

1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

Nylok LLC (State Registration No.: N5656) contracted Montrose Air Quality Services, LLC (Montrose) to perform a compliance test program on the FG-COATINGLINEA at the Nylok LLC facility located in Macomb, Michigan. Testing was performed on February 26, 2021, for the purpose of satisfying the emission testing requirements pursuant to Michigan Department of Environment, Great Lakes, and Energy (EGLE) Renewable Operating Permit No. MI-ROP-N5656-2020.

The specific objectives were to:

- Verify the volatile organic compounds (VOC) as total gaseous organics (TGO) destruction efficiency (DE) of the regenerative thermal oxidizer (RTO) serving FG-COATINGLINEA
- Evaluate the permanent total enclosure (PTE) serving FG-COATINGLINEA to verify 100% VOC capture efficiency (CE)
- 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	Unit ID/ Source Name	Activity/ Parameters	Test Methods	No. of Runs	Duration (Minutes)
02/26/2021	RTO Inlet/Exhaust	Velocity/Volumetric Flow Rate	EPA 1 & 2	3	3 to 7
02/26/2021	RTO Inlet/Exhaust	O ₂ , CO ₂	EPA 3	3	4
02/26/2021	RTO Inlet	Moisture (wet bulb/dry bulb)	EPA 4	3	1
02/26/2021	RTO Exhaust	Moisture	EPA 4	3	30
02/26/2021	RTO Inlet/Exhaust	VOC (TGO)	EPA 25A	3	60
02/26/2021	PTE	VOC CE	EPA 204	--	--

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

Nylok LLC (SRN: N5656)
2021 Compliance Source Test Report

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 on February 26, 2021. The tests were conducted according to the test plan that was received on January 4, 2021 and approved January 21, 2021 by EGLE.

**TABLE 1-2
SUMMARY OF AVERAGE COMPLIANCE RESULTS -
RTO
FEBRUARY 26, 2021**

Parameter/Units	Average Results	Allowable Limit
VOC (TGO) Destruction Efficiency (DE) %	98	95

1.2 KEY PERSONNEL

A list of project participants is included below:

Facility Information

Source Location: Nylok LLC
15260 Hallmark Drive
Macomb, MI 48042
Project Contact: Faraz Mizra
Company: Nylok LLC
Telephone: 586-786-0100
Email: faraz.mizra@nylok.com



Agency Information

Regulatory Agency: EGLE	
Contact: Karen Kajiya-Mills	Mark Dziadosz
Telephone: 517-335-3122	586-854-1611
Email: kajiya-millk@michigan.gov	dziadoszm@michigan.gov

Testing Company Information

Testing Firm: Montrose Air Quality Services, LLC	
Contact: Matthew Young	Steve Smith
Title: District Manager	Client Project Manager
Telephone: 248-548-8070	248-548-8070
Email: myoung@montrose-env.com	ssmith@montrose-env.com

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

**TABLE 1-3
TEST PERSONNEL AND OBSERVERS**

Name	Affiliation	Role/Responsibility
Steve Smith	Montrose	Client Project Manager
David Trahan	Montrose	Field Technician
Mike Nummer	Montrose	Field Technician
Scott Dater	Montrose	Field Technician
Mark Dziadosz	EGLE	Observer

2.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

2.1 PROCESS DESCRIPTION, OPERATION, AND CONTROL EQUIPMENT

The facility's coating operations FG-COATINGLINEA includes eleven coating lines which apply specialty adhesive and coatings to metal fasteners. Emissions from FG-COATINGLINEA were controlled by an RTO.

2.2 FLUE GAS SAMPLING LOCATION

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

**TABLE 2-1
 SAMPLING LOCATIONS**

Sampling Location	Stack Inside Dimensions (in.)	Distance from Nearest Disturbance		Number of Traverse Points
		Downstream EPA "B" (in./dia.)	Upstream EPA "A" (in./dia.)	
RTO Inlet Duct	34.0	100 / 2.9	90 / 2.6	Flow: 16 (2/port) Moisture (wb/db): 1 Gaseous: 1
RTO Exhaust Stack	36.0	100 / 2.8	180 / 5.0	Flow: 16 (2/port) Moisture: 1 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 Appendices A.1 through A.3 for more information.

