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Source Test Report for 2023 Compliance Emissions Testing

Coating Operations (FGCOATINGLINE)

Ventra Fowlerville LLC
Fowlerville, Michigan

Prepared For:

Ventra Fowlerville LLC
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Prepared By:

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For Submission To:

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ACCREDITED
TO ASTM D7036 ONLY
CERT #3923.01

Review and Certification

All work, calculations, and other activities and tasks performed and presented in this document 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 Management System and ASTM D7036-04 during this test project.

Signature: Jeremiah Hicks **Date:** 09 / 26 / 2023

Name: Jeremiah Hicks **Title:** Client Project Manager

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, accurate, and conforms to the requirements of the Montrose Quality Management System and ASTM D7036-04.

Signature: robert j lisy jr **Date:** 10 / 02 / 2023

Name: Robert J. Lisy, Jr. **Title:** Reporting Hub Manager

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1.0 Introduction

1.1 Summary of Test Program

Ventra Fowlerville LLC contracted Montrose Air Quality Services, LLC (Montrose) to perform a compliance test program on the Coating Operations (FGCOATINGLINE) at the Ventra Fowlerville facility (State Registration No.: N7413) located in Fowlerville, Michigan. Testing was performed on August 9-10, 2023, for the purpose of satisfying the emission testing requirements pursuant to Michigan Department of Environment, Great Lakes, and Energy (EGLE) Renewable Operation Permit No. MI-ROP-N7413-2020 and 40 CFR Part 63, Subpart PPPP.

The specific objectives were to:

- Determine the volatile organic compound (VOC) destruction efficiency (DE) of the SV-RTO serving the FGCOATINGLINE
- Determine the VOC capture efficiency (CE) of the Temporary Total Enclosure (TTE) serving the FGCOATINGLINE
- Conduct the test program with a focus on safety

Montrose performed the tests to measure the emission parameters listed in Table 1-1.

Table 1-1
Summary of Test Program

Test Date(s)	Unit ID/ Source Name	Activity/ Parameters	Test Methods	No. of Runs	Duration (Minutes)
8/9/2023 and 8/10/2023	FGCOATINGLINE SV-RTO Inlet	Velocity/Volumetric Flow Rate	EPA 1 & 2	6	45
8/9/2023 and 8/10/2023	FGCOATINGLINE SV-RTO Inlet	O_2, CO_2	EPA 3	6	45
8/9/2023 and 8/10/2023	FGCOATINGLINE SV-RTO Inlet	Moisture	EPA 4	6	45
8/9/2023 and 8/10/2023	FGCOATINGLINE SV-RTO Inlet	THC	EPA 25A	6	45
8/9/2023	FGCOATINGLINE SV-RTO Exhaust	Velocity/Volumetric Flow Rate	EPA 1 & 2	3	45
8/9/2023	FGCOATINGLINE SV-RTO Exhaust	O_2, CO_2	EPA 3	3	45
8/9/2023	FGCOATINGLINE SV-RTO Exhaust	Moisture	EPA 4	3	45
8/9/2023	FGCOATINGLINE SV-RTO Exhaust	THC	EPA 25A	3	45
8/9/2023 and 8/10/2023	FGCOATINGLINE Coating Vats	VOC CE	EPA 204A	6	--

To simplify this report, a list of Units and Abbreviations is included in Appendix D.1. Throughout this report, chemical nomenclature, acronyms, and reporting units are not defined. Please refer to the list for specific details.

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 1-2. Detailed results for individual test runs can be found in Section 4.0. All supporting data can be found in the appendices.

The testing was conducted by the Montrose personnel listed in Table 1-3. The tests were conducted according to the test plan (protocol) dated July 7, 2023, that was submitted to the EGLE.

Table 1-2
Summary of Average Compliance Results – FGCOATINGLINE

August 9-10, 2023

Parameter/Units	Average Results	Emission Limits
VOC Destruction Efficiency (DE)		
%	97.6	95
VOC Capture Efficiency (CE)		
%, LCL Approach	68.0	90

1.2 Key Personnel

A list of project participants is included below:

Facility Information

Source Location:	Ventra Fowlerville LLC 8887 West Grand River Avenue Fowlerville, MI 39628
Project Contact:	Evan Urbanski
Role:	EHS Specialist
Company:	Ventra Fowlerville
Telephone:	517-226-4504
Email:	eurbanski@flexngate.com

Agency Information

Regulatory Agency:	EGLE	
Agency Contact:	TPU Supervisor	David Rauch
Telephone:	517-335-3122	517-216-0423
Email:	--	rauchd2@michigan.gov

Testing Company Information

Testing Firm:	Montrose Air Quality Services, LLC	
Contact:	Robert J. Lisy, Jr.	Jeremiah Hicks
Title:	Reporting Hub Manager	Client Project Manager
Telephone:	440-262-3760	440-262-3760
Email:	rlisy@montrose-env.com	jhicks@montrose-env.com

Laboratory Information

Laboratory:	Montrose-Wauconda
City, State:	Wauconda, Illinois
Method:	EPA Method 204A

Test personnel and observers are summarized in Table 1-3.

