



10/01/2026

Jenny Crittall
Huntsman Advanced Materials Americas, LLC
10003 Woodloch Forest Dr
The Woodlands, TX 77380

RE: DRAFT AIR POLLUTION PERMIT-TO-INSTALL

Facility ID: 1677010029
Permit Number: P0140980
Permit Type: Administrative Modification
County: Summit

No	TOXIC REVIEW
No	PSD
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
Yes	MACT/GACT
No	NSPS
No	NESHAPS
No	NETTING
No	MAJOR NON-ATTAINMENT
No	MODELING SUBMITTED
No	MAJOR GHG
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

Dear Permit Holder:

A draft of the Ohio Administrative Code (OAC) Chapter 3745-31 Air Pollution Permit-to-Install for the referenced facility has been issued for the emissions unit(s) listed in the Authorization section of the enclosed draft permit. This draft action is not an authorization to begin construction or modification of your emissions unit(s). The purpose of this draft is to solicit public comments on the permit. A public notice will appear in the Ohio Environmental Protection Agency (Ohio EPA) [Weekly Review and Public Notices](#) website. A copy of the public notice and the draft permit are enclosed. This permit can be accessed electronically on the Ohio EPA document search webpage: [eDocument Search](#). Comments will be accepted as a marked-up copy of the draft permit or in narrative format. Any comments must be sent to the following:

Andrea Moore
Permitting Section
Ohio EPA, DAPC
50 West Town Street, Suite 700
P.O. Box 1049
Columbus, Ohio 43216-1049

and Akron Regional Air Quality Management District
1867 West Market St.
Akron, OH 44313

Comments and/or a request for a public hearing will be accepted within 30 days of the date the notice is published on the Ohio EPA [Weekly Review and Public Notices](#) website. You will be notified in writing if a public hearing is scheduled. A decision on issuing a final permit-to-install will be made after consideration of comments received and oral testimony if a public hearing is conducted. Any permit fee that will be due upon issuance of a final Permit-to-Install is indicated in the Authorization section. Please do not submit any payment now. If you have any questions, please contact Akron Regional Air Quality Management District at (330)375-2480.

Sincerely,

Robert Hodanbosi
Chief, Division of Air Pollution Control

cc: U.S. EPA Region 5 - *Via E-Mail Notification*
ARAQMD; Pennsylvania; West Virginia; Canada

PUBLIC NOTICE

The following matters are the subject of this public notice by the Ohio Environmental Protection Agency. The complete public notice, including any additional instructions for submitting comments, requesting information, a public hearing, or filing an appeal may be obtained at: [Weekly Review and Public Notices | Ohio Environmental Protection Agency](#) or Hearing Clerk, Ohio EPA, 50 W. Town St., Columbus, Ohio 43215. Ph: 614-644-3037 email: HClerk@epa.ohio.gov

Draft Air Pollution Permit-to-Install Administrative Modification

Huntsman Advanced Materials Americas, LLC
240 West Emerling Avenue
Akron, OH 44301-1600

ID#: P0140980

Date of Action: 10/01/2026

Permit Desc: Facility-initiated administrative modification to incorporate RACT standards. Pursuant to Part D of Title I of the Clean Air Act (CAA), Ohio EPA is required to establish a State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. The above-mentioned permit is a part of Ohio's SIP for attainment and maintenance of the 2015 ozone NAAQS and will be submitted to United States Environmental Protection Agency (U.S. EPA) as a modification of the SIP.

The permit and complete instructions for requesting information or submitting comments may be obtained at: <https://ohioepa.commentinput.com> - Search by entering the permit # P0140980 in the "Search Projects" search box.

The public comment period will run until 11/02/2026 at 11:59 PM.

Permit Strategy Write-Up

1. Check all that apply:

☐ Synthetic Minor Determination **N/A**

☐ Netting Determination **N/A**

2. Source Description:

Emissions unit P020 – RLP - Reactive Liquid Polymers - raw material charging system, reactors, solvent recovery system, monomer recovery system, wet rubber storage tanks, dryer condenser system, AEP storage tank, post-reaction and blending system, and Adduct storage tank. As required by the reclassification to serious nonattainment for ozone under the 2015 ozone National Ambient Air Quality Standards (NAAQS) promulgated by U.S. EPA, this facility has submitted a VOC Reasonably Available Control Technology (RACT) study on March 30, 2026 (subsequently revised on April 20, 2026, May 15, 2026, July 10, 2026, September 10, 2026 and September 17, 2026) to address the feasibility of controlling VOC emissions from their synthetic rubber latex manufacturing operations. Huntsman Advanced Materials Americas, LLC (“Huntsman”) does not have any prior source-specific VOC RACT established under OAC rule 3745-21-09. This permit modification includes the implementation of the proposed RACT limits in the September 17, 2026 revision of the RACT study. Section B of this permit cites the RACT limits under OAC rule 3745-21-11(B). The RACT limits are implemented under an OAC rule 3745-31-05(D) synthetic minor restriction for the affected emissions units in section C of this permit.

Pursuant to Part D of Title I of the Clean Air Act (CAA), Ohio EPA is required to establish a State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. This permit is part of Ohio’s SIP for attainment and maintenance of the 2015 ozone NAAQS and will be submitted to U.S. EPA as a modification of the SIP.

3. Facility Emissions and Attainment Status:

Huntsman operates under a Title V permitting classification due to the requirement in 40 CFR Part 63, Subpart VVVVV for area sources with a federally-enforceable control device on affected chemical manufacturing process units [§63.11494(e)]. Summit County was designated as serious nonattainment for the 2015 ozone NAAQS but is now a maintenance county. The county is currently designated attainment for all NAAQS (criteria) pollutants which include ozone, PM_{2.5}, PM₁₀, CO, NO₂, lead, and SO₂.

4. Source Emissions:

Emissions unit P020 has VOC emissions that are subject to the VOC RACT requirements. The VOC RACT determination for these emissions unit is venting VOC emissions to Therman Oxidizer (TOX) at all times emissions unit P020 is in operation. TOX shall achieve an overall control efficiency of at least 99%, by weight, for VOC. In addition, Huntsman will implement a facility-wide LDAR program equivalent to 40 CFR Part 63 Subpart H for all components contacting streams containing 5 wt% or greater HAP or 10 wt% or greater VOC and not in heavy liquid service as defined in § 60.478. Associated monitoring, record keeping, reporting, and testing requirements are included to demonstrate ongoing compliance with these VOC RACT emissions limitations and control measures.

**Draft Permit-to-Install**

Huntsman Advanced Materials Americas, LLC

Permit Number: P0140980**Facility ID:** 1677010029**Effective Date:** To be entered upon final issuance

5. Conclusion:

This permit establishes VOC RACT limits as proposed by Huntsman in their VOC RACT study as part of the requirements for the 2015 ozone NAAQS nonattainment and maintenance areas under the reclassification to serious nonattainment for the Cleveland area. The VOC RACT limits established in this permit are based on existing control equipment and will be implemented upon final issuance of this permit.

6. Please provide additional notes or comments as necessary:

None.

7. Total Permit Allowable Emissions Summary (for informational purposes only):

<u>Pollutant</u>	<u>Tons Per Year</u>
Individual HAPs	9.9
Combined HAPs	24.9
VOC	9.6



DRAFT

Division of Air Pollution Control

Permit-to-Install

for

Huntsman Advanced Materials Americas, LLC

Facility ID:	1677010029
Permit Number:	P0140980
Permit Type:	Administrative Modification
Issued:	10/01/2026
Effective:	To be entered upon final issuance



Division of Air Pollution Control

Permit-to-Install

for

Huntsman Advanced Materials Americas, LLC

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Authorization

Facility ID: 1677010029
Facility Description: Industrial Organic Chemicals
Application Number(s): M0008833
Permit Number: P0140980
Permit Type: Permit-To-Install
Permit Fee: \$0.00 *DO NOT send payment at this time, subject to change before final issuance*
Issue Date: 10/01/2026
Effective Date: To be entered upon final issuance

This document constitutes issuance of a Permit-to-Install for the emissions unit(s) identified on the following page to:

Huntsman Advanced Materials Americas, LLC
240 West Emerling Avenue
Akron, OH 44301-1600

Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Akron Regional Air Quality Management District
1867 West Market St.
Akron, OH 44313
(330)375-2480

The above-named entity is hereby granted this Permit-to-Install for the air contaminant source(s) (emissions unit(s)) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the described emissions unit(s) will operate in compliance with applicable State and Federal laws and regulations and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described emissions unit(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

John Logue
Director

Authorization (continued)

Permit Number: P0140980

Permit Description: Facility-initiated administrative modification to incorporate RACT standards. Pursuant to Part D of Title I of the Clean Air Act (CAA), Ohio EPA is required to establish a State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. The above-mentioned permit is a part of Ohio's SIP for attainment and maintenance of the 2015 ozone NAAQS and will be submitted to United States Environmental Protection Agency (U.S. EPA) as a modification of the SIP.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Emissions Unit ID:	P020
Company Equipment ID:	RLP
Superseded Permit Number:	P0137816
General Permit Category and Type:	Not Applicable

List of Commonly Used Abbreviations

AP-42 = U.S. EPA's Compilation of Air Pollution Emissions Factors	HVLP = high volume, low pressure	PER = Permit Evaluation Report
ASTM = American Society for Testing and Materials	LAER = lowest achievable emission rate	PM = particulate matter
BACT = Best Available Control Technology	lb(s)/hr = pound(s) per hour	PM ₁₀ = particulate matter with an aerodynamic diameter less than or equal to 10 microns
BAT = Best Available Technology	LDAR = leak detection and repair	PM _{2.5} = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
CAA = Clean Air Act	LPG = liquefied petroleum gas/propane	ppb = parts per billion
CAM = compliance assurance monitoring	MACT = maximum achievable control technology	ppm = parts per million
CEMS = continuous emissions monitoring system	MAGLC = maximum acceptable ground level concentration	PSD = Prevention of Significant Deterioration
CFC = chlorofluorocarbon	mg/m ³ = milligrams per cubic meter	psi = pounds per square inch
CFR = Code of Federal Regulations	MM = million	psia = pounds per square inch absolute
CH ₄ = methane	MMBtu = million British Thermal Units	PTE = potential-to-emit
CI = compression ignition	MSDS = material safety data sheet	PTI = Permit-to-Install
CO = carbon monoxide	MSW = municipal solid waste	PTIO = Permit-to-Install and Operate
CO ₂ = carbon dioxide	NAAQS = National Ambient Air Quality Standard	PTO = Permit-to-Operate
COM = continuous opacity monitor	NESHAP = National Emission Standard for Hazardous Air Pollutants	PWR = process weight rate
DAPC = Division of Air Pollution Control	NG = natural gas	RACM = reasonably available control measures
DO/LAA = District Office/Local Air Agency	ng/m ³ = nanograms per cubic meter	RACT = reasonably available control technology
dscf = dry standard cubic foot	NH ₃ = ammonia	RATA = relative accuracy test audit
EAC = emissions activity category	NMHC = non-methane hydrocarbons	RTO = regenerative thermal oxidizer
eDocs = electronic documents database	NMOC = non-methane organic compound	SB265 = Senate Bill 265
ERAC = Environmental Review Appeals Commission	NO = nitrogen oxide	scfm = standard cubic feet per minute
ESP = electrostatic precipitator	NO ₂ = nitrogen dioxide	SI = spark ignition
EU = emissions unit	NO _x = nitrogen oxides	SIP = State Implementation Plan
FEPTIO = Federally Enforceable Permit-to-Install and Operate	NSPS = New Source Performance Standard	SO ₂ = sulfur dioxide
FER = Fee Emissions Report	NSR = New Source Review	SSMP = startup, shutdown, and malfunction plan
FR = Federal Register	NTV = Non-Title V	TDS = total dissolved solids
GACT = generally achievable control technology	O&M = operation and maintenance	TLV = threshold limit value
GHG = greenhouse gases	OAC = Ohio Administrative Code	TO = thermal oxidizer
gr/dscf = grains per dry standard cubic foot	OC = organic compound	TPH = ton(s) per hour
H ₂ S = hydrogen sulfide	Ohio EPA = Ohio Environmental Protection Agency	TPY = ton(s) per year
H ₂ SO ₄ = sulfuric acid	ORC = Ohio Revised Code	TSP = total suspended particulates
HAP = hazardous air pollutant	Pb = lead	VE = visible particulate emissions
HCl = hydrogen chloride	PBR = Permit-By-Rule	VMT = vehicle miles traveled
HF = hydrogen fluoride	PCB = polychlorinated biphenyl	VOC = volatile organic compound
Hg = mercury	PE = particulate emissions	WPP = work practice plan
hp = horsepower	PEMS = predictive emissions monitoring system	µg/m ³ = micrograms per cubic meter

A. Standard Terms and Conditions

1. Federally Enforceable Standard Terms and Conditions

- a) All Standard Terms and Conditions are federally enforceable, with the exception of those listed below which are enforceable under state law only:
 - (1) Standard Term and Condition A.2.a), Severability Clause
 - (2) Standard Term and Condition A.3.c) through A. 3.e), General Requirements
 - (3) Standard Term and Condition A.6.c), Compliance Requirements
 - (4) Standard Term and Condition A.9., Reporting Requirements
 - (5) Standard Term and Condition A.10., Applicability
 - (6) Standard Term and Condition A.11.b) through A.11.e), Construction of New Source(s) and Authorization to Install
 - (7) Standard Term and Condition A.14., Public Disclosure
 - (8) Standard Term and Condition A.15., Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations
 - (9) Standard Term and Condition A.16., Fees
 - (10) Standard Term and Condition A.17., Permit Transfers

2. Severability Clause

- a) A determination that any term or condition of this permit is invalid shall not invalidate the force or effect of any other term or condition thereof, except to the extent that any other term or condition depends in whole or in part for its operation or implementation upon the term or condition declared invalid.
- b) All terms and conditions designated in parts B. and C. of this permit are federally enforceable as a practical matter, if they are required under the Act, or any of its applicable requirements, including relevant provisions designed to limit the potential to emit of a source, are enforceable by the Administrator of the U.S. EPA and the state and by citizens (to the extent allowed by section 304 of the Act) under the Act. Terms and conditions in parts B and C of this permit shall not be federally enforceable and shall be enforceable under state law only, only if specifically identified in this permit as such.