2.3 OPERATING CONDITIONS AND PROCESS DATA

Emission tests were performed while FG-COATINGLINEA was operating at or near maximum routine operating conditions and while the RTO was at operating at representative conditions.

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:

- RTO Chamber Temperature, °F
- Fan Speed, Hz
- Parts produced

3.0 SAMPLING AND ANALYTICAL PROCEDURES

3.1 TEST METHODS

The test methods for this test program were presented previously 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

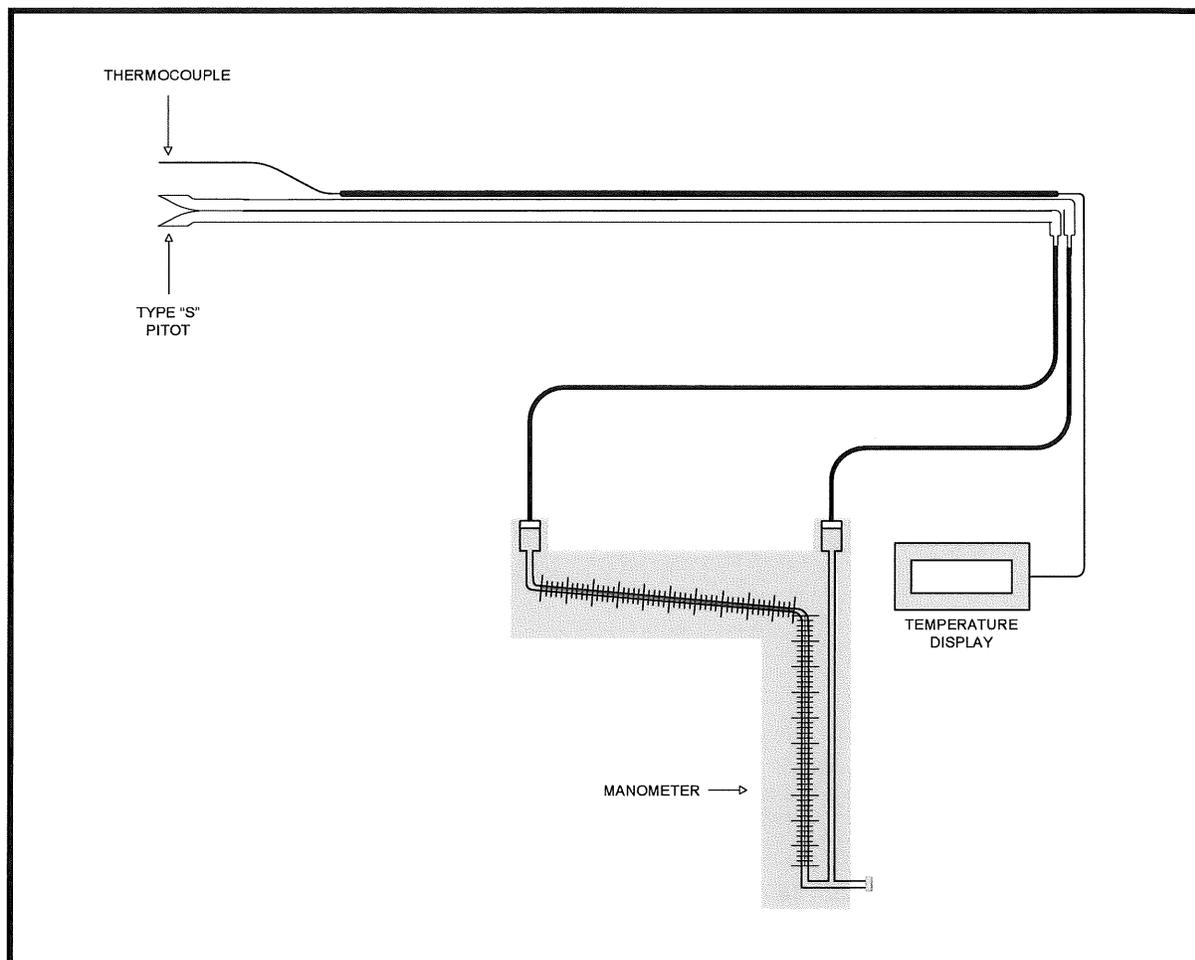
EPA Method 1 is used to assure that representative measurements of volumetric flow rate are obtained by dividing the cross-section of the stack or duct into equal areas, and then locating a traverse point within each of the equal areas. Acceptable sample locations must be located at least two stack or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

3.1.2 EPA Method 2, Determination of Stack 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.

The 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.