Table 1-3
Test Personnel and Observers

Name	Affiliation	Role/Responsibility
Jeremiah Hicks	Montrose	Client Project Manager, QI
Shawn Jaworski	Montrose	Field Project Manager, QI
Kyle Watkins	Montrose	Field Technician
Anthony Kemer	Montrose	Field Technician
Jachin Burhoe	Montrose	Field Technician
Evan Urbanski	Ventra Fowlerville LLC	Test Coordinator
David Rauch	EGLE	Observer

2.0 Plant and Sampling Location Descriptions

2.1 Process Description, Operation, and Control Equipment

Ventra Fowlerville operates an automotive plastic parts coating line (FGCOATINGLINE). The FGCOATINGLINE is an automated conveyor system consisting of a 5-stage aqueous wash line, three down-draft water-wash spray booths (adhesive promoter (Ad-Pro), basecoat, and clearcoat), an Ad-Pro drying oven, and a final cure oven. The Ad-Pro booth (EUAPPROCESS) is equipped with four robots employing non-electrostatic applicators. The basecoat booth (EUCOATINGLINE) is equipped with eight robots, five employing electrostatic bell guns and three electrostatic gun applicators. The clearcoat booth is equipped with six robots, all employing electrostatic bell applicators.

Uncoated parts enter the wash line for a thorough cleaning and are oven dried prior to being conveyed to the spray booths where the Ad-Pro, basecoat, and clearcoat are applied. Coated parts are then conveyed to a second oven where the coating is cured. The FGCOATINGLINE is a fully enclosed system. Once parts enter the wash line, they are not exposed to the general plant environment until after they emerge from the final cure oven. The FGCOATINGLINE was in operation for this test event.

2.2 Flue Gas Sampling Locations

Information regarding the sampling locations is presented in Table 2-1.

Table 2-1
Sampling Locations

Sampling Location	Stack Inside Diameter (in.)	Distance from Nearest Disturbance		Number of Traverse Points
		Downstream EPA "B" (in./dia.)	Upstream EPA "A" (in./dia.)	
SV-RTO Inlet	47.9 X 48.3	129 / 2.7	48 / 1.0	Flow: 16 (8/port) Gaseous: 1
SV-RTO Exhaust	57.3	183 / 3.2	305 / 5.3	Flow: 16 (8/port) Gaseous: 1

Sample locations were verified in the field to conform to EPA Method 1. Acceptable cyclonic flow conditions were confirmed prior to testing using EPA Method 1, Section 11.4. See Appendix A.1 for more information.

2.3 Operating Conditions and Process Data

Emission tests were performed while the EUAPPROCESS and EUCOATINGLINE were operating at or near maximum routine operating conditions, and the RTO was operating at the conditions determined by the facility.

Plant personnel were responsible for establishing the test conditions and collecting all applicable unit-operating data. The process data that was provided is presented in Appendix B. Data collected includes the following parameters:

- EPA Method 204A Material Balance Sheets
  - Coating identification code
  - Run start/stop times
  - Initial and final vat weights, lb
- RTO schematic
- RTO temperature, °F

3.0 Sampling and Analytical Procedures

3.1 Test Methods

The test methods for this test program have been presented in Table 1-1. Additional information regarding specific applications or modifications to standard procedures is presented below.

3.1.1 EPA Method 1, Sample and Velocity Traverses for Stationary Sources

EPA Method 1 is used to assure that representative samples or measurements of volumetric flow rate are obtained by dividing the cross-section of the stack or duct into equal areas, and then locating a traverse point within each of the equal areas. Acceptable sample locations must be located at least two stack or duct equivalent diameters downstream from a flow disturbance and one-half equivalent diameter upstream from a flow disturbance.

Pertinent information regarding the performance of the method is presented below:

- Method Options:
  - None
- Method Exceptions:
  - None

The sample port and traverse point locations are detailed in Appendix A.

