	0.082
STARBST_SP_1_2651.LAB	10/22/2019	14:02:03	0.8	2.3	0.08	0.4	1.2	0.44	150.0	1.012	0.082
STARBST_SP_1_2652.LAB	10/22/2019	14:02:13	0.8	2.1	0.08	0.5	1.2	0.43	150.0	1.013	0.082
STARBST_SP_1_2653.LAB	10/22/2019	14:02:23	0.8	2.3	0.07	0.5	1.2	0.44	150.0	1.012	0.082
STARBST_SP_1_2654.LAB	10/22/2019	14:02:32	0.8	2.3	0.08	0.4	1.2	0.43	150.0	1.013	0.082
STARBST_SP_1_2655.LAB	10/22/2019	14:02:42	0.7	2.2	0.07	0.4	1.2	0.44	149.9	1.012	0.082
STARBST_SP_1_2656.LAB	10/22/2019	14:02:52	0.8	2.1	0.07	0.4	1.2	0.43	150.0	1.013	0.082
STARBST_SP_1_2657.LAB	10/22/2019	14:03:02	0.8	2.2	0.06	0.5	1.2	0.44	150.0	1.012	0.082
		Average						**0.44**			**0.082**

StarBoost Exhaust - Dry Bed Outlet, Prior to Analyte Spike, using the StarBoost Sampling System

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
STARBST_NAT_2_2667.LAB	10/22/2019	14:05:08	0.4	2.4	0.08	-0.1	1.3	-0.01	149.8	1.013
STARBST_NAT_2_2668.LAB	10/22/2019	14:05:18	0.3	2.4	0.09	-0.1	1.3	-0.01	149.8	1.013
STARBST_NAT_2_2669.LAB	10/22/2019	14:05:28	0.3	2.4	0.08	-0.1	1.3	-0.01	149.8	1.013
STARBST_NAT_2_2670.LAB	10/22/2019	14:05:38	0.4	2.4	0.07	-0.2	1.3	-0.01	149.7	1.013
STARBST_NAT_2_2671.LAB	10/22/2019	14:05:48	0.3	2.3	0.08	-0.2	1.3	0.00	149.7	1.013
STARBST_NAT_2_2672.LAB	10/22/2019	14:05:57	0.3	2.2	0.09	-0.1	1.3	-0.01	149.7	1.013
STARBST_NAT_2_2673.LAB	10/22/2019	14:06:08	0.3	2.2	0.08	-0.1	1.3	-0.01	149.8	1.013
STARBST_NAT_2_2674.LAB	10/22/2019	14:06:17	0.3	2.3	0.07	-0.2	1.3	-0.01	149.8	1.014
STARBST_NAT_2_2675.LAB	10/22/2019	14:06:27	0.3	2.3	0.08	-0.1	1.3	-0.01	149.7	1.013
STARBST_NAT_2_2676.LAB	10/22/2019	14:06:37	0.3	2.3	0.09	-0.1	1.3	0.01	149.7	1.014
		Average						**-0.01**		

StarBoost Exhaust - Dry Bed Outlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6, using the StarBoost System to Determine Dilution Factor

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
STARBST_SP_2_2679.LAB	10/22/2019	14:07:41	0.9	2.2	0.08	0.5	1.2	0.45	149.7	1.014	0.084
STARBST_SP_2_2680.LAB	10/22/2019	14:07:50	0.8	2.2	0.07	0.4	1.2	0.45	149.8	1.013	0.085
STARBST_SP_2_2681.LAB	10/22/2019	14:08:00	0.8	2.1	0.07	0.5	1.2	0.45	149.8	1.014	0.084
STARBST_SP_2_2682.LAB	10/22/2019	14:08:10	0.8	2.2	0.07	0.4	1.2	0.45	149.8	1.013	0.085
STARBST_SP_2_2683.LAB	10/22/2019	14:08:19	0.9	2.0	0.07	0.4	1.2	0.45	149.7	1.014	0.084
STARBST_SP_2_2684.LAB	10/22/2019	14:08:29	0.8	2.2	0.07	0.5	1.2	0.45	149.7	1.013	0.085
STARBST_SP_2_2685.LAB	10/22/2019	14:08:39	0.8	2.1	0.07	0.4	1.2	0.45	149.8	1.014	0.085
STARBST_SP_2_2686.LAB	10/22/2019	14:08:49	0.8	2.1	0.07	0.4	1.2	0.45	149.8	1.013	0.084
STARBST_SP_2_2687.LAB	10/22/2019	14:08:59	0.8	2.0	0.07	0.4	1.2	0.45	149.8	1.014	0.084
STARBST_SP_2_2688.LAB	10/22/2019	14:09:09	0.8	2.1	0.08	0.4	1.2	0.45	149.7	1.014	0.085
STARBST_SP_2_2689.LAB	10/22/2019	14:09:19	0.8	2.1	0.08	0.4	1.2	0.45	149.8	1.014	0.084
STARBST_SP_2_2690.LAB	10/22/2019	14:09:28	0.8	2.1	0.07	0.4	1.2	0.45	149.8	1.014	0.084
STARBST_SP_2_2691.LAB	10/22/2019	14:09:38	0.8	2.0	0.07	0.4	1.2	0.45	149.8	1.014	0.084
STARBST_SP_2_2692.LAB	10/22/2019	14:09:48	0.8	2.2	0.08	0.4	1.2	0.45	149.7	1.011	0.084
		Average						**0.45**			**0.084**

StarBoost Exhaust - Dry Bed Outlet, Prior to Analyte Spike, using the StarBoost Sampling System

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
STARBST_NAT_3_2710.LAB	10/22/2019	14:13:08	0.2	2.2	0.08	-0.1	1.3	-0.01	149.8	1.013
STARBST_NAT_3_2711.LAB	10/22/2019	14:13:17	0.3	2.2	0.09	-0.1	1.3	-0.01	149.9	1.014
STARBST_NAT_3_2712.LAB	10/22/2019	14:13:27	0.3	2.2	0.08	-0.1	1.3	0.00	149.7	1.014
STARBST_NAT_3_2713.LAB	10/22/2019	14:13:37	0.3	2.2	0.07	-0.1	1.3	-0.01	149.8	1.014
STARBST_NAT_3_2714.LAB	10/22/2019	14:13:47	0.3	2.2	0.09	-0.2	1.3	-0.01	149.8	1.014
STARBST_NAT_3_2715.LAB	10/22/2019	14:13:57	0.3	2.3	0.08	-0.2	1.3	-0.01	149.8	1.014
STARBST_NAT_3_2716.LAB	10/22/2019	14:14:07	0.3	2.2	0.08	-0.2	1.3	-0.01	149.7	1.014
STARBST_NAT_3_2717.LAB	10/22/2019	14:14:16	0.3	2.2	0.08	-0.1	1.3	-0.01	149.7	1.014
		Average						**-0.01**		

StarBoost Exhaust - Dry Bed Outlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6, using the StarBoost System to Determine Dilution Factor

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
STARBST_SP_3_2732.LAB	10/22/2019	14:17:14	0.7	2.0	0.08	0.5	1.2	0.45	149.7	1.014	0.085
STARBST_SP_3_2733.LAB	10/22/2019	14:17:24	0.7	2.1	0.08	0.5	1.2	0.45	149.8	1.014	0.085
STARBST_SP_3_2734.LAB	10/22/2019	14:17:34	0.9	2.2	0.08	0.5	1.2	0.46	149.9	1.013	0.086
STARBST_SP_3_2735.LAB	10/22/2019	14:17:44	0.7	1.9	0.08	0.4	1.2	0.46	149.9	1.013	0.086
STARBST_SP_3_2736.LAB	10/22/2019	14:17:54	0.7	2.1	0.06	0.5	1.2	0.46	149.8	1.013	0.086
STARBST_SP_3_2737.LAB	10/22/2019	14:18:04	0.7	2.0	0.08	0.5	1.2	0.45	149.8	1.013	0.085
STARBST_SP_3_2738.LAB	10/22/2019	14:18:13	0.8	2.1	0.07	0.5	1.2	0.45	149.8	1.013	0.085
STARBST_SP_3_2739.LAB	10/22/2019	14:18:23	0.8	2.0	0.08	0.5	1.2	0.45	149.8	1.013	0.085
STARBST_SP_3_2740.LAB	10/22/2019	14:18:33	0.8	2.0	0.08	0.5	1.2	0.45	149.8	1.013	0.085
STARBST_SP_3_2741.LAB	10/22/2019	14:18:43	0.7	2.0	0.07	0.4	1.2	0.45	149.7	1.013	0.085
STARBST_SP_3_2742.LAB	10/22/2019	14:18:53	0.8	2.1	0.07	0.5	1.2	0.45	149.8	1.013	0.085
STARBST_SP_3_2743.LAB	10/22/2019	14:19:03	0.8	2.1	0.07	0.5	1.2	0.45	149.8	1.013	0.085
STARBST_SP_3_2744.LAB	10/22/2019	14:19:12	0.7	2.1	0.07	0.4	1.2	0.45	149.9	1.013	0.084
STARBST_SP_3_2745.LAB	10/22/2019	14:19:22	0.8	2.0	0.07	0.4	1.2	0.45	149.8	1.013	0.085
		Average						**0.45**			**0.085**

Zero Gas (Nitogen) Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
N2_DIR_2798BKG.LAB	10/23/2019	5:54:44	0.0	0.0	0.00	0.0	0.0	0.00	148.9	0.996
N2_DIR_2799.LAB	10/23/2019	5:55:01	0.0	0.0	0.00	-0.1	0.0	0.00	148.9	0.996
N2_DIR_2800.LAB	10/23/2019	5:55:11	0.0	0.0	0.00	0.0	0.0	0.00	149.0	0.996
N2_DIR_2801.LAB	10/23/2019	5:55:21	0.0	0.0	0.00	0.0	0.0	0.00	149.0	0.996
N2_DIR_2802.LAB	10/23/2019	5:55:31	0.0	0.0	0.01	0.0	0.0	0.00	148.9	0.996
N2_DIR_2803.LAB	10/23/2019	5:55:41	-0.1	0.1	-0.01	0.0	0.0	0.00	148.9	0.996

CTS, 99.95 ppm Ethylene Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Ethylene Recovery (%)
CTS_DIR_2805.LAB	10/23/2019	5:58:13	-0.3	0.1	0.01	101.0	0.0	-0.03	149.0	0.977	101.0%
CTS_DIR_2806.LAB	10/23/2019	5:58:23	-0.3	0.0	0.01	101.6	0.0	-0.03	149.0	0.977	101.6%
CTS_DIR_2807.LAB	10/23/2019	5:58:33	-0.3	0.0	0.02	101.7	0.0	-0.03	149.0	0.977	101.7%
CTS_DIR_2808.LAB	10/23/2019	5:58:43	-0.3	0.2	0.01	101.8	0.0	-0.02	149.0	0.977	101.8%
CTS_DIR_2809.LAB	10/23/2019	5:58:53	-0.4	0.1	0.01	101.7	0.0	-0.03	149.0	0.977	101.8%
CTS_DIR_2810.LAB	10/23/2019	5:59:02	-0.3	0.2	0.01	101.9	0.0	-0.03	149.0	0.977	101.9%
CTS_DIR_2811.LAB	10/23/2019	5:59:12	-0.4	0.1	0.01	101.8	0.0	-0.03	149.0	0.977	101.8%
CTS_DIR_2812.LAB	10/23/2019	5:59:22	-0.2	0.0	0.00	101.3	0.0	-0.03	149.0	0.980	101.4%
		Average				**101.6**					

CTS, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Ethylene Recovery (%)
CTS_SYS_2814.LAB	10/23/2019	6:00:06	-0.3	0.0	0.00	102.3	0.1	-0.03	148.9	1.022	100.7%
CTS_SYS_2815.LAB	10/23/2019	6:00:15	-0.4	0.1	0.01	102.1	0.1	-0.03	148.9	1.023	100.5%
CTS_SYS_2816.LAB	10/23/2019	6:00:25	-0.3	0.1	0.00	102.4	0.0	-0.03	148.8	1.023	100.8%
CTS_SYS_2817.LAB	10/23/2019	6:00:35	-0.4	0.0	0.00	102.4	0.0	-0.02	148.9	1.023	100.8%
CTS_SYS_2818.LAB	10/23/2019	6:01:31	-0.4	0.0	0.00	104.7	0.0	-0.02	148.7	1.003	103.0%
CTS_SYS_2819.LAB	10/23/2019	6:02:31	-0.4	0.1	0.01	102.6	0.0	-0.02	148.7	1.024	101.0%
CTS_SYS_2820.LAB	10/23/2019	6:02:41	-0.4	0.1	0.00	102.5	0.0	-0.03	148.7	1.024	100.9%
CTS_SYS_2821.LAB	10/23/2019	6:02:50	-0.4	0.0	0.01	102.6	0.0	-0.02	148.6	1.024	101.0%

4.984 ppm Ethylene Oxide / 5.031 ppm SF6 Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	EtO Recovery (%)
ETO_DIR_2836.LAB	10/23/2019	6:06:19	4.5	0.0	0.00	6.6	0.0	5.32	148.9	0.984	89.3%
ETO_DIR_2837.LAB	10/23/2019	6:06:29	4.5	0.0	0.00	6.7	0.0	5.32	148.8	0.984	90.0%
ETO_DIR_2838.LAB	10/23/2019	6:06:39	4.6	0.0	0.00	6.6	0.0	5.32	148.9	0.984	91.3%
ETO_DIR_2839.LAB	10/23/2019	6:06:49	4.5	0.0	0.00	6.6	0.0	5.32	148.9	0.984	90.3%
ETO_DIR_2840.LAB	10/23/2019	6:06:58	4.5	0.0	0.01	6.6	0.0	5.33	148.9	0.984	90.6%
ETO_DIR_2841.LAB	10/23/2019	6:07:08	4.6	0.0	0.01	6.6	0.0	5.32	148.9	0.984	91.6%
ETO_DIR_2842.LAB	10/23/2019	6:07:18	4.6	-0.1	0.00	6.6	0.0	5.32	148.9	0.984	92.3%
ETO_DIR_2843.LAB	10/23/2019	6:07:28	4.7	0.0	0.00	6.4	0.0	5.16	148.9	0.979	94.8%
		Average						**5.3**			

CTS, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Ethylene Recovery (%)
CTS_1_2936.LAB	10/23/2019	7:44:07	-1.1	0.0	0.00	103.5	0.0	-0.03	148.7	1.067	101.9%
CTS_1_2937.LAB	10/23/2019	7:44:18	-0.8	-0.1	0.00	103.5	0.0	-0.03	148.7	1.066	101.9%
CTS_1_2938.LAB	10/23/2019	7:44:27	-0.6	0.0	0.01	103.1	0.0	-0.03	148.7	1.066	101.5%
CTS_1_2939.LAB	10/23/2019	7:44:37	0.2	0.0	0.01	103.5	0.0	-0.02	148.6	1.058	101.9%
CTS_1_2940.LAB	10/23/2019	7:44:47	-0.7	0.0	0.00	102.8	0.0	-0.02	148.7	1.039	101.2%
CTS_1_2941.LAB	10/23/2019	7:44:56	-0.5	0.0	0.01	102.8	0.0	-0.02	148.7	1.038	101.2%
CTS_1_2942.LAB	10/23/2019	7:45:06	-0.6	0.0	0.00	102.8	0.0	-0.02	148.6	1.038	101.2%
CTS_1_2943.LAB	10/23/2019	7:45:16	-0.3	-0.1	0.01	102.9	0.0	-0.02	148.6	1.038	101.3%
CTS_1_2944.LAB	10/23/2019	7:45:26	-0.6	0.0	0.00	103.0	0.0	-0.02	148.7	1.035	101.4%
CTS_1_2945.LAB	10/23/2019	7:45:35	-0.6	0.0	0.01	102.6	0.0	-0.02	148.7	0.969	101.0%
CTS_1_2946.LAB	10/23/2019	7:45:45	-0.3	0.0	0.02	101.8	0.0	-0.02	148.7	0.967	100.2%
CTS_1_2947.LAB	10/23/2019	7:45:55	-0.5	0.0	0.01	101.7	0.0	-0.02	148.7	0.967	100.1%
CTS_1_2948.LAB	10/23/2019	7:46:05	-0.7	-0.1	0.01	101.5	0.0	-0.02	148.7	0.967	100.0%

Zero Gas (Nitogen) System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CTS_1_2954.LAB	10/23/2019	7:47:04	0.1	-0.2	0.00	0.0	0.0	0.00	148.7	1.029
CTS_1_2955.LAB	10/23/2019	7:47:14	0.0	-0.1	-0.01	0.0	0.0	0.00	148.7	1.029
CTS_1_2956.LAB	10/23/2019	7:47:24	-0.2	-0.2	-0.01	0.0	0.0	0.00	148.7	1.029
CTS_1_2957.LAB	10/23/2019	7:47:33	-0.1	-0.1	-0.01	0.0	0.0	0.00	148.7	1.029
CTS_1_2958.LAB	10/23/2019	7:47:43	-0.3	-0.1	0.00	0.0	0.0	0.00	148.7	1.029
CTS_1_2959.LAB	10/23/2019	7:47:53	0.0	-0.1	-0.01	0.0	0.0	0.00	148.7	1.029
CTS_1_2960.LAB	10/23/2019	7:48:03	-0.2	-0.2	0.00	0.0	0.0	0.00	148.7	1.029
CTS_1_2961.LAB	10/23/2019	7:48:13	-0.3	-0.2	-0.01	0.0	0.0	0.00	148.7	1.029
CTS_1_2962.LAB	10/23/2019	7:48:23	0.0	-0.1	0.00	0.1	0.0	0.00	148.7	1.028
CTS_1_2963.LAB	10/23/2019	7:48:33	1.3	0.5	0.01	0.0	0.1	0.00	148.7	1.028

Zero Gas (Nitogen) System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CTS_2_3041.LAB	10/23/2019	9:07:35	0.0	-0.2	0.00	0.0	0.1	0.00	148.8	1.016
CTS_2_3042.LAB	10/23/2019	9:07:45	-0.3	-0.2	0.01	0.0	0.0	0.00	148.8	1.016
CTS_2_3043.LAB	10/23/2019	9:07:55	-0.2	-0.1	0.00	0.0	0.0	0.00	148.8	1.016
CTS_2_3044.LAB	10/23/2019	9:08:05	-0.1	-0.2	-0.01	0.0	0.0	0.00	148.8	1.016
CTS_2_3045.LAB	10/23/2019	9:08:14	0.0	-0.2	0.00	0.0	0.0	0.00	148.7	1.015
CTS_2_3046.LAB	10/23/2019	9:08:24	-0.1	0.0	0.01	0.0	0.0	0.00	148.8	1.016
CTS_2_3047.LAB	10/23/2019	9:08:34	-0.2	-0.1	-0.01	0.0	0.0	0.00	148.7	1.015
CTS_2_3048.LAB	10/23/2019	9:08:44	-0.2	-0.2	0.00	0.0	0.0	0.00	148.7	1.015

CTS, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Ethylene Recovery (%)
CTS_2_3056.LAB	10/23/2019	9:10:02	-0.3	-0.1	0.01	96.6	0.1	-0.02	148.7	1.015	95.1%
CTS_2_3057.LAB	10/23/2019	9:10:12	-0.5	0.0	0.01	101.7	0.0	-0.03	148.8	1.015	100.1%
CTS_2_3058.LAB	10/23/2019	9:10:22	-0.7	-0.1	0.00	102.2	0.0	-0.02	148.7	1.015	100.6%
CTS_2_3059.LAB	10/23/2019	9:10:32	-0.7	-0.1	0.01	102.1	0.0	-0.02	148.8	1.015	100.5%
CTS_2_3060.LAB	10/23/2019	9:10:42	-0.9	0.0	0.01	101.6	0.0	-0.02	148.7	1.015	100.0%
CTS_2_3061.LAB	10/23/2019	9:10:52	-0.6	0.0	0.01	101.9	0.0	-0.03	148.7	1.015	100.3%
CTS_2_3062.LAB	10/23/2019	9:11:01	-0.6	-0.1	0.01	102.2	0.0	-0.03	148.7	1.015	100.6%
CTS_2_3063.LAB	10/23/2019	9:11:11	-0.6	-0.1	0.01	102.2	0.0	-0.02	148.7	1.015	100.6%

CTS, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Ethylene Recovery (%)
CTS_3_3155.LAB	10/23/2019	10:43:12	-0.4	-0.1	0.01	101.6	0.1	-0.03	148.7	1.014	100.0%
CTS_3_3156.LAB	10/23/2019	10:43:22	-0.6	-0.1	0.01	102.1	0.0	-0.03	148.8	1.014	100.5%
CTS_3_3157.LAB	10/23/2019	10:43:32	-0.8	-0.1	0.01	101.8	0.0	-0.03	148.7	1.014	100.2%
CTS_3_3158.LAB	10/23/2019	10:43:42	-0.6	-0.1	0.00	102.0	0.0	-0.03	148.8	1.014	100.4%
CTS_3_3159.LAB	10/23/2019	10:43:52	-0.7	-0.1	0.01	102.3	0.0	-0.03	148.7	1.014	100.7%
CTS_3_3160.LAB	10/23/2019	10:44:01	-0.5	-0.1	0.01	102.1	0.0	-0.03	148.7	1.014	100.5%
CTS_3_3161.LAB	10/23/2019	10:44:11	-0.7	-0.1	0.01	102.4	0.0	-0.03	148.7	1.014	100.8%
CTS_3_3162.LAB	10/23/2019	10:44:21	-0.8	-0.1	0.00	102.6	0.0	-0.03	148.7	1.013	101.0%
CTS_3_3163.LAB	10/23/2019	10:44:31	-0.5	-0.1	0.01	102.7	0.0	-0.03	148.8	1.014	101.1%
CTS_3_3164.LAB	10/23/2019	10:44:41	-0.7	-0.2	0.01	102.4	0.0	-0.03	148.8	1.014	100.8%
CTS_3_3165.LAB	10/23/2019	10:44:51	-0.7	-0.2	0.01	102.0	0.0	-0.02	148.7	1.013	100.4%

Zero Gas (Nitogen) System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CTS_3_3177.LAB	10/23/2019	10:46:49	-0.1	-0.1	0.00	0.0	0.0	0.00	148.7	1.014
CTS_3_3178.LAB	10/23/2019	10:46:58	-0.1	-0.2	0.00	0.1	0.0	0.00	148.7	1.014
CTS_3_3179.LAB	10/23/2019	10:47:08	-0.4	-0.2	-0.01	0.0	0.0	0.00	148.7	1.014
CTS_3_3180.LAB	10/23/2019	10:47:18	-0.2	-0.3	-0.01	0.1	0.0	0.00	148.8	1.014
CTS_3_3181.LAB	10/23/2019	10:47:28	-0.1	-0.2	-0.01	0.1	0.0	0.00	148.8	1.014
CTS_3_3182.LAB	10/23/2019	10:47:38	0.0	-0.2	0.00	0.0	0.0	0.00	148.7	1.014
CTS_3_3183.LAB	10/23/2019	10:47:48	-0.1	-0.3	0.01	0.0	0.0	0.00	148.8	1.014
CTS_3_3184.LAB	10/23/2019	10:47:57	-0.1	-0.2	0.00	0.0	0.0	0.00	148.7	1.014

Zero Gas (Nitogen) Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
N2_DIR_3224BKG.LAB	10/23/2019	11:01:07	0.0	0.0	0.00	0.0	0.0	0.00	149.0	0.983
N2_DIR_3225.LAB	10/23/2019	11:01:25	0.1	0.0	0.00	0.1	0.0	0.00	149.1	0.983
N2_DIR_3226.LAB	10/23/2019	11:01:35	0.0	0.0	-0.01	-0.1	0.0	0.00	149.2	0.984
N2_DIR_3227.LAB	10/23/2019	11:01:45	0.0	0.0	0.00	0.0	0.0	0.00	149.1	0.984
N2_DIR_3228.LAB	10/23/2019	11:01:54	0.1	0.0	0.01	0.0	0.0	0.00	149.1	0.983
N2_DIR_3229.LAB	10/23/2019	11:02:04	0.1	0.0	0.00	0.0	0.0	0.00	149.1	0.983
N2_DIR_3230.LAB	10/23/2019	11:02:14	0.1	-0.1	-0.01	-0.1	0.0	0.00	149.1	0.980
N2_DIR_3231.LAB	10/23/2019	11:02:24	0.1	-0.1	0.00	0.0	0.0	0.00	149.1	0.970
N2_DIR_3232.LAB	10/23/2019	11:02:34	0.1	0.0	0.00	0.1	0.0	0.00	149.1	0.968