3. General Requirements

- a) Any noncompliance with the federally enforceable terms and conditions of this permit constitutes a violation of the Act and is grounds for enforcement action or for permit revocation, revocation and re-issuance, or modification.
- b) It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the federally enforceable terms and conditions of this permit.
- c) This permit may be modified, revoked, or revoked and reissued, for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or revocation, or of a notification of planned changes or anticipated noncompliance does not stay any term and condition of this permit.



- d) This permit does not convey any property rights of any sort, or any exclusive privilege.
- e) The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying or revoking this permit or to determine compliance with this permit. Upon request, the permittee shall also furnish to the Director or an authorized representative of the Director, copies of records required to be kept by this permit. For information claimed to be confidential in the submittal to the Director, if the Administrator of the U.S. EPA requests such information, the permittee may furnish such records directly to the Administrator along with a claim of confidentiality.

4. Monitoring and Related Record Keeping and Reporting Requirements

- a) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall maintain records that include the following, where applicable, for any required monitoring under this permit:
 - (1) The date, place (as defined in the permit), and time of sampling or measurements.
 - (2) The date(s) analyses were performed.
 - (3) The company or entity that performed the analyses.
 - (4) The analytical techniques or methods used.
 - (5) The results of such analyses.
 - (6) The operating conditions existing at the time of sampling or measurement.
- b) Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Such records may be maintained in computerized form.
- c) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall submit required reports in the following manner:
 - (1) Reports of any required monitoring and/or recordkeeping of federally enforceable information shall be submitted to the Akron Regional Air Quality Management District.
 - (2) Quarterly written reports of (i) any deviations from federally enforceable emission limitations, operational restrictions, and control device operating parameter limitations, excluding deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06, that have been detected by the testing, monitoring and recordkeeping requirements specified in this permit, (ii) the probable cause of such deviations, and (iii) any corrective actions or preventive measures taken, shall be made to the Akron Regional Air Quality Management District. The written reports shall be submitted quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. See A.15. below if no deviations occurred during the quarter.



- (3) Written reports, which identify any deviations from the federally enforceable monitoring, recordkeeping, and reporting requirements contained in this permit shall be submitted to the Akron Regional Air Quality Management District every six months, by January 31 and July 31 of each year for the previous six calendar months. If no deviations occurred during a six-month period, the permittee shall submit a semiannual report, which states that no deviations occurred during that period.
 - (4) This permit is for an emissions unit located at a Title V facility. Each written report shall be signed by a responsible official certifying that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.
- d) The permittee shall report actual emissions pursuant to OAC Chapter 3745-78 for the purpose of collecting Air Pollution Control Fees.

5. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction, i.e., upset, of any emissions units or any associated air pollution control system(s) shall be reported to the Akron Regional Air Quality Management District in accordance with paragraph (B) of OAC rule 3745-15-06. (The definition of an upset condition shall be the same as that used in OAC rule 3745-15-06(B)(1) for a malfunction.) The verbal and written reports shall be submitted pursuant to OAC rule 3745-15-06.

Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emission unit(s) that is (are) served by such control system(s).

6. Compliance Requirements

- a) All applications, notifications or reports required by terms and conditions in this permit to be submitted or "reported in writing" are to be submitted to Ohio EPA through the Ohio EPA's eBusiness Center: Air Services web service ("Air Services"). Ohio EPA will accept hard copy submittals on an as-needed basis if the permittee cannot submit the required documents through the Ohio EPA eBusiness Center. In the event of an alternative hard copy submission in lieu of the eBusiness Center, the post-marked date or the date the document is delivered in person will be recognized as the date submitted. Electronic submission of applications, notifications or reports required to be submitted to Ohio EPA fulfills the requirement to submit the required information to the Director, the appropriate Ohio EPA District Office or contracted local air agency, and/or any other individual or organization specifically identified as an additional recipient identified in this permit unless otherwise specified. Consistent with OAC rule 3745-15-03, the electronic signature date shall constitute the date that the required application, notification or report is considered to be "submitted". Any document requiring signature may be represented by entry of the personal identification number (PIN) by responsible official as part of the electronic submission process or by the scanned attestation document signed by the Authorized Representative that is attached to the electronically submitted written report.

Any document (including reports) required to be submitted and required by a federally applicable requirement in this permit shall include a certification by a Responsible Official that, based on



information and belief formed after reasonable inquiry, the statements in the document are true, accurate, and complete

- b) Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Director of the Ohio EPA or an authorized representative of the Director to:
 - (1) At reasonable times, enter upon the permittee's premises where a source is located, or the emissions-related activity is conducted, or where records must be kept under the conditions of this permit.
 - (2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit, subject to the protection from disclosure to the public of confidential information consistent with ORC section 3704.08.
 - (3) Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.
 - (4) As authorized by the Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit and applicable requirements.
- c) The permittee shall submit progress reports to the Akron Regional Air Quality Management District concerning any schedule of compliance for meeting an applicable requirement. Progress reports shall be submitted semiannually or more frequently if specified in the applicable requirement or by the Director of the Ohio EPA. Progress reports shall contain the following:
 - (1) Dates for achieving the activities, milestones, or compliance required in any schedule of compliance, and dates when such activities, milestones, or compliance were achieved.
 - (2) An explanation of why any dates in any schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.

7. Best Available Technology

As specified in OAC Rule 3745-31-05, new sources that must employ Best Available Technology (BAT) shall comply with the Applicable Emission Limitations/Control Measures identified as BAT for each subject emissions unit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Reporting Requirements

The permittee shall submit required reports in the following manner:

- a) Reports of any required monitoring and/or recordkeeping of state-only enforceable information shall be submitted to the Akron Regional Air Quality Management District.
- b) Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from state-only required emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will



be taken, shall be submitted to the Akron Regional Air Quality Management District. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

10. Applicability

This permit-to-install is applicable only to the emissions unit(s) identified in the permit-to-install. Separate application must be made to the Director for the installation or modification of any other emissions unit(s) not exempt from the requirement to obtain a permit-to-install.

11. Construction of New Sources(s) and Authorization to Install

- a) This permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. This permit does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the application and terms and conditions of this permit. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of this permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Issuance of this permit is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities cannot meet the requirements of this permit or cannot meet applicable standards.
- b) If applicable, authorization to install any new emissions unit included in this permit shall terminate within eighteen months of the effective date of the permit if the owner or operator has not undertaken a continuing program of installation or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation. This deadline may be extended once by twelve months if application is made to the Director within a reasonable time before the termination date and the permittee shows good cause for any such extension.
- c) The permittee may notify Ohio EPA of any emissions unit that is permanently shut down (i.e., the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31) by submitting a certification from the authorized official that identifies the date on which the emissions unit was permanently shut down. Authorization to operate the affected emissions unit shall cease upon the date certified by the authorized official that the emissions unit was permanently shut down. At a minimum, notification of permanent shut down shall be made or confirmed by marking the affected emissions unit(s) as "permanently shut down" in "Air Services" along with the date the emissions unit(s) was permanently removed and/or disabled. Submitting the facility profile update electronically will constitute notifying the Director of the permanent shutdown of the affected emissions unit(s).
- d) The provisions of this permit shall cease to be enforceable for each affected emissions unit after the date on which an emissions unit is permanently shut down (i.e., emissions unit has been physically



removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31). All records relating to any permanently shut down emissions unit, generated while the emissions unit was in operation, must be maintained in accordance with law. All reports required by this permit must be submitted for any period an affected emissions unit operated prior to permanent shut down. At a minimum, the permit requirements must be evaluated as part of the reporting requirements identified in this permit covering the last period the emissions unit operated.

Unless otherwise exempted, no emissions unit certified by the responsible official as being permanently shut down may resume operation without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31 and OAC Chapter 3745-77 if the restarted operation is subject to one or more applicable requirements.

- e) The permittee shall comply with any residual requirements related to this permit, such as the requirement to submit a deviation report, air fee emission report, or any other reporting required by this permit for the period the operating provisions of this permit were enforceable, or as required by regulation or law. All reports shall be submitted in a form and manner prescribed by the Director. All records relating to this permit must be maintained in accordance with law.

12. Permit-To-Operate Application

The permittee is required to apply for a Title V permit pursuant to OAC Chapter 3745-77. The permittee shall submit a complete Title V permit application or a complete Title V permit modification application within twelve months after commencing operation of the emissions units covered by this permit. However, if operation of the proposed new or modified source(s) as authorized by this permit would be prohibited by the terms and conditions of an existing Title V permit, a Title V permit modification of such new or modified source(s) pursuant to OAC rule 3745-77-04(D) and OAC rule 3745-77-08(C)(3)(d) must be obtained before operating the source in a manner that would violate the existing Title V permit requirements.

13. Construction Compliance Certification

The applicant shall identify the following dates in the "Air Services" facility profile for each new emissions unit identified in this permit.

- a) Completion of initial installation date shall be entered upon completion of construction and prior to start-up.
- b) Commence operation after installation or latest modification date shall be entered within 90 days after commencing operation of the applicable emissions unit.

14. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

15. Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations

If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters.

16. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable permit-to-install fees within 30 days after the issuance of any permit-to-install. The permittee shall pay all applicable permit-to-operate fees within thirty days of the issuance of the invoice.

17. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The new owner must update and submit the ownership information via the "Owner/Contact Change" functionality in "Air Services" once the transfer is legally completed. The change must be submitted through "Air Services" within thirty days of the ownership transfer date.

18. Risk Management Plans

If the permittee is required to develop and register a risk management plan pursuant to section 112(r) of the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. ("Act"), the permittee shall comply with the requirement to register such a plan.

19. Title IV Provisions

If the permittee is subject to the requirements of 40 CFR Part 72 concerning acid rain, the permittee shall ensure that any affected emissions unit complies with those requirements. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

B. Facility Wide Terms and Conditions

1. All the following facility-wide terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.
 - a) None.
2. This facility is subject to 40 CFR Part 68 (112(r) of the Clean Air Act).
3. Facility-Wide Synthetic Minor to limit the PTE of any single HAP and combined HAPs to avoid Subpart U — National Emission Standards for Hazardous Air Pollutant Emissions: Group I Polymers and Resins.
 - a) The facility-wide individual HAP and the facility-wide total combined HAP emissions shall not exceed 9.9 and 24.9 tons per year, respectively, based upon rolling, 12-month summations of the monthly HAP emission rates calculated quarterly.
 - b) Operational Restrictions
 - (1) Process emissions from EU P020 shall be vented to the thermal oxidizer (TOX) at all times the P020 emission unit is in operation.
 - (2) The permittee shall implement an LDAR program equivalent to 40 CFR Part 63 Subpart H (version as promulgated in 85 FR 735854 on 11/19/2020) for all components contacting streams containing 5 wt % or greater HAP.
 - c) Monitoring and/or Recordkeeping Requirements
 - (1) The permittee shall collect and record process throughput and production information each month for emissions units B001, B014, P007, and P020 to calculate the emission unit-specific individual HAP and total combined HAP emissions, in tons per month, each quarter.
 - (2) The permittee shall calculate the rolling, 12-month summation of facility-wide individual HAP and facility-wide total combined HAP emissions, in tons, for comparison to the limits in B.3 each quarter.
 - d) Reporting Requirements
 - (1) The permittee shall identify the following information in the quarterly deviation report in accordance with the requirements in B.3 above:
 - a. All exceedances of the rolling, 12-month summations of facility-wide individual HAP and facility-wide total combined HAP emissions.

If no deviations (excursions) occurred during a calendar quarter, the permittee shall submit a report that states no deviations (excursions) occurred during the quarter.

The quarterly reports shall be submitted each year by January 31 (covering October to December), April 30 (covering January to March), July 31 (covering April to June), and October 31 (covering July to September), unless an alternative schedule has been established and approved by the Director (the appropriate Ohio EPA DO/LAA).

e) Testing Requirements

- (1) Compliance with the emission limitations in section B.3 shall be determined in accordance with the following method:

a. Emission Limitation:

The facility-wide individual HAP and the facility-wide total combined HAP emissions shall not exceed 9.9 and 24.9 tons per year, respectively, based upon rolling, 12-month summations of the monthly HAP emission rates calculated quarterly.

b. Applicable Compliance Method:

Compliance with the facility-wide individual HAP and the facility-wide total combined HAP emission limitations shall be based upon the recordkeeping requirements specified in B.3 and the control efficiencies for B001, B014, and the TOX demonstrated during the most recent performance test.

4. The Ohio EPA has determined that this facility is subject to the requirements of 40 CFR Part 63 Subpart VVVVV, NESHAP for Chemical Manufacturing, Area Sources. The following emissions units are subject to 40 CFR Part 63, Subpart VVVVV: P007 and P020. The complete GACT requirements, including the General Provisions, may be accessed via the internet from the e-CFR website <http://www.ecfr.gov/> or by contacting the appropriate Ohio EPA DO/LAA. Although Ohio EPA has determined that this Generally Available Control Technology NESHAP (GACT) applies, at this time Ohio EPA does not have the authority to enforce this standard. Instead, US EPA has the authority to enforce this standard. Please be advised that all requirements associated with this rule are in effect and shall be enforced by US EPA.

- a) In accordance with 40 CFR 63.11494(a) and (b), the emissions units listed above are part of a chemical manufacturing process with a specified Table 1 HAP and located at an area source of HAP emissions. The permittee shall comply with the applicable requirements under 40 CFR Part 63, Subpart VVVVV, including the following sections:

§63.11494(d), (f), and (i)	Definition of affected sources and compliance dates.
§63.11494(e)	Area source requirement to obtain a Title V permit.
§63.11495(a)	Management practices to reduce hazardous air pollutant (HAP) emissions during everyday facility operations.
§63.11495(a)(1)	Each process vessel must be equipped with a cover or lid that must remain closed at all times when it contains organic or metal Hazardous Air Pollutants (HAPs).
§63.11495(a)(2)	Control hazardous air pollutant (HAP) emissions when transferring liquid chemicals.
§63.11495(a)(3)	Inspections on process vessels and equipment to ensure they are sound and free of hazardous air pollutant (HAP) leaks.
§63.11495(a)(4)	Facilities must repair any detected leak within 15 calendar days of detection, or document the reason for any delay.