3.1.2 EPA Method 2, Determination of Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)

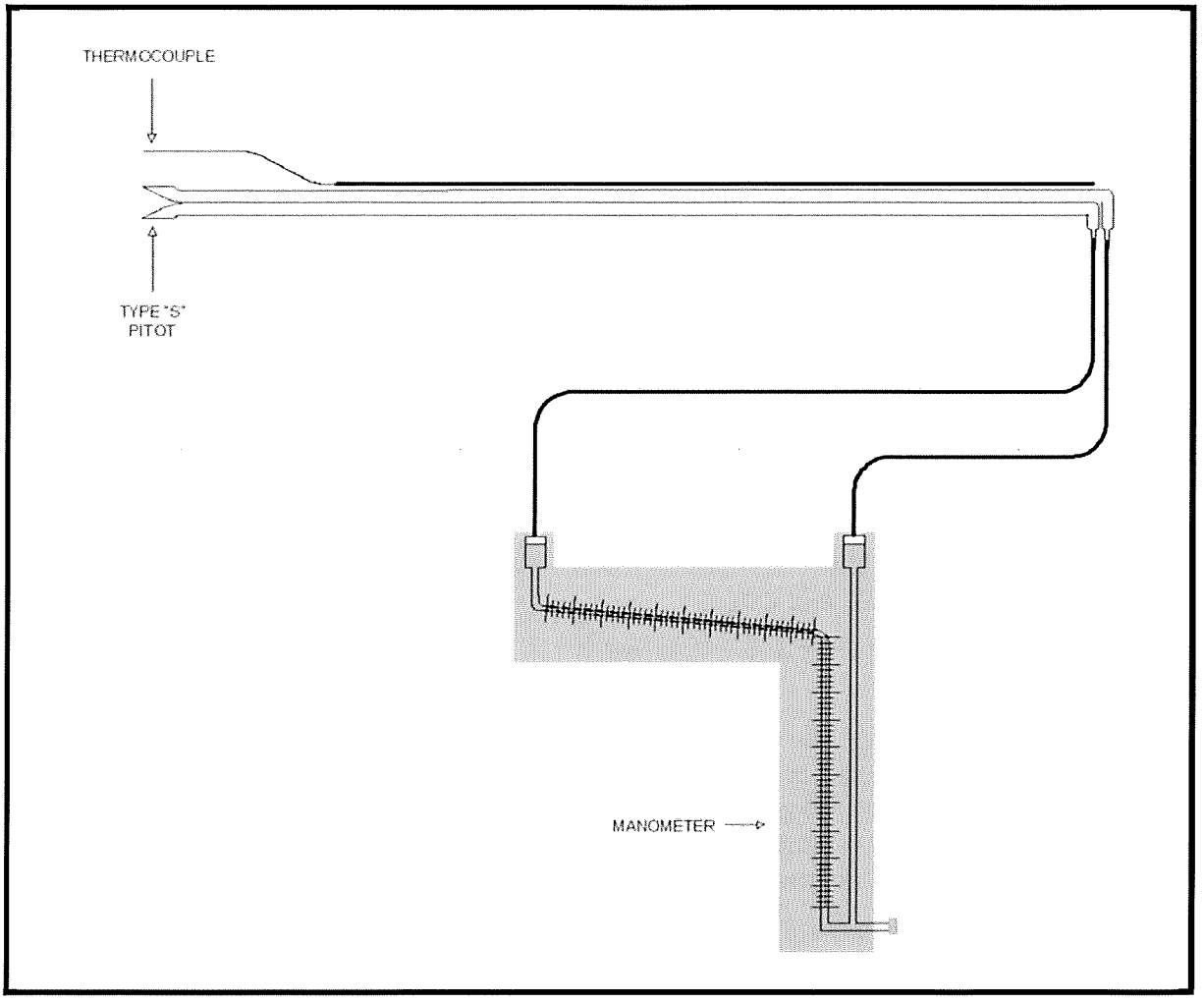
EPA Method 2 is used to measure the gas velocity using an S-type pitot tube connected to a pressure measurement device, and to measure the gas temperature using a calibrated thermocouple connected to a thermocouple indicator. Typically, Type S (Stausscheibe) pitot tubes conforming to the geometric specifications in the test method are used, along with an inclined manometer. The measurements are made at traverse points specified by EPA Method 1.

Pertinent information regarding the performance of the method is presented below:

- Method Options:
  - S-type pitot tube coefficient is 0.84
- Method Exceptions:
  - A flow traverse is conducted once during each test run to represent the flow rate for the entire test run
  - Stack gas temperatures thermocouples are checked using EPA Alternate Method 011 (ALT-011). A single-point calibration is performed using a NIST-traceable thermometer.

The typical sampling system is detailed in Figure 3-1.

Figure 3-1
EPA Method 2 Sampling Train



3.1.3 EPA Method 3, Gas Analysis for the Determination of Dry Molecular Weight

EPA Method 3 is used to calculate the dry molecular weight of the stack gas using one of three methods. The first choice is to measure the percent O_2 and CO_2 in the gas stream. A gas sample is extracted from a stack by one of the following methods: (1) single-point, grab sampling; (2) single-point, integrated sampling; or (3) multi-point, integrated sampling. The gas sample is analyzed for percent CO_2 and percent O_2 using either an Orsat or a Fyrite analyzer. The second choice is to use stoichiometric calculations to calculate dry molecular weight. The third choice is to use an assigned value of 30.0, in lieu of actual measurements, for processes burning natural gas, coal, or oil.

Pertinent information regarding the performance of the method is presented below:

- Method Options:
  - A Fyrite-type combustion gas analyzer is used to measure the analyte concentrations
  - Single-point integrated sampling is performed
- Method Exceptions:
  - None
- Target and/or Minimum Required Sample Duration: 45 minutes
- Target Analytes: O_2 and CO_2