100.0 ppm Methane Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
METHANE_DIR_3264.LAB	10/23/2019	11:09:55	0.1	101.4	0.00	0.0	0.0	0.00	149.2	0.988	101.4%
METHANE_DIR_3265.LAB	10/23/2019	11:10:05	0.0	101.6	0.00	0.0	0.0	0.00	149.2	0.988	101.6%
METHANE_DIR_3266.LAB	10/23/2019	11:10:15	0.0	101.3	-0.01	0.0	0.0	0.00	149.2	0.988	101.3%
METHANE_DIR_3267.LAB	10/23/2019	11:10:25	0.0	101.5	0.00	-0.1	0.0	0.00	149.1	0.988	101.5%
METHANE_DIR_3268.LAB	10/23/2019	11:10:34	0.0	101.4	0.00	0.0	0.0	0.00	149.2	0.988	101.4%
METHANE_DIR_3269.LAB	10/23/2019	11:10:44	0.0	101.5	-0.01	0.0	0.0	0.00	149.2	0.988	101.5%
METHANE_DIR_3270.LAB	10/23/2019	11:10:54	0.1	101.5	0.00	0.0	0.0	0.00	149.1	0.988	101.5%
		Average		**101.5**							

CTS, 99.95 ppm Ethylene Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Ethylene Recovery (%)
CTS_DIR_3271.LAB	10/23/2019	11:12:12	-0.1	0.2	0.01	101.5	0.0	-0.03	149.2	0.986	101.5%
CTS_DIR_3272.LAB	10/23/2019	11:12:22	-0.2	0.2	0.01	102.1	0.0	-0.03	149.2	0.986	102.1%
CTS_DIR_3273.LAB	10/23/2019	11:12:31	-0.2	0.1	0.02	102.1	0.0	-0.03	149.1	0.987	102.1%
CTS_DIR_3274.LAB	10/23/2019	11:12:41	-0.2	0.1	0.01	101.7	0.0	-0.03	149.1	0.986	101.7%
CTS_DIR_3275.LAB	10/23/2019	11:12:51	-0.2	0.2	0.01	101.8	0.0	-0.03	149.2	0.987	101.8%
CTS_DIR_3276.LAB	10/23/2019	11:13:01	-0.1	0.1	0.01	101.6	0.0	-0.03	149.2	0.987	101.6%
CTS_DIR_3277.LAB	10/23/2019	11:13:11	-0.2	0.0	0.00	101.5	0.0	-0.03	149.1	0.987	101.5%
CTS_DIR_3278.LAB	10/23/2019	11:13:21	-0.2	0.1	0.01	101.3	0.0	-0.03	149.2	0.987	101.4%
CTS_DIR_3279.LAB	10/23/2019	11:13:30	-0.2	0.0	0.00	101.4	0.0	-0.03	149.1	0.986	101.4%
		Average				**101.6**					

30.00 % CO2 Direct to FTIR

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	CO2 (Rercovery %)
CO2_DIR_3280.LAB	10/23/2019	11:14:28	0.0	0.1	29.29	0.3	0.0	0.00	149.1	1.005	97.6%
CO2_DIR_3281.LAB	10/23/2019	11:14:37	0.0	0.1	29.37	0.3	0.0	0.00	149.1	1.005	97.9%
CO2_DIR_3282.LAB	10/23/2019	11:14:47	0.0	0.0	29.38	0.2	0.0	0.00	149.2	1.005	97.9%
CO2_DIR_3283.LAB	10/23/2019	11:14:57	0.0	0.0	29.34	0.3	0.0	0.00	149.1	1.005	97.8%
CO2_DIR_3284.LAB	10/23/2019	11:15:07	-0.1	-0.1	29.33	0.2	0.0	0.00	149.1	1.005	97.8%
CO2_DIR_3285.LAB	10/23/2019	11:15:17	-0.1	0.1	29.32	0.2	0.0	0.00	149.1	1.005	97.7%
CO2_DIR_3286.LAB	10/23/2019	11:15:27	0.0	0.1	29.33	0.2	0.0	0.00	149.0	1.006	97.8%
CO2_DIR_3287.LAB	10/23/2019	11:15:36	0.0	0.0	29.30	0.3	0.0	-0.01	149.0	0.978	97.7%
		Average			**29.3**						

Diluted Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
N2_SYS_3564.LAB	10/23/2019	12:30:43	1.3	0.1	0.01	-0.1	0.0	0.003	148.8	0.999
N2_SYS_3565.LAB	10/23/2019	12:30:57	0.5	0.1	0.01	-0.1	0.0	0.001	148.8	0.999
N2_SYS_3566.LAB	10/23/2019	12:31:12	0.3	0.1	0.00	-0.1	0.0	0.000	148.8	0.999
N2_SYS_3567.LAB	10/23/2019	12:31:27	0.2	0.1	0.00	0.0	0.0	0.001	148.8	0.999
N2_SYS_3568.LAB	10/23/2019	12:31:41	0.2	0.2	0.01	0.0	0.0	0.000	148.7	0.999
N2_SYS_3569.LAB	10/23/2019	12:31:56	0.2	0.1	0.00	0.0	0.0	-0.001	148.7	0.999
N2_SYS_3570.LAB	10/23/2019	12:32:11	0.1	0.2	0.00	0.0	0.0	-0.001	148.8	0.999
N2_SYS_3571.LAB	10/23/2019	12:32:26	0.2	0.1	0.01	0.0	0.0	0.000	148.8	0.999
N2_SYS_3572.LAB	10/23/2019	12:32:40	0.2	0.1	0.01	0.0	0.0	0.000	148.7	0.999
N2_SYS_3573.LAB	10/23/2019	12:32:56	0.1	0.2	0.01	0.0	0.0	-0.002	148.7	0.999

Dilutied 30.00 % CO2 System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CALS_DIL_3593.LAB	10/23/2019	13:28:31	-0.1	0.3	0.25	0.0	0.0	0.001	148.9	0.998	116.6
CALS_DIL_3594.LAB	10/23/2019	13:28:41	-0.1	0.1	0.30	0.0	0.0	0.000	148.8	0.998	98.5
CALS_DIL_3595.LAB	10/23/2019	13:28:51	-0.1	0.0	0.30	0.0	0.0	-0.002	148.8	0.998	96.9
CALS_DIL_3596.LAB	10/23/2019	13:29:00	-0.1	0.0	0.31	0.0	0.0	-0.001	148.8	0.998	95.6
CALS_DIL_3597.LAB	10/23/2019	13:29:10	-0.1	0.0	0.30	0.0	0.0	0.000	148.8	0.998	96.9
CALS_DIL_3598.LAB	10/23/2019	13:29:20	-0.2	0.0	0.30	0.0	0.0	-0.001	148.8	0.998	98.0
CALS_DIL_3599.LAB	10/23/2019	13:29:30	-0.1	0.0	0.31	0.0	0.0	0.000	148.8	0.998	96.1
CALS_DIL_3600.LAB	10/23/2019	13:29:40	-0.2	0.1	0.29	0.0	0.0	0.000	148.8	0.998	101.0
CALS_DIL_3601.LAB	10/23/2019	13:29:50	-0.1	0.0	0.30	0.0	0.0	-0.001	148.8	0.998	97.2
CALS_DIL_3602.LAB	10/23/2019	13:29:59	-0.1	0.1	0.30	0.0	0.0	0.000	148.8	0.998	96.5
CALS_DIL_3603.LAB	10/23/2019	13:30:09	-0.1	0.1	0.32	0.0	0.0	-0.001	148.8	0.998	92.4
CALS_DIL_3604.LAB	10/23/2019	13:30:19	-0.1	0.1	0.30	-0.1	0.0	0.002	148.8	0.998	96.2
CALS_DIL_3605.LAB	10/23/2019	13:30:29	-0.1	0.0	0.31	0.0	0.0	0.002	148.8	0.998	95.4
CALS_DIL_3606.LAB	10/23/2019	13:30:39	-0.1	0.0	0.30	0.0	0.0	-0.001	148.9	0.998	98.5
CALS_DIL_3607.LAB	10/23/2019	13:30:49	-0.1	0.1	0.29	0.0	0.0	0.001	148.8	0.998	100.0
CALS_DIL_3608.LAB	10/23/2019	13:30:58	-0.1	0.1	0.30	0.0	0.0	0.000	148.8	0.998	96.9
CALS_DIL_3609.LAB	10/23/2019	13:31:08	-0.1	0.1	0.23	0.3	0.0	0.000	148.8	0.998	128.2
		Average									**100.1**

CTS Diluted, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CALS_DIL_3611.LAB	10/23/2019	13:31:28	-0.1	0.1	0.01	1.0	0.0	-0.002	148.8	0.998	103.3
CALS_DIL_3612.LAB	10/23/2019	13:31:38	-0.1	0.2	0.00	1.1	0.0	-0.001	148.8	0.998	96.6
CALS_DIL_3613.LAB	10/23/2019	13:31:48	0.0	0.2	-0.01	1.1	0.0	0.001	148.8	0.998	96.5
CALS_DIL_3614.LAB	10/23/2019	13:31:57	0.0	0.1	0.01	1.1	0.0	0.000	148.8	0.998	95.8
CALS_DIL_3615.LAB	10/23/2019	13:32:07	-0.1	0.1	0.00	1.0	0.0	-0.001	148.7	0.998	103.7
CALS_DIL_3616.LAB	10/23/2019	13:32:17	-0.1	0.0	0.00	1.0	0.0	-0.001	148.9	0.998	98.9
CALS_DIL_3617.LAB	10/23/2019	13:32:27	0.0	0.1	0.00	1.0	0.0	0.002	148.9	0.998	99.5
CALS_DIL_3618.LAB	10/23/2019	13:32:37	-0.1	0.0	0.00	1.1	0.0	0.001	148.8	0.998	93.9
CALS_DIL_3619.LAB	10/23/2019	13:32:47	-0.1	0.1	0.00	1.0	0.0	0.000	148.9	0.998	101.6
CALS_DIL_3620.LAB	10/23/2019	13:32:56	-0.1	0.0	-0.01	1.1	0.0	-0.001	148.8	0.998	95.9
CALS_DIL_3621.LAB	10/23/2019	13:33:06	-0.1	0.1	0.00	1.0	0.0	-0.002	148.7	0.998	101.5
CALS_DIL_3622.LAB	10/23/2019	13:33:16	-0.1	0.1	0.00	1.0	0.0	0.000	148.9	0.998	99.7
CALS_DIL_3623.LAB	10/23/2019	13:33:26	-0.1	0.1	0.01	1.0	0.0	0.000	148.8	0.998	99.3
CALS_DIL_3624.LAB	10/23/2019	13:33:36	-0.1	0.1	0.01	0.9	0.0	0.005	148.7	0.998	109.1
		Average									**99.4**

Diluted Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CALS_DIL_3625.LAB	10/23/2019	13:33:46	-0.1	0.0	0.00	0.3	0.0	0.044	148.8	0.998
CALS_DIL_3626.LAB	10/23/2019	13:33:55	-0.1	0.0	0.01	0.1	0.0	0.051	148.7	0.998
CALS_DIL_3627.LAB	10/23/2019	13:34:05	-0.1	0.1	0.00	0.0	0.0	0.053	148.8	0.998
CALS_DIL_3628.LAB	10/23/2019	13:34:15	-0.1	0.1	0.01	0.1	0.0	0.056	148.9	0.998
CALS_DIL_3629.LAB	10/23/2019	13:34:25	-0.1	0.2	0.01	0.1	0.0	0.055	148.7	0.998
CALS_DIL_3630.LAB	10/23/2019	13:34:35	0.0	0.1	0.00	0.0	0.0	0.055	148.9	0.998
CALS_DIL_3631.LAB	10/23/2019	13:34:45	0.0	0.0	0.01	0.0	0.0	0.055	148.8	0.998
CALS_DIL_3632.LAB	10/23/2019	13:34:54	-0.1	0.1	0.01	0.1	0.0	0.056	148.8	0.998
CALS_DIL_3633.LAB	10/23/2019	13:35:04	0.0	0.0	0.00	0.0	0.0	0.056	148.9	0.998
CALS_DIL_3634.LAB	10/23/2019	13:35:14	-0.1	0.0	0.01	0.1	0.0	0.053	148.7	0.998
CALS_DIL_3635.LAB	10/23/2019	13:35:24	0.0	0.1	0.01	0.1	0.0	0.056	148.8	0.998

Diluted Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CALS_1_3704.LAB	10/23/2019	15:09:56	0.0	0.0	0.00	0.0	0.0	0.00	148.6	1.024
CALS_1_3705.LAB	10/23/2019	15:10:06	-0.1	0.1	0.00	-0.1	0.0	0.00	148.6	1.024
CALS_1_3706.LAB	10/23/2019	15:10:16	0.0	0.0	0.00	0.0	0.0	0.00	148.6	1.024
CALS_1_3707.LAB	10/23/2019	15:10:26	-0.1	0.0	0.00	0.0	0.0	0.00	148.6	1.024
CALS_1_3708.LAB	10/23/2019	15:10:36	-0.1	0.0	0.01	0.0	0.0	0.00	148.6	1.024
CALS_1_3709.LAB	10/23/2019	15:10:45	0.0	0.0	0.00	0.0	0.0	0.00	148.6	1.025
CALS_1_3710.LAB	10/23/2019	15:10:55	0.2	0.0	0.00	-0.1	0.0	0.00	148.6	1.024
CALS_1_3711.LAB	10/23/2019	15:11:05	0.2	0.1	-0.01	0.1	0.0	0.00	148.6	1.025
CALS_1_3712.LAB	10/23/2019	15:11:15	0.1	0.1	0.00	0.3	0.0	0.00	148.6	1.025
CALS_1_3713.LAB	10/23/2019	15:11:25	0.0	0.0	0.01	0.3	0.0	0.00	148.6	1.025

CTS Diluted, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CALS_1_3729.LAB	10/23/2019	15:15:13	-0.1	0.0	0.00	0.7	0.0	0.00	148.5	1.004	149.5
CALS_1_3730.LAB	10/23/2019	15:15:22	-0.2	0.0	0.00	0.7	0.0	0.00	148.5	1.004	153.9
CALS_1_3731.LAB	10/23/2019	15:15:32	-0.1	0.0	0.00	0.6	0.0	0.00	148.6	1.004	159.7
CALS_1_3732.LAB	10/23/2019	15:15:42	-0.1	-0.1	0.01	0.6	0.0	0.00	148.6	1.004	164.2
CALS_1_3733.LAB	10/23/2019	15:15:52	-0.1	0.0	0.00	0.7	0.0	0.00	148.5	1.004	155.0
CALS_1_3734.LAB	10/23/2019	15:16:02	-0.1	0.0	0.00	0.7	0.0	0.00	148.6	1.004	153.4
CALS_1_3735.LAB	10/23/2019	15:16:12	-0.1	-0.1	0.00	0.7	0.0	0.00	148.6	1.004	146.5
CALS_1_3736.LAB	10/23/2019	15:16:22	-0.1	0.0	0.00	0.6	0.0	0.00	148.6	1.004	159.4
CALS_1_3737.LAB	10/23/2019	15:16:31	-0.1	-0.1	-0.01	0.7	0.0	0.00	148.6	1.004	155.5
CALS_1_3738.LAB	10/23/2019	15:16:41	-0.2	0.0	0.00	0.7	0.0	0.00	148.6	1.004	151.6
CALS_1_3739.LAB	10/23/2019	15:16:51	-0.1	0.0	0.00	0.7	0.0	0.00	148.6	1.004	155.1
CALS_1_3740.LAB	10/23/2019	15:17:01	-0.1	0.0	0.00	0.7	0.0	0.00	148.6	1.004	149.5
CALS_1_3741.LAB	10/23/2019	15:17:11	-0.2	0.1	0.00	0.7	0.0	0.00	148.6	1.004	153.4
CALS_1_3742.LAB	10/23/2019	15:17:20	-0.1	-0.1	0.00	0.7	0.0	0.00	148.5	1.004	144.8
CALS_1_3743.LAB	10/23/2019	15:17:30	-0.1	0.0	0.00	0.6	0.0	0.00	148.5	1.004	163.1
CALS_1_3744.LAB	10/23/2019	15:17:40	-0.1	0.1	0.00	0.7	0.0	0.00	148.5	1.004	149.0
CALS_1_3745.LAB	10/23/2019	15:17:50	-0.2	0.0	-0.01	0.6	0.0	0.00	148.6	1.004	158.9
CALS_1_3746.LAB	10/23/2019	15:18:00	-0.1	0.0	0.00	0.7	0.0	0.00	148.6	1.004	155.2
CALS_1_3747.LAB	10/23/2019	15:18:10	-0.2	0.0	0.00	0.6	0.0	0.00	148.6	1.005	159.4
		Average									**154.6**

Dilutied 30.00 % CO2 System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CALS_1_3763.LAB	10/23/2019	15:20:48	-0.1	0.0	0.18	0.0	0.0	0.00	148.5	1.004	163.4
CALS_1_3764.LAB	10/23/2019	15:20:58	-0.2	0.0	0.19	0.0	0.0	0.00	148.6	1.004	156.4
CALS_1_3765.LAB	10/23/2019	15:21:08	-0.1	0.0	0.19	0.0	0.0	0.00	148.5	1.004	157.5
CALS_1_3766.LAB	10/23/2019	15:21:18	-0.1	0.0	0.19	0.0	0.0	0.00	148.6	1.004	153.7
CALS_1_3767.LAB	10/23/2019	15:21:27	-0.2	-0.1	0.19	0.0	0.0	0.00	148.6	1.005	153.0
CALS_1_3768.LAB	10/23/2019	15:21:37	-0.1	0.0	0.19	0.0	0.0	0.00	148.6	1.005	152.5
CALS_1_3769.LAB	10/23/2019	15:21:47	-0.1	0.1	0.19	0.0	0.0	0.00	148.6	1.004	157.3
CALS_1_3770.LAB	10/23/2019	15:21:57	-0.1	0.0	0.20	0.0	0.0	0.00	148.6	1.005	148.5
CALS_1_3771.LAB	10/23/2019	15:22:07	-0.1	-0.1	0.19	0.1	0.0	0.00	148.6	1.004	154.6
CALS_1_3772.LAB	10/23/2019	15:22:16	-0.2	0.0	0.19	0.1	0.0	0.00	148.6	1.004	153.6
CALS_1_3773.LAB	10/23/2019	15:22:26	-0.2	0.1	0.19	0.0	0.0	0.00	148.6	1.005	150.7
CALS_1_3774.LAB	10/23/2019	15:22:36	-0.1	0.0	0.19	0.0	0.0	0.00	148.6	1.005	153.7
CALS_1_3775.LAB	10/23/2019	15:22:46	-0.2	0.1	0.20	0.0	0.0	0.00	148.6	1.004	149.3
CALS_1_3776.LAB	10/23/2019	15:22:56	-0.2	0.0	0.20	0.0	0.0	0.00	148.6	1.005	150.4
CALS_1_3777.LAB	10/23/2019	15:23:06	-0.1	0.0	0.20	0.0	0.0	0.00	148.6	1.005	150.2
CALS_1_3778.LAB	10/23/2019	15:23:16	-0.2	0.0	0.19	0.0	0.0	0.00	148.6	1.004	152.3
		Average									**153.6**

Dilutied 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CALS_1_3793.LAB	10/23/2019	15:25:43	-0.1	0.6	0.03	0.0	0.0	0.00	148.6	1.004	156.2
CALS_1_3794.LAB	10/23/2019	15:25:53	-0.2	0.7	0.02	0.0	0.0	0.00	148.6	1.004	148.4
CALS_1_3795.LAB	10/23/2019	15:26:03	-0.2	0.6	0.01	0.0	0.0	0.00	148.6	1.004	161.2
CALS_1_3796.LAB	10/23/2019	15:26:13	-0.2	0.7	0.02	0.0	0.0	0.00	148.6	1.004	146.2
CALS_1_3797.LAB	10/23/2019	15:26:22	-0.2	0.6	0.01	0.0	0.0	0.00	148.6	1.004	179.0
CALS_1_3798.LAB	10/23/2019	15:26:32	-0.2	0.6	0.01	0.0	0.0	0.00	148.5	1.004	159.0
CALS_1_3799.LAB	10/23/2019	15:26:42	-0.1	0.6	0.01	0.0	0.0	0.00	148.6	1.004	165.8
CALS_1_3800.LAB	10/23/2019	15:26:52	-0.2	0.7	0.01	0.0	0.0	0.00	148.6	1.004	144.3
CALS_1_3801.LAB	10/23/2019	15:27:02	-0.2	0.6	0.00	0.0	0.0	0.00	148.6	1.005	156.8
CALS_1_3802.LAB	10/23/2019	15:27:12	-0.2	0.6	0.00	0.0	0.0	0.00	148.6	1.004	163.6
CALS_1_3803.LAB	10/23/2019	15:27:22	-0.2	0.7	0.01	0.0	0.0	0.00	148.5	1.004	141.6
		Average									**156.6**

CTS Diluted, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CALS_1_3831.LAB	10/23/2019	16:02:22	11.2	0.0	-0.01	0.6	0.0	0.00	148.4	0.997	166.7
CALS_1_3832.LAB	10/23/2019	16:02:31	10.3	0.0	0.01	0.6	0.0	0.00	148.5	0.997	162.9
CALS_1_3833.LAB	10/23/2019	16:02:41	9.6	0.0	0.01	0.6	0.0	0.00	148.5	0.997	167.3
CALS_1_3834.LAB	10/23/2019	16:02:51	8.8	0.0	0.00	0.6	0.0	0.00	148.5	0.997	159.3
CALS_1_3835.LAB	10/23/2019	16:03:01	8.2	0.0	0.00	0.6	0.0	0.00	148.4	0.997	171.4
CALS_1_3836.LAB	10/23/2019	16:03:11	7.5	0.0	0.00	0.6	0.0	0.00	148.6	0.997	158.9
CALS_1_3837.LAB	10/23/2019	16:03:21	7.0	0.0	0.00	0.6	0.0	0.00	148.5	0.997	161.2
CALS_1_3838.LAB	10/23/2019	16:03:31	6.5	0.1	0.01	0.7	0.0	0.00	148.5	0.997	145.9
CALS_1_3839.LAB	10/23/2019	16:03:40	6.0	0.0	0.01	0.7	0.0	0.00	148.6	0.997	148.6
CALS_1_3840.LAB	10/23/2019	16:03:50	5.6	0.1	0.01	0.7	0.0	0.00	148.5	0.997	156.2
CALS_1_3841.LAB	10/23/2019	16:04:00	5.4	0.0	0.00	0.7	0.0	0.00	148.6	0.997	150.7
CALS_1_3842.LAB	10/23/2019	16:04:10	5.5	0.1	0.01	0.6	0.0	0.00	148.6	0.997	172.6
CALS_1_3843.LAB	10/23/2019	16:04:20	5.6	0.0	0.00	0.7	0.0	0.00	148.5	0.997	143.6
CALS_1_3844.LAB	10/23/2019	16:04:30	6.4	-0.1	0.03	0.6	0.0	0.00	148.5	0.998	163.3
		Average									**159.2**