§63.11495(a)(5)	Recordkeeping requirements for leak inspections and equipment repairs.
§63.11495(a)(6)	Monitoring and recordkeeping requirements for leak inspections and equipment repairs effective April 1, 2029.
§63.11495(b)	Regulation requirements for small heat exchange systems.
§63.11495(d)	General duty to operate and maintain the affected equipment (including pollution control and monitoring devices) safely and in a manner that minimizes air pollution emissions.
§63.11495(e)	Bypass provisions effective April 1, 2029.
§63.11496(a); Table 2	Organic HAP emission limits and compliance requirements specifically for "batch process vents".
§63.11496(g)	Performance testing and compliance procedures for controlling organic and halogenated hazardous air pollutants (HAP) from continuous and batch process vents in the Chemical Manufacturing Area Source.
§63.11496(i)	Startup, Shutdown, and Malfunction (SSM) provisions do not apply, the facility must comply with emissions standards at all times.
§63.11498(a); Table 6	The emission limits and compliance requirements for handling wastewater streams that contain HAP.
§63.11501(a); Table 9	Applicability of General Provisions.
§63.11501(b)	Notification of compliance status report requirements.
§63.11501(c)	Recordkeeping requirements.
§63.11501(d)	Requirements for Semiannual Compliance Reports.
§63.11502	Definitions
§63.11503	Implementation and enforcement

5. OAC rule 3745-21-11(B) VOC RACT Requirements

- a) As required by the reclassification to serious nonattainment for ozone under the 2015 ozone NAAQS promulgated by U.S. EPA, and pursuant to OAC rule 3745-21-11(B) and the VOC Reasonably Available Control Technology (RACT) Study submitted by Huntsman Advanced Materials Americas, LLC on March 30, 2026 (subsequently revised on April 20, 2026, May 15, 2026, July 10, 2026, September 10, 2026 and September 17, 2026):

- (1) "Huntsman Advanced Materials Americas, LLC (facility ID: 1677010029) or any subsequent owner/operator of the facility located at 240 W. Emerling Ave, Akron, OH shall comply with the following requirements:



- a. VOC emissions from the raw material charging system, reactors, solvent recovery system, monomer recovery system, wet rubber storage tanks, dryer condenser system, AEP storage tank, post-reaction and blending system, and Adduct storage tank of the RLP process shall be completely captured and vented through a closed vent system to the thermal oxidizer (TOX) at all times when the process is in operation. The TOX shall achieve a control efficiency of at least 99%, by weight, for VOC.
- b. The permittee shall implement an LDAR program equivalent to 40 CFR Part 63 Subpart H (version as promulgated in 85 FR 735854 on November 19, 2020) for all components contacting streams containing 5 wt% or greater HAP or 10 wt% or greater VOC and not in heavy liquid service as defined in § 60.481.

b) Monitoring and Recordkeeping Requirements

- (1) In order to maintain compliance with the control efficiency defined in 5.a)(1)a. above, the acceptable average combustion temperature within the TOX, for any 3-hour block of time when emissions unit P020 is in operation, shall not be more than 50°F below the average temperature measured during the most recent performance test that demonstrated the emissions unit was in compliance.
- (2) The permittee shall properly install, operate, and maintain a continuous temperature monitor and recorder that measures and records the combustion temperature within the TOX, whenever emissions unit P020 is in operation, including periods of startup and shutdown. Units shall be in degrees Fahrenheit (°F). The accuracy for each thermocouple, monitor, and recorder shall be guaranteed by the manufacturer to be within ±1% of the temperature being measured or ±5°F, whichever is greater. The temperature monitor and recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and the operating manuals, with any modifications deemed necessary by the permittee.
- (3) The permittee shall collect and record the following information for each day:
 - a. all 3-hour blocks of time, when emissions unit P020 was in operation, during which the average combustion temperature within the TOX was more than 50°F below the average temperature measured during the most recent performance test that demonstrated the emissions units were in compliance; and
 - b. a log or record of the operating time for the capture (collection) system, the control device, the monitoring equipment, and the associated emissions unit.

If all recorded values of the temperature within the TOX are above the minimum established temperature B.5.b)(3) above, the permittee may record that all values were above the minimum temperature rather than calculating and recording the 3-hour average temperature

- (4) Whenever the monitored average combustion temperature within the TOX deviates from the range or limit established in accordance with this permit, the permittee shall promptly investigate the cause of the deviation. The permittee shall maintain records of the following information for each investigation:



- a. the date and time the deviation began;
- b. the magnitude of the deviation at that time;
- c. the date the investigation was conducted;
- d. the name(s) of the personnel who conducted the investigation; and
- e. the findings and recommendations.

In response to each required investigation to determine the cause of a deviation, the permittee shall take prompt corrective action to bring the operation of the control equipment within the acceptable range/limit specified in this permit, unless the permittee determines that corrective action is not necessary and documents the reasons for that determination and the date and time the deviation ended. The permittee shall maintain records of the following information for each corrective action taken:

- f. a description of the corrective action;
- g. the date corrective action was completed;
- h. the date and time the deviation ended;
- i. the total period of time (in minutes) during which there was a deviation;
- j. the temperature readings immediately after the corrective action was implemented; and
- k. the name(s) of the personnel who performed the work.

Investigation and records required by this paragraph do not eliminate the need to comply with the requirements of OAC rule 3745-15-06 if it is determined that a malfunction has occurred.

- (5) The permittee shall collect and maintain LDAR records in accordance with 3.b)(2) above.

c) Reporting Requirements

- (1) The permittee shall submit quarterly deviation (excursion) reports that identify the following:
 - a. any 3-hour block of time when emissions unit P020 was in operation, during which the average combustion temperatures within the TOX was more than 50°F below the average temperature maintained during the most recent performance test that demonstrated the emissions units were in compliance; and
 - b. any period of time (start time and date, and end time and date) when emissions unit P020 was in operation and the process emissions were not vented to a control device.

The quarterly reports shall be submitted in accordance with the reporting requirements of the Standard Terms and Conditions in Section A of this permit.

- (2) The permittee shall submit LDAR reports in accordance with 3.b)(2) above.

d) Testing Requirements

- (1) The permittee shall conduct or have conducted, emissions testing for emissions unit P020 in accordance with the following requirements:



- a. The emission testing shall be conducted approximately 3 months after issuance of the permit.
- b. The emissions testing shall be conducted to demonstrate compliance with the VOC overall control efficiency limitation. No capture testing is required because the emissions units listed above are a closed system (emissions are hard piped to the control equipment).
- c. The control efficiency (that is, the percent reduction in mass emissions between the inlet and outlet of the control system) shall be determined per the test methods and procedures specified in OAC rule 3745-21-10 or an alternative test protocol approved by Ohio EPA. The test methods and procedures selected shall be based on a consideration of the diversity of the organic species present and the total concentration, and on a consideration of the potential presence of interfering gases.
- d. During the emissions testing, the EU shall be operated under operational conditions approved in advance by the appropriate Ohio DO/LAA. Operational conditions that may need to be approved include, but are not limited to, the production rate, the type of material processed, material make-up (solvent content, etc.) or control equipment operational limitations (burner temperature, precipitator voltage, etc.). In general, testing shall be done under worst case conditions expected during the life of the permit. As part of the information provided in the Intent to Test (ITT) notification form described below, the permittee shall provide a description of the EU operational conditions they will meet during the emissions testing and describe why they believe worst case operating conditions will be met. Prior to conducting the test(s), the permittee shall confirm with the appropriate Ohio EPA DO/LAA that the proposed operating conditions constitute worst case. Failure to test under the approved conditions may result in Ohio EPA not accepting the test results as a demonstration of compliance.
- e. Not later than 30 days prior to the proposed test date(s), the permittee shall submit an ITT notification to the appropriate Ohio EPA DO/LAA. The ITT notification shall describe in detail the proposed test methods and procedures, the EU operating parameters, the time(s) and date(s) of the test(s) and the person(s) who will be conducting the test(s). Failure to submit such notification for review and approval prior to the test(s) may result in the Ohio EPA DO/LAA's refusal to accept the results of the emission test(s).
- f. Personnel from the appropriate Ohio EPA DO/LAA shall be permitted to witness the test(s), examine the testing equipment and acquire data and information necessary to ensure that the operation of the EU and the testing procedures provide a valid characterization of the emissions from the EU and/or the performance of the control equipment.
- g. A comprehensive written report on the results of the emissions test(s) shall be signed by the person(s) responsible for the tests and submitted to the appropriate Ohio EPA DO/LAA within 30 days following completion of the test(s). The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the appropriate Ohio EPA DO/LAA.

C. Emissions Unit Terms and Conditions

1. P020, RLP

Operations, Property and/or Equipment Description:

RLP - Reactive Liquid Polymers - reactors, processing vessels, product purification, finishing, and raw material recovery

- a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) None.

- b) Applicable Emissions Limitations and/or Control Requirements

- (1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(A)(3)	9.6 tons of volatile organic compounds (VOC) per year. See b)(2)a. below
b.	OAC rule 3745-31-05(D) [Federally enforceable requirements to avoid 40 CFR Part 63, Subpart U applicability, and to comply with OAC rule 3745-21-11(B)]	See Facility-Wide Terms and Conditions Sections B.3 and B.5.
c.	40 CFR Part 63, Subpart VVVVV (40 CFR Part 63.11494 – 63.11503)	See Facility-Wide Terms and Conditions Section B.4.
d.	40 CFR Part 63, Subpart A (40 CFR Part 63.1 – 63.16)	The permittee shall comply with the requirements of 40 CFR part 63, subpart A as shown in in Table 9 of Subpart VVVVV.

- (2) Additional Terms and Conditions

- a. The BAT overall control efficiency requirement under OAC rule 3745-31-05(A)(3) is less stringent than VOC overall control efficiency established under OAC rule 3745-21-11(B).

b. See Facility-Wide Terms and Conditions B.5.a) above.

- c) Operational Restrictions

(1) None.

- d) Monitoring and/or Recordkeeping Requirements
 - (1) See Facility-Wide Terms and Conditions B.5.b) above
- e) Reporting Requirements
 - (1) Unless other arrangements have been approved by the Director, all notifications and reports shall be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal.
 - (2) See Facility-Wide Terms and Conditions B.5.c) above.
- f) Testing Requirements
 - (1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:
 - a. Emissions Limitation
9.6 tons of VOC per year.
Applicable Compliance Method
Compliance with the annual allowable VOC emission limitation shall be determined by the record keeping requirements specified in d)(4) above.
 - b. Emission Limitation:
The overall control efficiency shall exceed 85% by weight for VOC.
Applicable Compliance Method:
See Facility-Wide Terms and Conditions B.5.d) above.
- g) Miscellaneous Requirements
 - (1) None.



VOC RACT Engineering Study

March 2026, rev. September 17, 2026

Prepared for:

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Attachments

Attachment A: Facility Plot Plan

Attachment B: Stack Test Reports

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1. Introduction

1.1 Background

Huntsman Advanced Materials Americas, LLC (Huntsman) currently operates a resin manufacturing facility located at 240 West Emerling Avenue in Akron, Summit County, Ohio (Akron facility). The facility's emissions units (EU) are authorized to operate under Title V Air Operating Permit Number P0128543, effective September 29, 2021, and PTI Number P0137816, effective May 14, 2025. The Huntsman Akron facility operates two manufacturing processes: the Latex process (EU P007) and the Reactive Liquid Polymer (RLP) process (EU P020). Volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions generated by the Latex process are vented to and combusted in one of two boilers (EUs B001 and B014). VOC and HAP emissions generated by the RLP process are vented to and combusted in a thermal oxidizer (TOX).

Summit County is one of seven Ohio counties that comprise the Cleveland nonattainment area for the 2015 ozone standard. Based on certified ozone monitoring data for 2021, 2022, and 2023, this area failed to meet the ozone standard by the August 3, 2024, attainment date and was reclassified to serious nonattainment by U.S. Environmental Protection Agency (EPA) in accordance with the Clean Air Act (CAA) effective January 16, 2025. Reclassification to serious nonattainment has triggered additional CAA requirements for major stationary sources located in the serious nonattainment area including evaluation and potential implementation of Reasonably Available Control Technology (RACT).

As a result of the reclassification to serious nonattainment, the Ohio EPA finalized revisions to Ohio Administrative Code (OAC) Chapter 3745-21, "Carbon Monoxide, Ozone, Hydrocarbon Air Quality Standards, and Related Emission Requirements" on April 1, 2025, as part of the RACT State Implementation Plan (SIP). These revisions included, among other changes, lowering the RACT threshold in Rule 3745-21-11 from 100 tons/year potential to emit VOC to 50 tons/year for VOC emissions from sources located in any of seven Ohio counties that comprise the Cleveland ozone nonattainment area.

While the definition of potential to emit in Rule 3745-21-01 allows for the inclusion of federally enforceable operational limits, including air pollution control equipment, Huntsman was notified by Ohio EPA that U.S. EPA's position on the potential to emit for RACT studies is that sources can only use controlled emissions provided they also have federally enforceable restrictions on operations of the source (i.e., limit on production, capacity, or hours of operation) and not solely an emissions limit or use of a control device. Title V Permit Number P0128543 nor PTI Number P0137816 include a federally enforceable limit on the operations of the source; therefore, Huntsman is subject to the RACT study requirements in Rule 3745-21-11(B) as their uncontrolled potential to emit VOCs is greater than 50 ton/year.

1.2 RACT Study Requirements

Under Rule 3745-21-11, a full RACT engineering study must include the following information:

- General information on the owner/operator, contact information, and standard industrial classification code and source classification code.



- General information for each affected source including company identification and Ohio EPA emissions unit identification number, source description, installation date, normal operating schedule, annual production rates, average and maximum daily production rates, and type of control equipment employed and the date the control equipment was installed.
- A plot plan which shows the general layout of the facility and the affected sources.
- Emissions data for each affected source including average daily VOC emissions, maximum daily VOC emissions, annual VOC emissions, general composition of the VOC emissions, documentation of the efficiency of the existing control equipment, and documentation of any emissions testing which has been performed.
- If coating materials are used in the source, identification and formulation of each coating.
 - The Huntsman Akron facility does not operate any EUs that employ coating materials.
- Composition, density, and quantity of any clean-up solvents employed.
 - The Huntsman Akron facility does not operate any EUs that employ clean-up solvents.
- A detailed discussion of the technical feasibility of employing each of the following types of control measures for each affected source (or combination of sources) including carbon adsorber, thermal incinerator, catalytic incinerator, condenser, scrubber, and any other such RACT alternatives that may be applicable to an affected source.
- For each type of control measure that is determined to be technically feasible, an estimate of the control efficiency that can be achieved.
- A detailed discussion of the technical feasibility of modifying or replacing the source in order to minimize or eliminate the VOC emissions.
- A quantification of the VOC emission reductions that could be achieved, at the production rates for the calendar year, by each control option that is determined to be technically feasible.
- For each control option that is determined to be technically feasible, an estimate of the capital cost, annualized cost (including capital and operating costs), and the cost-effectiveness (annual dollars per ton of VOC removed annually).
- A comparison and discussion of the advantages and disadvantages of control options that are determined to be technically feasible.
- A recommended definition of RACT for the source, including one or more of the following: enforceable production limitations, emissions limitations, control efficiencies, and operating requirements.
- An expeditious schedule for implementing the recommended definition of RACT, including milestones for awarding contracts, initiating construction, completing construction, and performing emissions testing, if necessary, to demonstrate compliance with the approved definition of RACT.
- Clean and detailed documentation of all calculations of the VOC emissions, including all assumptions made.
- Capital and operating costs and cost-effectiveness estimates calculated in a manner consistent with the most recent edition of the "United States environmental protection agency air pollution control cost manual."