3.1.4 EPA Method 4, Determination of Moisture Content in Stack Gas

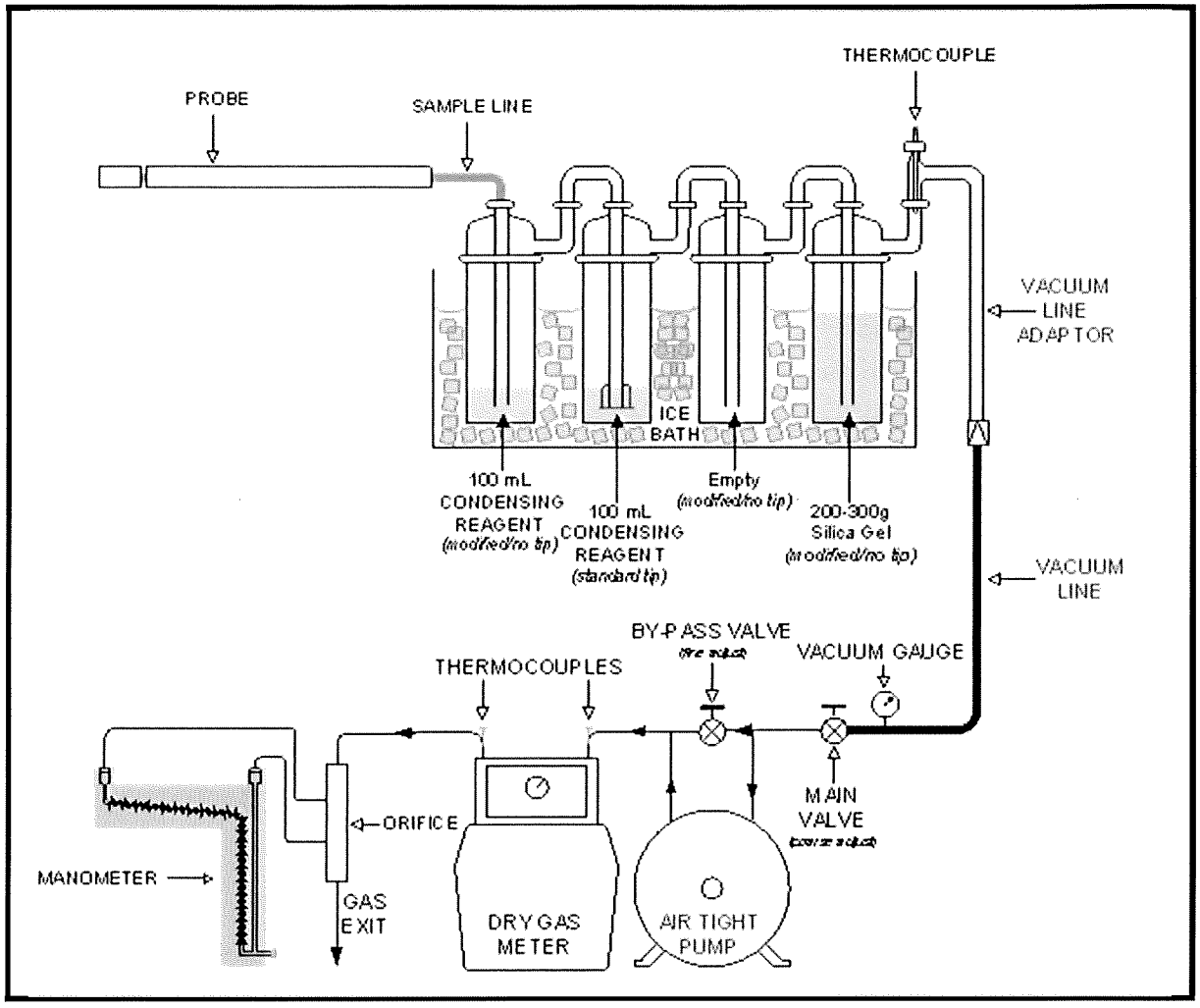
EPA Method 4 is a manual, non-isokinetic method used to measure the moisture content of gas streams. Gas is sampled at a constant sampling rate through a probe and impinger train. Moisture is removed using a series of pre-weighed impingers containing methodology-specific liquids and silica gel immersed in an ice water bath. The impingers are weighed after each run to determine the percent moisture.

Pertinent information regarding the performance of the method is presented below:

- Method Options:
  - The reference method is used to measure moisture
- Method Exceptions:
  - Moisture sampling is performed as a stand-alone method at a single point in the centroid of the stack
- Target and/or Minimum Required Sample Duration: 45 minutes
- Target and/or Minimum Required Sample Volume: 21 scf

The typical sampling system is detailed in Figure 3-2.

Figure 3-2
EPA Method 4 Sampling Train



3.1.5 EPA Method 25A, Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer

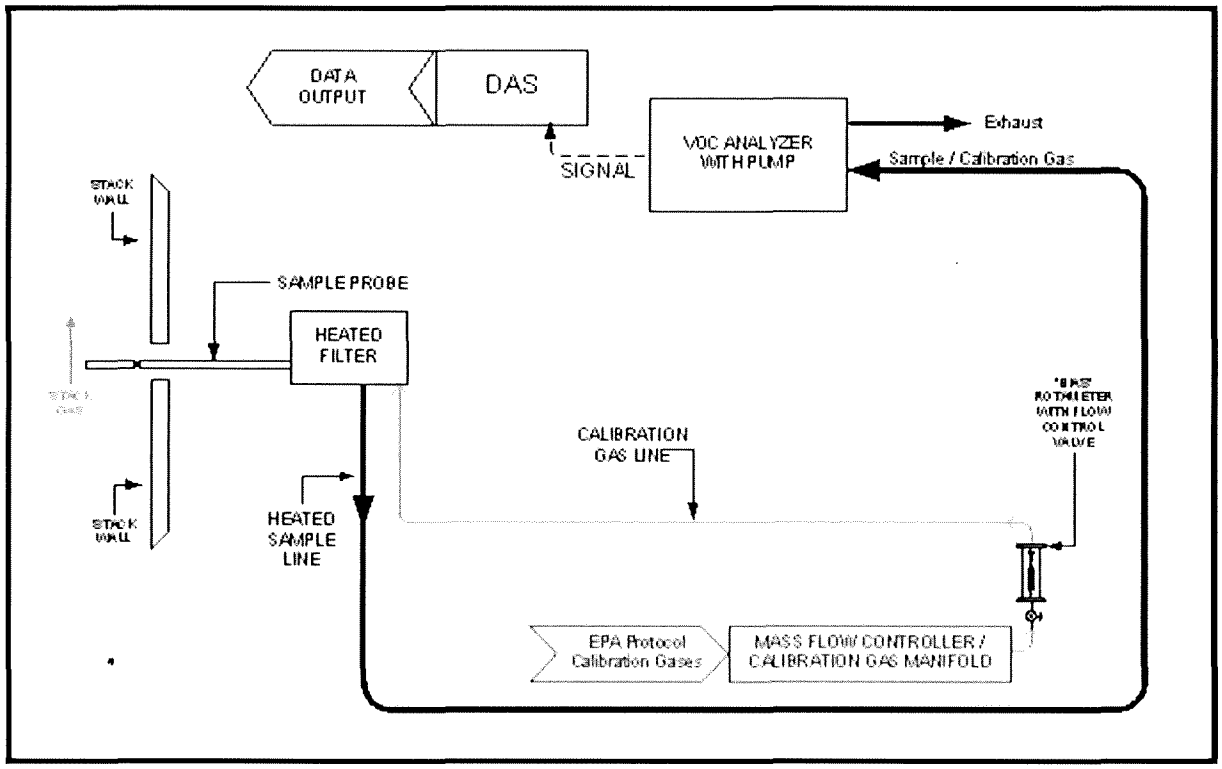
EPA Method 25A is an instrumental test method used for the determination of total gaseous organic concentration of vapors in stack gas. A gas sample is extracted from the source through a heated sample line and glass fiber filter to an FIA. Results are reported as THC as volume concentration equivalents of the calibration gas, typically propane, or as carbon equivalents.