Dilutied 30.00 % CO2 System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CALS_1_3854.LAB	10/23/2019	16:06:08	1.8	0.0	0.18	0.0	0.0	0.00	148.5	0.997	163.2
CALS_1_3855.LAB	10/23/2019	16:06:18	1.4	0.0	0.18	0.1	0.0	0.00	148.5	0.997	163.2
CALS_1_3856.LAB	10/23/2019	16:06:28	1.2	0.0	0.18	0.0	0.0	0.00	148.5	0.998	161.1
CALS_1_3857.LAB	10/23/2019	16:06:38	1.0	0.0	0.18	0.0	0.0	0.00	148.6	0.997	160.3
CALS_1_3858.LAB	10/23/2019	16:06:48	0.7	0.0	0.19	0.1	0.0	0.00	148.5	0.997	155.6
CALS_1_3859.LAB	10/23/2019	16:06:58	0.6	-0.1	0.20	0.0	0.0	0.00	148.5	0.997	147.1
CALS_1_3860.LAB	10/23/2019	16:07:07	0.6	-0.1	0.19	0.0	0.0	0.00	148.5	0.997	158.4
CALS_1_3861.LAB	10/23/2019	16:07:17	0.4	0.0	0.19	0.0	0.0	0.00	148.5	0.997	157.6
CALS_1_3862.LAB	10/23/2019	16:07:27	0.3	0.0	0.20	-0.1	0.0	0.00	148.6	0.998	148.9
		Average									**157.3**

CTS Diluted, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CTS_2_3946.LAB	10/23/2019	17:20:12	17.2	0.0	0.00	0.6	0.0	0.00	148.5	0.997	161.8
CTS_2_3947.LAB	10/23/2019	17:20:21	15.6	-0.1	0.00	0.6	0.0	0.00	148.5	0.997	165.8
CTS_2_3948.LAB	10/23/2019	17:20:31	14.3	0.1	0.01	0.6	0.0	0.00	148.6	0.997	169.2
CTS_2_3949.LAB	10/23/2019	17:20:41	13.2	0.0	0.00	0.7	0.0	0.00	148.5	0.997	147.6
CTS_2_3950.LAB	10/23/2019	17:20:51	12.2	0.0	-0.01	0.7	0.0	0.00	148.5	0.997	147.7
CTS_2_3951.LAB	10/23/2019	17:21:01	11.3	-0.1	0.00	0.6	0.0	0.00	148.5	0.997	163.3
CTS_2_3952.LAB	10/23/2019	17:21:11	10.4	0.0	0.01	0.7	0.0	0.00	148.5	0.997	139.5
CTS_2_3953.LAB	10/23/2019	17:21:21	9.7	0.0	0.00	0.7	0.0	0.00	148.5	0.997	144.4
CTS_2_3954.LAB	10/23/2019	17:21:30	8.9	-0.1	0.01	0.7	0.0	0.00	148.5	0.997	154.6
CTS_2_3955.LAB	10/23/2019	17:21:40	8.3	0.1	0.01	0.7	0.0	0.00	148.5	0.997	150.9
CTS_2_3956.LAB	10/23/2019	17:21:50	7.7	0.0	0.01	0.7	0.0	0.00	148.4	0.997	152.9
CTS_2_3957.LAB	10/23/2019	17:22:00	7.2	-0.1	0.01	0.6	0.0	0.00	148.5	0.997	160.1
CTS_2_3958.LAB	10/23/2019	17:22:10	18.3	0.0	0.01	0.6	0.0	0.00	148.5	0.997	158.2
		Average									**155.1**

Dilutied 30.00 % CO2 System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CTS_2_3969.LAB	10/23/2019	17:23:58	4.6	0.0	0.18	0.0	0.0	0.00	148.4	0.997	164.7
CTS_2_3970.LAB	10/23/2019	17:24:07	3.7	0.0	0.18	0.1	0.0	0.00	148.5	0.997	160.0
CTS_2_3971.LAB	10/23/2019	17:24:18	3.1	0.0	0.20	0.0	0.0	0.00	148.4	0.997	149.0
CTS_2_3972.LAB	10/23/2019	17:24:27	2.6	0.0	0.18	0.0	0.0	0.00	148.5	0.997	158.8
CTS_2_3973.LAB	10/23/2019	17:24:37	2.1	0.0	0.18	0.0	0.0	0.00	148.5	0.997	158.9
CTS_2_3974.LAB	10/23/2019	17:24:47	1.8	0.1	0.19	0.0	0.0	0.00	148.5	0.997	154.7
CTS_2_3975.LAB	10/23/2019	17:24:57	1.5	0.0	0.18	0.0	0.0	0.00	148.5	0.996	160.2
CTS_2_3976.LAB	10/23/2019	17:25:06	1.2	0.0	0.20	0.0	0.0	0.00	148.5	0.997	145.7
CTS_2_3977.LAB	10/23/2019	17:25:16	1.1	-0.1	0.21	0.0	0.0	0.00	148.4	0.997	141.1
CTS_2_3978.LAB	10/23/2019	17:25:26	0.9	0.0	0.19	0.0	0.0	0.00	148.5	0.997	151.0
CTS_2_3979.LAB	10/23/2019	17:25:36	0.8	0.0	0.19	0.0	0.0	0.00	148.5	0.997	156.0
CTS_2_3980.LAB	10/23/2019	17:25:46	0.7	0.0	0.20	0.0	0.0	0.00	148.5	0.997	147.5
CTS_2_3981.LAB	10/23/2019	17:25:56	0.6	0.0	0.20	0.0	0.0	0.00	148.5	0.997	148.4
CTS_2_3982.LAB	10/23/2019	17:26:05	7.4	0.0	0.19	0.0	0.0	0.00	148.4	0.997	155.2
		Average									**153.7**

Dilutied 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CTS_2_3992.LAB	10/23/2019	17:27:44	7.9	0.6	0.04	0.0	0.0	0.00	148.5	0.997	176.9
CTS_2_3993.LAB	10/23/2019	17:27:54	6.5	0.6	0.03	-0.1	0.0	0.00	148.5	0.997	160.2
CTS_2_3994.LAB	10/23/2019	17:28:03	5.2	0.6	0.02	0.0	0.0	0.00	148.6	0.997	161.0
CTS_2_3995.LAB	10/23/2019	17:28:13	4.3	0.5	0.02	0.1	0.0	0.00	148.4	0.997	184.5
CTS_2_3996.LAB	10/23/2019	17:28:23	3.5	0.7	0.01	0.0	0.0	0.00	148.5	0.997	142.5
CTS_2_3997.LAB	10/23/2019	17:28:33	3.0	0.7	0.02	0.0	0.0	0.00	148.5	0.997	145.9
CTS_2_3998.LAB	10/23/2019	17:28:43	2.5	0.7	0.01	0.0	0.0	0.00	148.5	0.997	146.1
CTS_2_3999.LAB	10/23/2019	17:28:53	2.1	0.6	0.01	0.0	0.0	0.00	148.5	0.997	176.6
CTS_2_4000.LAB	10/23/2019	17:29:02	1.8	0.7	0.02	0.0	0.0	0.00	148.5	0.997	138.6
CTS_2_4001.LAB	10/23/2019	17:29:12	1.5	0.6	0.00	0.0	0.0	0.00	148.5	0.997	170.3
CTS_2_4002.LAB	10/23/2019	17:29:22	1.3	0.6	0.01	0.0	0.0	0.00	148.5	0.997	156.3
CTS_2_4003.LAB	10/23/2019	17:29:32	1.2	0.7	0.00	0.0	0.0	0.00	148.5	0.997	138.3
CTS_2_4004.LAB	10/23/2019	17:29:42	1.0	0.7	0.02	-0.1	0.0	0.00	148.5	0.997	138.5
CTS_2_4005.LAB	10/23/2019	17:29:51	0.9	0.7	0.01	0.0	0.0	0.00	148.5	0.997	155.2
CTS_2_4006.LAB	10/23/2019	17:30:02	0.8	0.6	0.01	0.0	0.0	0.00	148.4	0.997	157.7
CTS_2_4007.LAB	10/23/2019	17:30:11	0.7	0.6	0.01	0.0	0.0	0.00	148.4	0.997	165.2
CTS_2_4008.LAB	10/23/2019	17:30:21	0.6	0.7	0.00	0.0	0.0	0.00	148.5	0.997	150.4
		Average									**156.7**

CTS Diluted, 99.95 ppm Ethylene System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CTS_3_4149.LAB	10/23/2019	19:39:51	26.8	0.1	0.01	0.7	0.0	0.00	148.6	0.981	155.8
CTS_3_4150.LAB	10/23/2019	19:40:01	23.7	0.0	0.01	0.6	0.0	0.00	148.6	0.982	165.0
CTS_3_4151.LAB	10/23/2019	19:40:11	21.2	0.0	0.01	0.6	0.0	0.00	148.6	0.981	160.8
CTS_3_4152.LAB	10/23/2019	19:40:21	19.1	0.0	0.00	0.7	0.0	0.00	148.6	0.981	154.2
CTS_3_4153.LAB	10/23/2019	19:40:30	17.3	0.0	0.01	0.7	0.0	0.00	148.6	0.981	150.0
CTS_3_4154.LAB	10/23/2019	19:40:40	15.8	0.0	0.01	0.6	0.0	0.00	148.6	0.981	167.6
CTS_3_4155.LAB	10/23/2019	19:40:50	14.5	0.0	0.00	0.6	0.0	0.00	148.7	0.981	160.1
CTS_3_4156.LAB	10/23/2019	19:41:00	13.3	0.0	0.00	0.7	0.0	0.00	148.6	0.981	145.9
CTS_3_4157.LAB	10/23/2019	19:41:10	12.4	0.0	0.01	0.7	0.0	0.00	148.6	0.981	149.9
CTS_3_4158.LAB	10/23/2019	19:41:20	11.5	-0.1	0.00	0.7	0.0	0.00	148.6	0.981	147.2
CTS_3_4159.LAB	10/23/2019	19:41:29	30.0	0.1	0.01	0.6	0.0	0.00	148.6	0.981	159.3
		Average									**156.0**

Dilutied 30.00 % CO2 System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CTS_3_4170.LAB	10/23/2019	19:43:18	7.2	0.0	0.19	0.0	0.0	0.00	148.6	0.981	156.8
CTS_3_4171.LAB	10/23/2019	19:43:27	5.9	0.0	0.18	0.1	0.0	0.00	148.6	0.981	161.0
CTS_3_4172.LAB	10/23/2019	19:43:37	4.9	0.0	0.18	0.1	0.0	0.00	148.6	0.981	159.9
CTS_3_4173.LAB	10/23/2019	19:43:47	4.1	0.0	0.19	0.0	0.0	0.00	148.6	0.981	155.7
CTS_3_4174.LAB	10/23/2019	19:43:57	3.5	-0.1	0.19	0.0	0.0	0.00	148.6	0.982	155.0
CTS_3_4175.LAB	10/23/2019	19:44:07	2.9	0.0	0.19	0.0	0.0	0.00	148.6	0.981	153.7
CTS_3_4176.LAB	10/23/2019	19:44:17	2.5	0.0	0.19	0.0	0.0	0.00	148.6	0.981	154.3
CTS_3_4177.LAB	10/23/2019	19:44:26	2.1	-0.1	0.19	0.0	0.0	0.00	148.6	0.982	151.0
CTS_3_4178.LAB	10/23/2019	19:44:36	1.9	-0.1	0.20	0.0	0.0	0.00	148.6	0.981	144.0
CTS_3_4179.LAB	10/23/2019	19:44:46	1.5	0.0	0.19	0.0	0.0	0.00	148.6	0.981	150.6
		Average									**154.2**

Diluted Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene oxide (ppmv wet)	Methane (ppmv wet)	CO2 (%v wet)	Ethylene (ppmv wet)	Water (%v)	SF6 (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor
CTS_3_4186.LAB	10/23/2019	19:45:55	1.1	0.5	0.04	0.0	0.0	0.00	148.6	0.982	217.6
CTS_3_4187.LAB	10/23/2019	19:46:05	1.0	0.6	0.05	0.0	0.0	0.00	148.6	0.981	164.9
CTS_3_4188.LAB	10/23/2019	19:46:15	0.8	0.6	0.04	0.0	0.0	0.00	148.6	0.982	166.9
CTS_3_4189.LAB	10/23/2019	19:46:24	0.7	0.6	0.04	0.0	0.0	0.00	148.6	0.982	168.0
CTS_3_4190.LAB	10/23/2019	19:46:35	0.6	0.6	0.03	0.1	0.0	0.00	148.6	0.981	162.3
CTS_3_4191.LAB	10/23/2019	19:46:44	0.5	0.7	0.02	0.0	0.0	0.00	148.6	0.982	143.6
CTS_3_4192.LAB	10/23/2019	19:46:54	0.4	0.6	0.03	0.1	0.0	0.00	148.6	0.982	184.3
CTS_3_4193.LAB	10/23/2019	19:47:04	0.3	0.7	0.03	0.0	0.0	0.00	148.6	0.981	149.3
CTS_3_4194.LAB	10/23/2019	19:47:14	0.3	0.6	0.01	0.0	0.0	0.00	148.6	0.982	171.0
CTS_3_4195.LAB	10/23/2019	19:47:23	0.3	0.7	0.01	0.0	0.0	0.00	148.5	0.981	148.9
CTS_3_4196.LAB	10/23/2019	19:47:33	0.2	0.7	0.02	0.0	0.0	0.00	148.6	0.982	138.5
CTS_3_4197.LAB	10/23/2019	19:47:43	0.2	0.6	0.01	0.0	0.0	0.00	148.6	0.981	157.5
CTS_3_4198.LAB	10/23/2019	19:47:53	0.1	0.7	0.00	0.0	0.0	0.00	148.6	0.981	137.6
CTS_3_4199.LAB	10/23/2019	19:48:03	0.2	0.8	0.02	-0.1	0.0	0.00	148.6	0.982	129.5
CTS_3_4200.LAB	10/23/2019	19:48:12	0.1	0.8	0.02	0.0	0.0	0.00	148.6	0.981	134.4
		Average									**158.3**

Zero Gas (Nitrogen) Direct to FTIR

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
ZERO DIRECT_0000002.LAB	10/22/2019	12:41:08	0.004	0.01	-0.10	150.8	0.973
ZERO DIRECT_0000003.LAB	10/22/2019	12:42:06	0.005	0.01	-0.06	150.7	0.974
ZERO DIRECT_0000004.LAB	10/22/2019	12:43:05	-0.002	0.01	0.01	150.5	0.973
ZERO DIRECT_0000005.LAB	10/22/2019	12:44:04	-0.009	0.02	0.06	150.5	0.975
ZERO DIRECT_0000006.LAB	10/22/2019	12:45:03	-0.008	0.01	0.07	150.7	0.975
ZERO DIRECT_0000007.LAB	10/22/2019	12:46:02	-0.018	0.01	0.06	150.9	0.974
ZERO DIRECT_0000008.LAB	10/22/2019	12:47:01	-0.005	0.01	0.07	150.7	0.974
ZERO DIRECT_0000009.LAB	10/22/2019	12:47:59	-0.012	0.01	0.04	150.7	0.975

CTS, 100.0 ppm Methane Direct Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS DIRECT_0000015.LAB	10/22/2019	13:20:51	0.119	0.02	102.96	150.0	0.998	103.0%
CTS DIRECT_0000016.LAB	10/22/2019	13:21:06	0.120	0.02	103.04	150.1	0.997	103.0%
CTS DIRECT_0000017.LAB	10/22/2019	13:21:20	0.124	0.02	103.23	150.2	0.995	103.2%
CTS DIRECT_0000018.LAB	10/22/2019	13:21:35	0.123	0.02	102.76	150.1	0.998	102.8%
CTS DIRECT_0000019.LAB	10/22/2019	13:21:50	0.128	0.02	103.20	150.1	0.994	103.2%
CTS DIRECT_0000020.LAB	10/22/2019	13:22:04	0.130	0.02	103.00	150.1	0.996	103.0%
CTS DIRECT_0000021.LAB	10/22/2019	13:22:19	0.136	0.02	102.90	150.1	0.997	102.9%
		Average			**103.0**			

4.984 ppm Ethylene Oxide / 5.031 SF6 Direct Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	EtO Recovery (%)
CAL DIRECT_0000029.LAB	10/22/2019	13:24:17	4.800	0.01	0.13	150.4	1.012	96.3%
CAL DIRECT_0000030.LAB	10/22/2019	13:24:31	4.823	0.01	0.10	150.2	1.013	96.8%
CAL DIRECT_0000031.LAB	10/22/2019	13:24:46	4.842	0.01	0.11	150.2	1.014	97.2%
CAL DIRECT_0000032.LAB	10/22/2019	13:25:01	4.853	0.01	0.12	150.4	1.014	97.4%
CAL DIRECT_0000033.LAB	10/22/2019	13:25:16	4.874	0.01	0.12	150.2	1.013	97.8%
CAL DIRECT_0000034.LAB	10/22/2019	13:25:30	4.878	0.01	0.12	150.1	1.015	97.9%
CAL DIRECT_0000035.LAB	10/22/2019	13:25:45	4.903	0.01	0.10	150.2	1.013	98.4%
CAL DIRECT_0000036.LAB	10/22/2019	13:26:00	4.907	0.01	0.12	150.3	1.015	98.4%
		Average	**4.860**					

Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
ZERO SYSTEM_0000040.LAB	10/22/2019	13:30:04	-0.011	0.03	0.11	150.1	1.032
ZERO SYSTEM_0000041.LAB	10/22/2019	13:31:02	-0.021	0.03	0.11	150.2	1.033
ZERO SYSTEM_0000042.LAB	10/22/2019	13:32:01	-0.012	0.03	0.10	150.1	1.031
ZERO SYSTEM_0000043.LAB	10/22/2019	13:33:00	-0.012	0.02	0.12	150.1	1.032
ZERO SYSTEM_0000044.LAB	10/22/2019	13:33:59	-0.015	0.03	0.11	150.1	1.030
ZERO SYSTEM_0000045.LAB	10/22/2019	13:34:58	-0.014	0.02	0.11	150.1	1.030
ZERO SYSTEM_0000046.LAB	10/22/2019	13:35:57	-0.015	0.02	0.11	150.1	1.033
ZERO SYSTEM_0000047.LAB	10/22/2019	13:36:56	-0.013	0.02	0.12	150.1	1.029

CTS, 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000048.LAB	10/22/2019	13:44:14	0.143	0.03	105.07	150.0	1.030	102.0%
CTS SYSTEM_0000049.LAB	10/22/2019	13:44:28	0.166	0.03	105.12	150.0	1.029	102.0%
CTS SYSTEM_0000050.LAB	10/22/2019	13:44:43	0.136	0.03	105.21	150.0	1.029	102.1%
CTS SYSTEM_0000051.LAB	10/22/2019	13:44:58	0.145	0.03	105.16	150.0	1.029	102.1%
CTS SYSTEM_0000052.LAB	10/22/2019	13:45:13	0.158	0.03	105.09	149.9	1.030	102.0%
CTS SYSTEM_0000053.LAB	10/22/2019	13:45:27	0.128	0.03	104.92	150.1	1.032	101.9%
CTS SYSTEM_0000054.LAB	10/22/2019	13:45:42	0.118	0.03	105.13	150.0	1.030	102.1%

Dry Bed Outlet, Prior to Analyte Spike

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
NATIVE_0000055.LAB	10/22/2019	13:48:42	-0.017	1.18	2.57	150.1	1.031
NATIVE_0000056.LAB	10/22/2019	13:48:57	-0.029	1.18	2.57	150.1	1.030
NATIVE_0000057.LAB	10/22/2019	13:49:12	-0.024	1.18	2.59	150.2	1.033
NATIVE_0000058.LAB	10/22/2019	13:49:26	-0.025	1.18	2.62	150.1	1.033
NATIVE_0000059.LAB	10/22/2019	13:49:41	-0.024	1.18	2.68	150.1	1.032
NATIVE_0000060.LAB	10/22/2019	13:49:56	-0.022	1.18	2.71	150.1	1.029
NATIVE_0000061.LAB	10/22/2019	13:50:11	-0.040	1.17	2.64	150.1	1.032
NATIVE_0000062.LAB	10/22/2019	13:50:25	-0.017	1.17	2.64	150.1	1.030
		Average	**-0.025**				

Dry Bed Outlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6, Note: SF6 was measured using a 2nd FTIR

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor	EtO Recovery (%)
SPIKE_0000081.LAB	10/22/2019	14:01:42	0.413	1.10	2.20	150.8	1.012	0.082	110.0%
SPIKE_0000082.LAB	10/22/2019	14:01:57	0.404	1.10	2.21	150.5	1.015	0.082	107.6%
SPIKE_0000083.LAB	10/22/2019	14:02:11	0.390	1.11	2.27	150.8	1.013	0.082	103.9%
SPIKE_0000084.LAB	10/22/2019	14:02:26	0.391	1.11	2.29	150.9	1.015	0.082	104.0%
SPIKE_0000085.LAB	10/22/2019	14:02:41	0.399	1.11	2.27	150.9	1.014	0.082	106.1%
SPIKE_0000086.LAB	10/22/2019	14:02:55	0.390	1.12	2.27	150.9	1.013	0.082	103.9%
SPIKE_0000087.LAB	10/22/2019	14:03:10	0.401	1.12	2.24	150.9	1.013	0.082	106.7%
SPIKE_0000088.LAB	10/22/2019	14:03:25	0.334	1.13	2.23	151.0	1.015	0.082	89.0%
		Average							**103.9%**

Dry Bed Outlet, Prior to Analyte Spike

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
NATIVE_0000091.LAB	10/22/2019	14:04:09	0.006	1.22	2.39	150.9	1.012
NATIVE_0000092.LAB	10/22/2019	14:04:24	0.014	1.23	2.40	151.0	1.010
NATIVE_0000093.LAB	10/22/2019	14:04:38	0.013	1.22	2.44	150.8	1.015
NATIVE_0000094.LAB	10/22/2019	14:04:53	0.009	1.23	2.50	150.9	1.013
NATIVE_0000095.LAB	10/22/2019	14:05:08	-0.002	1.22	2.51	150.9	1.014
NATIVE_0000096.LAB	10/22/2019	14:05:23	-0.005	1.22	2.47	150.9	1.015
NATIVE_0000097.LAB	10/22/2019	14:05:37	0.007	1.22	2.45	150.9	1.015
NATIVE_0000098.LAB	10/22/2019	14:05:52	-0.005	1.22	2.42	150.8	1.015
NATIVE_0000099.LAB	10/22/2019	14:06:07	0.000	1.22	2.42	150.9	1.013
NATIVE_0000100.LAB	10/22/2019	14:06:21	-0.005	1.22	2.40	150.7	1.012
		Average	**0.003**				

Dry Bed Outlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6, Note: SF6 was measured using a 2nd FTIR

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor	EtO Recovery (%)
SPIKE_0000105.LAB	10/22/2019	14:07:39	0.425	1.11	2.28	150.7	1.014	0.084	103.4%
SPIKE_0000106.LAB	10/22/2019	14:07:54	0.400	1.10	2.23	150.7	1.014	0.084	97.3%
SPIKE_0000107.LAB	10/22/2019	14:08:09	0.400	1.10	2.20	150.5	1.013	0.084	97.3%
SPIKE_0000108.LAB	10/22/2019	14:08:24	0.406	1.11	2.21	150.7	1.012	0.084	98.8%
SPIKE_0000109.LAB	10/22/2019	14:08:38	0.413	1.10	2.19	150.7	1.013	0.084	100.4%
SPIKE_0000110.LAB	10/22/2019	14:08:53	0.413	1.10	2.16	150.4	1.013	0.084	100.4%
SPIKE_0000111.LAB	10/22/2019	14:09:08	0.413	1.10	2.19	150.5	1.012	0.084	100.5%
SPIKE_0000112.LAB	10/22/2019	14:09:22	0.431	1.10	2.21	150.5	1.013	0.084	104.7%
SPIKE_0000113.LAB	10/22/2019	14:09:37	0.407	1.10	2.25	150.5	1.014	0.084	99.1%
SPIKE_0000114.LAB	10/22/2019	14:09:52	0.411	1.09	2.30	150.4	1.015	0.084	100.0%
		Average							**100.2%**