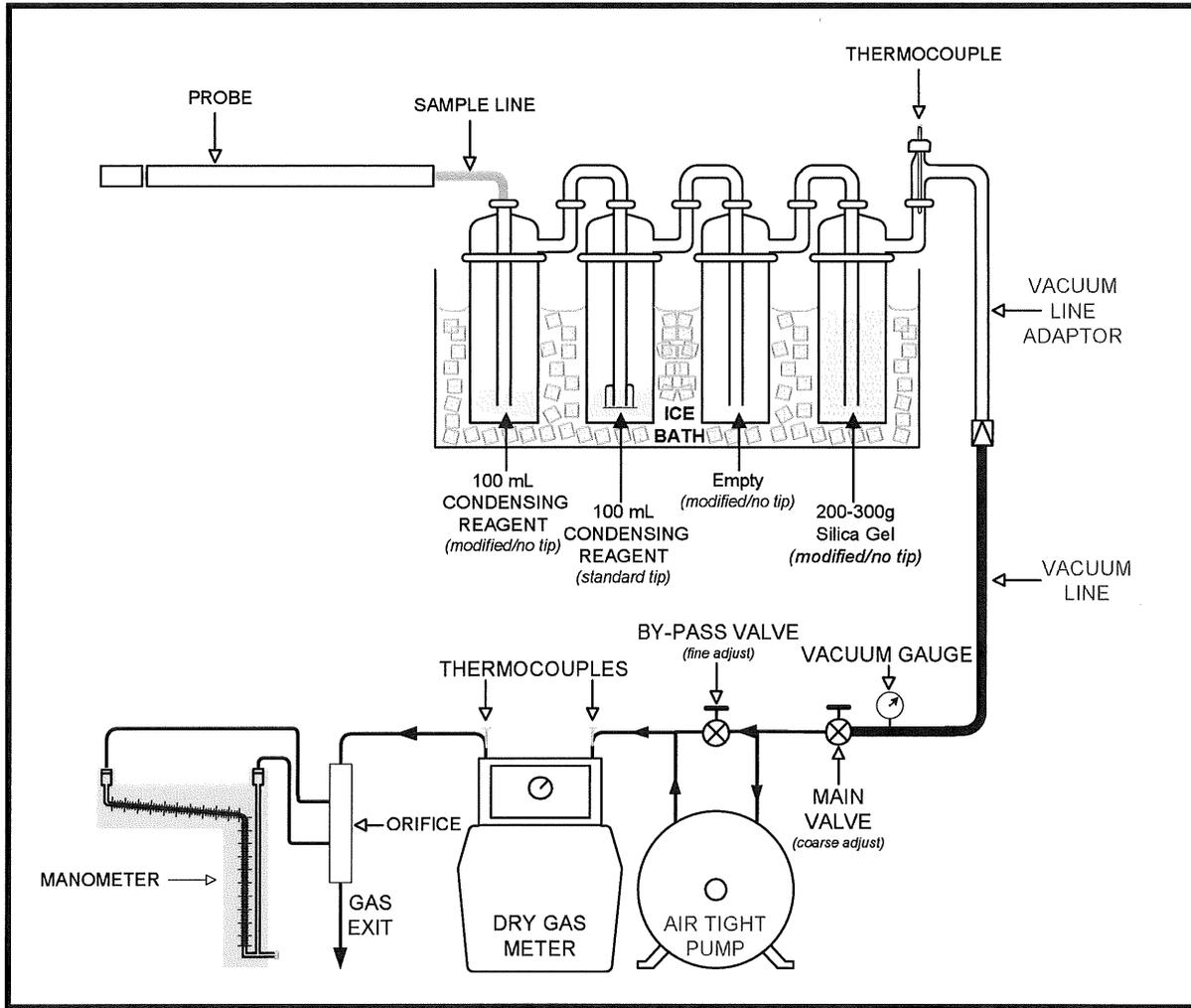
3.1.4 EPA Method 4, Determination of Moisture Content in Stack Gas

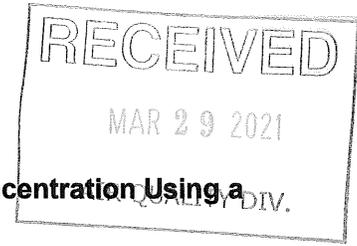
EPA Method 4 is a manual, non-isokinetic method used to measure the moisture content of gas streams. Gas is sampled at a constant sampling rate through a probe and impinger train.