Pertinent information regarding the performance of the method is presented below:

- Method Options:
  - EPA Method 205 is used to prepare calibration gas mixtures, with the prior approval of the administrator
  - Results are reported in terms of propane
  - Span value for THC at the inlet is 1,250 ppmvw and at the outlet is 450 ppmvw
- Method Exceptions:
  - For gaseous emissions sampling, MDL are calculated for each analyzer. The ISDL is equal to the sensitivity of the instrumentation, which is 2% of the span value.
- Target and/or Minimum Required Sample Duration: 45 minutes

The typical sampling system is detailed in Figure 3-3.

Figure 3-3
EPA Method 25A Sampling Train



3.1.6 EPA Method 204A, Volatile Organic Compounds Content in Liquid Input Stream

The amount of VOC containing liquid introduced to the process is determined as the weight difference of the feed material before and after each sampling run. The VOC content of the liquid input material is determined by volatilizing a small aliquot of the material and analyzing the volatile material using a flame ionization analyzer (FIA). A sample of each VOC containing liquid is analyzed with an FIA to determine VOC.

Pertinent information regarding the performance of the method is presented below:

- Method Options:
  - None
- Method Exceptions:
  - None

3.2 Process Test Methods

Process samples of coatings were obtained by Montrose personnel from the coating vats associated with the FGCOATINGLINE at the beginning and end of each CE test period. These samples were later analyzed utilizing EPA Method 204A to determine the VOC content (%-by weight as propane).

4.0 Test Discussion and Results

4.1 Field Test Deviations and Exceptions

No field deviations or exceptions from the test plan or test methods occurred during this test program.

4.2 Presentation of Results

The average results are compared to the permit limits in Table 1-2. The results of individual compliance test runs performed are presented in Tables 4-1 and 4-2. Emissions are reported in units consistent with those in the applicable regulations or requirements. Additional information is included in the appendices as presented in the Table of Contents.

Table 4-1
VOC Emissions and VOC CE Results -
FGCOATINGLINE SV-RTO Inlet Duct

Parameter/Units	Run 1	Run 2	Run 3
Date	8/9/2023	8/9/2023	8/9/2023
Time	13:29-14:17	14:51-15:36	16:21-17:06
Process Data *			
Coating Usage Rate, lb/hr	417.3	529.3	312.0
Weight Rate of VOC (as propane) Applied During Test Run †			
lb/hr	215.7	248.3	145.8
Sampling & Flue Gas Parameters			
sample duration, minutes	45	45	45
O_2, % volume dry	19.08	18.83	19.50
CO_2, % volume dry	0.00	0.00	0.00
flue gas temperature, °F	121.2	124.2	119.9
moisture content, % volume	4.94	5.08	4.10
volumetric flow rate, scfm	28,689	29,996	31,634
volumetric flow rate, dscfm	27,272	28,473	30,339
Volatile Organic Compounds (VOC), as propane			
ppmvw	750.4	864.6	786.3
lb/hr	147.8	178.1	170.8
VOC Capture Efficiency (CE)			
Measured VOC CE, %	68.5	71.7	117.1
Acceptability Criteria (< 105%) Met, (Yes/No)	--	Yes	No
Rolling DQO Indicator Statistic (P)	--	28.4	--
Rolling Lower Confidence Limit (LCL) VOC CE, %	--	65.2	--

* Process data was provided by Ventra Fowlerville personnel.

† Weight rate of VOC applied was determine from the coating usage rate and the VOC fraction of liquid samples determined by EPA Method 204A analysis.