Dry Bed Outlet, Prior to Analyte Spike

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
NATIVE_0000123.LAB	10/22/2019	14:12:04	-0.005	1.22	2.39	150.5	1.013
NATIVE_0000124.LAB	10/22/2019	14:12:19	-0.008	1.22	2.38	150.4	1.012
NATIVE_0000125.LAB	10/22/2019	14:12:34	-0.009	1.23	2.37	150.3	1.012
NATIVE_0000126.LAB	10/22/2019	14:12:48	-0.003	1.23	2.37	150.3	1.013
NATIVE_0000127.LAB	10/22/2019	14:13:03	0.005	1.23	2.35	150.3	1.015
NATIVE_0000128.LAB	10/22/2019	14:13:18	0.002	1.23	2.38	150.4	1.014
NATIVE_0000129.LAB	10/22/2019	14:13:32	0.007	1.23	2.37	150.4	1.014
NATIVE_0000130.LAB	10/22/2019	14:13:47	-0.002	1.23	2.37	150.5	1.011
NATIVE_0000131.LAB	10/22/2019	14:14:02	-0.011	1.23	2.35	150.3	1.014
NATIVE_0000132.LAB	10/22/2019	14:14:17	0.005	1.23	2.35	150.4	1.015
		Average	**-0.002**				

Dry Bed Outlet Analyte Spike, Using 4.984 ppm EtO/5.031 ppm SF6, Note: SF6 was measured using a 2nd FTIR

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Dilution Factor	EtO Recovery (%)
SPIKE_0000144.LAB	10/22/2019	14:17:13	0.424	1.11	2.14	150.2	1.012	0.085	103.1%
SPIKE_0000145.LAB	10/22/2019	14:17:28	0.416	1.10	2.15	150.3	1.014	0.085	101.1%
SPIKE_0000146.LAB	10/22/2019	14:17:43	0.412	1.10	2.13	150.3	1.016	0.085	100.2%
SPIKE_0000147.LAB	10/22/2019	14:17:57	0.413	1.10	2.14	150.2	1.012	0.085	100.5%
SPIKE_0000148.LAB	10/22/2019	14:18:12	0.409	1.10	2.12	150.3	1.016	0.085	99.5%
SPIKE_0000149.LAB	10/22/2019	14:18:27	0.412	1.10	2.14	150.2	1.014	0.085	100.2%
SPIKE_0000150.LAB	10/22/2019	14:18:41	0.410	1.10	2.17	150.3	1.013	0.085	99.6%
SPIKE_0000151.LAB	10/22/2019	14:18:56	0.416	1.10	2.24	150.3	1.014	0.085	101.2%
SPIKE_0000152.LAB	10/22/2019	14:19:11	0.419	1.10	2.22	150.3	1.015	0.085	101.9%
SPIKE_0000153.LAB	10/22/2019	14:19:25	0.418	1.10	2.18	150.2	1.013	0.085	101.7%
		Average							**100.7%**

Zero Gas (Nitrogen) Direct to FTIR

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
ZERO DIRECT_0000004.LAB	10/23/2019	5:49:09	0.002	0.02	0.00	150.5	0.978
ZERO DIRECT_0000005.LAB	10/23/2019	5:50:21	0.009	0.02	-0.01	150.5	0.972
ZERO DIRECT_0000006.LAB	10/23/2019	5:51:20	0.001	0.02	-0.01	150.5	0.975
ZERO DIRECT_0000007.LAB	10/23/2019	5:52:19	0.006	0.02	0.00	150.5	0.977
ZERO DIRECT_0000008.LAB	10/23/2019	5:53:18	0.001	0.02	0.00	150.5	0.974
ZERO DIRECT_0000009.LAB	10/23/2019	5:54:17	0.003	0.02	-0.01	150.5	0.975
ZERO DIRECT_0000010.LAB	10/23/2019	5:55:16	0.004	0.02	-0.01	150.4	0.977
ZERO DIRECT_0000011.LAB	10/23/2019	5:56:14	0.004	0.02	-0.02	150.5	0.972

CTS, 100.0 ppm Methane Direct Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS DIRECT_0000019.LAB	10/23/2019	5:58:37	0.145	0.03	100.47	150.7	0.974	100.5%
CTS DIRECT_0000020.LAB	10/23/2019	5:58:52	0.151	0.02	100.58	150.5	0.972	100.6%
CTS DIRECT_0000021.LAB	10/23/2019	5:59:07	0.141	0.03	100.37	150.5	0.975	100.4%
CTS DIRECT_0000022.LAB	10/23/2019	5:59:21	0.146	0.02	100.44	150.5	0.974	100.4%
CTS DIRECT_0000023.LAB	10/23/2019	5:59:36	0.134	0.02	100.38	150.4	0.973	100.4%
CTS DIRECT_0000024.LAB	10/23/2019	5:59:51	0.140	0.02	100.51	150.5	0.972	100.5%
CTS DIRECT_0000025.LAB	10/23/2019	6:00:05	0.144	0.03	100.49	150.5	0.972	100.5%
CTS DIRECT_0000026.LAB	10/23/2019	6:00:20	0.145	0.03	100.32	150.5	0.974	100.3%
		Average			**100.4**			

4.984 ppm Ethylene Oxide / 5.031 SF6 Direct Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	EtO Recovery (%)
CAL DIRECT_0000033.LAB	10/23/2019	6:02:03	4.782	0.02	-0.01	150.5	0.973	96.0%
CAL DIRECT_0000034.LAB	10/23/2019	6:02:18	4.806	0.02	-0.02	150.5	0.974	96.4%
CAL DIRECT_0000035.LAB	10/23/2019	6:02:32	4.796	0.02	-0.01	150.4	0.974	96.2%
CAL DIRECT_0000036.LAB	10/23/2019	6:02:56	4.833	0.02	-0.03	150.4	0.974	97.0%
CAL DIRECT_0000037.LAB	10/23/2019	6:03:11	4.823	0.02	-0.02	150.4	0.974	96.8%
CAL DIRECT_0000038.LAB	10/23/2019	6:03:25	4.888	0.02	-0.03	150.4	0.975	98.1%
CAL DIRECT_0000039.LAB	10/23/2019	6:03:40	4.967	0.02	-0.01	150.4	0.972	99.7%
CAL DIRECT_0000040.LAB	10/23/2019	6:03:55	4.956	0.02	-0.02	150.4	0.971	99.4%

Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
ZERO SYSTEM_0000041.LAB	10/23/2019	6:05:09	0.082	0.63	0.50	150.4	0.973
ZERO SYSTEM_0000042.LAB	10/23/2019	6:06:08	0.000	0.05	0.00	150.4	0.976
ZERO SYSTEM_0000043.LAB	10/23/2019	6:07:06	0.002	0.04	-0.01	150.4	0.976
ZERO SYSTEM_0000044.LAB	10/23/2019	6:08:05	0.005	0.03	-0.01	150.5	0.972

CTS, 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000049.LAB	10/23/2019	6:09:34	0.140	0.05	100.34	150.4	0.974	99.9%
CTS SYSTEM_0000050.LAB	10/23/2019	6:09:49	0.155	0.04	100.58	150.5	0.973	100.1%
CTS SYSTEM_0000051.LAB	10/23/2019	6:10:03	0.131	0.04	100.30	150.5	0.977	99.9%
CTS SYSTEM_0000052.LAB	10/23/2019	6:10:18	0.146	0.04	100.46	150.5	0.975	100.0%
CTS SYSTEM_0000053.LAB	10/23/2019	6:10:33	0.148	0.04	100.43	150.4	0.976	100.0%
CTS SYSTEM_0000054.LAB	10/23/2019	6:10:47	0.154	0.03	100.55	150.4	0.974	100.1%
CTS SYSTEM_0000055.LAB	10/23/2019	6:11:02	0.136	0.03	100.79	150.4	0.972	100.3%
CTS SYSTEM_0000056.LAB	10/23/2019	6:11:17	0.125	0.03	100.32	150.5	0.977	99.9%

CTS, 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000151.LAB	10/23/2019	7:44:06	0.140	0.14	100.79	150.5	1.012	100.3%
CTS SYSTEM_0000152.LAB	10/23/2019	7:44:21	0.143	0.07	101.32	150.5	1.013	100.9%
CTS SYSTEM_0000153.LAB	10/23/2019	7:44:35	0.151	0.05	101.58	150.5	1.010	101.1%
CTS SYSTEM_0000154.LAB	10/23/2019	7:44:50	0.136	0.04	101.46	150.5	1.012	101.0%
CTS SYSTEM_0000155.LAB	10/23/2019	7:45:05	0.153	0.04	101.73	150.4	1.009	101.3%
CTS SYSTEM_0000156.LAB	10/23/2019	7:45:19	0.172	0.04	101.42	150.5	1.013	101.0%
CTS SYSTEM_0000157.LAB	10/23/2019	7:45:34	0.141	0.03	101.59	150.4	1.011	101.1%
CTS SYSTEM_0000158.LAB	10/23/2019	7:45:49	0.137	0.03	101.84	150.5	1.008	101.4%

Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CTS SYSTEM_0000247.LAB	10/23/2019	9:07:43	0.012	0.12	0.00	150.5	1.011
CTS SYSTEM_0000248.LAB	10/23/2019	9:07:58	-0.006	0.06	-0.02	150.5	1.013
CTS SYSTEM_0000249.LAB	10/23/2019	9:08:13	0.017	0.05	-0.03	150.5	1.015
CTS SYSTEM_0000250.LAB	10/23/2019	9:08:27	0.002	0.04	-0.03	150.5	1.012
CTS SYSTEM_0000251.LAB	10/23/2019	9:08:42	0.005	0.03	-0.03	150.5	1.014
CTS SYSTEM_0000252.LAB	10/23/2019	9:08:57	0.008	0.03	-0.02	150.5	1.014
CTS SYSTEM_0000253.LAB	10/23/2019	9:09:11	0.002	0.03	-0.02	150.4	1.015
CTS SYSTEM_0000254.LAB	10/23/2019	9:09:26	0.044	0.39	1.80	150.4	1.016

CTS, 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000257.LAB	10/23/2019	9:10:10	0.170	0.06	101.33	150.5	1.013	100.9%
CTS SYSTEM_0000258.LAB	10/23/2019	9:10:25	0.152	0.04	101.47	150.5	1.014	101.0%
CTS SYSTEM_0000259.LAB	10/23/2019	9:10:40	0.149	0.04	101.55	150.4	1.014	101.1%
CTS SYSTEM_0000260.LAB	10/23/2019	9:10:54	0.156	0.03	101.65	150.5	1.013	101.2%
CTS SYSTEM_0000261.LAB	10/23/2019	9:11:09	0.150	0.03	101.69	150.4	1.013	101.2%
CTS SYSTEM_0000262.LAB	10/23/2019	9:11:24	0.174	0.03	101.51	150.5	1.014	101.1%
CTS SYSTEM_0000263.LAB	10/23/2019	9:11:38	0.142	0.03	101.49	150.5	1.015	101.0%
CTS SYSTEM_0000264.LAB	10/23/2019	9:11:53	0.149	0.03	101.80	150.4	1.011	101.3%

CTS, 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000362.LAB	10/23/2019	10:43:54	0.152	0.04	101.77	150.5	1.013	101.3%
CTS SYSTEM_0000363.LAB	10/23/2019	10:44:09	0.154	0.04	101.44	150.3	1.016	101.0%
CTS SYSTEM_0000364.LAB	10/23/2019	10:44:24	0.169	0.03	101.79	150.4	1.012	101.3%
CTS SYSTEM_0000365.LAB	10/23/2019	10:44:39	0.165	0.03	101.67	150.3	1.014	101.2%
CTS SYSTEM_0000366.LAB	10/23/2019	10:44:53	0.163	0.03	101.84	150.4	1.012	101.4%
CTS SYSTEM_0000367.LAB	10/23/2019	10:45:08	0.175	0.03	101.64	150.4	1.014	101.2%
CTS SYSTEM_0000368.LAB	10/23/2019	10:45:23	0.153	0.03	101.67	150.3	1.014	101.2%
CTS SYSTEM_0000369.LAB	10/23/2019	10:45:37	0.160	0.03	101.84	150.3	1.012	101.4%

Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CTS SYSTEM_0000373.LAB	10/23/2019	10:46:36	0.009	0.06	0.20	150.5	1.012
CTS SYSTEM_0000374.LAB	10/23/2019	10:46:51	0.015	0.04	0.10	150.1	1.014
CTS SYSTEM_0000375.LAB	10/23/2019	10:47:06	0.007	0.04	0.07	150.3	1.014
CTS SYSTEM_0000376.LAB	10/23/2019	10:47:20	0.006	0.03	0.03	150.3	1.014
CTS SYSTEM_0000377.LAB	10/23/2019	10:47:35	0.007	0.03	0.03	150.5	1.012
CTS SYSTEM_0000378.LAB	10/23/2019	10:47:50	0.013	0.03	0.03	150.3	1.014
CTS SYSTEM_0000379.LAB	10/23/2019	10:48:04	0.003	0.03	0.03	150.5	1.014
CTS SYSTEM_0000380.LAB	10/23/2019	10:48:19	0.024	0.03	0.18	150.4	1.025

Zero Gas (Nitrogen) Direct to FTIR

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
ZERO DIRECT_0000007.LAB	10/23/2019	11:22:05	-0.006	0.00	-0.03	150.8	0.998
ZERO DIRECT_0000008.LAB	10/23/2019	11:23:04	0.002	0.00	-0.04	150.8	1.000
ZERO DIRECT_0000009.LAB	10/23/2019	11:24:03	-0.002	0.00	-0.03	150.9	0.998
ZERO DIRECT_0000010.LAB	10/23/2019	11:25:01	0.000	0.00	-0.04	150.8	0.998
ZERO DIRECT_0000011.LAB	10/23/2019	11:26:00	-0.001	0.00	-0.03	150.8	0.999
ZERO DIRECT_0000012.LAB	10/23/2019	11:26:59	-0.002	0.00	-0.03	150.7	0.998
ZERO DIRECT_0000013.LAB	10/23/2019	11:27:58	0.000	0.00	-0.04	150.7	1.000
ZERO DIRECT_0000014.LAB	10/23/2019	11:28:57	-0.005	0.00	-0.03	150.8	0.978

CTS, 100.0 ppm Methane Direct Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS DIRECT_0000018.LAB	10/23/2019	11:30:20	0.173	-0.02	101.54	150.9	1.008	101.5%
CTS DIRECT_0000019.LAB	10/23/2019	11:30:35	0.176	-0.02	101.53	150.5	1.008	101.5%
CTS DIRECT_0000020.LAB	10/23/2019	11:30:49	0.168	-0.02	101.45	150.5	1.009	101.5%
CTS DIRECT_0000021.LAB	10/23/2019	11:31:04	0.170	-0.02	101.38	150.8	1.010	101.4%
CTS DIRECT_0000022.LAB	10/23/2019	11:31:19	0.175	-0.02	101.39	150.8	1.010	101.4%
CTS DIRECT_0000023.LAB	10/23/2019	11:31:33	0.169	-0.02	101.43	150.7	1.009	101.4%
CTS DIRECT_0000024.LAB	10/23/2019	11:31:48	0.171	-0.02	101.30	150.5	1.010	101.3%
CTS DIRECT_0000025.LAB	10/23/2019	11:32:03	0.184	-0.02	101.59	150.8	1.008	101.6%
		Average			**101.4**			

CTS, 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000040.LAB	10/23/2019	11:35:56	0.182	0.00	101.42	150.5	1.013	100.0%
CTS SYSTEM_0000041.LAB	10/23/2019	11:36:11	0.165	0.00	101.74	150.5	1.010	100.3%
CTS SYSTEM_0000042.LAB	10/23/2019	11:36:26	0.191	0.00	101.21	150.7	1.016	99.8%
CTS SYSTEM_0000043.LAB	10/23/2019	11:36:41	0.178	-0.01	101.35	150.5	1.014	99.9%
CTS SYSTEM_0000044.LAB	10/23/2019	11:36:55	0.167	0.00	101.54	150.5	1.012	100.1%
CTS SYSTEM_0000045.LAB	10/23/2019	11:37:10	0.174	0.00	101.34	150.5	1.015	99.9%
CTS SYSTEM_0000046.LAB	10/23/2019	11:37:25	0.170	0.00	101.32	150.5	1.015	99.9%
CTS SYSTEM_0000047.LAB	10/23/2019	11:37:39	0.173	-0.01	101.70	150.5	1.010	100.2%

4.984 ppm Ethylene Oxide / 5.031 SF6 Direct Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	EtO Recovery (%)
CAL DIRECT_0000067.LAB	10/23/2019	11:46:32	4.836	0.00	-0.04	150.5	1.001	97.0%
CAL DIRECT_0000068.LAB	10/23/2019	11:46:47	4.834	0.00	-0.03	150.5	1.001	97.0%
CAL DIRECT_0000069.LAB	10/23/2019	11:47:02	4.853	0.00	-0.04	150.4	1.002	97.4%
CAL DIRECT_0000070.LAB	10/23/2019	11:47:16	4.859	0.00	-0.05	150.5	0.998	97.5%
CAL DIRECT_0000071.LAB	10/23/2019	11:47:31	4.862	0.00	-0.04	150.5	1.000	97.6%
CAL DIRECT_0000072.LAB	10/23/2019	11:47:46	4.862	0.00	-0.04	150.5	1.000	97.5%
CAL DIRECT_0000073.LAB	10/23/2019	11:48:00	4.866	0.00	-0.04	150.3	1.002	97.6%
CAL DIRECT_0000074.LAB	10/23/2019	11:48:15	4.884	0.00	-0.03	150.5	1.001	98.0%

Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
ZERO SYSTEM_0000077.LAB	10/23/2019	11:49:59	0.106	0.21	4.54	150.2	1.011
ZERO SYSTEM_0000078.LAB	10/23/2019	11:50:58	-0.002	0.02	-0.01	150.5	1.012
ZERO SYSTEM_0000079.LAB	10/23/2019	11:51:56	-0.002	0.01	-0.02	150.3	1.014
ZERO SYSTEM_0000080.LAB	10/23/2019	11:52:55	0.001	0.01	-0.02	150.4	1.012
ZERO SYSTEM_0000081.LAB	10/23/2019	11:53:54	0.001	0.01	-0.03	150.4	1.013
ZERO SYSTEM_0000082.LAB	10/23/2019	11:54:53	0.002	0.01	-0.03	150.5	1.012
ZERO SYSTEM_0000083.LAB	10/23/2019	11:55:52	-0.001	0.01	-0.03	150.7	1.013
ZERO SYSTEM_0000084.LAB	10/23/2019	11:56:51	0.002	0.01	-0.04	150.7	1.011

CTS, 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000263.LAB	10/23/2019	15:50:07	0.211	1.48	102.59	150.7	1.019	101.1%
CTS SYSTEM_0000264.LAB	10/23/2019	15:50:22	0.197	1.30	102.65	150.8	1.021	101.2%
CTS SYSTEM_0000265.LAB	10/23/2019	15:50:37	0.183	1.15	102.51	150.8	1.022	101.0%
CTS SYSTEM_0000266.LAB	10/23/2019	15:50:51	0.166	0.94	102.38	150.8	1.022	100.9%
CTS SYSTEM_0000267.LAB	10/23/2019	15:51:06	0.152	0.81	102.46	150.8	1.021	101.0%
CTS SYSTEM_0000268.LAB	10/23/2019	15:51:21	0.158	0.72	102.14	150.9	1.023	100.7%
CTS SYSTEM_0000269.LAB	10/23/2019	15:51:35	0.160	0.67	102.54	150.7	1.019	101.1%
CTS SYSTEM_0000270.LAB	10/23/2019	15:51:50	0.197	0.61	102.23	150.5	1.020	100.8%

Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CTS SYSTEM_0000314.LAB	10/23/2019	16:02:37	0.014	0.07	-0.01	150.7	1.018
CTS SYSTEM_0000315.LAB	10/23/2019	16:02:52	-0.011	0.07	0.01	150.7	1.014
CTS SYSTEM_0000316.LAB	10/23/2019	16:03:07	0.010	0.07	0.01	150.5	1.015
CTS SYSTEM_0000317.LAB	10/23/2019	16:03:21	-0.005	0.07	-0.02	150.7	1.014
CTS SYSTEM_0000318.LAB	10/23/2019	16:03:36	0.001	0.07	-0.01	150.5	1.016
CTS SYSTEM_0000319.LAB	10/23/2019	16:03:51	-0.002	0.06	-0.02	150.5	1.016
CTS SYSTEM_0000320.LAB	10/23/2019	16:04:06	-0.002	0.06	-0.01	150.5	1.015
CTS SYSTEM_0000321.LAB	10/23/2019	16:04:20	-0.004	0.06	-0.01	150.5	1.014

Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CTS SYSTEM_0000403.LAB	10/23/2019	17:18:39	-0.027	2.11	-0.02	150.8	1.025
CTS SYSTEM_0000404.LAB	10/23/2019	17:18:54	-0.028	1.87	-0.01	150.5	1.029
CTS SYSTEM_0000405.LAB	10/23/2019	17:19:09	-0.020	1.77	-0.03	150.8	1.027
CTS SYSTEM_0000406.LAB	10/23/2019	17:19:23	-0.007	1.67	-0.01	150.7	1.026
CTS SYSTEM_0000407.LAB	10/23/2019	17:19:38	-0.025	1.60	-0.03	150.8	1.026
CTS SYSTEM_0000408.LAB	10/23/2019	17:19:53	-0.022	1.55	-0.02	150.8	1.029
CTS SYSTEM_0000409.LAB	10/23/2019	17:20:08	-0.001	2.17	0.22	150.8	1.025
CTS SYSTEM_0000410.LAB	10/23/2019	17:20:22	0.076	1.92	50.44	150.5	1.022

CTS, 100.0 ppm Methane System Purge

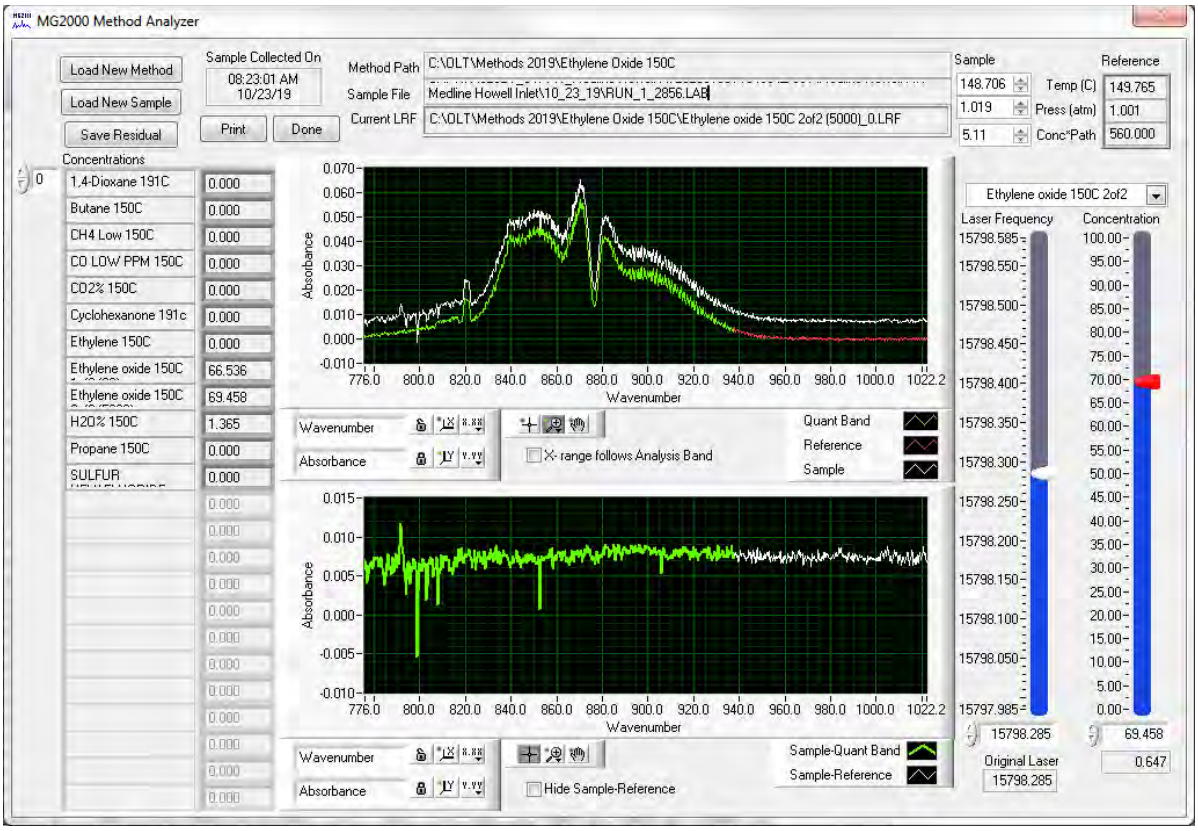
Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000411.LAB	10/23/2019	17:20:37	0.186	1.55	102.62	150.8	1.021	101.2%
CTS SYSTEM_0000412.LAB	10/23/2019	17:20:52	0.178	1.49	102.92	150.9	1.023	101.4%
CTS SYSTEM_0000413.LAB	10/23/2019	17:21:06	0.180	1.47	102.77	150.7	1.025	101.3%
CTS SYSTEM_0000414.LAB	10/23/2019	17:21:21	0.168	1.45	103.04	150.7	1.023	101.6%
CTS SYSTEM_0000415.LAB	10/23/2019	17:21:36	0.176	1.43	103.06	150.7	1.023	101.6%
CTS SYSTEM_0000416.LAB	10/23/2019	17:21:51	0.187	1.41	103.20	150.8	1.023	101.7%
CTS SYSTEM_0000417.LAB	10/23/2019	17:22:05	0.168	1.39	102.88	150.8	1.026	101.4%
CTS SYSTEM_0000418.LAB	10/23/2019	17:22:20	0.170	1.37	102.80	150.8	1.025	101.3%