2. Facility Information

The main operating processes at the Huntsman Akron facility include the Latex process (EU P007) and the RLP process (EU P020). The Latex process reactors use acrylonitrile, 1,3-butadiene, styrene, methacrylic acid, and smaller quantities of other monomers to produce the nitrile latex polymer product. Non-condensable gases from the reactors, blend tanks, reactor blowdown tank, thin film evaporator, and wastewater stripper and process water sump are routed through a gas collection system to either Boiler #1 (EU B001) or Boiler #14 (EU B014) for control of the VOCs and HAPs.

The RLP process reactors use acrylonitrile and 1,3-butadiene monomers and a water/acetone polymerization initiator to produce the RLP rubber product. Non-condensable gases from the raw material charging system, reactors, monomer recovery system, wet rubber storage tanks, dryer condenser system, post-reaction and blending system, and Adduct (hazardous waste) storage tank are routed through a gas collection system to a dedicated TOX for control of VOCs and HAPs.

2.1 General Facility Information

Table 1 provides the general facility information required in Rule 3745-21-11(B)(1) through (4).

Table 1: General Facility Information

Facility Name	Huntsman Advanced Materials Americas, LLC
Ohio EPA Facility Identification Number	1677010029
Facility Address	240 West Emerling Avenue, Akron, Ohio 44301-1600
Huntsman RACT Study Contact Person	Kara DeRocha, Corporate Environmental Engineer Huntsman International LLC 10003 Woodloch Forest Drive The Woodlands, Texas 77380 Mobile: 832-333-4652 kara_derocha@huntsman.com
Responsible Official	Roddie MacDonald, Akron Site Manager 240 West Emerling Avenue Akron, Ohio 44301-1600 Office: 440.261.4677 roddie_macdonald@huntsman.com
Standard Industrial Code (SIC)	2821-Plastics Materials and Resins 2822-Synthetic Rubber
North American Industry Classification System (NAICS)	325211-Plastics Material and Resin Manufacturing 325212-Synthetic Rubber Manufacturing

Note: Source classification code numbers are provided in Table 2 for the applicable affected source.

2.2 RACT Affected Source Determination

RACT applicability and analysis applies to air contaminant sources, as defined in OAC 3745-15-05(A)(3), that are subject to Ohio EPA air regulations. As such, Huntsman must complete a RACT study in accordance with OAC rule 3745-21-11(B) that includes all air contaminant sources subject to Ohio EPA



regulations that are not controlled by Ohio's Control Technology Guideline (CTG) regulations in Chapter 21.

Table 2 summarizes the air contaminant sources (i.e., EUs) installed at the facility and identifies their current permitting status, exemption status, if applicable, and VOC potential to emit.

Table 2: Facility-Wide Summary of Permitting Status and VOC PTE for Each Source⁽¹⁾

EU ID	EU Description	Permit Status	Exemption Status	Uncontrolled VOC PTE (ton/yr)	Controlled VOC PTE (ton/year)
B001	93 MMBtu/hr Natural gas-fired boiler	Title V	N/A	0.42 ⁽²⁾	uncontrolled
B010	Hycar 115 kW Diesel Emergency Generator	Permit-by-Rule	N/A	0.10	uncontrolled
B014	90.67 MMBtu/hr Natural gas-fired boiler	PTI/Title V	N/A	2.14	uncontrolled
B015	209 hp Diesel Fire Pump	Permit-by-Rule	N/A	0.13	uncontrolled
F001	Roadways & Parking Areas	None	De minimis	0 (non-VOC)	0 (non-VOC)
L001	H2S Laboratory Cylinder & Hood	None	De minimis	0 (non-VOC)	0 (non-VOC)
P007	Latex Process	Title V	N/A	309.0	8.4
P020	RLP Process	PTI/Title V	N/A	446.2	9.6
P022	Lab Vents	None	De minimis	negligible	negligible
P023	RLP ETBN Blending Process	Included in P020			
P024	RLP Dimer Collection System	Included in P020			
P026	60 hp NG RLP Emergency Generator	Permit-by-Rule	N/A	0.006	uncontrolled
T041	12,000-gal Acrylonitrile Tank #60	None	De minimis	0.24	2E-03 ⁽³⁾
T042	12,000-gal Acrylonitrile Tank #61	None	De minimis	0.24	2E-03 ⁽³⁾
T043	12,000-gal Styrene Tank #62	None	De minimis	0.02	1E-03 ⁽⁴⁾
T044	12,000-gal Acrylonitrile Tank #63	None	De minimis	0.24	2E-03 ⁽³⁾
T045	26,000-gal pressurized Butadiene Tank #64	None	De minimis	0	0
T046	26,000-gal pressurized Butadiene Tank #65	None	De minimis	0	0
T047	16,000-gal pressurized Recovered Butadiene Tank #66	None	De minimis	0	0
T058	8,500-gal Recovered Acetone Tank #101	None	De minimis	0 (non-VOC)	0 (non-VOC)
T059	8,000-gal ADVA Tank #102	None	De minimis	0.03	3E-04 ⁽³⁾
T064	7,140-gal Hydrogen Peroxide Tank	None	Permit Exempt	0 (non-VOC)	0 (non-VOC)
T065	Emergency Engines Diesel Tanks (4)	None	Permit Exempt	4E-04	uncontrolled
T072	Chemical Storage and Mixing Tanks - Boiler House Water Treatment	None	De minimis	2E-04	uncontrolled
T087	5,000-gal Latex KOH Tank - TK69	None	Permit Exempt	0 (non-VOC)	0 (non-VOC)
T089	12,750-gal Resin 895 Tank #71	None	De minimis	negligible	negligible
TMP224095	Adduct Storage Tank (Hazardous Waste Storage Tank) - TK-04H08	Included in P020			

1. PTE = Potential to Emit

2. B001 emissions include a 19% utilization restriction to avoid NOx RACT requirements; see Section 2.4 below. B014 has no operational restrictions.

3. Controlled by TOX.

4. Controlled by carbon drum.

2.2.1 Exempt and Excluded Emissions Units

Under Rule 3745-15-05(B), air contaminant sources that have a *de minimis* level of emissions are exempt from Ohio's air regulations, and therefore not subject to RACT requirements in OAC rule 3745-21-11. Additionally, current Ohio EPA guidance is that EUs that are insignificant activities, *de minimis*, or permanently exempt can be excluded from a RACT Study. Insignificant activities are defined in OAC 3745-77-1 as any of the following:

- All source categories excluded from the requirements to obtain installation permits or operating permits under section 3704.011 of the Revised Code or Chapter 3745-15 or 3745-31 of the Administrative Code.
- All source categories specifically exempted under 40 Code of Federal Regulations (CFR) Part 70.
- Any emissions unit with uncontrolled potential emissions of five tons or less per year of any regulated air pollutant other than a HAP and not more than twenty percent of an applicable major source threshold under the Act.
- Any research and development source that is by itself not a major source.

Based on this guidance, the EUs identified in Table 2 as *de minimis* or permit exempt are not subject to RACT study requirements and are not addressed further herein.

2.2.1.1 Emergency Equipment

Huntsman is authorized to operate the following emergency equipment under permits-by-rule (PBR) pursuant to OAC Rule 3745-31-30(C)(2)(a) for the emergency electrical generators and emergency fire water pump:

- B010 – 154 hp, diesel-fired Emergency Generator = 0.10 tons VOC per year
- B015 – 209 hp, diesel-fired Emergency Water Pump = 0.13 tons VOC per year
- P026 – 60 hp, natural gas-fired Emergency Generator = 0.006 tons VOC per year

These emergency equipment have a total potential to emit less than 0.24 ton of VOCs per year based on the 500 hours per rolling twelve-month period limit in the PBR. Additionally, each emergency generator and water pump engine is limited to no more than 100 hours per year of operation for maintenance checks and readiness testing and up to 50 hours per year in non-emergency situations, which must be counted as part of the 100 hours per year limit for maintenance checks and readiness testing [40 CFR 60.4211(f)(2) and (3) for P026 and 40 CFR 60.4243(d)(2) and (3) for B010 and B015].

Based on the negligible potential uncontrolled VOC emissions for EUs B010, B015, and P026, controlling VOC emissions using any add-on control device is highly unlikely to be technologically and/or economically feasible. These units are not addressed further herein for assessment of RACT. However, Huntsman does implement good combustion practices for the emergency generators and emergency fire water pump engines through routine maintenance and operating in accordance with manufacturer recommendations.

2.2.1.2 Boilers B001 and B014

Huntsman is authorized to operate Boilers B001 and B014 under Title V Operating Permit P0128543. The boilers provide process heat and serve as control devices to combust Latex process gases. These boilers are permitted due to nitrogen oxides (NO_x) and carbon monoxide (CO) emissions; however,

the uncontrolled potential VOC emissions from the combustion of natural gas in these boilers is insignificant at only 0.42 ton VOC per year from B001 and 2.14 tons VOC per year from B014.

Similar to the emergency equipment identified in Section 2.2.1.1, based on the negligible potential uncontrolled VOC emissions for EUs B001 and B014, controlling VOC emissions using any add-on control device is highly unlikely to be technologically and/or economically feasible. These units are not addressed further herein for assessment of RACT. However, Huntsman does implement good combustion practices for the boilers through routine maintenance and operating in accordance with manufacturer recommendations.

2.2.2 RACT Affected Sources

The remaining EUs identified in Table 2 that are not permit exempt or excluded from the RACT study requirements as discussed above include the Latex process (P007) and the RLP process (P020).

Emissions from P007 include:

1. Non-condensable VOCs that remain in the gas stream from the reactors, blend tanks, blowdown tank and thin film evaporator following the reactors, wastewater stripper system, and process water sump, which are completely captured and routed through a closed vent system to either boiler B014 for combustion or B001 when B014 is down for repairs/maintenance.
2. VOCs generated during final product loading into rail cars, trucks, totes, or drums, which consists primarily of polymer and water with residual monomer and other non-monomer components.
3. VOCs generated from handling of waste acrylonitrile recovered from the process, including emissions occurring during transfer into the recovered acrylonitrile tank and during transfer into drums prior to shipping off site.
4. VOCs generated during process wastewater treatment.
5. Fugitive equipment leaks occurring from Latex process components in VOC/HAP service for which the facility has implemented a Leak Detection and Repair [LDAR] Program to minimize emissions.

The Latex activities in items 2, 3, and 4 above have potential uncontrolled VOC emissions of 0.2, 1.7, and 0.003 ton/yr, respectively, based on 8,760 hr/yr operation, which are each less than the *de minimis* threshold in OAC 3745-15-05 of less than 10 lb/day (equivalent to 1.82 ton/yr). Controlling VOC emissions using any add-on control device for these activities is highly unlikely to be technologically and/or economically feasible. Therefore, these activities are not addressed further herein for assessment of RACT.

Emissions from P020 include:

1. Non-condensable VOCs that remain in the gas stream from the raw material charging system, reactors, solvent recovery system, monomer recovery system, wet rubber storage tanks, dryer condenser system, AEP storage tank, post-reaction and blending system, and Adduct (hazardous waste) storage tank, which are completely captured and routed through a closed vent system to the TOX for combustion.
2. VOCs generated during final product loading, which has minimal residual acrylonitrile content, into trucks, totes, or drums.
3. VOCs generated during loading of recovered 1,3-butadiene and acetone into tank trucks (performed with a vapor balance to minimize emissions).

4. VOCs generated during transfer of Dimer waste to a storage tank and then to a tank truck for shipment off site. Vapors displaced during tank loading are exhausted to the TOX for VOC control. Vapors displaced during tank truck loading are exhausted to a drum filled with activated carbon for VOC control.
5. VOCs generated during process wastewater treatment.
6. Fugitive equipment leaks occurring from RLP process components in VOC/HAP service for which the facility has implemented an LDAR Program to minimize emissions.

The RLP activities in items 2, 3, 4, and 5 above have potential uncontrolled VOC emissions of 0.0003, 1.8, 0.08, and 4E-07 ton/yr, respectively, based on 8,760 hr/yr operation, which are each less than the *de minimis* threshold in OAC 3745-15-05 of less than 10 lb/day (equivalent to 1.82 ton/yr). In addition, the natural gas-fired TOX burner is an insignificant activity exempt from permitting under Chapter 3745-31 of the Administrative Code. Controlling VOC emissions using any add-on control device for these activities is highly unlikely to be technologically and/or economically feasible. Therefore, these activities are not addressed further herein for assessment of RACT. Table 3 and Table 4 provide the general information on the Latex and RLP processes required by OAC 3745-21-11(B)(5).