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.

The sampling system is detailed in Figure 3-2.

FIGURE 3-2
EPA METHOD 4 (DETACHED) SAMPLING TRAIN



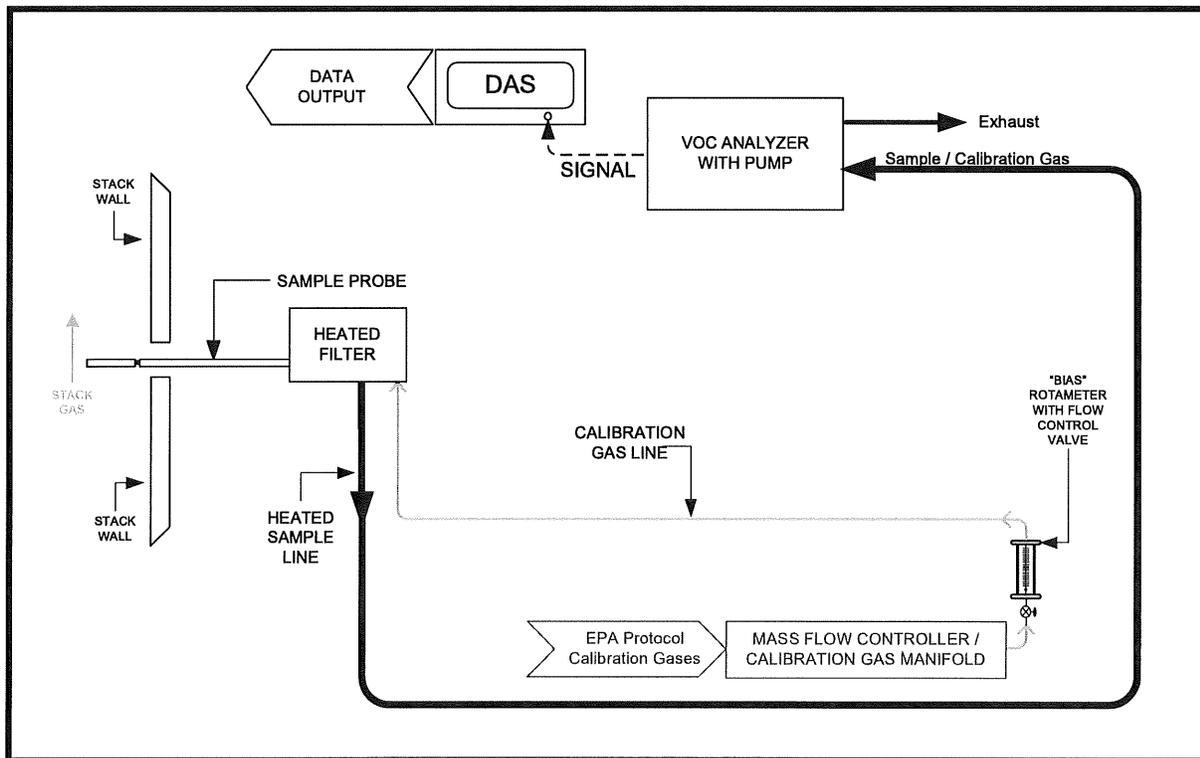


3.1.5 EPA Method 25A, Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer

EPA Method 25A is an instrumental test method used to measure the concentration of THC in stack gas. A gas sample is extracted from the source through a heated sample line and glass fiber filter to a flame ionization analyzer (FIA). Results are reported as volume concentration equivalents of the calibration gas or as carbon equivalents.

The sampling system is detailed in Figure 3-3.