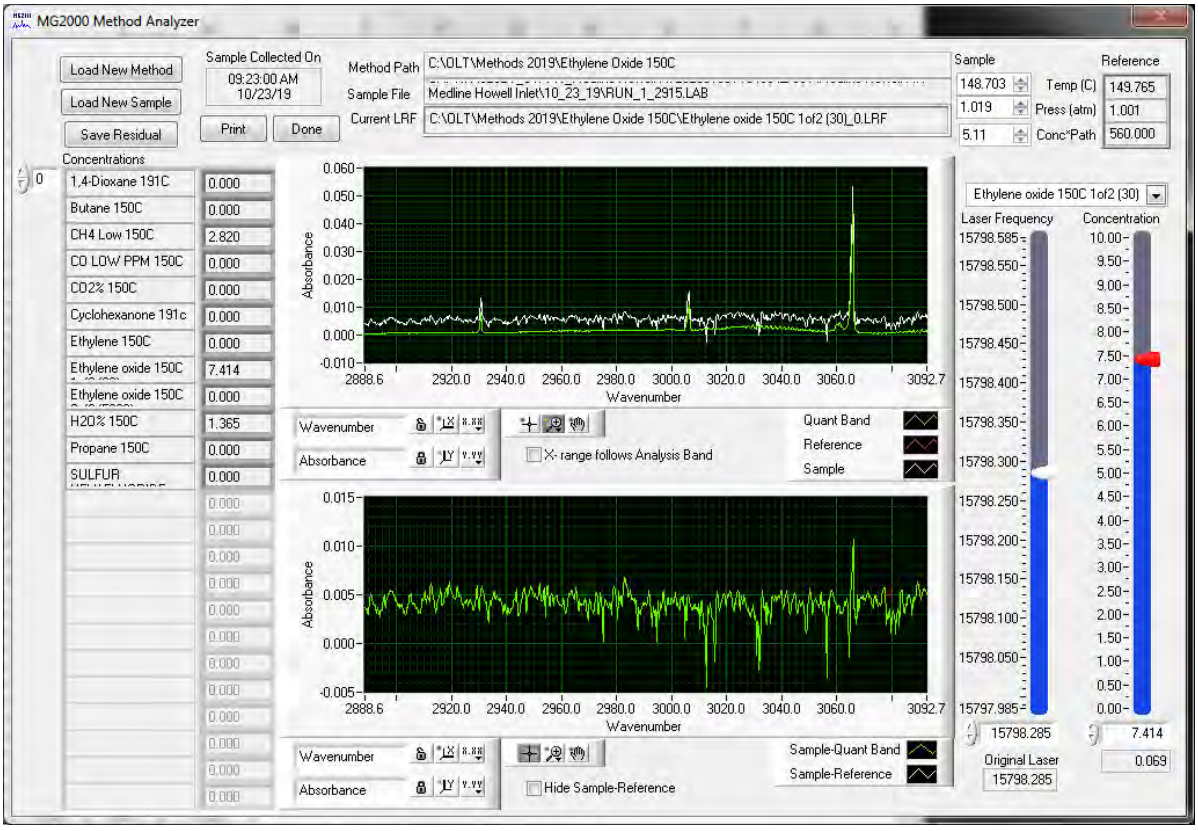
CTS, 100.0 ppm Methane System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)	Methane Recovery (%)
CTS SYSTEM_0000571.LAB	10/23/2019	19:39:29	0.266	2.53	103.87	150.5	1.028	102.4%
CTS SYSTEM_0000572.LAB	10/23/2019	19:39:44	0.246	2.41	103.95	150.5	1.026	102.5%
CTS SYSTEM_0000573.LAB	10/23/2019	19:39:58	0.221	2.32	103.67	150.4	1.029	102.2%
CTS SYSTEM_0000574.LAB	10/23/2019	19:40:13	0.231	2.26	104.02	150.5	1.026	102.5%
CTS SYSTEM_0000575.LAB	10/23/2019	19:40:28	0.212	2.16	104.08	150.5	1.025	102.6%
CTS SYSTEM_0000576.LAB	10/23/2019	19:40:42	0.207	2.08	103.68	150.5	1.027	102.2%
CTS SYSTEM_0000577.LAB	10/23/2019	19:40:57	0.239	2.01	103.48	150.5	1.030	102.0%
CTS SYSTEM_0000578.LAB	10/23/2019	19:41:12	0.204	1.99	104.02	150.7	1.025	102.5%

Zero Gas (Nitrogen) System Purge

Spectrum	Date	Time	Ethylene Oxide (ppmv wet)	Water (%)	Methane (ppmv wet)	FTIR Gas Cell Temp (°C)	FTIR Gas Cell Pressure (Atm)
CTS SYSTEM_0000582.LAB	10/23/2019	19:42:11	-0.033	3.78	0.17	150.5	1.025
CTS SYSTEM_0000583.LAB	10/23/2019	19:42:25	-0.041	4.02	0.14	150.5	1.022
CTS SYSTEM_0000584.LAB	10/23/2019	19:42:40	0.005	4.21	0.08	150.9	1.022
CTS SYSTEM_0000585.LAB	10/23/2019	19:42:55	-0.006	4.43	0.06	150.5	1.025
CTS SYSTEM_0000586.LAB	10/23/2019	19:43:09	-0.027	4.66	0.04	150.7	1.022
CTS SYSTEM_0000587.LAB	10/23/2019	19:43:24	-0.012	4.80	0.06	150.9	1.021
CTS SYSTEM_0000588.LAB	10/23/2019	19:43:39	-0.028	4.90	0.07	150.7	1.025
CTS SYSTEM_0000589.LAB	10/23/2019	19:43:54	-0.009	5.03	0.05	150.7	1.024


MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Sample Collected On
08:23:01 AM
10/23/19
Print
Done
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_1_2856.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_0.LRF
Sample
Reference
148.706
Temp (C)
149.765
1.019
Press (atm)
1.001
5.11
Conc*Path
560.000
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 0.000
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 66.536
Ethylene oxide 150C 69.458
H2O% 150C 1.365
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
15798.285
69.458
Original Laser
15798.285
0.647
Sample-Quant Band
Sample-Reference
Hide Sample-Reference


MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Sample Collected On
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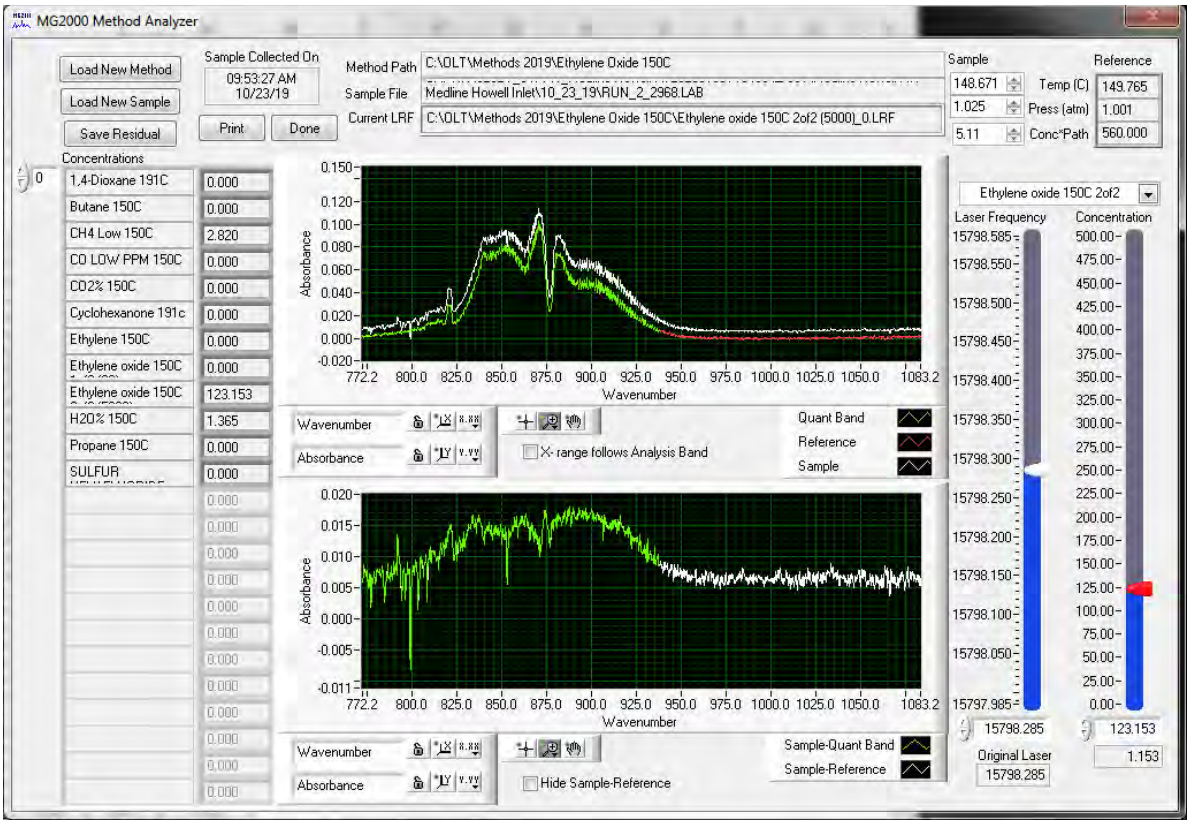
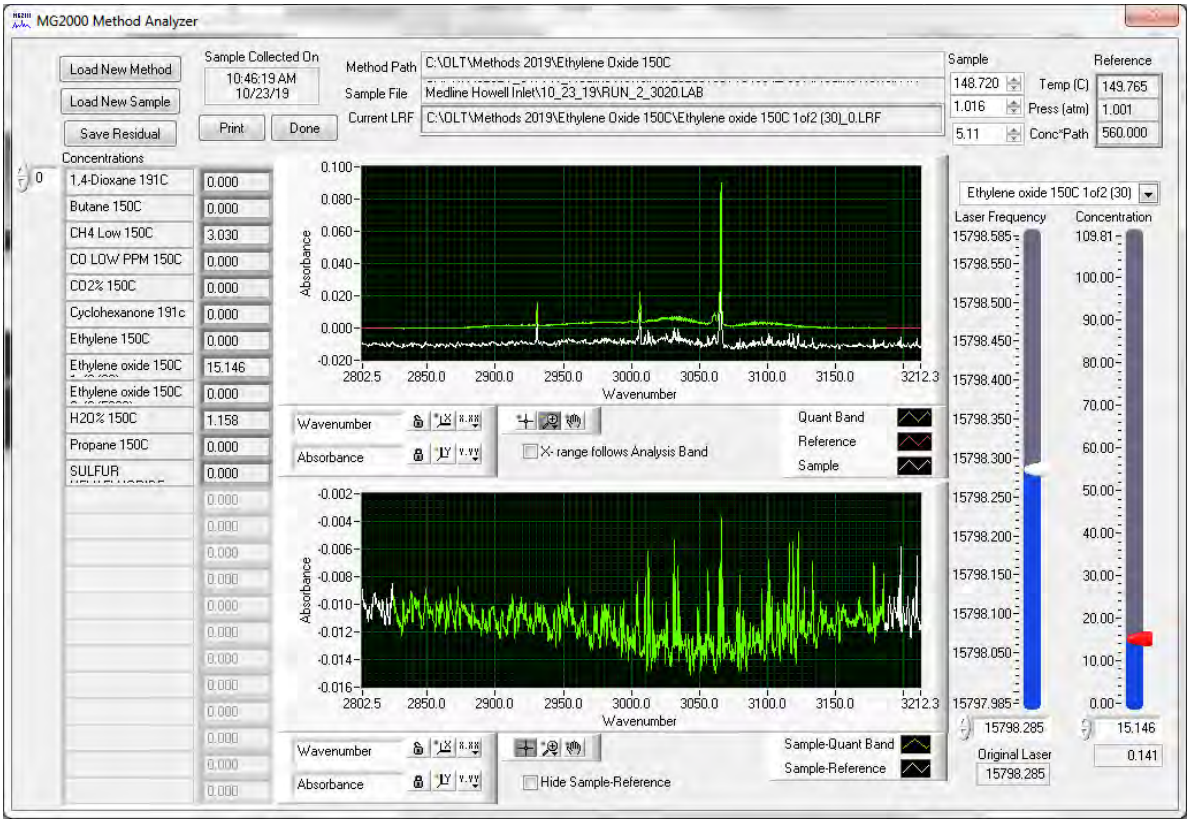
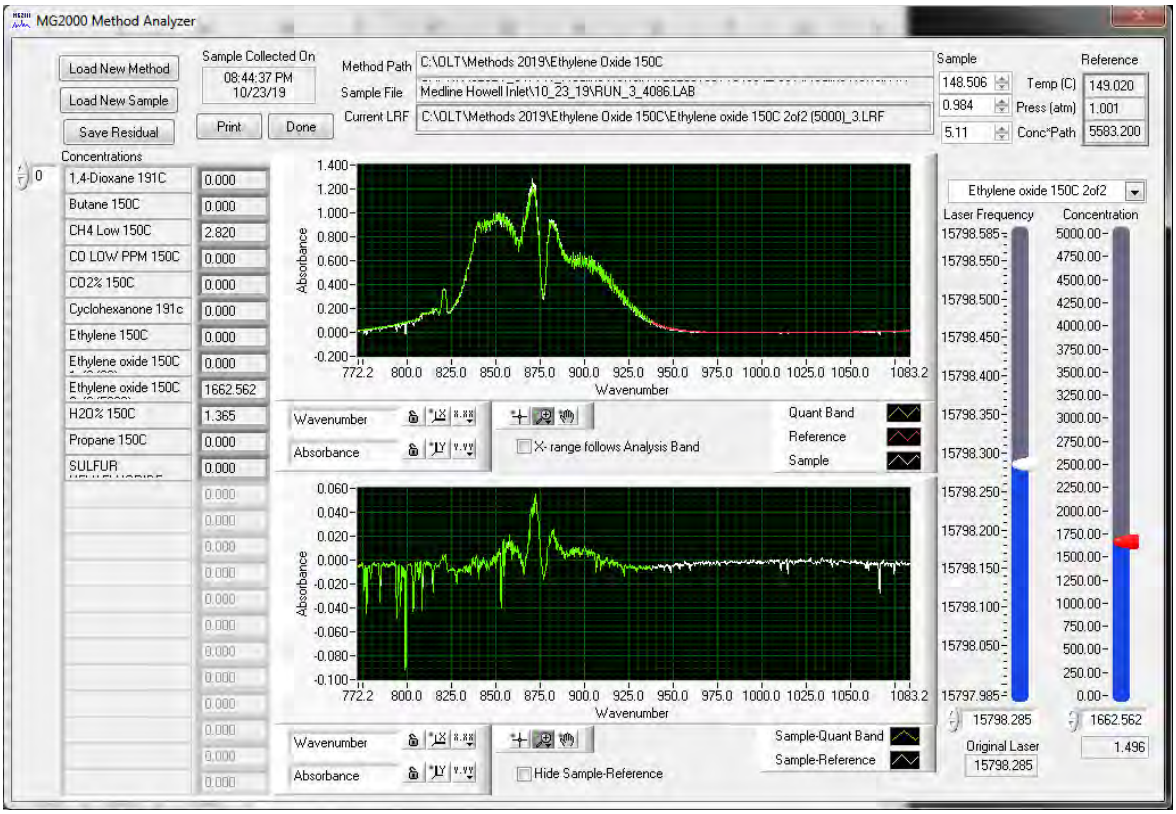
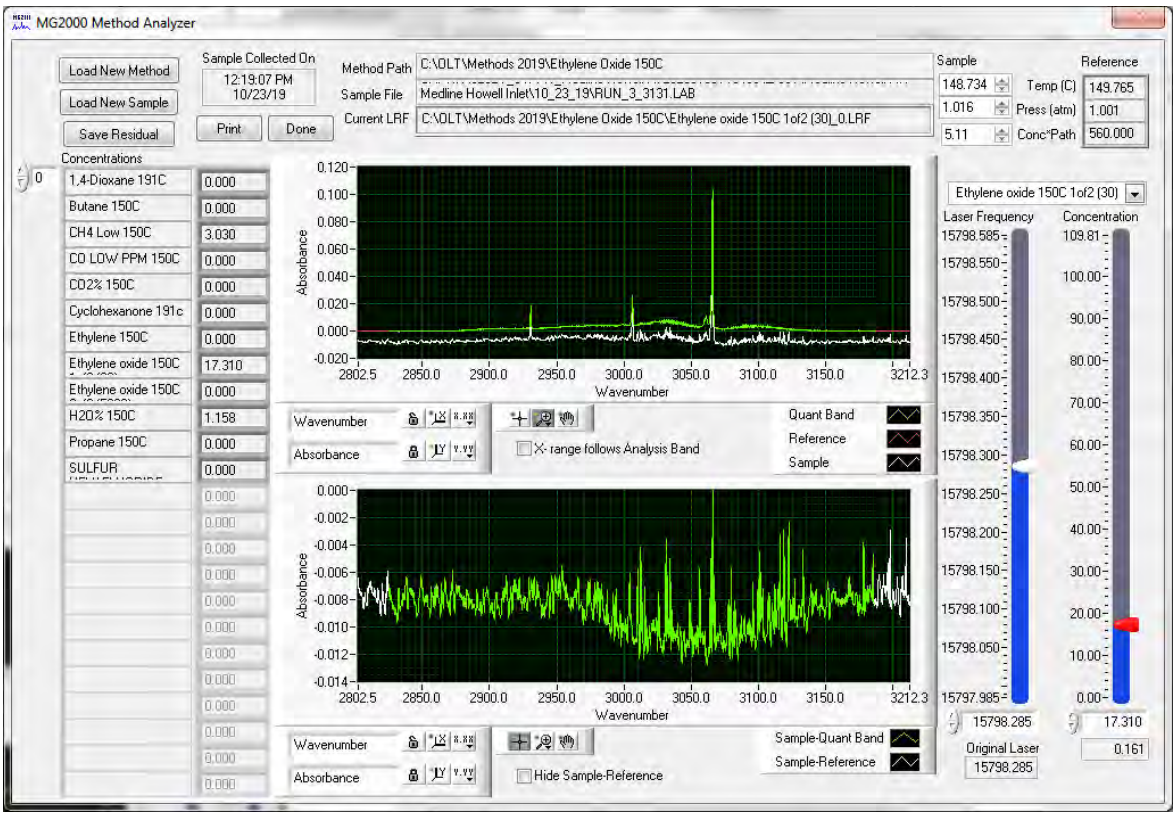
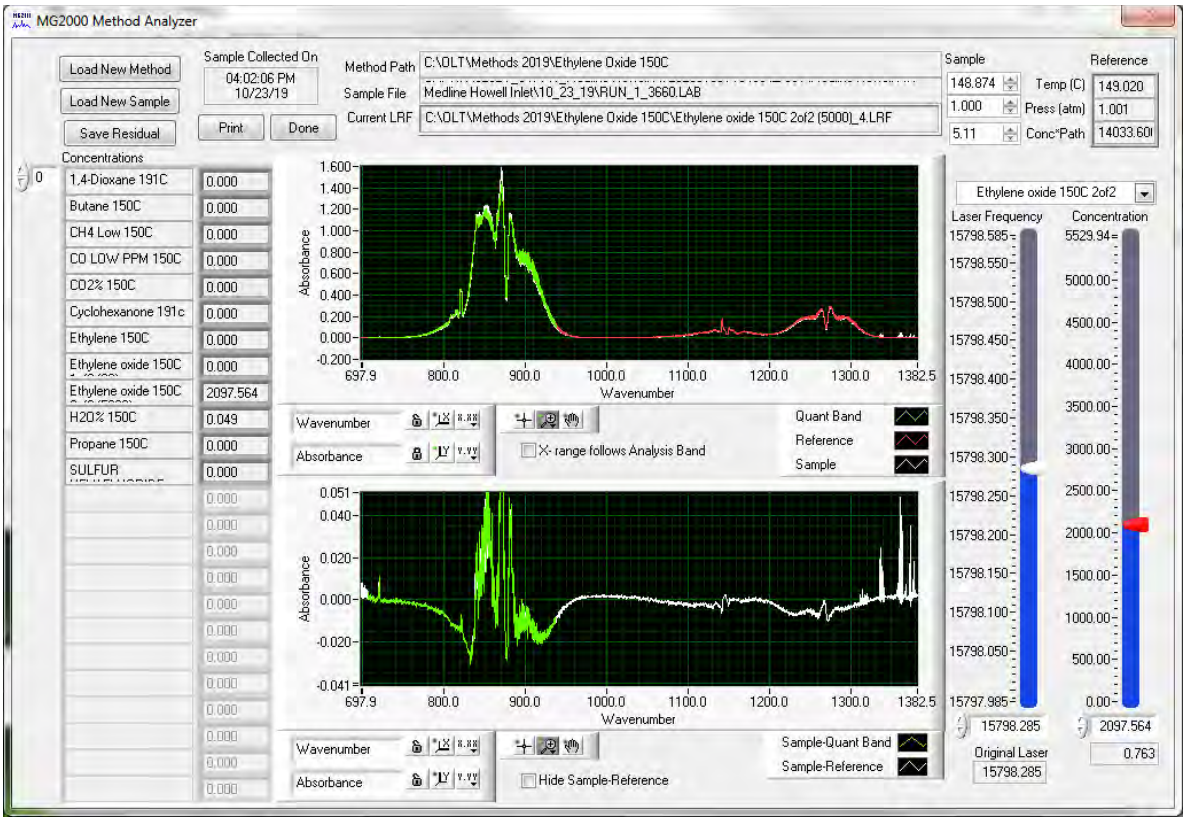
10/23/19
Print
Done
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_1_2915.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 1of2 (30)_0.LRF
Sample
Reference
148.703
Temp (C)
149.765
1.019
Press (atm)
1.001
5.11
Conc*Path
560.000
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 2.820
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 7.414
Ethylene oxide 150C 0.000
H2O% 150C 1.365
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 1of2 (30)
Laser Frequency
Concentration
15798.285
7.414
Original Laser
15798.285
0.069
Sample-Quant Band
Sample-Reference
Hide Sample-Reference