Table 3: General Information for Latex Process (P007)

Ohio EPA EU identification number	P007
Source description	Nitrile Latex Production (EU P007) includes 25 to 30 different formulations and uses acrylonitrile, 1,3-butadiene, and styrene as raw materials, which are stored in a tank farm. The monomers are delivered to the plant by rail and tank trucks. Process equipment includes polymerizers, blowdown tanks, concentrators, blend tanks, etc. Emissions generated from the process are vented to the boiler house for incineration through a controlled system.
Source classification code numbers	3-01-026-01, Industrial Processes, Chemical Manufacturing, Synthetic Rubber (Manufacturing Only), General
Current Ohio EPA permit number	P0129543 – Active Title V Permit
Current Ohio EPA application number	Title V PTO Renewal Application (A0079456)
Month and year installed	June 1939
Normal operating schedule	24 hours a day, 7 days per week, 52 weeks per year
Annual production rates (lb/yr):	
2025	
2024	
2023	
Daily maximum production rates (lb/day):	
2025	
2024	
2023	
Daily average production rates (lb/day):	
2025	
2024	
2023	
Type of Control Equipment	Boiler #1 (B001) installed June 1, 1969 Boiler #14 (B014) installed November 25, 2014

Table 4: General Information for RLP Process (P020)

Ohio EPA EU identification number	P020
Source description	The RLP department produces a variety of carboxyl terminated butadiene/acrylonitrile (CTBN) polymers. In addition to the main raw materials 1,3-butadiene and acrylonitrile, a water/acetone initiator is used for the polymerizations. Butadiene and acrylonitrile are stored on site in the Latex department tank farm from which RLP draws. Acetone is recovered from the process and recycled to the supplier. Process equipment includes reactors, processing vessels, product purification, finishing, and raw material recovery. Emissions generated from the process are vented to a TOX for control.
Source classification code numbers	3-01-810-02, Industrial Processes, Chemical Manufacturing, General Processes, Distillation Unit
Current Ohio EPA permit number	P0129543 – Active Title V Permit P0137816 – PTI for HAP Synthetic Minor
Current Ohio EPA application number	Title V PTO Renewal Application (A0079456)
Month and year installed	December 1978
Normal operating schedule	24 hours a day, 7 days per week, 52 weeks per year
Annual production rates (lb/yr):	
2025	
2024	
2023	
Daily maximum production rates (lb/day):	
2025	
2024	
2023	
Daily average production rates (lb/day):	
2025	
2024	
2023	
Type of Control Equipment	Thermal Oxidizer installed December 8, 2014

Pursuant to OAC 3745-21-11(B)(6), a plot plan showing the general layout of the facility and the location of permitted emission units is presented in Attachment A.

2.3 Stack Testing Results

Huntsman conducted stack testing of B001, B014, and the TOX in March, May, and June 2015, respectively. The stack testing was completed to demonstrate compliance with the control requirements of the Ohio EPA Title V Permit Number P0102593 and the requirements contained in the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Group 1 Polymers and Resins (40 CFR Part 63, Subpart U).

All three stack tests conducted in 2015 demonstrated compliance with the requirement in 40 CFR 63.487(b)(2)) to reduce emissions of organic HAP by at least 90 percent by weight (wt%) or to a concentration of less than 20 parts per million by volume (ppmv) on a dry basis (ppmvd), whichever is less stringent. In addition, the concentration must be corrected to 3% oxygen if supplemental combustion air is used to combust the emissions. The three stack tests resulted in average total gaseous organic (TGO)

concentrations for B001, B014, and the TOX of 34.4, <1.80, and <2.0 ppmv as propane (B001 was corrected to 3% oxygen due to employing supplemental combustion air), respectively, and average TGO destruction efficiencies for B001, B014, and the TOX of 96.83%, >99.55%, and >99.9%, respectively. Detailed test results including inlet and outlet rates in pounds per hour and ppmvd are summarized in Table 5 below and provided in Attachment B.

The TGO destruction efficiency and hourly emission rates were determined based on U.S. EPA Reference Test Method 25A. This method measures TGO concentration, reported as propane, which does not differentiate between VOCs and non-VOC hydrocarbons. As such, the TGO emission rates determined by Method 25A may overestimate the actual VOC emissions by accounting for non-VOC hydrocarbon emissions.

Table 5: TGO Emission Rates Detected During 2015 Stack Testing

Test Date	Stack Tested	Average Emissions at Inlet (uncontrolled)		Average Emission at Exhaust Stack (controlled)		Average Destruction Efficiency (%)
		lb/hr (as propane)	ppmvd (as propane)	lb/hr (as propane)	ppmvd (as propane)	
March 5, 2015	B001	29.7	850	0.53	34.4 ³	96.83
May 19, 2015	B014	35.5	921 ¹	<0.097 ²	<1.80 ^{1,2}	>99.55
June 2, 2015	TOX	25.6	720,658	<0.024 ²	<2.0 ²	>99.9

1. Reported as ppmv on a wet basis.
2. The "<" indicates the compound was not present at quantities above the Minimum Detection Limit (MDL) of the analytical method.
3. Average TGO concentration corrected to 3% oxygen (ppmvd as propane).

Future stack tests will be completed in accordance with air permit testing requirements.

2.4 VOC Emissions from Affected Sources

Table 6 and Table 7 provide the uncontrolled and controlled average daily, maximum daily, and annual VOC emissions for the Latex and RLP processes, respectively, as required by OAC 3745-21-11(B)(7)(a) through (d). Pursuant to OAC 3745-21-11(B)(7), Huntsman selected calendar year 2019 for the Latex process and calendar year 2023 for the RLP process as the years most representative of the highest emissions for each process.

For the Latex process, the non-condensable VOCs that remain in the process gas stream may be vented to either B001 or B014 for combustion. Huntsman has a federally enforceable operating restriction for B001 to limit potential NOx emissions to 9.9 tons per year to avoid NOx RACT requirements. This limitation equates to a maximum 19% utilization for B001. Therefore, the Latex process annual and average daily, controlled VOC emissions in Table 6 and Table 7 were estimated using a weighted average boiler control efficiency of 99.0% calculated as shown below. However, it should be noted that B001 is only used as a control device when B014 is down for repairs or maintenance, resulting in a historic annual usage of B001 less than 10% of its annual capacity. Therefore, the annual and average daily, controlled VOC emissions in Table 6 are conservative:

$$(19\% \times 96.83\% \text{ control for B001}) + ((100\% - 19\%) \times 99.55\% \text{ control for B014}) = 99.0\% \text{ control}$$

The Latex maximum daily, controlled VOC emissions were conservatively calculated using the B001 control efficiency.

Attachment C presents the detailed VOC emission calculations for P007 and P020.

Uncontrolled fugitive equipment leak emissions from the Latex and RLP processes were calculated using emission factors from TCEQ Fugitive Guidance APDG 6422 Table I – Uncontrolled SOCMI Fugitive Emission Factors, SOCMI without Ethylene (C2) and assuming the components leak 8,760 hr/yr.¹ Control efficiencies for connectors, gas valves, light liquid valves, and pumps (85%, 98%, 98%, and 90%, respectively for Latex; 90%, 99%, 99%, and 99%, respectively for RLP) were calculated based on 5-year actual leak rates and equations from the US EPA Protocol for Equipment Leak Emission Estimates.² All agitators and pumps are considered leakless. PRVs that vent to the closed vent system were considered to be 100% controlled. All other PRVs are assumed to have 97% control based on Table V of the TCEQ guidance for the 28VHP and 28CNTA-level monitoring programs, which are equivalent to MACT Subpart H.

Table 6: Latex VOC Emissions

Chemical	2019 Annual			2019 Maximum Daily		2019 Average Daily	
	Uncontrolled Emissions (lb/yr)	Uncontrolled Emissions (ton/yr)	Controlled Emissions (ton/yr)	Uncontrolled Emissions (lb/day)	Controlled Emissions (lb/day)	Uncontrolled Emissions (lb/day)	Controlled Emissions (lb/day)
Latex Emissions through Closed Vent System to B001 or B014							
acrylonitrile	17,512.21	8.76	0.08	335.00	10.62	98.00	3.11
1,3-butadiene	228,642.00	114.32	1.11	2,313.00	73.32	1,178.00	37.34
styrene	5,222.99	2.61	0.03	264.00	8.37	35.00	1.11
Total VOC		125.69	1.22	2,912.00	92.31	1,311.00	41.56
VOC Control Efficiency Used			99.0%		96.83%		99.0%
Latex Equipment Leaks¹							
acrylonitrile	19,758.52	9.9	0.35	54.13	2.22	54.13	2.22
1,3-butadiene	195,695.31	97.8	0.43	536.15	23.49	536.15	23.49
styrene	4,211.78	2.11	0.22	11.54	0.45	11.54	0.45
Total VOC		109.9	1.0	602.25	26.25	602.25	26.25

1. Uncontrolled annual equipment leak emissions are not available (N/A). Actual 2019 annual equipment leaks are calculated in the LDAR program software, LeakDAS, based on the actual number of leaking components in the year.

¹ <https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/fugitive-guidance.pdf>

² https://19january2021snapshot.epa.gov/sites/static/files/2020-09/documents/protocol_for_equipment_leak_emission_estimates.pdf

Table 7: RLP VOC Emissions

Chemical	2023 Annual			2023 Maximum Daily		2023 Average Daily	
	Uncontrolled Emissions (lb/yr)	Uncontrolled Emissions (ton/yr)	Controlled Emissions (ton/yr)	Uncontrolled Emissions (lb/day)	Controlled Emissions (lb/day)	Uncontrolled Emissions (lb/day)	Controlled Emissions (lb/day)
RLP Emissions through Closed Vent System to TOX							
acrylonitrile	4,586	2.29	0.002	15.18	0.02	14.06	0.01
1,3-butadiene	300,448	150.22	0.15	1,382.76	1.38	805.90	0.81
styrene	0	0	0	0	0	0	0
triethyl amine	0	0	0.00	3.26	0.003	2.40	0.00
Total VOC		152.52	0.15	1,401.3	1.40	822.5	0.82
VOC Control Efficiency Used			99.9%		99.9%		99.9%
RLP Equipment Leaks¹							
acrylonitrile	17,382.64	8.7	0.05	47.62	1.44	47.62	1.44
1,3-butadiene	66,994.94	33.5	0.14	183.55	4.75	183.55	4.75
styrene	6,845.20	3.42	0.01	18.75	0.35	18.75	0.35
Total VOC		53.7	0.20	294.03	33.64	294.03	33.64

1. Uncontrolled annual equipment leak emissions are not available (N/A). Actual 2023 annual equipment leaks are calculated in the LDAR program software, LeakDAS, based on the actual number of leaking components in the year.

2.5 Control Equipment for RACT Affected Sources

In accordance with the federally enforceable terms and conditions of PTI Number P0137816, effective May 14, 2025, the recovered non-condensable process gas that is generated by the Latex process is vented to B014, or to B001 when B014 is down for repairs or maintenance, for thermal destruction of VOCs and organic HAPs at all times the unit is in operation. Similarly, the recovered non-condensable process gas that is generated by the RLP process is vented to the TOX for thermal destruction of VOCs and organic HAPs at all times the unit is in operation.

A PTI application was submitted September 10, 2024, to transition the Akron facility from a major source of HAP emissions to a synthetic minor HAP source by accepting facility-wide federally enforceable limitations of 9.9 tons per year of any individual HAP and 24.9 tons per year of total combined HAP emissions to avoid the requirements of 40 CFR Part 63, Subpart U. The emissions restricted by these limitations are organic HAP and inherently also limit VOCs. The PTI issued as a result of the 2024 application included the following operational restrictions:

1. Process emissions from EU P007 shall be vented to EU B001 or B014 at all times the P007 emissions unit is in operation.
2. Process emissions from EU P020 shall be vented to the thermal oxidizer at all times the P020 emission unit is in operation.
3. The permittee shall implement an LDAR program equivalent to 40 CFR Part 63 Subpart H (version as promulgated in 85 FR 735854 on November 19, 2020) for all components contacting streams containing 5 wt% or greater HAP.

The compliance method section of the PTI states that compliance with the individual HAP and facility-wide total combined HAP emissions limitations would be based on the recordkeeping requirements in the

PTI and the control efficiencies for B001, B014, and the TOX demonstrated during the most recent performance test (in 2015).

Although these federally enforceable conditions limit HAP emissions and require the use of the control equipment, they do not consist of a federally enforceable restriction on operations of the source (i.e., limit on production, capacity, or hours of operation) or specify minimum control efficiencies for the boilers or TOX. Therefore, Huntsman must complete this VOC RACT study for the Latex and RLP processes in accordance with Rule 3745-21-11(B).

3. VOC RACT Evaluation

U.S. EPA defines RACT as the lowest emission limit that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility³. U.S. EPA guidance on RACT studies indicates that the analysis may rely on past U.S. EPA guidance, such as the CTGs, for help and should also review other available information regarding the appropriate controls. With respect to using a Best Available Control Technology (BACT) “top-down” analysis, U.S. EPA indicates that BACT requires that new or modified sources adopt the best available controls and, as such, the BACT analysis first looks at the most stringent level of control available for a source. RACT requires that sources adopt controls that are reasonably available and thus they may not be the most stringent controls that have been adopted as BACT for other similar sources⁴.

Irrespective of whether a “top-down” analysis could result in identifying technically feasible control options that may be more stringent than those considered reasonably available, this VOC RACT evaluation was generally based on a “top-down” approach that included the following steps:

1. Identify possible VOC control options;
2. Review the technical feasibility of the control options and identify the potential VOC control efficiency for each option;
3. Rank the control options based upon emissions reduction potential and address economic factors for the top-ranked options; and
4. Identify RACT as the top-ranked control option considering the economic factors.

3.1 VOC Control Options

Under CAA section 108(h), the EPA is required to make information regarding emission control technology available to states and to the general public through a central database. The RACT/BACT/LAER Clearinghouse (RBLC) database is mainly a repository for air pollution control and pollution prevention technology determinations required for major new and modified sources subject to new source review (BACT and Lowest Achievable Emission Rate [LAER]) permitting requirements but can also be informative in RACT due diligence reviews.

An RBLC database search was performed to identify the emission control technologies and emission levels that were determined by permitting authorities within the past ten years for process codes 63.000 (Polymer and Resin Production), 64.000 (Synthetic Organic Chemical Processing Industry), and 69.000 (Chemical Manufacturing, except 61, 62, 63, 64, and 65) and then reduced to sources similar to Huntsman within Standard Industrial Classification Codes 2821 and 2822. The RBLC database search identified 29 facilities with VOC permit limits for similar process operations. The VOC control requirements for these process operations included thermal oxidizers and/or flares with control efficiencies of 98% or 99% and

³ 44 FR 53762, September 17, 1979

⁴ U.S. EPA Memo from William T. Harnett, Air Quality Policy Division Director, to Regional Air Division Directors, May 18, 2006, “RACT Qs & As – Reasonably Available Control Technology (RACT): Questions and Answers”, pg. 2.

one for a thermal oxidizer at 99.9% control. The basis for all but one of these control requirements was either Best Available Control Technology (BACT)-Prevention of Significant Deterioration (PSD) or LAER, both of which are more stringent than RACT. The remaining requirement was a RACT limit for Braskem America Inc., in Marcus Hook, Pennsylvania, which required the use of a flare to control 98% of emissions from their Plant 1 polypropylene manufacturing sources. This RACT limit is comparable to the level of control achieved by the Huntsman boilers and TOX. In addition to the results for processes, the search results indicate an LDAR program is considered BACT-PSD for fugitive equipment leaks. Attachment D provides a summary of the RBLC search results.