**FIGURE 3-3
EPA METHOD 25A SAMPLING TRAIN**



3.1.6 EPA Method 204, Criteria for and Verification of a Permanent or Temporary Total Enclosure

An enclosure is evaluated against a set of criteria. If the criteria are met and if all the exhaust gases from the enclosure are ducted to a control device, then the volatile organic compounds (VOC) capture efficiency (CE) is assumed to be 100 percent, and CE need not be measured. However, if part of the exhaust gas stream is not ducted to a control device, CE must be determined.

3.2 PROCESS TEST METHODS

The test plan did not require that process samples be collected during this test program; therefore, no process sample data are presented in this test report.

4.0 TEST DISCUSSION AND RESULTS

4.1 FIELD TEST DEVIATIONS AND EXCEPTIONS

EPA Method 204 Section 8.4 requires that the direction of air flow be monitored at each NDO, using streamers, smoke tubes, or tracer gases, for at least 1 hour, with checks made no more than 10 minutes apart. During this test event a Δp reading (0.02 in-H₂O) and a single smoke tube reading for inward flow was taken. This approach to evaluating the PTE was witnessed by the on-site EGLE representative.

4.2 PRESENTATION OF RESULTS

The average results are displayed in Table 1-2. The results of individual 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.

The wet bulb/dry bulb approximation method (EPA Method 4, Section 2.2.1) was utilized during each run at the RTO Inlet Duct.

**TABLE 4-1
 VOC (TGO) EMISSIONS RESULTS -
 RTO INLET**

Run Number	1	2	3	Average
Date	02/26/21	02/26/21	02/26/21	--
Time	08:51-10:11	10:25-11:25	12:45-13:45	--
Flue Gas Parameters				
O ₂ , % volume dry	21.0	21.0	21.0	21.0
CO ₂ , % volume dry	0.0	0.0	0.0	0.0
flue gas temperature, °F	62.9	61.1	61.1	61.7
moisture content, % volume	0.9	0.9	0.9	0.9
volumetric flow rate, scfm	14,102	14,178	14,413	14,231
VOC (TGO), as propane				
ppmvw	168	141	148	152
lb/hr	16.3	13.8	14.6	14.9

Nylok LLC (SRN: N5656)
 2021 Compliance Source Test Report

**TABLE 4-2
 VOC (TGO) EMISSIONS AND DE RESULTS -
 RTO EXHAUST**

Run Number	1	2	3	Average
Date	02/26/21	02/26/21	02/26/21	--
Time	08:51-10:11	10:25-11:25	12:45-13:45	--
Process Data*				
RTO Temperature, °F	1,500 - 1,600			
Flue Gas Parameters				
O ₂ , % volume dry	21.0	21.0	21.0	21.0
CO ₂ , % volume dry	0.0	0.0	0.0	0.0
flue gas temperature, °F	185	216	201	201
moisture content, % volume	1.10	1.18	1.49	1.26
volumetric flow rate, scfm	16,653	16,710	15,827	16,396
VOC (TGO), as propane				
ppmvw	2.92	3.10	2.75	2.92
lb/hr	0.33	0.36	0.30	0.33
VOC (TGO) Destruction Efficiency (DE)				
%	97.9	97.4	97.9	97.8

* Process data provided by Nylok LLC personnel.

**TABLE 4-3
 PTE AND CE VERIFICATION -
 FG-COATING LINE A PTE
 FEBRUARY 26, 2021**

Parameter/Units	Results	Allowable
North Elevation - NDO No. 1		
Equivalent Diameter, in.	6.68	--
Differential Pressure, in-H ₂ O	0.02	≥0.007
Distance to Nearest VOC Emitting Point, in.	228	≥26.7
Inward Flow Verified with Smoke Tubes (Y/N)*	Y	--
North Elevation - NDO No. 2		
Equivalent Diameter, in.	6.68	--
Differential Pressure, in-H ₂ O	0.02	≥0.007
Distance to Nearest VOC Emitting Point, in.	336	≥26.7
Inward Flow Verified with Smoke Tubes (Y/N)*	Y	--
NDO to Enclosure Area Ratio (NEAR)		
Total Area of NDO's (A _N), ft. ²	0.486	--
Total Surface Area of Enclosure (A _T), ft. ²	22,300	--
NEAR (A _N /A _T), %	0.0022	≤5

* One smoke tube reading was taken at each NDO during this test event. See Section 4.1 for details.