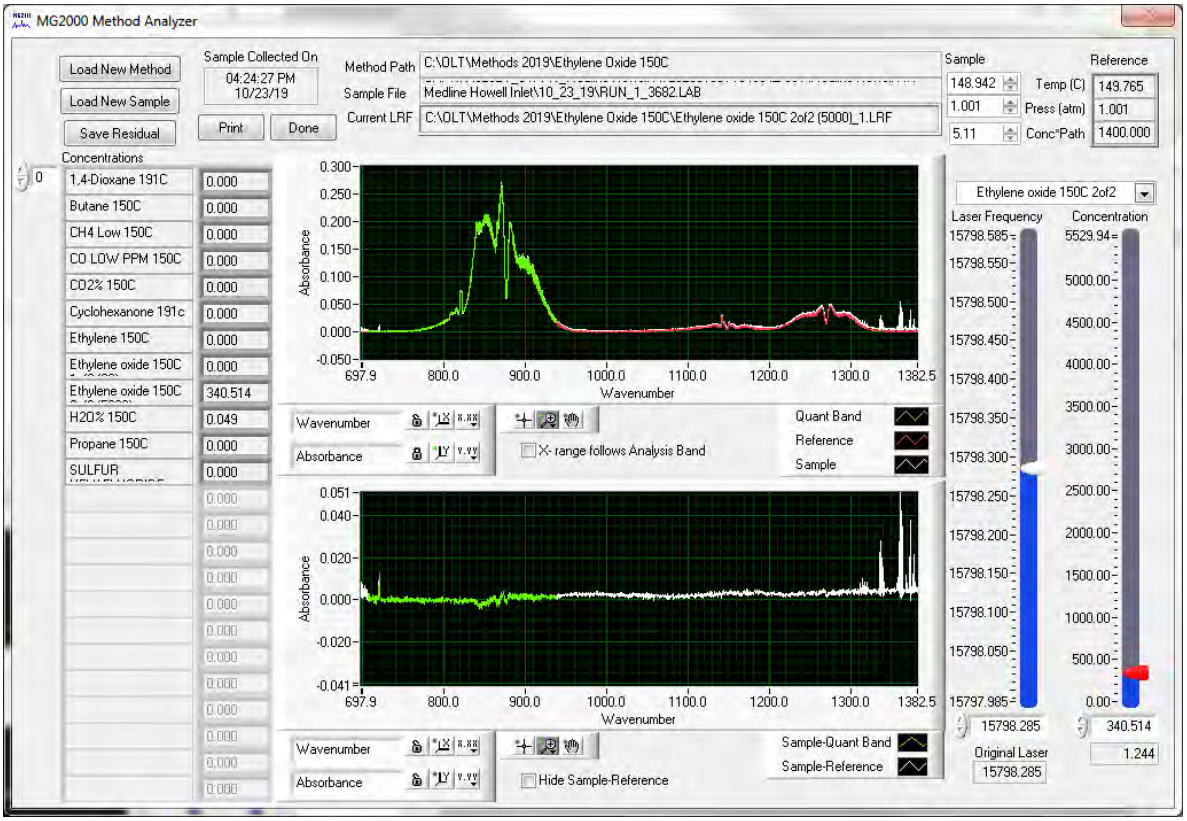

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Print
Done
Sample Collected On
09:53:27 AM
10/23/19
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_2_2968.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_0.LRF
Sample
Reference
148.671
Temp (C)
149.765
1.025
Press (atm)
1.001
5.11
Conc*Path
560.000
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 2.820
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 0.000
Ethylene oxide 150C 123.153
H2O% 150C 1.365
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
Absorbance
Wavenumber
Wavenumber
Absorbance
Hide Sample-Reference
Sample-Quant Band
Sample-Reference
15798.285
123.153
Original Laser
15798.285
1.153

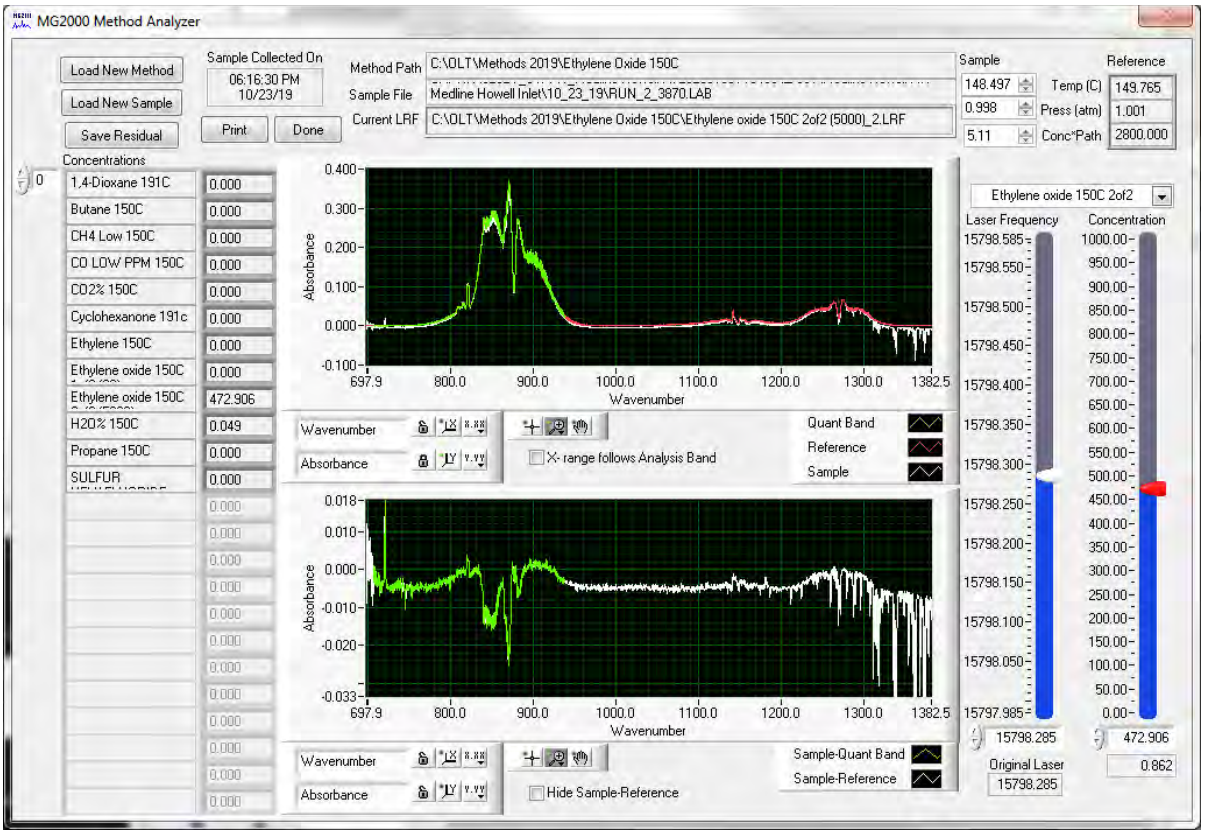

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Print
Done
Sample Collected On
10:46:19 AM
10/23/19
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_2_3020.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 1of2 (30)_0.LRF
Sample
Reference
148.720
Temp (C)
149.765
1.016
Press (atm)
1.001
5.11
Conc*Path
560.000
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 3.030
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 15.146
Ethylene oxide 150C 0.000
H2O% 150C 1.158
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 1of2 (30)
Laser Frequency
Concentration
Absorbance
Wavenumber
Wavenumber
Absorbance
Hide Sample-Reference
Sample-Quant Band
Sample-Reference
15798.285
15.146
Original Laser
15798.285
0.141

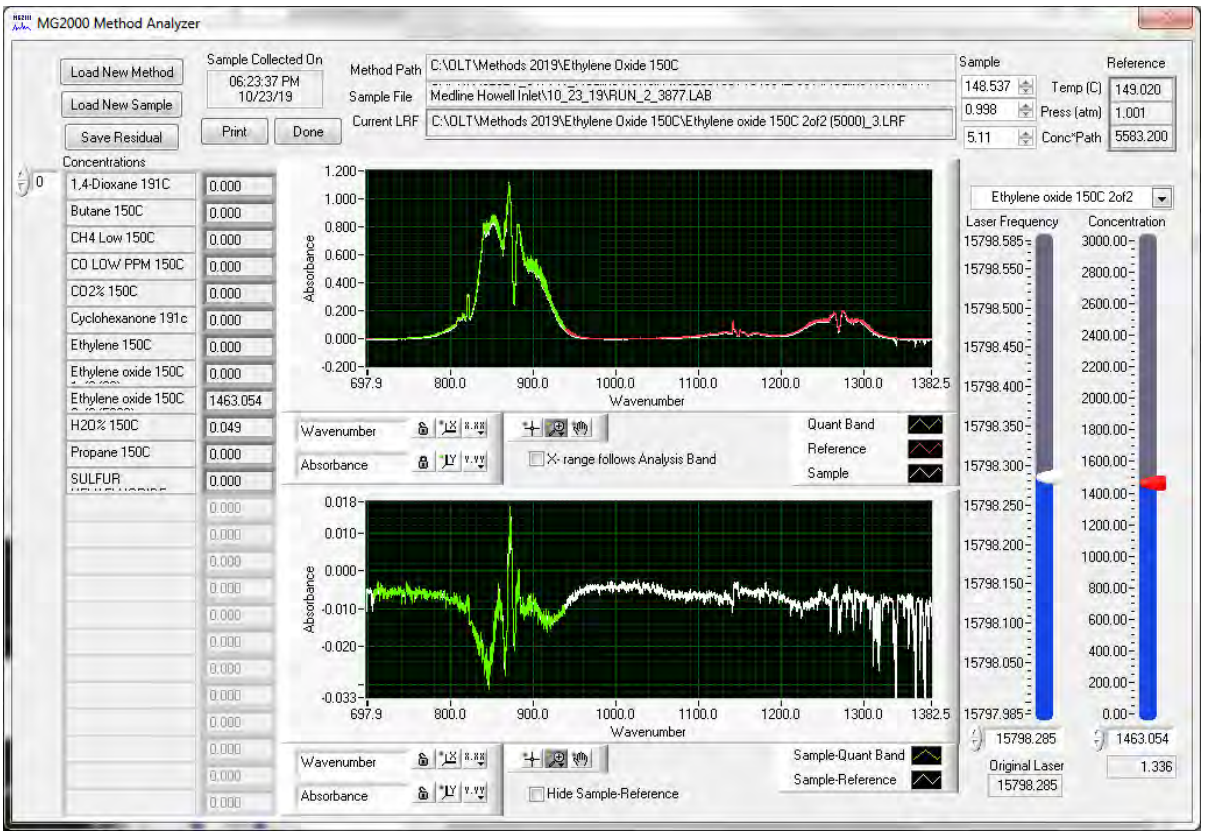

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Print
Done
Sample Collected On
08:44:37 PM
10/23/19
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_3_4086.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_3.LRF
Sample
Reference
148.506
Temp (C)
149.020
0.984
Press (atm)
1.001
5.11
Conc*Path
5583.200
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 2.820
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 0.000
Ethylene oxide 150C 1662.562
H2O% 150C 1.365
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
Hide Sample-Reference
Sample-Quant Band
Sample-Reference
Original Laser
15798.285
1662.562
1.496

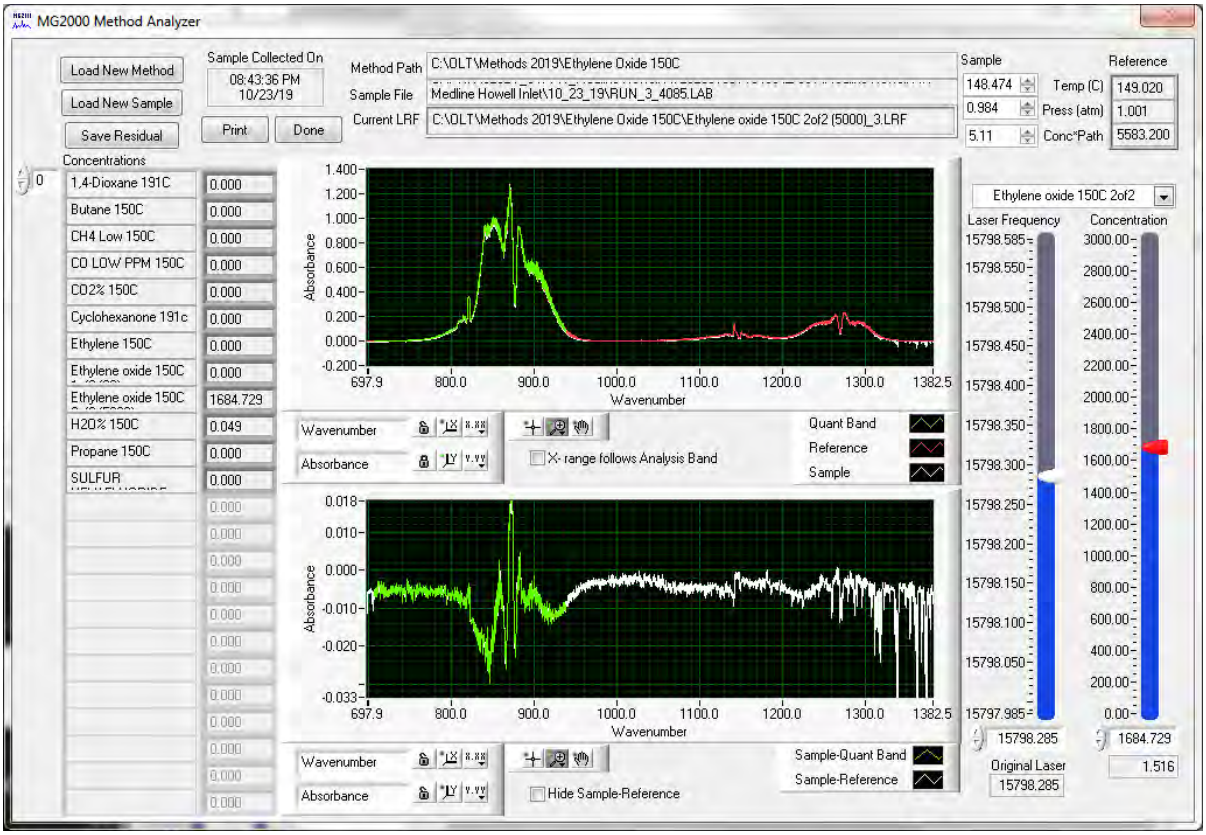

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Print
Done
Sample Collected On
12:19:07 PM
10/23/19
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_3_3131.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 1of2 (30)_0.LRF
Sample
Reference
148.734
Temp (C)
149.765
1.016
Press (atm)
1.001
5.11
Conc*Path
560.000
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 3.030
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 17.310
Ethylene oxide 150C 0.000
H2O% 150C 1.158
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 1of2 (30)
Laser Frequency
Concentration
Hide Sample-Reference
Sample-Quant Band
Sample-Reference
Original Laser
15798.285
17.310
0.161

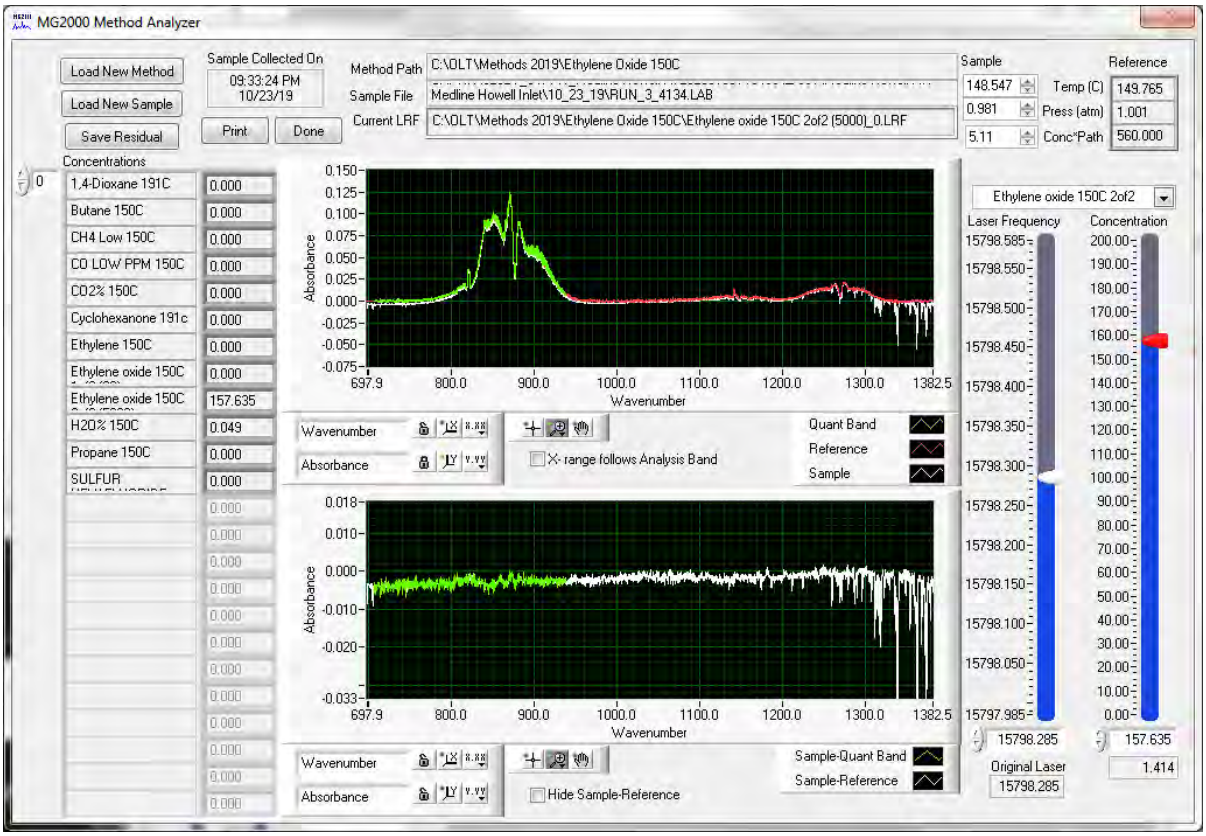

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Print
Done
Sample Collected On
04:02:06 PM
10/23/19
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_1_3660.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_4.LRF
Sample
Reference
148.874
Temp (C)
149.020
1.000
Press (atm)
1.001
5.11
Conc*Path
14033.601
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 0.000
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 0.000
Ethylene oxide 150C 2097.564
H2O% 150C 0.049
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
15798.285
2097.564
Original Laser
15798.285
0.763
Sample-Quant Band
Sample-Reference
Hide Sample-Reference

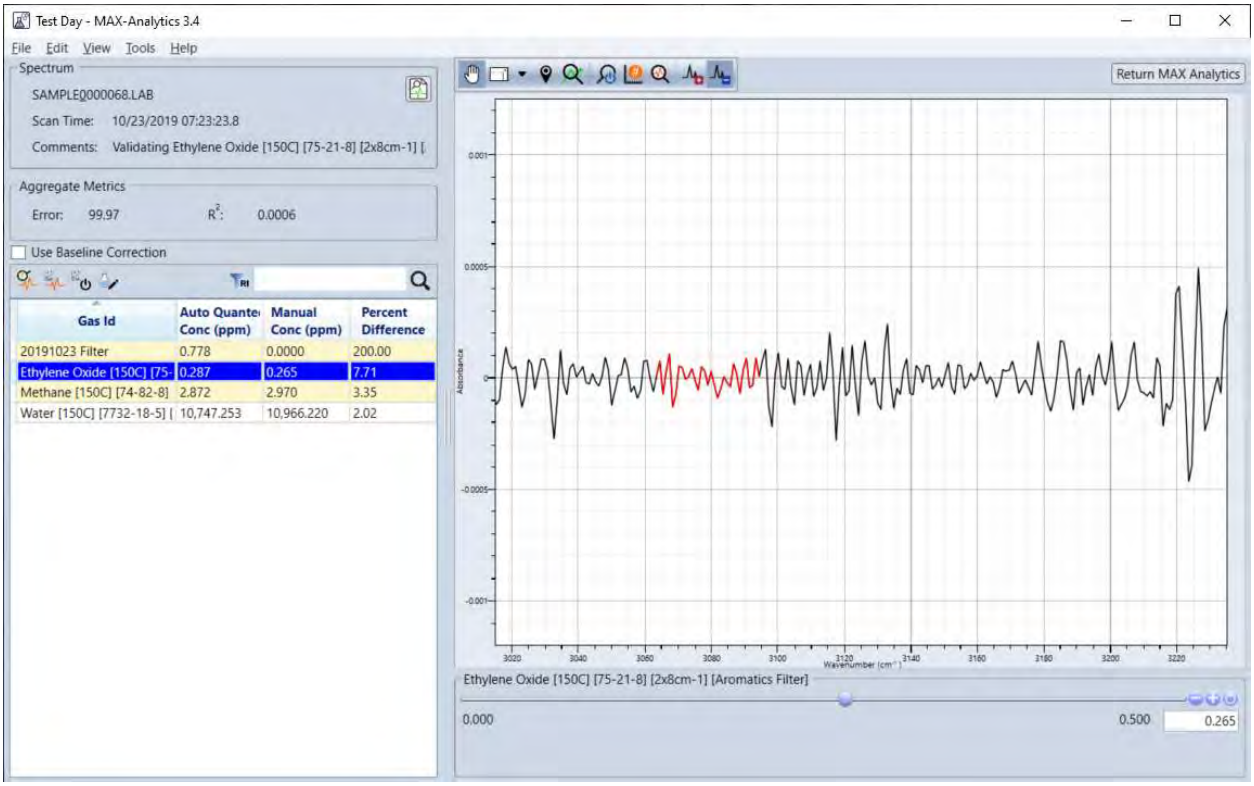

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Print
Done
Sample Collected On
04:24:27 PM
10/23/19
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_1_3682.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_1.LRF
Sample
Reference
148.942
Temp (C)
149.765
1.001
Press (atm)
1.001
5.11
Conc*Path
1400.000
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 0.000
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 0.000
Ethylene oxide 150C 340.514
H2O% 150C 0.049
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
15798.285
340.514
Original Laser
15798.285
1.244
Sample-Quant Band
Sample-Reference
Hide Sample-Reference

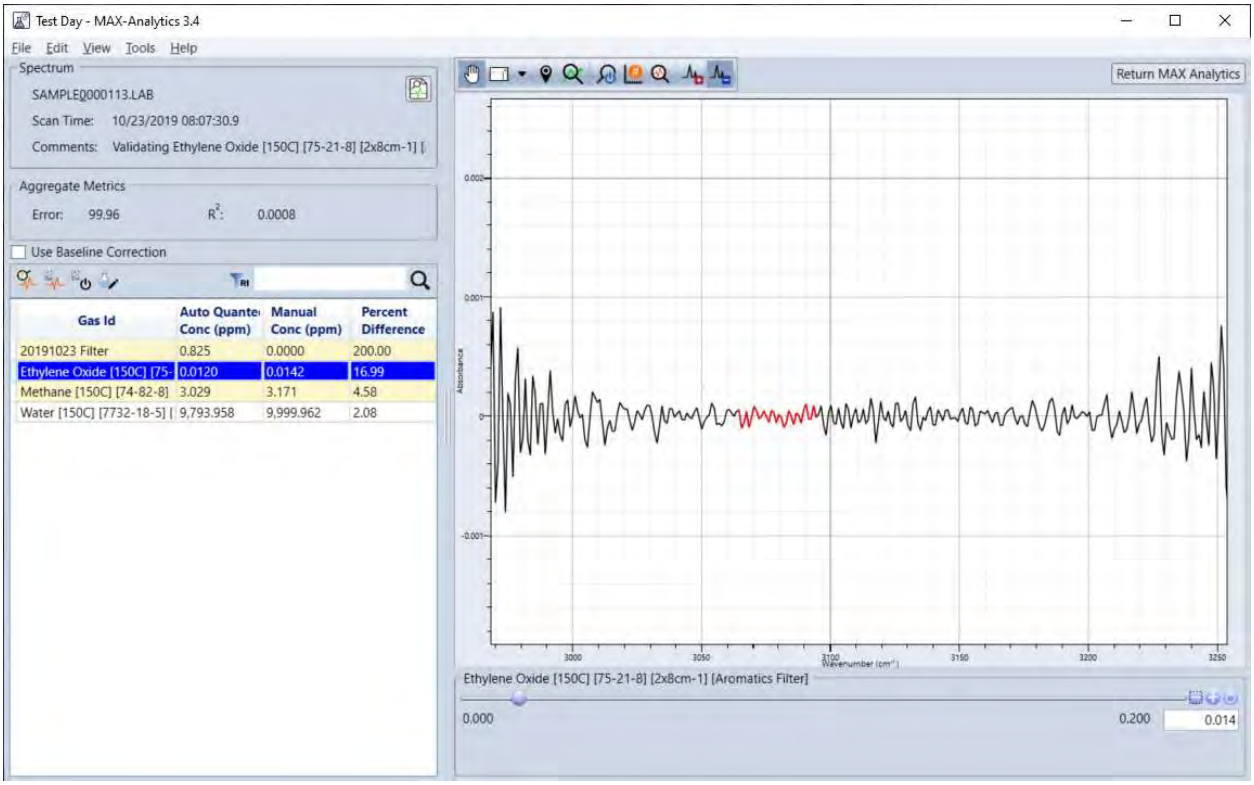

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Sample Collected On
06:16:30 PM
10/23/19
Print
Done
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_2_3870.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_2.LRF
Sample
Reference
148.497
Temp (C)
149.765
0.998
Press (atm)
1.001
5.11
Conc*Path
2800.000
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 0.000
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 0.000
Ethylene oxide 150C 472.906
H2O% 150C 0.049
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
15798.285
472.906
Original Laser
15798.285
0.862
Hide Sample-Reference
Sample-Quant Band
Sample-Reference