In addition, Ohio EPA considers the following technologies to be generally available for controlling VOC emissions and must be evaluated, as specified in OAC 3745-21-11(B):

- Thermal Incinerator
- Catalytic Incinerator
- Carbon Adsorber
- Condenser
- Scrubber

These control options, as well as boilers, are discussed below, including the respective VOC control efficiencies.

3.1.1 Thermal Oxidation

Thermal oxidation is the process of oxidizing organic contaminants in a waste gas stream by raising the temperature above the autoignition point in the presence of oxygen and maintaining it at high temperature for sufficient time to completely oxidize the organic contaminants to carbon dioxide and water. The residence time, temperature, turbulence, and the amount of oxygen affect the oxidation rate and destruction efficiency. For safety considerations, the maximum concentration of the VOC in the waste gas must be substantially below the lower flammable level (lower explosive limit, or LEL) of the specific compound being controlled. As a rule, a safety factor of four (i.e., 25% of the LEL) is used, although some direct-flame oxidizers are able to operate safely above this level. The waste gas may be diluted with ambient air, if necessary, to lower the concentration.

The required level of VOC control of the waste gas that must be achieved in the time that it spends in the thermal combustion chamber dictates the reactor temperature, i.e., the shorter the residence time, the greater the required reactor temperature. Thermal oxidizers are typically designed to have a residence time of one second or less and combustion chamber temperatures between 1,200 and 2,000°F. Thermal oxidizers typically require combustion of an auxiliary fuel (e.g., natural gas), when insufficient VOCs are present to maintain oxidation alone, to maintain the combustion chamber temperature high enough to completely oxidize the contaminant gases.

There are three main types of thermal oxidizers (a.k.a., thermal incinerators): 1) direct flame, 2) recuperative, and 3) regenerative. They are differentiated by the equipment used for heat recovery:

1. A direct flame thermal oxidizer consists of only a combustion chamber with no heat recovery equipment. The waste gas stream is burned by an open flame in an enclosed stack using a specially designed burner tip, auxiliary fuel, and steam or air to promote mixing for nearly complete VOC destruction. Complete combustion in a direct flame thermal oxidizer is governed

by flame temperature, residence time in the combustion zone, turbulent mixing of the components to complete the oxidation reaction, and available oxygen for free radical formation.

2. A recuperative oxidizer is comprised of the combustion chamber, the waste gas preheater (heat exchanger), and, if low-pressure steam or hot water can be used on site, a secondary energy recovery heat exchanger. Considerable fuel savings may be realized by recovering the heat energy from the exhaust gas and preheating the incoming waste gas. Recuperative thermal oxidizers can recover up to 70% of the waste heat from the exhaust gases.
3. In a regenerative thermal oxidizer, the waste gas stream is preheated using the heat content of the treated gas stream, resulting in improved oxidizer efficiency and significant fuel cost savings. In a regenerative thermal oxidizer, a high-density media such as a packed ceramic bed, which is heated in a previous cycle, is used to preheat the incoming waste gas stream, resulting in improved oxidizer efficiency and significant fuel cost savings.

In general, thermal oxidizers are less efficient at treating waste gas streams with highly variable flowrates, since the variable flowrate results in varying residence times, combustion chamber temperature, and poor mixing. Typical thermal oxidizer design efficiencies range from 98% to greater than 99%, depending on system requirements and characteristics of the contaminated stream⁵.

3.1.2 Boilers

Industrial boilers can be used for combusting (i.e., thermal oxidizing) process vent streams from chemical operations, especially when heat recovery potential is high, and can destroy VOCs by burning the waste gas either by mixing with the fuel supply or through a dedicated burner. Most units in chemical plants are natural gas-fired watertube boilers, where combustion gases heat water inside tubes to provide steam and hot water for plant processes. These systems are highly efficient, often above 85%, and additional heat recovery can be achieved using air preheaters or economizers. Burners are designed to fully mix fuel and air; when vent gases are added, their characteristics dictate burner selection.

A boiler is comparable to an incinerator where the average furnace temperature and residence time determines the destruction efficiency. However, when a vent gas is injected as a fuel into the flame zone of a boiler, the required residence time is reduced due to the relatively high flame zone temperature. While vent streams may cause operational changes due to variations in flow, heating value, or corrosive content, boilers can typically accommodate these conditions with adjustments. Depending on vent stream composition, heat transfer inside the furnace may change. Sometimes the organic content reduces fuel needs; in other scenarios, more fuel is required or flame stability may be affected. With appropriate precautions, boilers provide at least 98% VOC destruction and nearly complete recovery of the waste stream's heat. They must, however, operate whenever emissions are generated unless alternative controls are available⁶.

⁵ EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-022, [Thermal Incinerator](#)

⁶ EPA [Control Techniques for Volatile Organic Compound Emissions from Stationary Sources](#), EPA 453/R-92-018

3.1.3 Catalytic Incinerator

Catalytic oxidation is the process of oxidizing organic contaminants in a waste gas stream within a heated chamber containing a bed of active material (catalyst) that facilitates the overall combustion reaction. The catalyst has the effect of increasing the reaction rate, enabling conversion at lower reaction temperatures than in thermal incinerator units. The waste stream must be preheated to a sufficiently high temperature (usually from 300 to 900°F) to initiate the oxidation reactions. The waste stream is preheated either directly in a preheater combustion chamber or indirectly by heat exchange with the incinerator's effluent and/or other process heat. The preheated gas stream is then passed over the catalyst bed. The chemical reaction (combustion) between the oxygen in the gas stream and the gaseous pollutants takes place at the catalyst surface. Catalytic incineration can, in principle, be used to destroy essentially any oxidizable compound in an air stream. However, there are practical limits to the types of compounds that can be oxidized due to the poisoning effect some species have on the catalyst. In addition, most configurations require a low heating value and low particulate content of the inlet gas.

VOC destruction efficiency is dependent upon VOC composition and concentration, operating temperature, oxygen concentration, catalyst characteristics, and space velocity. Space velocity is commonly defined as the volumetric flow of gas entering the catalyst bed chamber divided by the volume of the catalyst bed. The relationship between space velocity and VOC destruction efficiency is strongly influenced by catalyst operating temperature. As space velocity increases, VOC destruction efficiency decreases, and as temperature increases, VOC destruction efficiency increases. Under typical operating conditions, catalytic incinerators can achieve 95 percent VOC destruction efficiency. Higher destruction efficiencies of (98 - 99 percent) are achievable but require larger catalyst volumes and/or higher temperatures and are usually designed on a site-specific basis⁷.

3.1.4 Carbon Adsorption

Carbon adsorption utilizes a column of activated carbon to adsorb organic pollutants. Adsorption is a non-destructive control technology employed to remove VOCs from low to medium concentration gas streams. Adsorption is a phenomenon where gas molecules passing through a bed of solid particles (e.g., activated carbon) are selectively held there by attractive forces which are weaker and less specific than those of chemical bonds. During adsorption, a gas molecule migrates from the gas stream to the surface of the solid where it is held by physical attraction releasing energy, which typically equals or exceeds the heat of condensation. Gases form actual chemical bonds with the adsorbent surface groups. Most adsorbates can be cleaned by heating to a sufficiently high temperature, usually via steam or (increasingly) hot combustion gases, or by reducing the pressure to a sufficiently low value (vacuum desorption).

Carbon adsorbers use activated carbon to adsorb VOCs with intermediate molecular weights (typically between 45 and 130 lb/lb-mole). Smaller compounds do not adsorb well and larger compounds cannot be removed during carbon bed regeneration when the carbon adsorber is cleaned using a sufficiently high temperature. Carbon beds can be plugged by heavy particulate or wet gas streams. Carbon adsorbers are particularly useful for situations where there are relatively dilute VOC concentrations (less than 100 ppmv) and moderate flow rates, which can be difficult or uneconomical to remove using other

⁷ EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-018, [Catalytic Incinerator](#)

types of pollution controls. When properly designed, operated, and maintained, carbon adsorbers can achieve high VOC removal efficiencies of 95 to 99 percent at input VOC concentrations of between 500 and 2,000 ppm in air⁸.

3.1.5 Condenser

Condensation is the process by which the temperature of the waste gas stream is lowered to below the dew point of the contaminant gases in the waste gas forcing a phase change from gas to liquid. Condensers in use today may fall in either of two categories: refrigerated or non-refrigerated. Non-refrigerated condensers are widely used as raw material and/or product recovery devices in chemical process industries. They are frequently used prior to control devices (e.g., incinerators or absorbers). Refrigerated condensers are used as air pollution control devices for treating emission streams with high VOC concentrations (usually > 5,000 ppmv) in applications involving gasoline bulk terminals and storage, where recovery of the raw material or product is economically beneficial. A condenser cannot lower the inlet concentration to levels below the saturation concentration at the coolant temperature. Removal efficiencies above 90 percent can be achieved with coolants such as chilled water, brine solutions, ammonia, or chlorofluorocarbons, depending on the VOC composition and concentration level of the emission stream⁹.

3.1.6 Scrubber

Scrubbing is the process of removing air pollutants by inertial or diffusional impaction, reaction with a sorbent or reagent slurry, or absorption into liquid solvent. A packed scrubber can be used to remove organic components out of a gas stream and into a liquid stream through absorption in which a waste gas stream interacts with a scrubbing liquid inside a contact chamber containing a bed of packing media. Absorption is widely used as a raw material and/or product recovery technique in separation and purification of gaseous streams containing high concentrations of VOC, especially water-soluble compounds such as methanol, ethanol, isopropanol, butanol, acetone, and formaldehyde. Hydrophobic VOCs can be absorbed using an amphiphilic block copolymer dissolved in water. However, as an emission control technique, it is much more commonly employed for controlling inorganic gases than for VOC. When using absorption as the primary control technique for organic vapors, the spent solvent must be easily regenerated or disposed of in an environmentally acceptable manner.

Removal efficiencies for gas absorbers vary for each pollutant-solvent system and with the type of absorber used. Most absorbers have removal efficiencies in excess of 90 percent, and packed-tower absorbers may achieve efficiencies greater than 99 percent for some pollutant-solvent systems. The typical collection efficiency ranges from 70 to greater than 99 percent¹⁰.

⁸ EPA Air Pollution Control Cost Manual*, EPA/452/B-02-001, [Section 3.1, Chapter 1 - Carbon Adsorber](#)

⁹ EPA Air Pollution Control Cost Manual, EPA/452/B-02-001, [Section 3.1, Chapter 2 – Refrigerated Condensers](#)

¹⁰ EPA Air Pollution Control Technology Fact Sheet, EPA-452/F-03-015, [Packed-Bed/Packed-Tower Wet Scrubber](#)



3.1.7 RACT Alternatives

While it is possible to replace process equipment, it is not expected that new equipment would result in a significant decrease in emissions. The Akron processes are designed and currently operated to maximize production, minimize waste, and minimize emissions by routing emissions from the reaction processes through closed vent systems to control devices and by implementing an LDAR program to minimize fugitive emissions from equipment leaks. Huntsman has actively identified and implemented several minor process improvements that include reducing leak points and establishing preventive maintenance programs to maintain seal integrity. While these measures reflect commitment to continuous improvement, their cumulative impact on overall emissions is marginal compared to the primary source output. Huntsman also operates area monitoring systems that alarm if there is a leak in the process areas. When compared to others in the chemical industry, the Akron facility's emissions are low and use similarly performing controls (e.g., 98% efficient flares; see RBLC discussion above).

Huntsman did not identify any feasible manufacturing alternatives to produce the Latex and RLP product or any additional control options to reduce VOC emissions beyond those identified above. As such, it is not expected that replacement or modification of the process operations or control devices would result in a significant decrease in emissions that would be cost-effective.

3.2 Evaluation of Most Effective Control Option

The control technologies options reviewed above are ranked by estimated control efficiency:

1. Thermal oxidation, including thermal incinerators and boilers (98% VOC control efficiency or greater)
2. Catalytic incinerators (95% VOC control efficiency or greater)
3. Carbon adsorbers (95% VOC control efficiency or greater)
4. Condensers (90% VOC control efficiency or greater)
5. Scrubbers (90% VOC control efficiency or greater)

Emissions from the Latex and RLP reactors and other process equipment described in Section 2.2.2 are completely captured and routed through closed vent systems to boilers B001 or B014 or the TOX, each of which has a tested VOC destruction efficiency equal to or better than all potential VOC control options listed above. Therefore, further evaluation of potential control options, including an economic feasibility analysis, is not warranted and RACT can be defined as the use of the existing boilers and TOX that are currently installed and operating at the Huntsman facility.

3.3 RACT Limit Definition

In accordance with OAC 3745-21-11(B)(15), a RACT study must provide a recommended definition of RACT for the affected source(s), which should include one or more of the following:

- Enforceable production limitations.
- Emissions limitations.
- Control efficiencies.
- Operating requirements.



To determine the appropriate form of the RACT definition for Huntsman, an evaluation was completed of the previously defined RACT requirements codified in Ohio EPA VOCs RACT regulations that were adopted to meet the presumptive level of RACT established in the CTGs and non-CTG categories. These RACT regulations include in the CTG regulations in OAC 3745-21-09(C) to (R), (T), (U) to (Z), (BB) to (EE), (DDD) and (EEE), -13, -15, -19, -20, -22, -23, -24, and -26 through -29 and the non-CTG regulations in OAC 3745-21-12, -14, -16, -21, and -25.

Based on review of the RACT limits established in the CTGs and non-CTG categories, the majority of the limits include a VOC content limit, such as lb of VOC/lb of coating applied. Others include operating requirements, such as use of vapor balance systems or LDAR programs, while others include a VOC content limit with the option to use an add-on control device in lieu of meeting the VOC content limit. In all cases where a control device can be used in lieu of a VOC content limit, the most stringent control requirement is at least 95% for control systems installed after April 2, 2009, on heatset web offset lithographic or heatset web letterpress printing press (Rule 3745-21-22), while all other add-on control requirements are no more than at least 90% overall control. Where an add-on control device is required, the most stringent control requirement is at least 98% for VOC combustion devices for air oxidation processes that produce organic chemicals installed after December 31, 1987 (Rule 3745-21-09(EE)).