Table 4-1 continued
VOC CE Results -
FGCOATINGLINE SV-RTO Inlet Duct

Parameter/Units	Run 4	Run 5	Run 6
Date	8/10/2023	8/10/2023	8/10/2023
Time	8:06-8:51	9:22-10:07	10:48-11:33
Process Data *			
Coating Usage Rate, lb/hr	450.7	624.0	408.0
Weight Rate of VOC (as propane) Applied During Test Run †			
lb/hr	206.9	254.1	206.5
Sampling & Flue Gas Parameters			
sample duration, minutes	45	45	45
O_2, % volume dry	20.00	20.17	20.00
CO_2, % volume dry	0.00	0.00	0.00
flue gas temperature, °F	112.8	109.4	113.0
moisture content, % volume	3.78	4.22	3.44
volumetric flow rate, scfm	30,829	29,305	29,679
volumetric flow rate, dscfm	29,662	28,068	28,657
Volatile Organic Compounds (VOC), as propane			
ppmvw	626.7	837.7	738.3
lb/hr	136.1	182.0	160.4
VOC Capture Efficiency (CE)			
Measured VOC CE, %	65.8	71.6	77.7
Acceptability Criteria (< 105%) Met, (Yes/No)	Yes	Yes	Yes
Rolling DQO Indicator Statistic (P)	10.7	6.5	7.7
Rolling Lower Confidence Limit (LCL) VOC CE, %	65.4	67.1	68.0

* Process data was provided by Ventra Fowlerville personnel.

† Weight rate of VOC applied was determine from the coating usage rate and the VOC fraction of liquid samples determined by EPA Method 204A analysis.

Table 4-2
VOC Emissions and VOC DE Results -
FGCOATINGLINE SV-RTO Exhaust Stack

Parameter/Units	Run 1	Run 2	Run 3	Average
Date	8/9/2023	8/9/2023	8/9/2023	--
Time	13:29-14:14	14:51-15:36	16:21-17:06	--
Sampling & Flue Gas Parameters				
sample duration, minutes	45	45	45	--
O_2, % volume dry	19.00	19.67	18.67	19.11
CO_2, % volume dry	0.00	0.00	0.00	0.00
flue gas temperature, °F	228.3	221.1	217.0	222.1
moisture content, % volume	5.84	7.00	4.20	5.68
volumetric flow rate, scfm	29,371	34,489	31,993	31,951
volumetric flow rate, dscfm	27,656	32,074	30,649	30,126
Volatile Organic Compounds (VOC), as propane				
ppmvw	16.6	19.5	17.8	17.9
lb/hr	3.34	4.61	3.91	3.95
VOC Destruction Efficiency (DE)				
%	97.7	97.4	97.7	97.6

5.0 Internal QA/QC Activities

5.1 QA/QC Audits

The meter boxes and sampling trains used during sampling performed within the requirements of their respective methods. All post-test leak checks, minimum metered volumes met the applicable QA/QC criteria.

Fyrite analyzer audits were performed during this test in accordance with EPA Method 3, Section 10.1 requirements. The results were within ± 0.5% of the respective audit gas concentrations.

EPA Method 25A FIA calibration audits were within the measurement system performance specifications for the calibration drift checks and calibration error checks.

An EPA Method 205 field evaluation of the calibration gas dilution system was conducted. The dilution accuracy and precision QA specifications were met.

5.2 QA/QC Discussion

All QA/QC criteria were met during this test program.