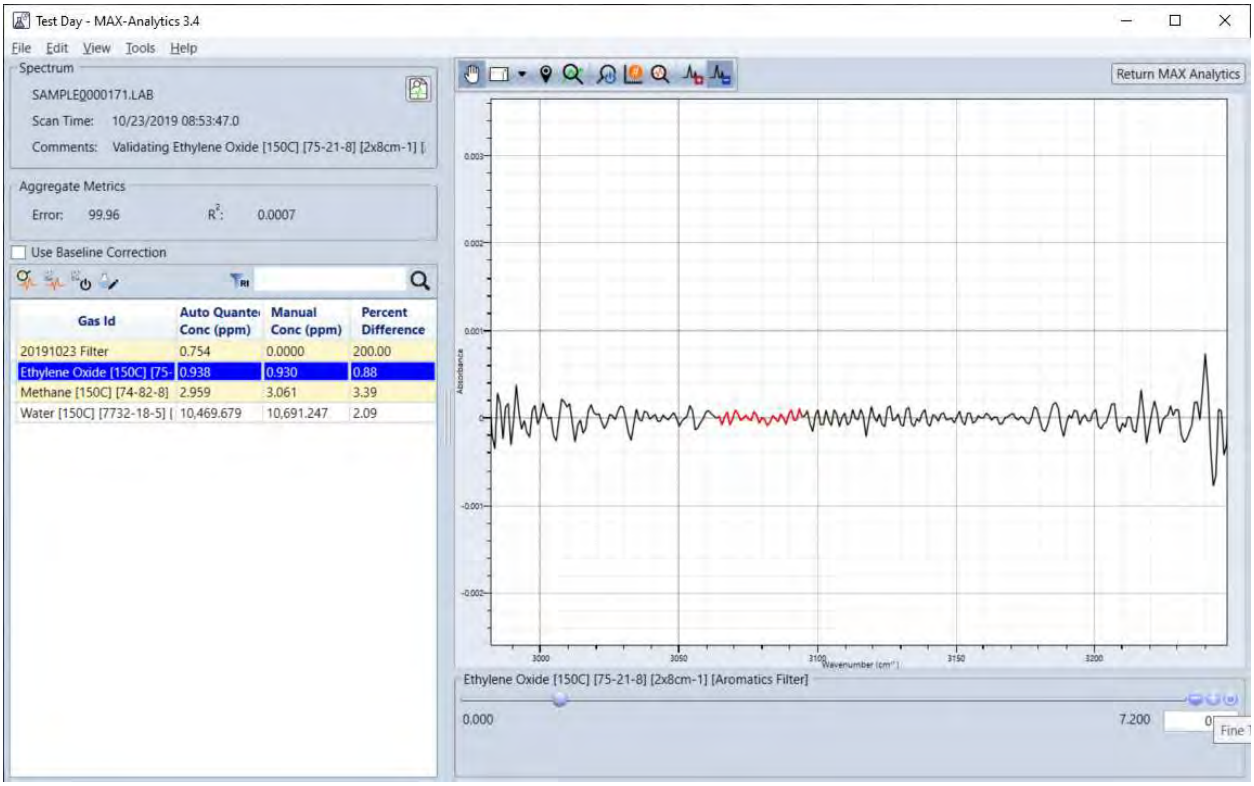

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Sample Collected On
06:23:37 PM
10/23/19
Print
Done
Method Path
C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File
Medline Howell Inlet\10_23_19\RUN_2_3877.LAB
Current LRF
C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_3.LRF
Sample
Reference
148.537
Temp (C)
149.020
0.998
Press (atm)
1.001
5.11
Conc*Path
5583.200
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 0.000
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 0.000
Ethylene oxide 150C 1463.054
H2O% 150C 0.049
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
15798.285
1463.054
Original Laser
15798.285
1.336
Hide Sample-Reference
Sample-Quant Band
Sample-Reference

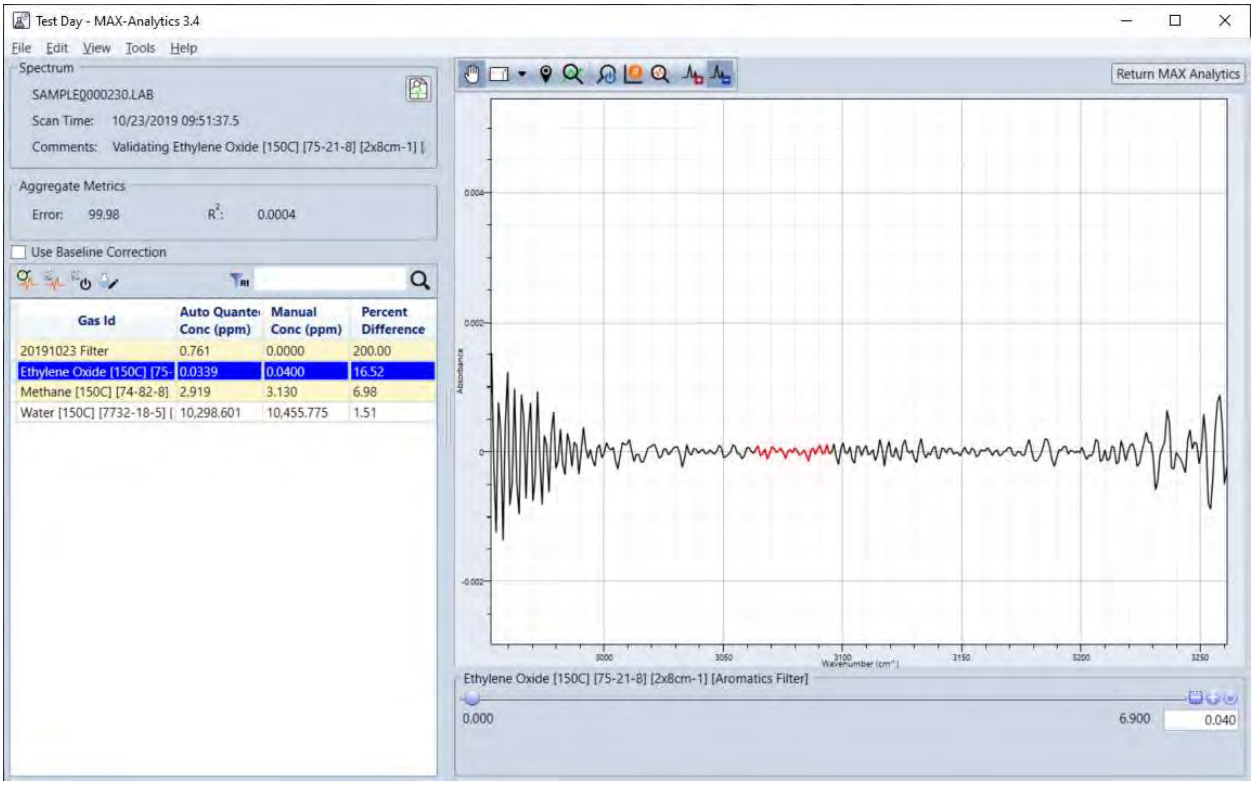

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Sample Collected On
08:43:36 PM
10/23/19
Print
Done
Method Path C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File Medline Howell Inlet\10_23_19\RUN_3_4085.LAB
Current LRF C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_3.LRF
Sample
Reference
148.474 Temp (C) 149.020
0.984 Press (atm) 1.001
5.11 Conc*Path 5583.200
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 0.000
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 0.000
Ethylene oxide 150C 1684.729
H20% 150C 0.049
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
15798.285
1684.729
Original Laser
15798.285
1.516
Sample-Quant Band
Sample-Reference
Hide Sample-Reference

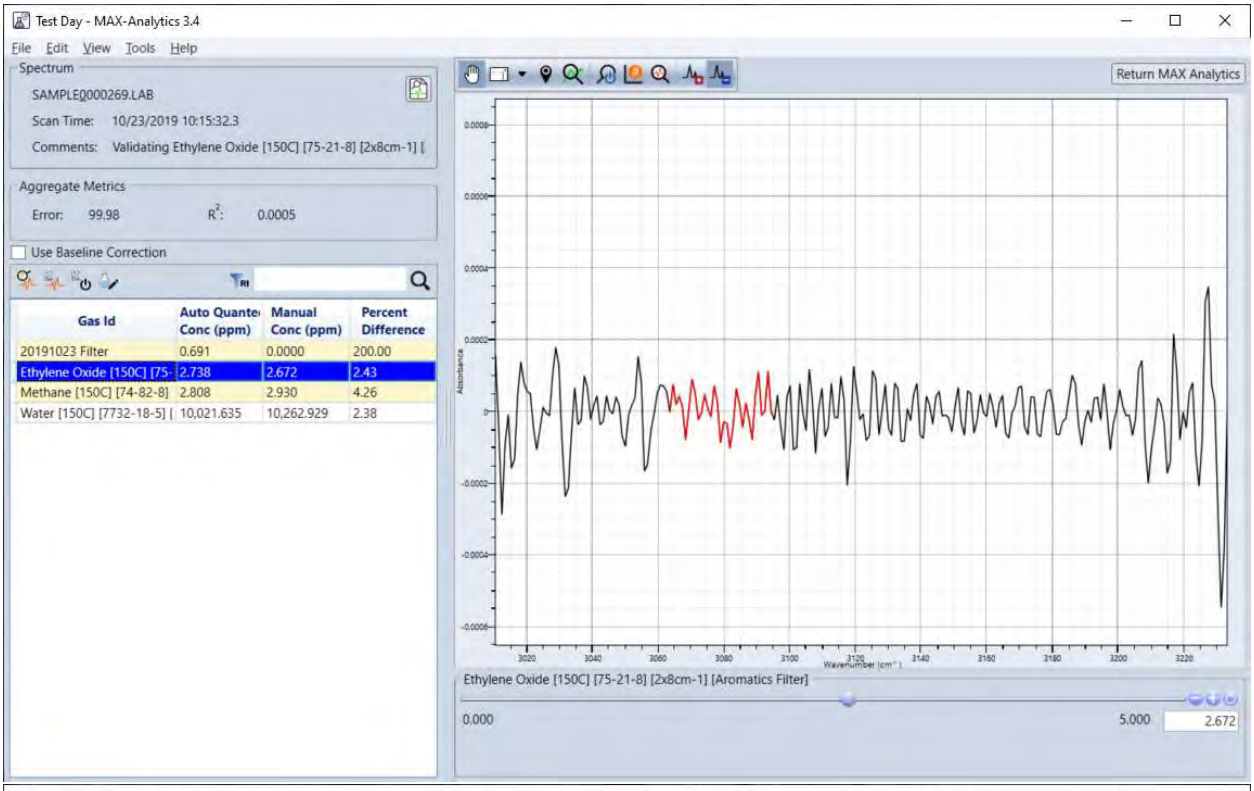

MG2000 Method Analyzer
Load New Method
Load New Sample
Save Residual
Sample Collected On
09:33:24 PM
10/23/19
Print
Done
Method Path C:\OLT\Methods 2019\Ethylene Oxide 150C
Sample File Medline Howell Inlet\10_23_19\RUN_3_4134.LAB
Current LRF C:\OLT\Methods 2019\Ethylene Oxide 150C\Ethylene oxide 150C 2of2 (5000)_0.LRF
Sample
Reference
148.547 Temp (C) 149.765
0.981 Press (atm) 1.001
5.11 Conc*Path 560.000
Concentrations
1,4-Dioxane 191C 0.000
Butane 150C 0.000
CH4 Low 150C 0.000
CO LOW PPM 150C 0.000
CO2% 150C 0.000
Cyclohexanone 191c 0.000
Ethylene 150C 0.000
Ethylene oxide 150C 0.000
Ethylene oxide 150C 157.635
H20% 150C 0.049
Propane 150C 0.000
SULFUR 0.000
Absorbance
Wavenumber
Wavenumber
Absorbance
X- range follows Analysis Band
Quant Band
Reference
Sample
Ethylene oxide 150C 2of2
Laser Frequency
Concentration
15798.285
157.635
Original Laser
15798.285
1.414
Sample-Quant Band
Sample-Reference
Hide Sample-Reference

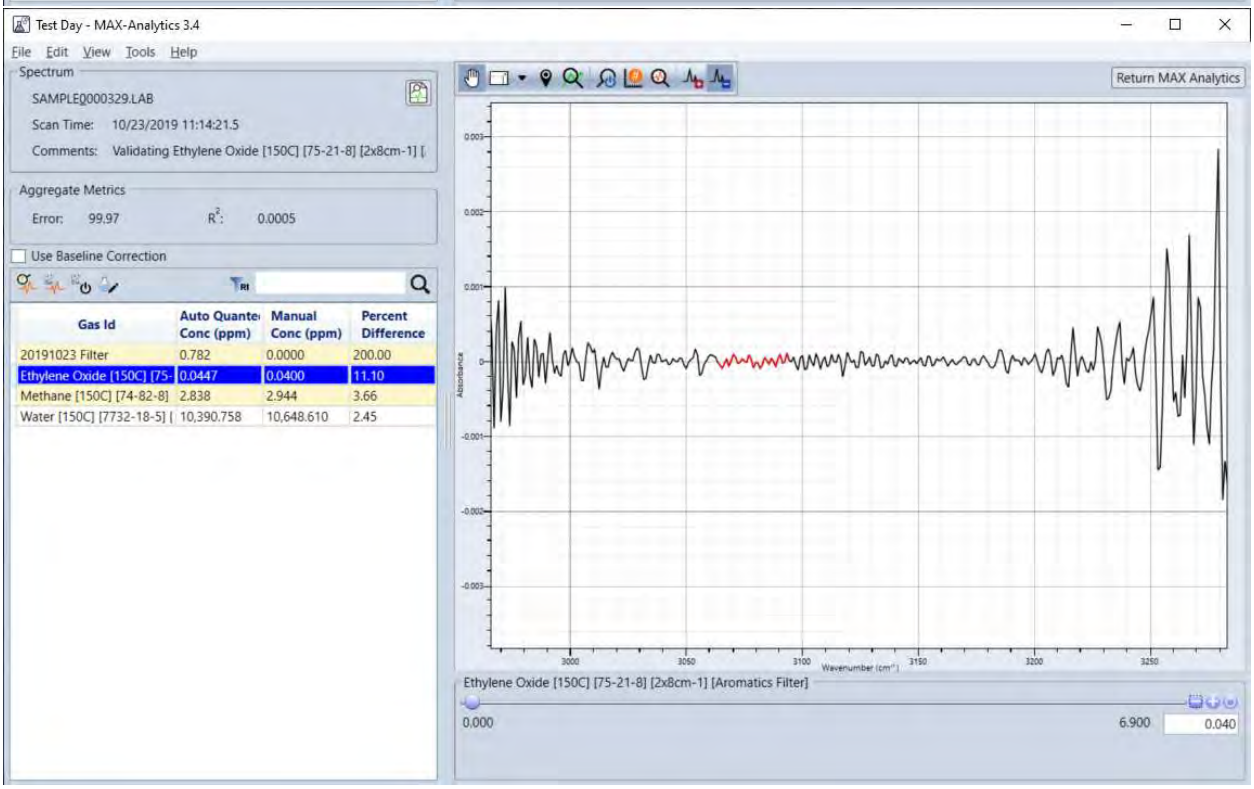

Test Day - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000068.LAB
Scan Time: 10/23/2019 07:23:23.8
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.97
R²: 0.0006
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
20191023 Filter | 0.778 | 0.0000 | 200.00
Ethylene Oxide [150C] [75- | 0.287 | 0.265 | 7.71
Methane [150C] [74-82-8] | 2.872 | 2.970 | 3.35
Water [150C] [7732-18-5] [| 10,747.253 | 10,966.220 | 2.02
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
0.500
0.265

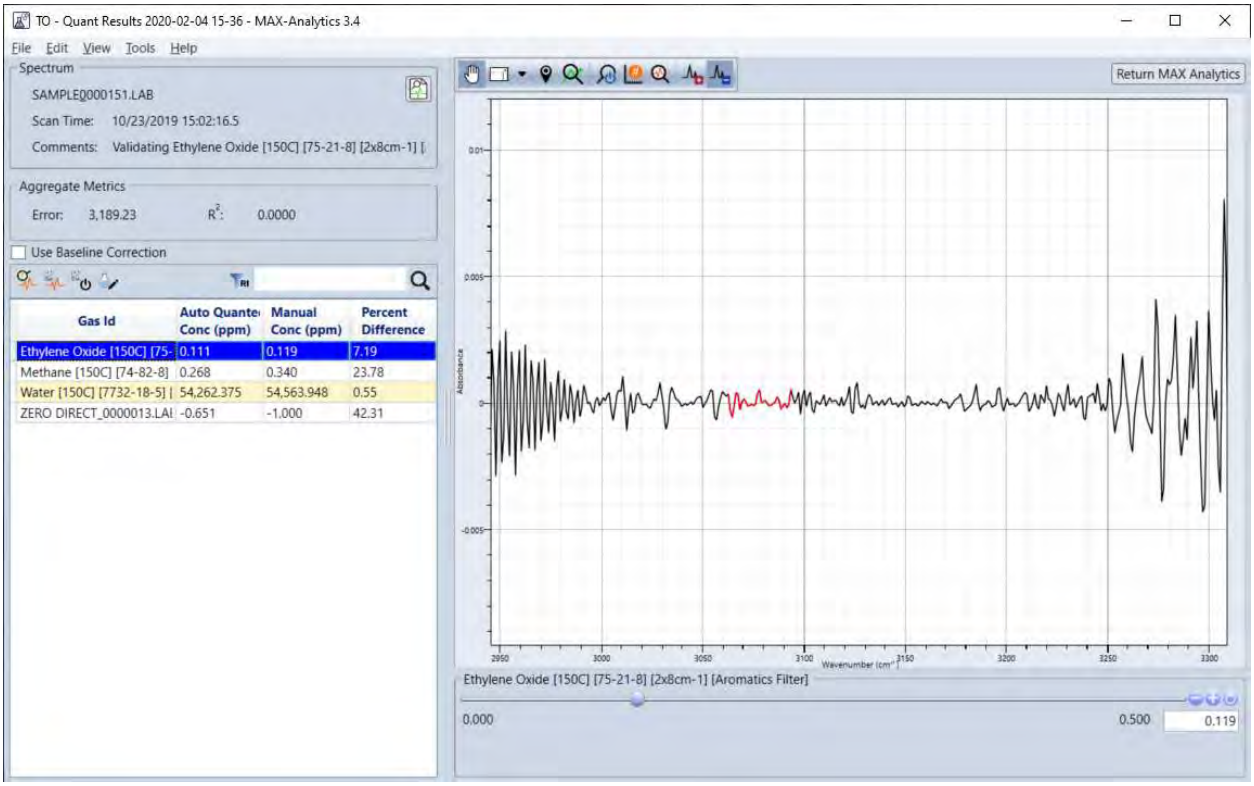

Test Day - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000113.LAB
Scan Time: 10/23/2019 08:07:30.9
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.96
R²: 0.0008
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
20191023 Filter | 0.825 | 0.0000 | 200.00
Ethylene Oxide [150C] [75- | 0.0120 | 0.0142 | 16.99
Methane [150C] [74-82-8] | 3.029 | 3.171 | 4.58
Water [150C] [7732-18-5] [| 9,793.958 | 9,999.962 | 2.08
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
0.200
0.014

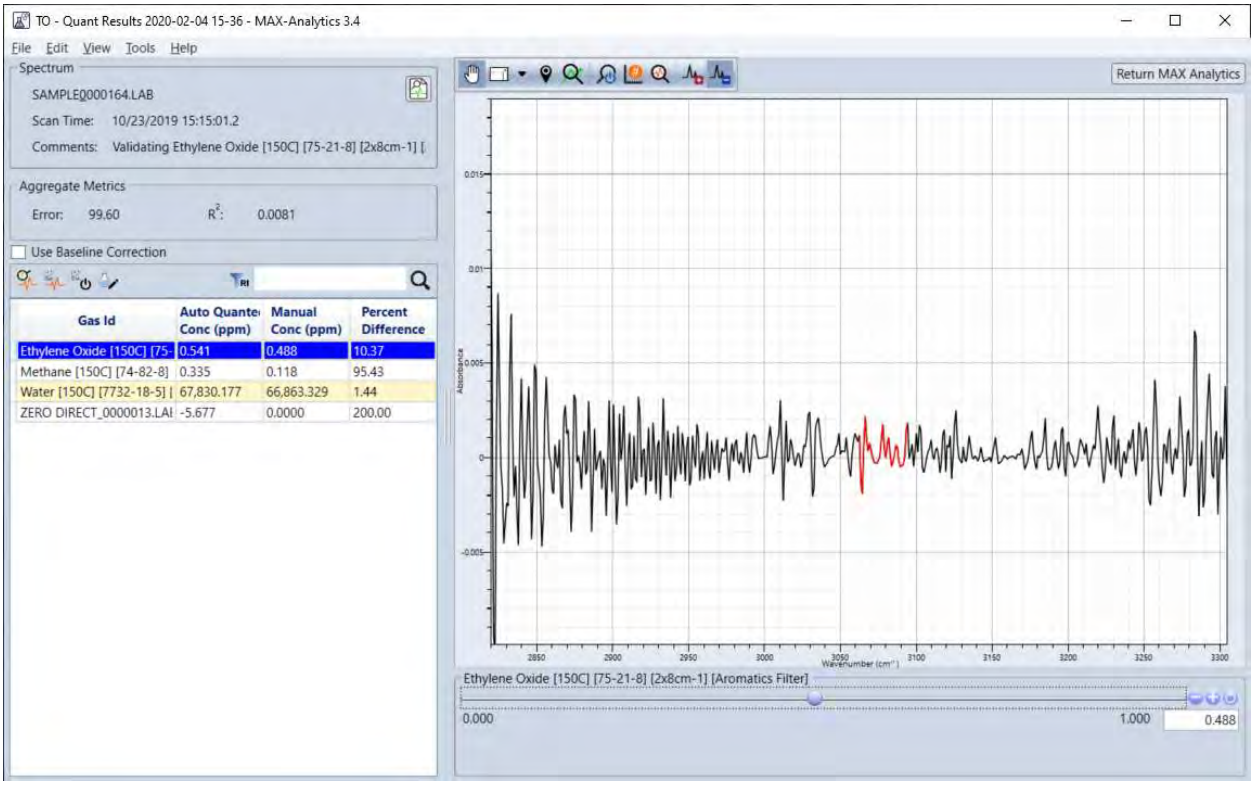

Test Day - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000171.LAB
Scan Time: 10/23/2019 08:53:47.0
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.96
R²: 0.0007
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
20191023 Filter | 0.754 | 0.0000 | 200.00
Ethylene Oxide [150C] [75- | 0.938 | 0.930 | 0.88
Methane [150C] [74-82-8] | 2.959 | 3.061 | 3.39
Water [150C] [7732-18-5] [| 10,469.679 | 10,691.247 | 2.09
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
7.200