In addition to the RACT limits established for the CTGs and non-CTG category sources, Rule 3745-21-09(KK) through (ZZ) include site-specific RACT limits established through the VOC RACT study requirements for the marginal nonattainment area SIP development process. Additionally, Federal Register Volume 91, Number 29, dated February 27, 2026, includes a proposed rule where U.S. EPA is proposing to approve site-specific RACT limits under the moderate nonattainment area SIP development process. These established and proposed site-specific RACT limits primarily include VOC control requirements ranging from at least 90% to at least 98%. As with the operations covered by these site-specific RACT limits, Huntsman's production process does not include application of VOC-containing materials that could be changed to materials with lower VOC content in order to achieve a defined VOC emissions limitation. Similarly, Huntsman cannot reduce VOC emissions through specific operating requirements that would limit the amount of VOC emitted. Therefore, without accepting enforceable production limitations to reduce emissions, the only remaining RACT limit option is a minimum control efficiency.

To that end, Huntsman has defined RACT as 1) completely capturing and venting all non-condensable VOCs that remain in the gas stream from the reactors, blend tanks, blowdown tank and thin film evaporator following the reactors, wastewater stripper system, and process water sump of the Latex process through a closed vent system to B014 (industrial boiler); and 2) completely capturing and venting all non-condensable VOCs that remain in the gas stream from the raw material charging system, reactors, solvent recovery system, monomer recovery system, wet rubber storage tanks, dryer condenser system, AEP storage tank, post-reaction and blending system, and Adduct (hazardous waste) storage tank of the RLP process through a closed vent system to the TOX (direct flame thermal oxidizer). B001 may be used as a back-up for B014 for periods of maintenance and repair but is limited to 10% of its annual capacity when operating as a control device. This RACT limit is consistent with the most stringent VOC control technology defined as VOC RACT in Ohio. In addition, since the existing control devices are the most effective VOC control technologies identified, an evaluation of the cost-effectiveness of less efficient controls is not necessary.

4. Selected RACT for Affected Sources

As discussed herein, technically feasible alternative add-on VOC control technologies for the Latex and RLP processes have not been demonstrated to provide a higher level of VOC control than the existing boilers and TOX. Table 8 summarizes Huntsman's proposed RACT in accordance with OAC 3745-21-11(B)(15).

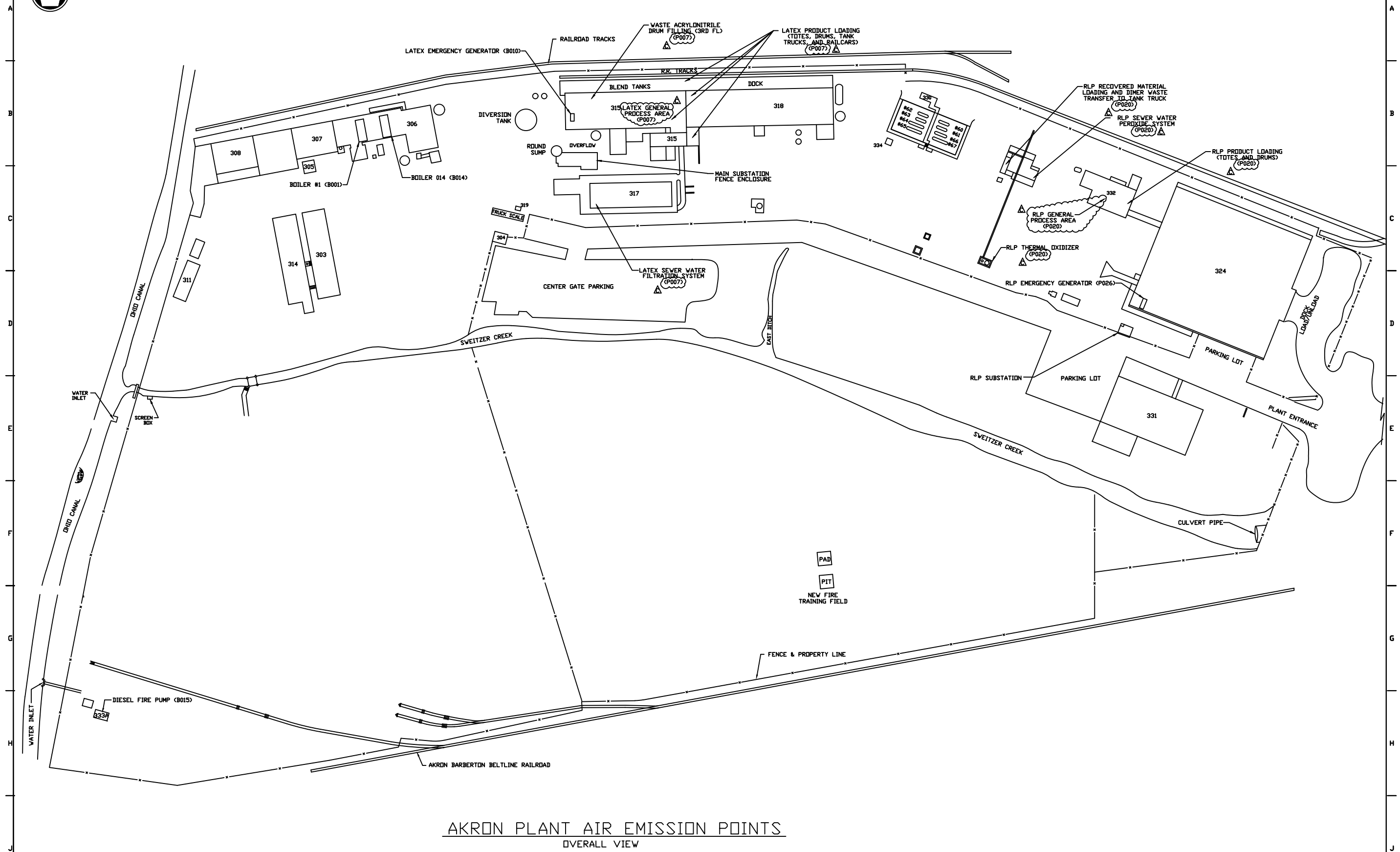
Table 8: Proposed RACT for Each Affected Source

EU ID	EU Description		RACT Limit
P007	Latex Process	Stack emissions	VOC emissions from the reactors, blend tanks, blowdown tank and thin film evaporator following the reactors, wastewater stripper system, and process water sump of the Latex process shall be completely captured and vented through a closed vent system to boiler B014 at all times the process is in operation or B001 when B014 is undergoing maintenance or repair. B001 may operate no more than 10% of its annual capacity when being used as a control device for P007. Boiler B014 shall achieve a control efficiency of not less than 99%, by weight, for VOC. Boiler B001 shall achieve a control efficiency of not less than 93%, by weight, for VOC when being used as a control device for P007. The permittee shall implement an LDAR program equivalent to 40 CFR Part 63 Subpart H (version as promulgated in 85 FR 735854 on November 19, 2020) for all components contacting streams containing 5 wt% or greater HAP or 10 wt% or greater VOC and not in heavy liquid service as defined in § 60.481.
P020	RLP Process	Stack emissions	VOC emissions from the raw material charging system, reactors, solvent recovery system, monomer recovery system, wet rubber storage tanks, dryer condenser system, AEP storage tank, post-reaction and blending system, and Adduct storage tank of the RLP process shall be completely captured and vented through a closed vent system to the thermal oxidizer (TOX) at all times when the process is in operation. The TOX shall achieve a control efficiency of not less than 99%, by weight, for VOC. The permittee shall implement an LDAR program equivalent to 40 CFR Part 63 Subpart H (version as promulgated in 85 FR 735854 on November 19, 2020) for all components contacting streams containing 5 wt% or greater HAP or 10 wt% or greater VOC and not in heavy liquid service as defined in § 60.481.

Huntsman will implement these RACT requirements immediately (OAC 3745-21-11(B)(16)) by continuing to maintain and demonstrate compliance with the RACT limits through the Operational Restrictions, Monitoring, Recordkeeping, and Reporting requirements currently specified in Title V Air Operating Permit Number P0128543 and PTI Number P0137816. These requirements include continuously monitoring and maintaining the temperature in the firebox of each control device at no less than the minimum temperature established during the most recent emission test that demonstrated the emissions unit was in compliance.

Attachment A: Facility Plot Plan





AKRON PLANT AIR EMISSION POINTS
OVERALL VIEW

REVISION	DATE	BY	DESCRIPTION
1	02/17/17	NTS	AKRON PLANT AIR EMISSION POINTS
2	02/24/17	NTS	AKRON PLANT AIR EMISSION POINTS
3	02/24/17	NTS	AKRON PLANT AIR EMISSION POINTS

REFERENCE DRAWINGS
GEN. ARR.
DEPT. ARR.
FLR. ARR.
DATE

Drawn by: RSD	Revised by:	Checked by:	DEPT.:	BLDG.:	FLR.:
Date: 2/6/17	Date:	Date:	APPROVED		
Scale: NONE					

HUNTSMAN	
Enriching lives through innovation	
AKRON CHEMICAL PLANT	
AIR EMISSION POINTS	
AK-3324-666-PP-0106	REV. C

Attachment B: Stack Test Reports



Compliance Stack Emission Test Report

Determination of Natural Gas Boiler Destruction Efficiency

EPA Methods 1, 2, 3, 3B, 4, and 25A

Synthetic Rubber Latex (P007) and Natural Gas-Fired Boiler (B001)

Test Date(s): March 5, 2015

Source Location: Akron, Ohio

Report Number: 150314.1.0

Report Date: April 1, 2015

Prepared For:

Emerald Performance Materials
240 West Emerling Ave
Akron, Ohio 44301

Prepared By:

Air Compliance

Testing, Inc.

A Division of Montrose Air Quality Services



PO Box 41156
Cleveland OH 44141-0156
Phone: (800) EPA-AIR1 (372-2471)

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1-800-EPA-AIR1 www.aircomp.com

April 1, 2015

Kevin Cherney
HS&E Manager CHMM
Emerald Performance Materials
240 West Emerling Ave
Akron, Ohio 44301

Dear Kevin:

The following report provides the results of the compliance emission testing conducted on March 5, 2015. These results are a product of the application of the U.S. EPA Stationary Source Sampling Methods listed in 40 CFR Part 60 Appendix A that were in effect at the time of this test. To the best of my knowledge, this report has been checked for completeness, and the results presented are accurate, error-free, legible, and representative of the actual emissions measured during testing.

Please mail one copy of this report along with any other supportive process operating data collected during this test to your local EPA representative. You should also attach a cover letter (on company letterhead) stating the purpose and the outcome of this test. Additionally, you may address, preferably in a timetable format, any obligations or implications that might be necessary to achieve environmental compliance because of the result of this test.

Please do not hesitate to call if you have any questions or concerns about these test results. On behalf of Air Compliance Testing, I would also like to personally thank you for the opportunity to work with you on this testing project and would enjoy the opportunity to work with you again on any additional future testing projects.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Lis", written over a horizontal line.

Robert J. Lis, Jr.
District Manager

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1.0 INTRODUCTION

1.1 Summary of Test Program

Emerald Performance Materials (Facility ID: 16-77-01-0029), located in Akron, Ohio contracted Air Compliance Testing, Inc. of Cleveland, Ohio to conduct compliance stack emission testing for their Synthetic Rubber Latex (P007) and 93 MMBtu Natural Gas-Fired Boiler (B001). Testing was performed to satisfy the emissions testing requirements pursuant to Ohio Environmental Protection Agency (OEPA) Title V Permit No. P0102593 and the requirements contained in the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Group 1 Polymers and Resins (40 CFR Part 63, Subpart U). The testing was performed on March 5, 2015.

Simultaneous sampling was performed at the P007 Boiler Inlet Duct and at the P007/B001 Exhaust Stack to determine the total gaseous organics (TGO) destruction efficiency (DE) of the B001 Boiler associated with the P007, and the emissions of TGO at the P007/B001 Exhaust Stack. Testing was conducted during representative operations. During this test, emissions from P007 were controlled by B001, and emissions from B001 were uncontrolled.

The test methods that were conducted during this test were EPA Methods 1, 2, 3, 3B, 4, and 25A.

1.2 Key Personnel

The key personnel who coordinated this test program (and their phone numbers) were:

Kevin Cherney, HS&E Manager CHMM, Emerald Performance Materials, 330-374-2418

Megan Talcott, Air Quality Engineer, Akron Regional Air Quality Management District, 330-812-3904

Robert Lisy QSTI, District Manager, Air Compliance Testing, Inc., 800-372-2471

Robert Sava, Senior Project Manager, Air Compliance Testing, Inc., 800-372-2471

2.0 SUMMARY AND DISCUSSION OF TEST RESULTS

2.1 Objectives and Test Matrix

The purpose of this test was to determine the TGO DE of the boiler (B001) associated with P007 and the TGO emissions at the P007/B001 Exhaust Stack during representative operations. Testing was performed to satisfy the emissions testing requirements pursuant to OEPA Title V Permit No. P0102593 and the requirements contained in 40 CFR Part 63, Subpart U.

The specific test objectives for this test were to:

Simultaneously measure the TGO concentrations at the P007 Boiler Inlet Duct and the P007/B001 Exhaust Stack.

Simultaneously measure the actual and dry standard volumetric flow rate of the stack gas at the P007 Boiler Inlet Duct and the P007/B001 Exhaust Stack.

Utilize the above variables to determine the TGO DE of the boiler (B001) associated with P007 and the emissions of TGO at the P007/B001 Exhaust Stack during representative operations.

Table 2.1 presents the sampling and analytical matrix log for this test.

2.2 Field Test Changes and Problems

No field test changes or problems occurred during the performance of this test that would bias the accuracy of the results of this test.

2.3 Presentation of Results

Two (2) sampling trains were utilized during each run at the P007 Boiler Inlet Duct and at the P007/B001 Exhaust Stack to determine the TGO DE of the boiler (B001) associated with P007 and the emissions of TGO at the exhaust. At the inlet, one sampling train measured the duct gas dry molecular weight and moisture content while the second sampling train measured the duct gas concentration of TGO. At the exhaust, one sampling train measured the stack gas moisture content and the concentration of oxygen (O₂) and carbon dioxide (CO₂) while the second sampling train measured the stack gas concentration of TGO. The stack gas volumetric flow rate was measured at both locations prior to each concentration run.

Table 2.2 displays the TGO DE of the boiler (B001) associated with P007 and the emissions of TGO at the P007/B001 Exhaust Stack during representative operations.

Since more than 10% of the individual DP readings recorded at the P007/B001 Exhaust Stack during each run were below 0.05 in-H₂O, a more sensitive manometer was utilized at this location as per EPA Method 2, Section 6.2. The sensitivity of the micromanometer used was similar to a digital pressure gauge with divisions of 0.005 in-H₂O in the inclined scale.

The graphs that present the raw, uncorrected concentration data measured in the field by the EPA Method 25A sampling systems at the P007 Boiler Inlet Duct and P007/B001 Exhaust Stack are located in the Field Data section of the Appendix.