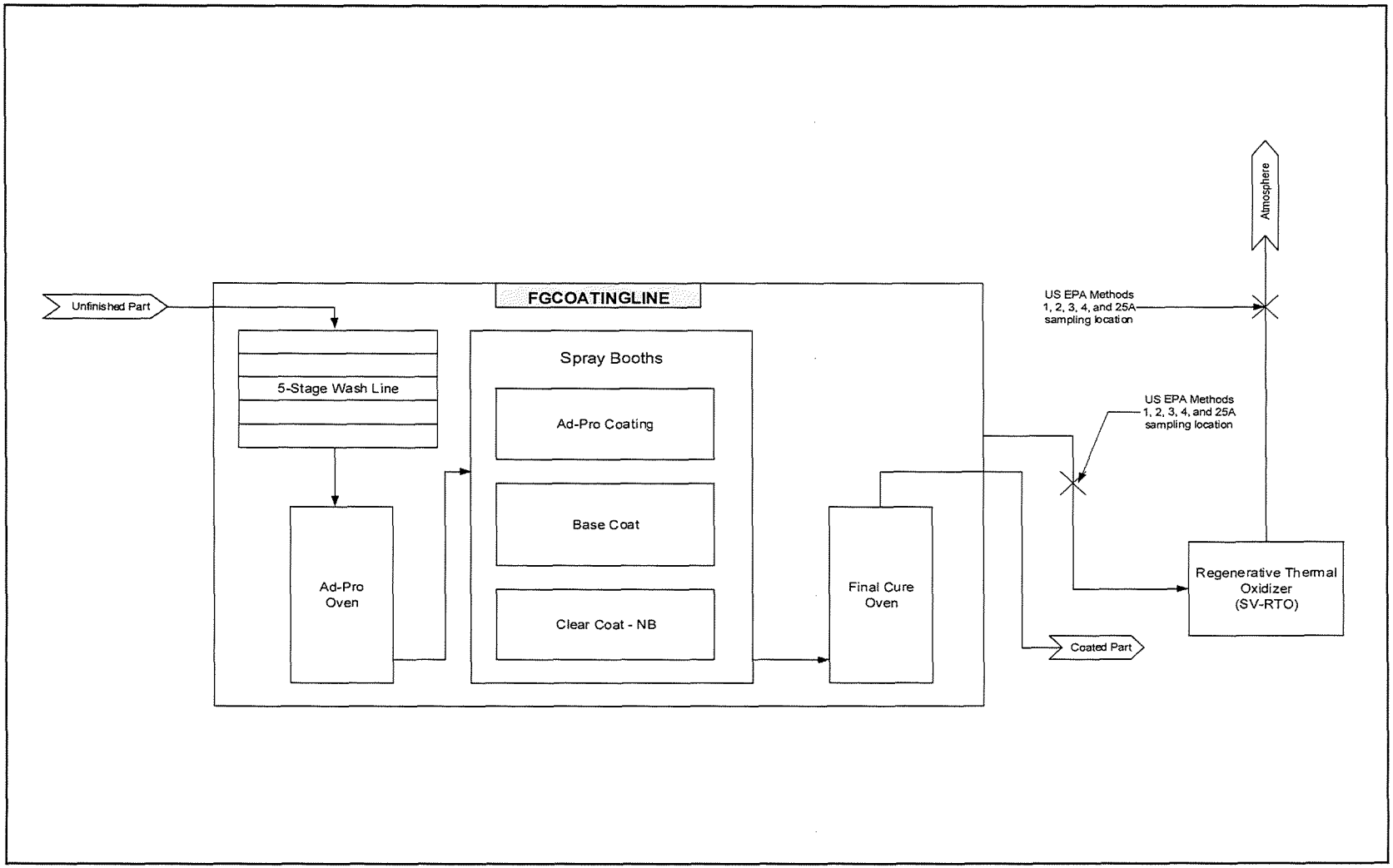
5.3 Quality Statement

Montrose is qualified to conduct this test program and has established a quality management system that led to accreditation with ASTM Standard D7036-04 (Standard Practice for Competence of Air Emission Testing Bodies). Montrose participates in annual functional assessments for conformance with D7036-04 which are conducted by the American Association for Laboratory Accreditation (A2LA). All testing performed by Montrose is supervised on site by at least one Qualified Individual (QI) as defined in D7036-04 Section 8.3.2. Data quality objectives for estimating measurement uncertainty within the documented limits in the test methods are met by using approved test protocols for each project as defined in D7036-04 Sections 7.2.1 and 12.10. Additional quality assurance information is included in the report appendices. The content of this report is modeled after the EPA Emission Measurement Center Guideline Document (GD-043).