5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA/QC AUDITS

The meter box and sampling trains used during sampling performed within the requirements of their respective methods. All post-test leak checks and 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.

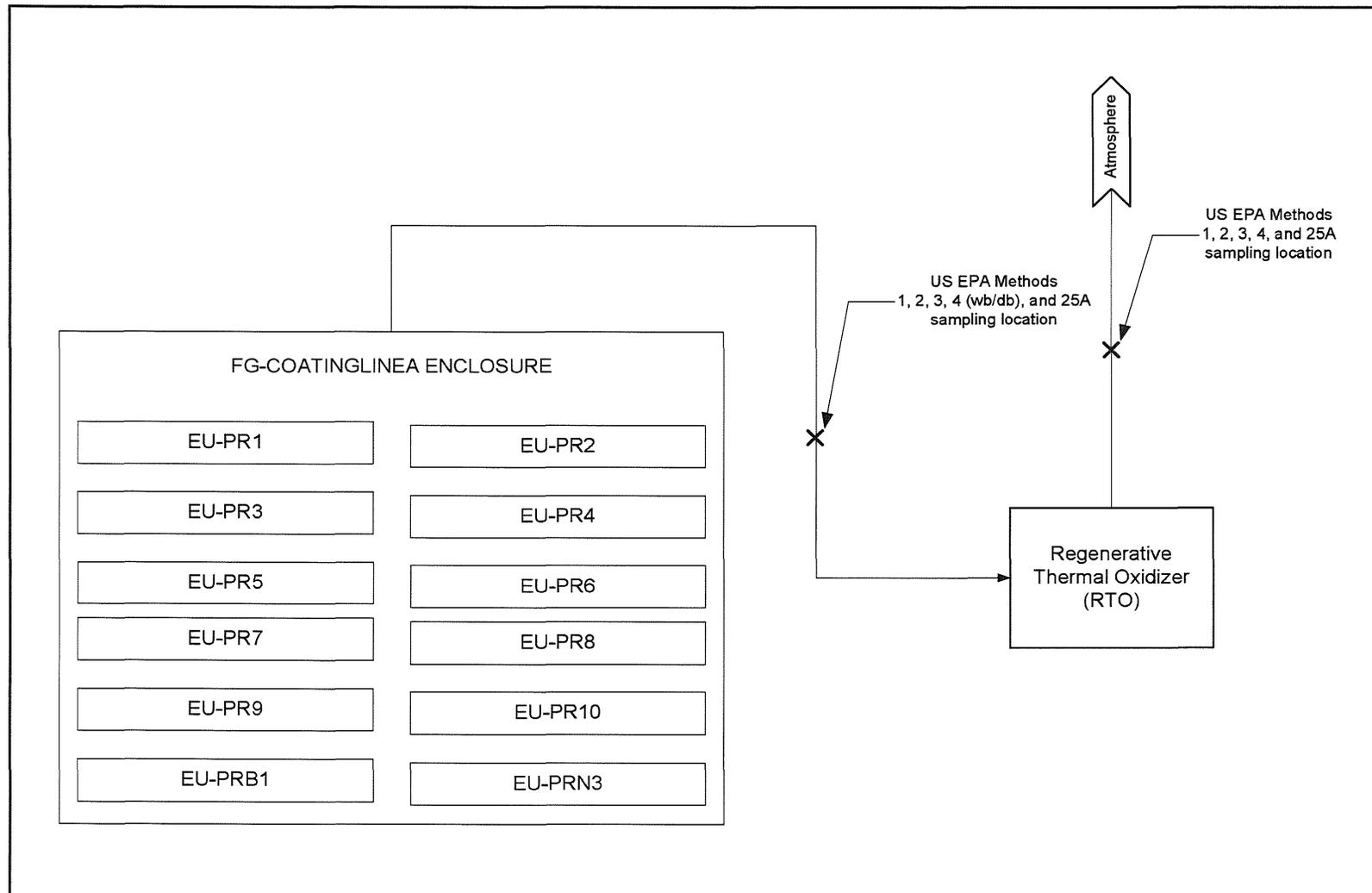
5.3 QUALITY STATEMENT

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).