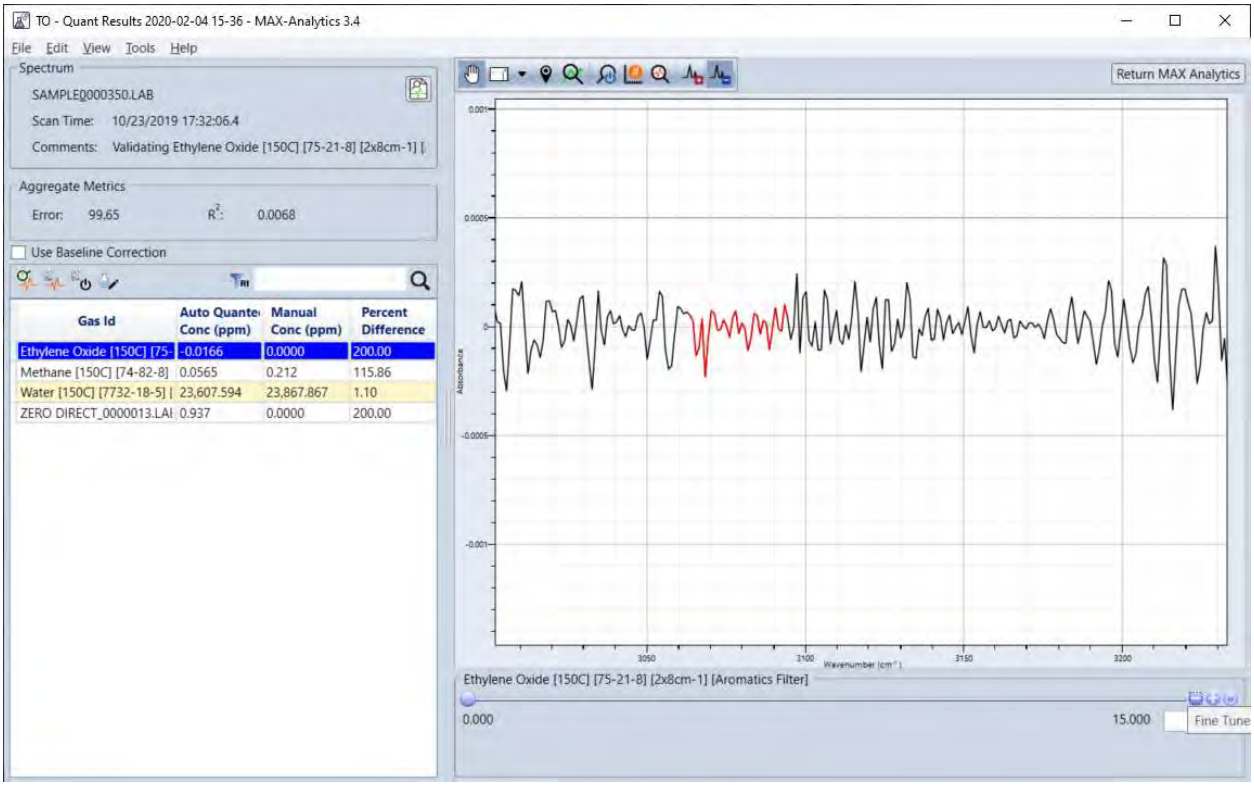

Test Day - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000230.LAB
Scan Time: 10/23/2019 09:51:37.5
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.98
R²: 0.0004
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
20191023 Filter | 0.761 | 0.0000 | 200.00
Ethylene Oxide [150C] [75- | 0.0339 | 0.0400 | 16.52
Methane [150C] [74-82-8] | 2.919 | 3.130 | 6.98
Water [150C] [7732-18-5] [| 10,298.601 | 10,455.775 | 1.51
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
6.900
0.040

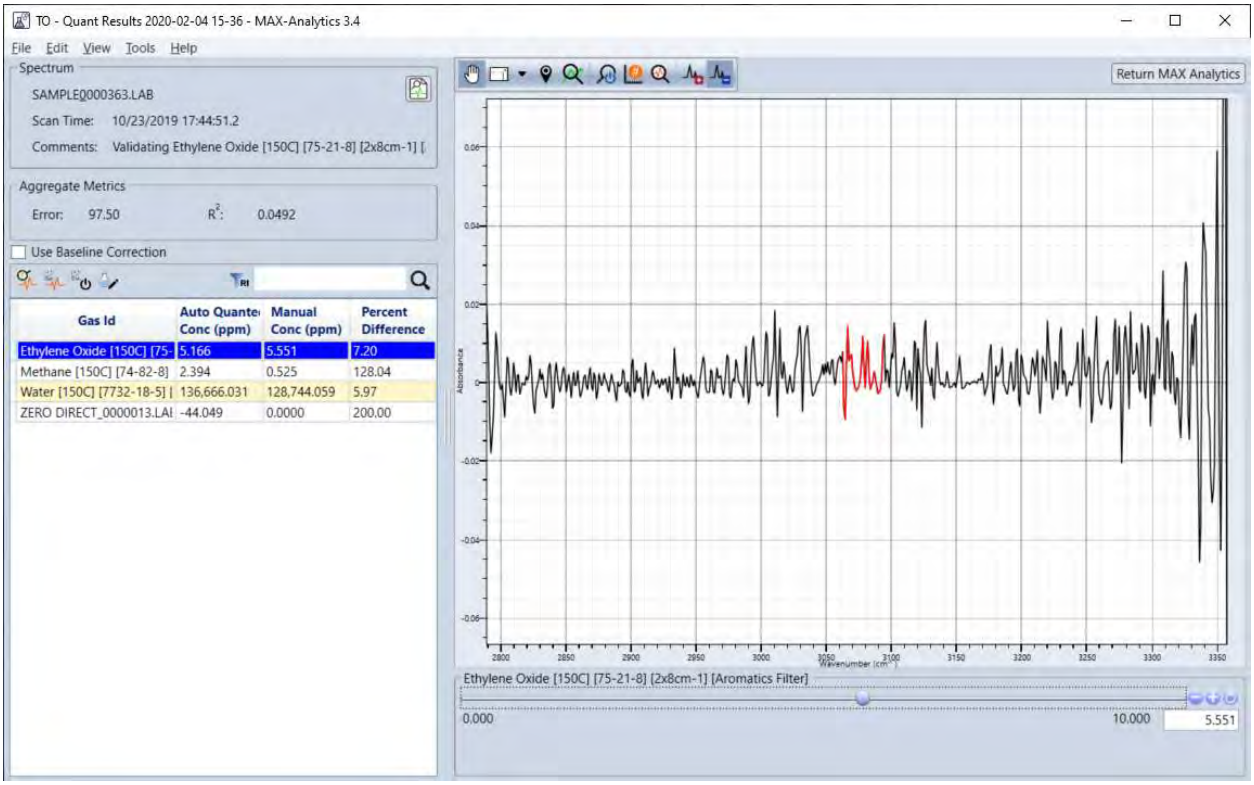

Test Day - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000269.LAB
Scan Time: 10/23/2019 10:15:32.3
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.98
R²: 0.0005
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
20191023 Filter | 0.691 | 0.0000 | 200.00
Ethylene Oxide [150C] [75- | 2.738 | 2.672 | 2.43
Methane [150C] [74-82-8] | 2.808 | 2.930 | 4.26
Water [150C] [7732-18-5] [| 10,021.635 | 10,262.929 | 2.38
Return MAX Analytics
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
5.000
2.672

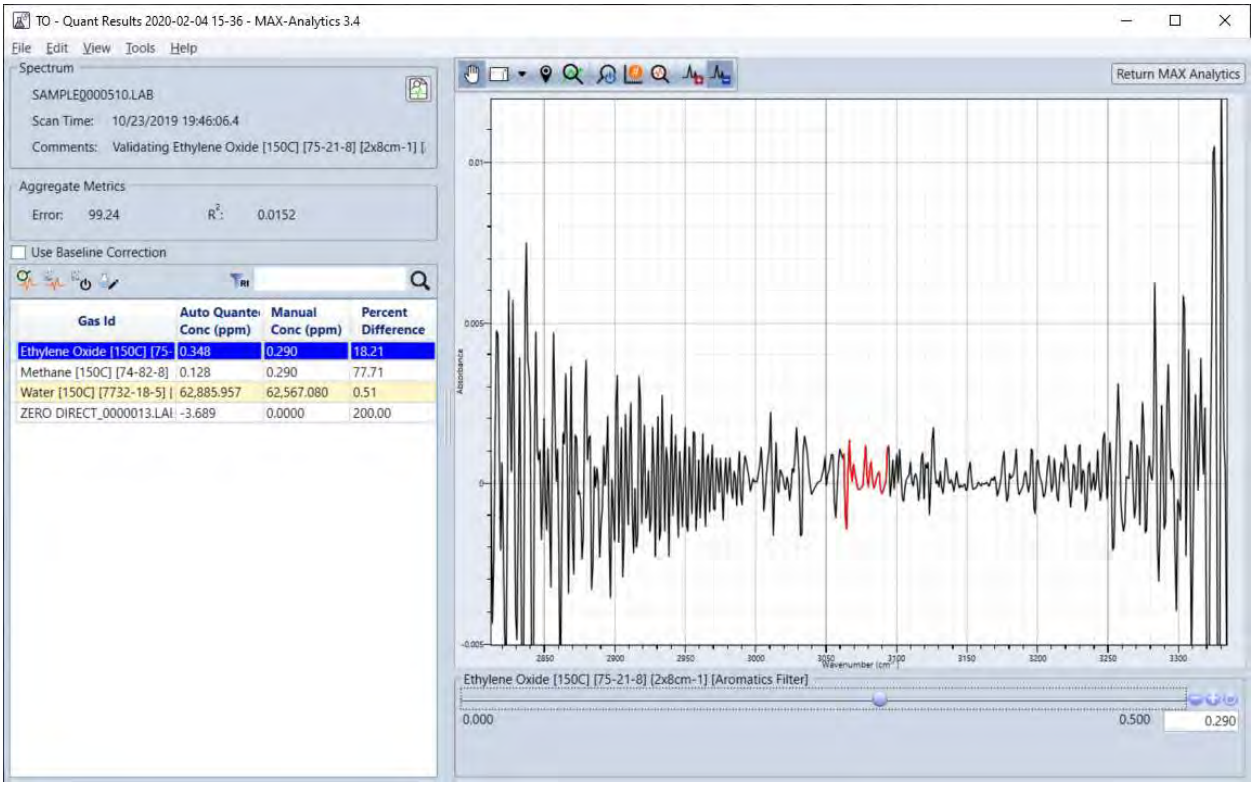

Test Day - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000329.LAB
Scan Time: 10/23/2019 11:14:21.5
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.97
R²: 0.0005
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
20191023 Filter | 0.782 | 0.0000 | 200.00
Ethylene Oxide [150C] [75- | 0.0447 | 0.0400 | 11.10
Methane [150C] [74-82-8] | 2.838 | 2.944 | 3.66
Water [150C] [7732-18-5] [| 10,390.758 | 10,648.610 | 2.45
Return MAX Analytics
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
6.900
0.040

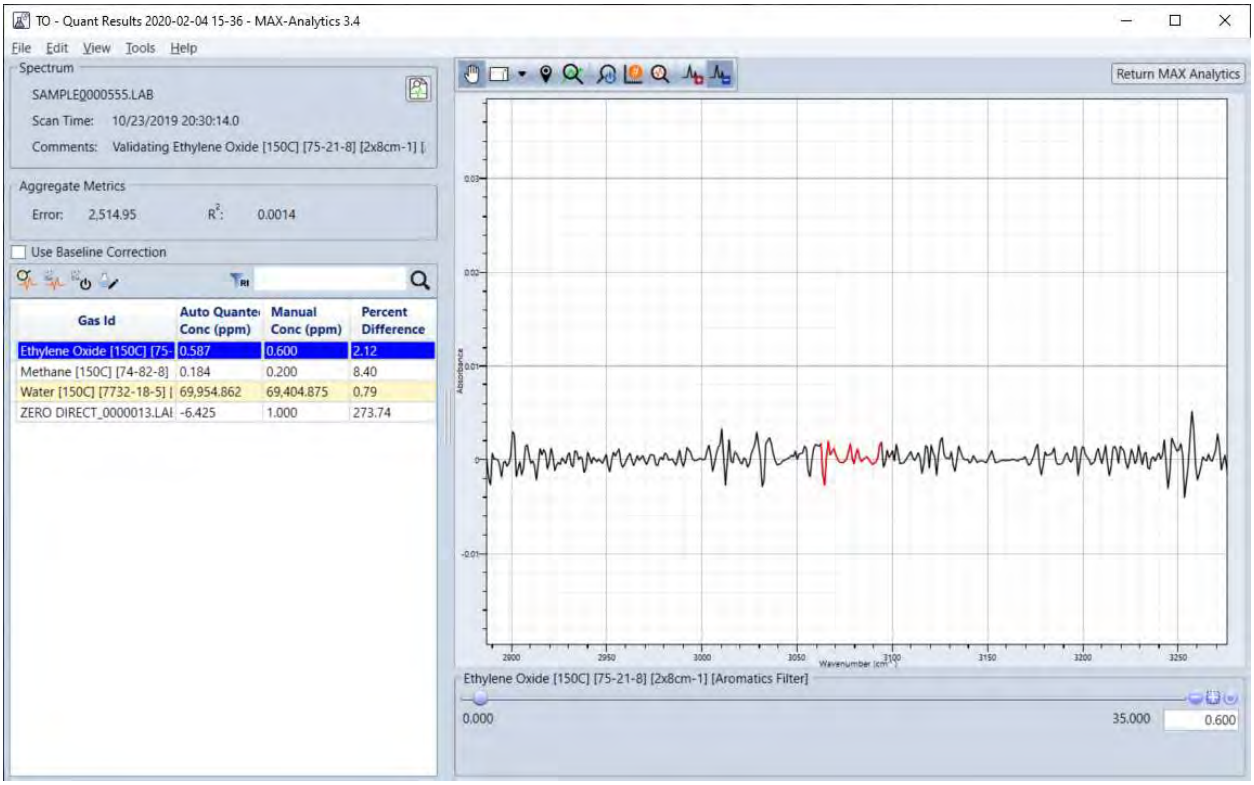

TO - Quant Results 2020-02-04 15-36 - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000151.LAB
Scan Time: 10/23/2019 15:02:16.5
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 3,189.23
R²: 0.0000
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
Ethylene Oxide [150C] [75- | 0.111 | 0.119 | 7.19
Methane [150C] [74-82-8] | 0.268 | 0.340 | 23.78
Water [150C] [7732-18-5] | 54,262.375 | 54,563.948 | 0.55
ZERO DIRECT_0000013.LAI | -0.651 | -1.000 | 42.31
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
0.500
0.119


TO - Quant Results 2020-02-04 15-36 - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000164.LAB
Scan Time: 10/23/2019 15:15:01.2
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.60
R²: 0.0081
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
Ethylene Oxide [150C] [75- | 0.541 | 0.488 | 10.37
Methane [150C] [74-82-8] | 0.335 | 0.118 | 95.43
Water [150C] [7732-18-5] | 67,830.177 | 66,863.329 | 1.44
ZERO DIRECT_0000013.LAI | -5.677 | 0.0000 | 200.00
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
1.000
0.488


TO - Quant Results 2020-02-04 15-36 - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000350.LAB
Scan Time: 10/23/2019 17:32:06.4
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.65
R²: 0.0068
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
Ethylene Oxide [150C] [75- | -0.0166 | 0.0000 | 200.00
Methane [150C] [74-82-8] | 0.0565 | 0.212 | 115.86
Water [150C] [7732-18-5] | 23,607.594 | 23,867.867 | 1.10
ZERO DIRECT_0000013.LAI | 0.937 | 0.0000 | 200.00
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
15.000
Fine Tune


TO - Quant Results 2020-02-04 15-36 - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000363.LAB
Scan Time: 10/23/2019 17:44:51.2
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 97.50
R²: 0.0492
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
Ethylene Oxide [150C] [75- | 5.166 | 5.551 | 7.20
Methane [150C] [74-82-8] | 2.394 | 0.525 | 128.04
Water [150C] [7732-18-5] | 136,666.031 | 128,744.059 | 5.97
ZERO DIRECT_0000013.LAI | -44.049 | 0.0000 | 200.00
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
10.000
5.551


TO - Quant Results 2020-02-04 15-36 - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000510.LAB
Scan Time: 10/23/2019 19:46:06.4
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 99.24
R²: 0.0152
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
Ethylene Oxide [150C] [75- | 0.348 | 0.290 | 18.21
Methane [150C] [74-82-8] | 0.128 | 0.290 | 77.71
Water [150C] [7732-18-5] | 62,885.957 | 62,567.080 | 0.51
ZERO DIRECT_0000013.LAI | -3.689 | 0.0000 | 200.00
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
0.500
0.290


TO - Quant Results 2020-02-04 15-36 - MAX-Analytics 3.4
File Edit View Tools Help
Spectrum
SAMPLE0000555.LAB
Scan Time: 10/23/2019 20:30:14.0
Comments: Validating Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [
Aggregate Metrics
Error: 2,514.95
R²: 0.0014
Use Baseline Correction
Gas Id | Auto Quante Conc (ppm) | Manual Conc (ppm) | Percent Difference
Ethylene Oxide [150C] [75- | 0.587 | 0.600 | 2.12
Methane [150C] [74-82-8] | 0.184 | 0.200 | 8.40
Water [150C] [7732-18-5] | 69,954.862 | 69,404.875 | 0.79
ZERO DIRECT_0000013.LAI | -6.425 | 1.000 | 273.74
Return MAX Analytics
Absorbance
Wavenumber (cm⁻¹)
Ethylene Oxide [150C] [75-21-8] [2x8cm-1] [Aromatics Filter]
0.000
35.000
0.600

Appendix D.3
Span Gas Certificates

Airgas Specialty Gases
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI70E15A2565	Reference Number:	54-124571962-1
Cylinder Number:	CC18189	Cylinder Volume:	162.5 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	1974 PSIG
PGVP Number:	B12016	Valve Outlet:	580
Gas Code:	CO2,BALN	Certification Date:	Aug 25, 2016

Expiration Date: Aug 25, 2024

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	30.00 %	30.00 %	G2	+/- 1% NIST Traceable	08/25/2016
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060414	CC413576	7.489 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 14, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CAI-110	Paramagnetic	Aug 24, 2016

Triad Data Available Upon Request

Signature on file
Approved for Release

Airgas Specialty Gases
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Part Number:	X02NI99C15A1268	Reference Number:	54-401337249-1
Cylinder Number:	CC218918	Cylinder Volume:	144.4 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
Analysis Date:	Oct 24, 2018	Valve Outlet:	350
Lot Number:	54-401337249-1		

Expiration Date: Oct 24, 2021

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
ETHYLENE	100.0 PPM	99.95 PPM	+/- 2%
NITROGEN	Balance		

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas USA, LLC
1601 Nicholas Blvd
Elk Grove, IL 60007
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: PRIMARY STANDARD

Part Number:	X02NI99P15A4784	Reference Number:	136-401614332-1
Cylinder Number:	CC210851	Cylinder Volume:	144.3 CF
Laboratory:	192 - Elk Grove (SAP) - IL	Cylinder Pressure:	2015 PSIG
Analysis Date:	Oct 03, 2019	Valve Outlet:	350
Lot Number:	136-401614332-1		

Expiration Date: Oct 03, 2027

Primary Standard Gas Mixtures are traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
METHANE	100.0 PPM	100.0 PPM	+/- 1%
NITROGEN	Balance		

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 1
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	MONTROSE ENVIRONMENTAL GROUP		
Part Number:	X03NI99C15A0287	Reference Number:	160-401353039-1
Cylinder Number:	CC470995	Cylinder Volume:	144.3 Cubic Feet
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2015 PSIG
Analysis Date:	Nov 22, 2018	Valve Outlet:	350SS
Lot Number:	160-401353039-1		

Expiration Date: May 22, 2019

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
ETHYLENE OXIDE	5.000 PPM	4.984 PPM	+/- 5%
SULFUR HEXAFLUORIDE	5.000 PPM	5.031 PPM	+/- 5%
NITROGEN	Balance		

Approved for Release

Appendix D.4
Equipment Calibration Data

Montrose Air Quality Services, LLC
S-Type Pitot Tube Inspection Form

Date 1/3/19
Pitot ID AE2-2-2
Operator DD

	Measured	Allowed
Outside Tube Diameter - Dt (inches)	0.250	NA
Base To Opening Distance - Pa (inches)	0.348	NA
Base To Opening Distance - Pb (inches)	0.348	NA
Pa/Dt	1.39	1.05-1.50
Pb/Dt	1.39	1.05-1.50
Angle $\alpha 1(^{o})$	1	10
Angle $\alpha 2(^{o})$	0.4	10
Angle $B1(^{o})$	1.3	5
Angle $B1(^{o})$	0.5	5
Opening to Opening Distance Pa+Pb (inches)	0.696	NA
Angle Z (^{o})	1	NA
z (inches)	0.0121	0.125
Angle W (^{o})	1.4	NA
w (inches)	0.017	0.031

Note Any Damage, Nicks or Dents to the Pitot Tube

Is the Pitot Tube Part of an Assembly Yes
If Yes, Complete the Section Below

Pitot	Measured	Minimum
Distance From Nozzle (inches)	NA	0.75 in.
Pitot to Thermocouple Distance (inches)	2.25	2 in.
Pitot to Sample Probe Distance (inches)	6	3 in.

Does the Pitot Tube Meet the Above Requirements Yes
Is the Pitot Tube Free of Damage Yes

If Yes to Both, a Pitot Tube Coefficient of 0.84 is Assigned
If No to Either, then the Pitot Tube Must be Calibrated

Montrose Air Quality Services, LLC
S-Type Pitot Tube Inspection Form

Date 1/18/19
Pitot ID AE2-4-2
Operator JB

	Measured	Allowed
Outside Tube Diameter - Dt (inches)	0.250	NA
Base To Opening Distance - Pa (inches)	0.346	NA
Base To Opening Distance - Pb (inches)	0.346	NA
Pa/Dt	1.38	1.05-1.50
Pb/Dt	1.38	1.05-1.50
Angle $\alpha 1(^{o})$	0.2	10
Angle $\alpha 2(^{o})$	0.4	10
Angle $B1(^{o})$	0.5	5
Angle $B1(^{o})$	1.8	5
Opening to Opening Distance Pa+Pb (inches)	0.692	NA
Angle Z (^{o})	1.1	NA
z (inches)	0.0133	0.125
Angle W (^{o})	0.5	NA
w (inches)	0.006	0.031

Note Any Damage, Nicks or Dents to the Pitot Tube

Is the Pitot Tube Part of an Assembly Yes
If Yes, Complete the Section Below

Pitot	Measured	Minimum
Distance From Nozzle (inches)	NA	0.75 in.
Pitot to Thermocouple Distance (inches)	2.25	2 in.
Pitot to Sample Probe Distance (inches)	6	3 in.

Does the Pitot Tube Meet the Above Requirements Yes
Is the Pitot Tube Free of Damage Yes

If Yes to Both, a Pitot Tube Coefficient of 0.84 is Assigned
If No to Either, then the Pitot Tube Must be Calibrated

THIS IS THE LAST PAGE OF THIS DOCUMENT

If you have any questions, please contact one of the following individuals by email or phone.

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Email: pclark@montrose-env.com
Phone: (303)670-0530

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Title: Project Manager
Region: Central Region
Email: awebster@montrose-env.com
Phone: (303)670-0530