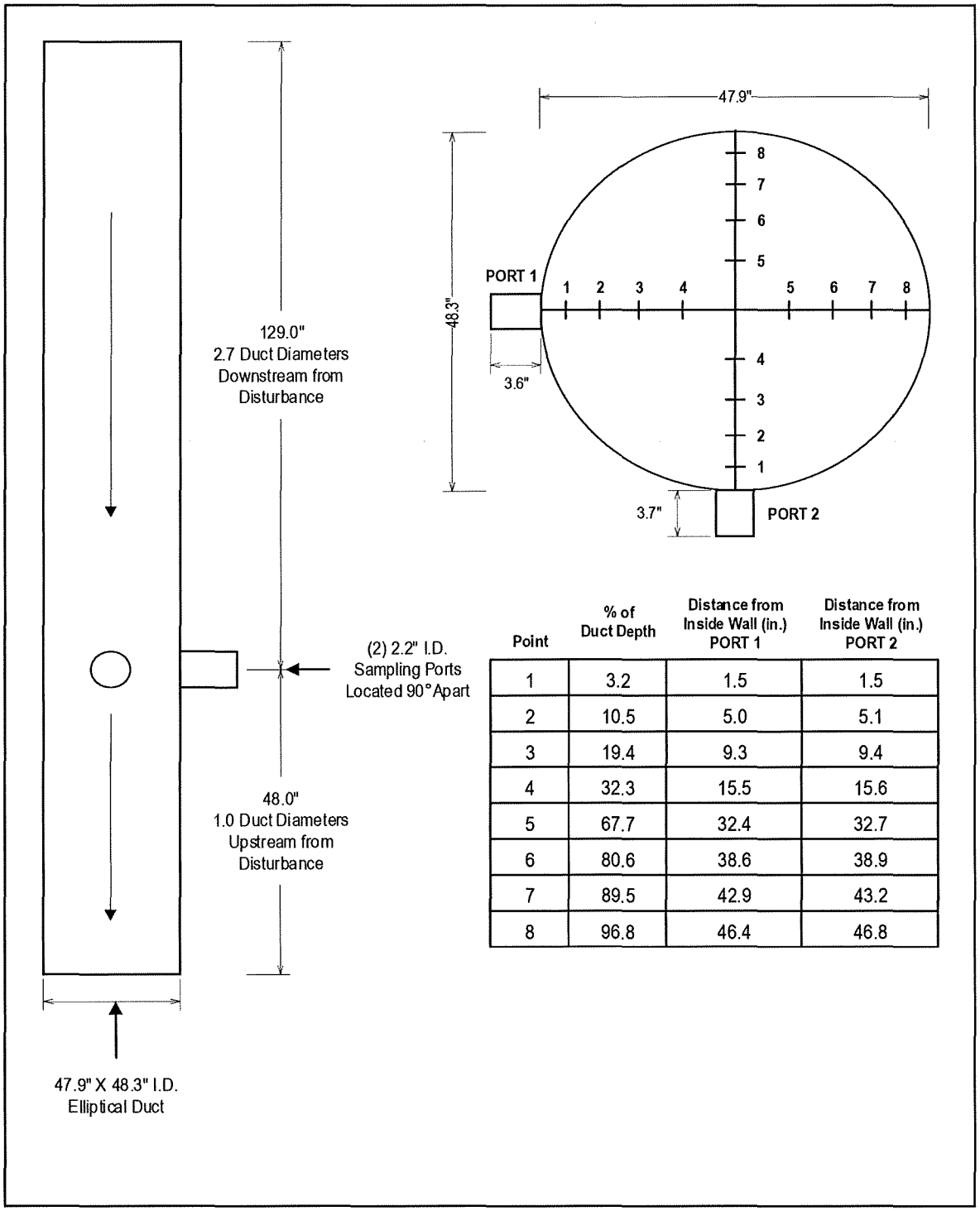
Appendix A
Field Data and Calculations

Appendix A.1
Sampling Locations

FGCOATINGLINE PROCESS AND SAMPLING LOCATION SCHEMATIC

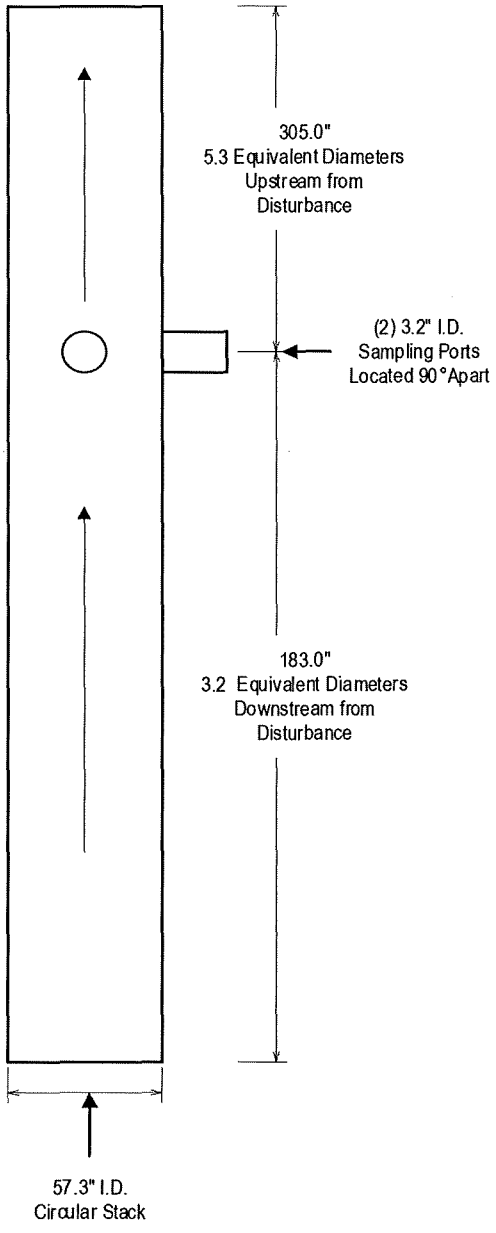


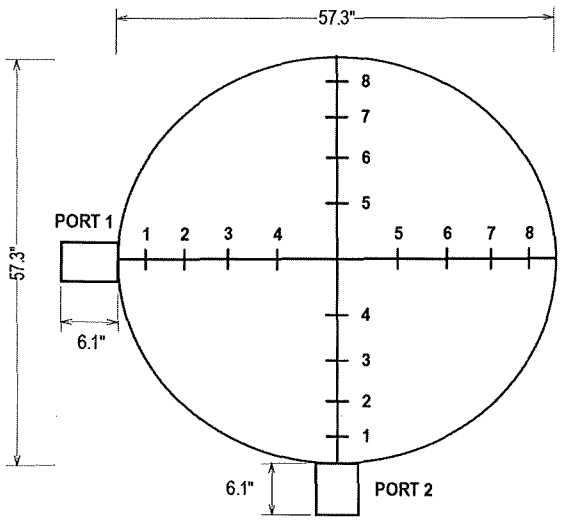
SV-RTO INLET DUCT TRAVERSE POINT LOCATION DRAWING



Point	% of Duct Depth	Distance from Inside Wall (in.) PORT 1	Distance from Inside Wall (in.) PORT 2
1	3.2	1.5	1.5
2	10.5	5.0	5.1
3	19.4	9.3	9.4
4	32.3	15.5	15.6
5	67.7	32.4	32.7
6	80.6	38.6	38.9
7	89.5	42.9	43.2
8	96.8	46.4	46.8

SV-RTO EXHAUST TRAVERSE POINT LOCATION DRAWING





Point	% of Duct Depth	Distance from Inside Wall (in.) PORT 1	Distance from Inside Wall (in.) PORT 2
1	3.2	1.8	1.8
2	10.5	6.0	6.0
3	19.4	11.1	11.1
4	32.3	18.5	18.5
5	67.7	38.8	38.8
6	80.6	46.2	46.2
7	89.5	51.3	51.3
8	96.8	55.5	55.5

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