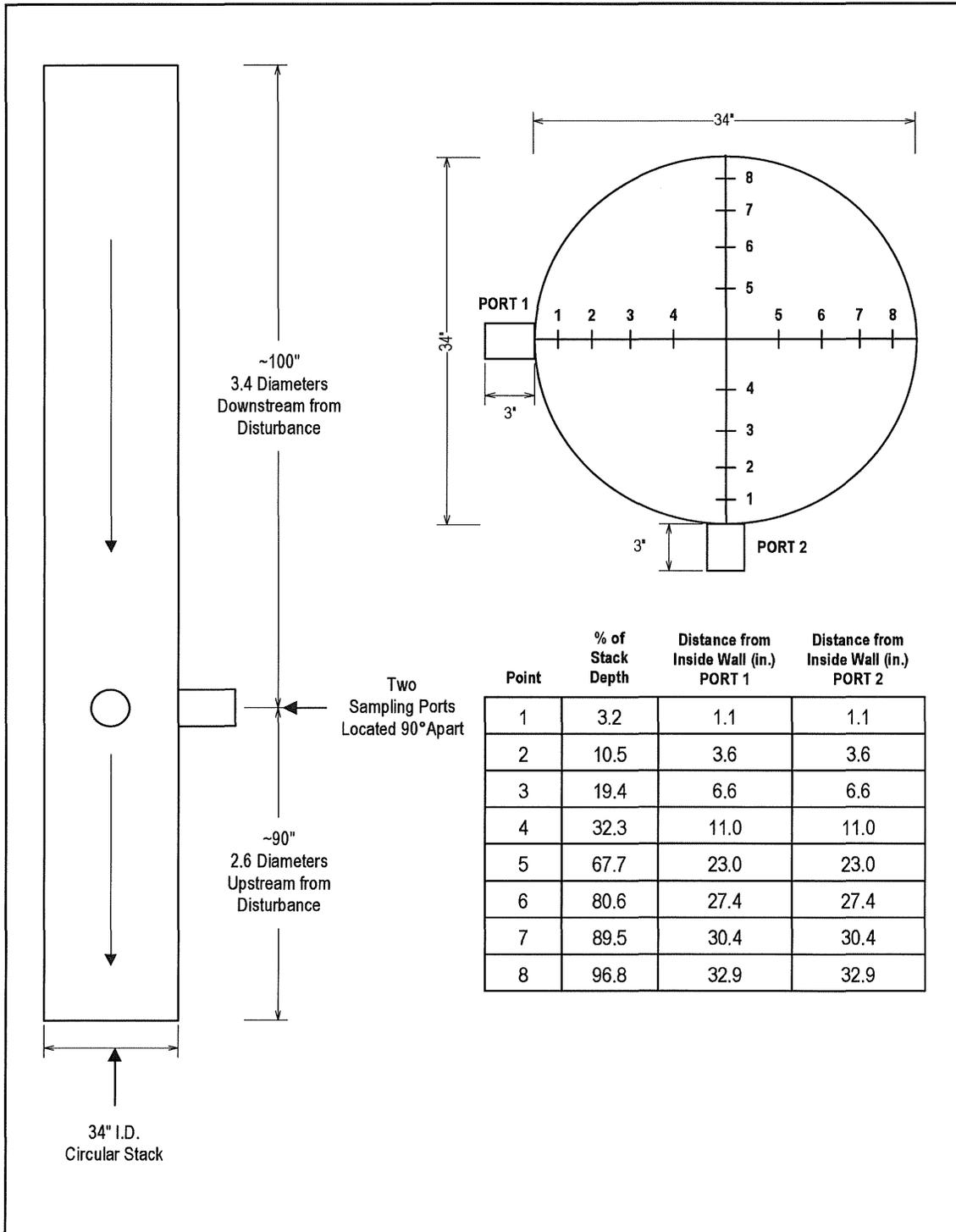
APPENDIX A FIELD DATA AND CALCULATIONS

Appendix A.1 Sampling Locations

FG-COATINGLINE/RTO SAMPLING LOCATION SCHEMATIC



RTO INLET TRAVERSE POINT LOCATION DRAWING



RTO EXHAUST TRAVERSE POINT LOCATION DRAWING