		EPA TEST METHODS UTILIZED					
Date	Run No.	Sampling Location	M1/M2 (Flow)	M3 (Dry Mol. Wt.)	M3B (O ₂ /CO ₂)	M4 (%H ₂ O)	M25A (TGO)
3/5/2015	1	P007 Boiler Inlet Duct	Sampling Time / Duration (min) 10:30 - 10:40 10	Sampling Time / Duration (min) 11:02 - 12:02 60	Sampling Time / Duration (min) 11:02 - 12:02 60	Sampling Time / Duration (min) 11:02 - 12:02 60	Sampling Time / Duration (min) 11:02 - 12:02 60
3/5/2015	2	P007 Boiler Inlet Duct	12:32 - 12:38 6	12:58 - 13:58 60	12:58 - 13:58 60	12:58 - 13:58 60	12:58 - 13:58 60
3/5/2015	3	P007 Boiler Inlet Duct	14:15 - 14:20 5	14:35 - 15:35 60	14:35 - 15:35 60	14:35 - 15:35 60	14:35 - 15:35 60
3/5/2015	1	P007/B001 Exhaust Stack	10:40 - 10:53 13	11:02 - 12:02 60	11:02 - 12:02 60	11:02 - 12:02 60	11:02 - 12:02 60
3/5/2015	2	P007/B001 Exhaust Stack	12:50 - 13:00 10	12:58 - 13:58 60	12:58 - 13:58 60	12:58 - 13:58 60	12:58 - 13:58 60
3/5/2015	3	P007/B001 Exhaust Stack	14:30 - 14:38 8	14:35 - 15:35 60	14:35 - 15:35 60	14:35 - 15:35 60	14:35 - 15:35 60

All times are Eastern Standard Time.

Table 2.1 - Sampling and Analytical Matrix

	P007 Boiler Inlet Duct				P007/B001 Exhaust Stack			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
TGO Destruction Efficiency (%)	-	-	-	-	99.40	98.22	92.87	96.83
TGO Mass Emission Rate (lb/hr as propane)	48.7	29.7	10.6	29.7	0.29	0.53	0.76	0.53
Average TGO Concentration Corrected to 3% Oxygen (ppmvd as propane)	-	-	-	-	19.2	32.9	51.1	34.4
TGO Concentration (ppmvd as propane)	1,394	857	300	850	7.7	12.8	19.9	13.5
Stack Gas Average Flow Rate (acfm)	5,146	5,146	5,214	5,169	10,290	10,969	10,121	10,460
Stack Gas Average Flow Rate (scfm)	5,137	5,098	5,166	5,134	6,066	6,521	5,994	6,194
Stack Gas Average Flow Rate (dscfm)	5,093	5,057	5,147	5,099	5,581	6,031	5,534	5,715
Stack Gas Average Velocity (fpm)	1,761	1,761	1,784	1,768	821	875	807	834
Stack Gas Average Static Pressure (in-H ₂ O)	0.32	0.55	0.34	0.40	-0.25	-0.25	-0.25	-0.25
Stack Gas Average Temperature (°F)	57	61	62	60	415	407	412	411
Stack Gas Percent by Volume Moisture (%H ₂ O)	0.87	0.82	0.37	0.69	7.99	7.51	7.68	7.73
Measured Stack Inner Diameter (in)*	23.1 X 23.2	23.1 X 23.2	23.1 X 23.2	23.1 X 23.2	48.2 X 47.7	48.2 X 47.7	48.2 X 47.7	48.2 X 47.7
Percent by Volume Carbon Dioxide in Stack Gas (%-dry)	0.00	0.00	0.00	0.00	3.73	3.63	3.63	3.66
Percent by Volume Oxygen in Stack Gas (%-dry)	21.00	21.00	21.00	21.00	13.73	13.93	13.93	13.86
Percent by Volume Nitrogen in Stack Gas (%-dry)	79.00	79.00	79.00	79.00	82.54	82.44	82.44	82.47

* The P007 Boiler Inlet Duct and the P007/B001 Exhaust Stack were elliptical in shape.

Table 2.2 - Emission Results

3.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

3.1 Process Description and Operation

Emerald Performance Materials produces advanced specialty chemicals, polymer-based formulations, and chemical additives for a broad range of consumer and industrial applications. Emerald Performance Materials operates a Synthetic Rubber Latex (P007) and a 93 MMBtu/hr Natural Gas-Fired Boiler (B001) at their Akron, Ohio facility. P007 and B001 were in operation during the performance of this test.

Figure 3.1 depicts the sampling location schematic.

3.2 Control Equipment Description

During this test, emissions from P007 were controlled by B001, and emissions from B001 were uncontrolled.

3.3 Flue Gas Sampling Locations

3.3.1 P007 Boiler Inlet Duct

The P007 Boiler Inlet Duct was elliptical in shape with measured inner diameters of 23.1-inches and 23.2-inches, was oriented in the horizontal plane, and was accessed by ladder. Two (2) sampling ports, one measuring 3.8-inch I.D. and the other measuring 2.7-inch I.D., were located 90° apart from one another at a location that met EPA Method 1, Section 11.1.1 criteria. Prior to emissions sampling, the duct was traversed to verify the absence of cyclonic flow. An average yaw angle of 9.3° was measured. Therefore, the sampling location also met EPA Method 1, Section 11.4.2 criteria. During emissions sampling, the duct was traversed for duct gas volumetric flow rate. A single point was utilized to measure the duct gas dry molecular weight and moisture content. A second point, located within the central 10% of the duct cross-sectional area, was utilized for TGO concentration determination.

3.3.2 P007/B001 Exhaust Stack

The P007/B001 Exhaust Stack was elliptical in shape with a measured inner diameters of 48.2-inches and 47.7-inches, was oriented in the vertical plane, and was accessed by manlift. Two (2) 4.0-inch I.D. sampling ports were located 90° apart from one another at a location that met EPA Method 1, Section 11.1.1 criteria. Prior to emissions sampling, the stack was traversed to verify the absence of cyclonic flow. An average yaw angle of 11.0° was measured. Therefore, the sampling location also met EPA Method 1, Section 11.4.2 criteria. During emissions sampling, the stack was traversed for stack gas volumetric flow rate. A single point was utilized to measure the stack gas moisture content and O₂ and CO₂ concentrations. A second point, located within the central 10% of the stack cross-sectional area, was utilized for TGO concentration determination.

Figures 3.2 and 3.3 schematically illustrate the traverse point and sample port locations utilized.

3.4 Process Sampling Location

The EPA Reference Test Methods performed did not specifically require that process samples were to be taken during the performance of this testing event. It is in the best knowledge of Air Compliance Testing that no process samples were obtained and therefore no process sampling location was identified in this report.

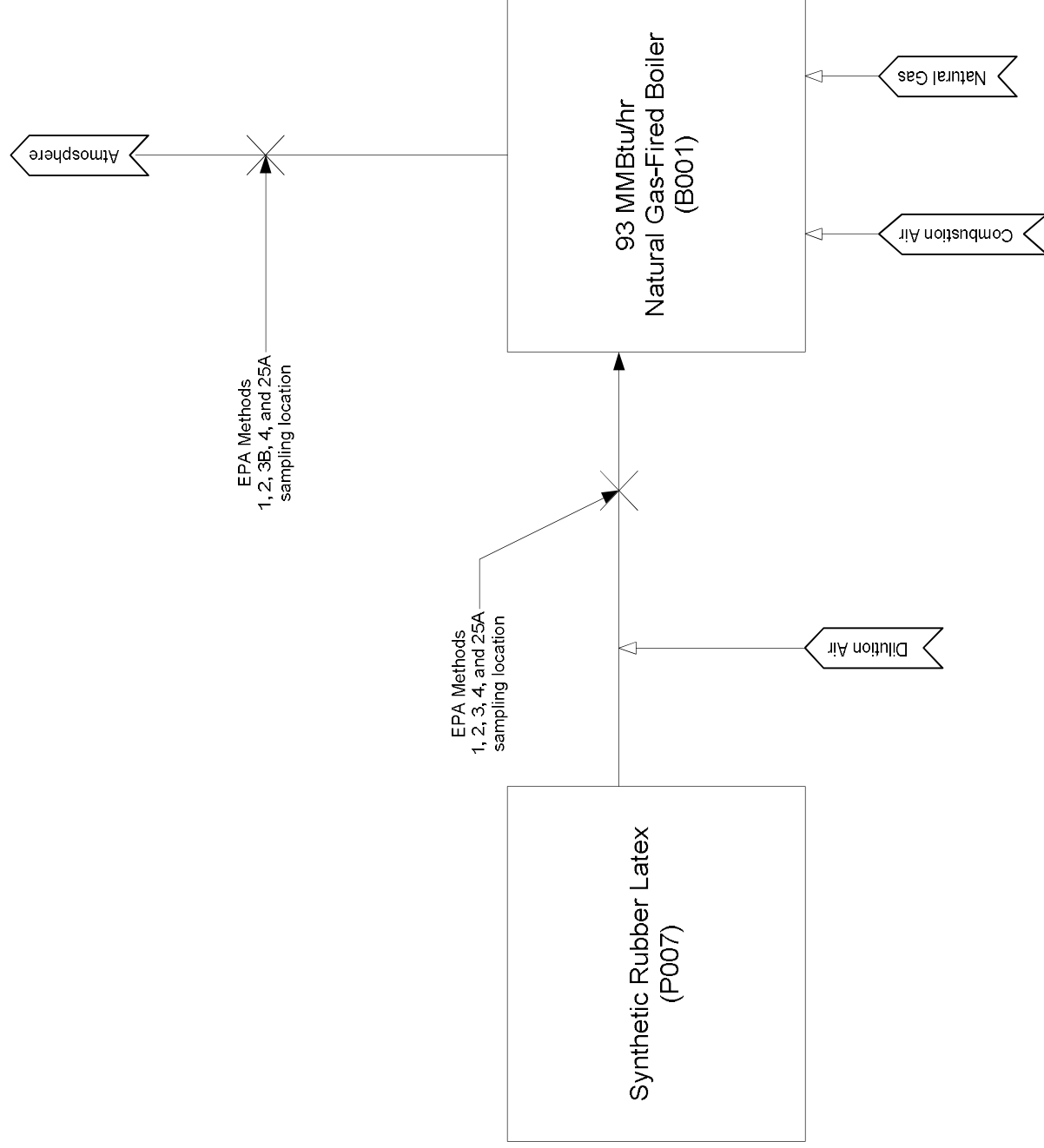


Figure 3.1 - P007/B001 Sampling Location Schematic

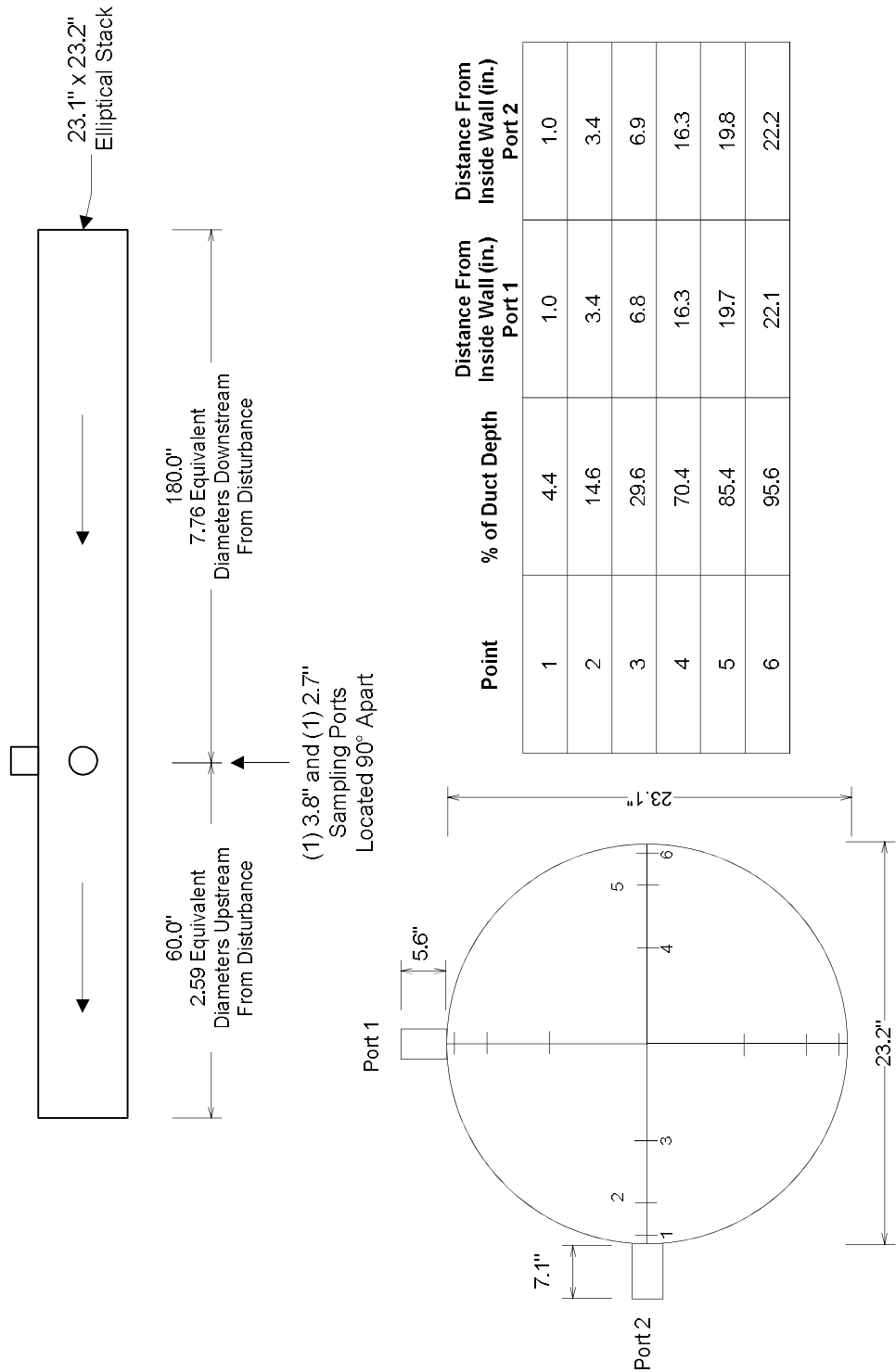


Figure 3.2 - P007 Boiler Inlet Duct Traverse Point Location Drawing

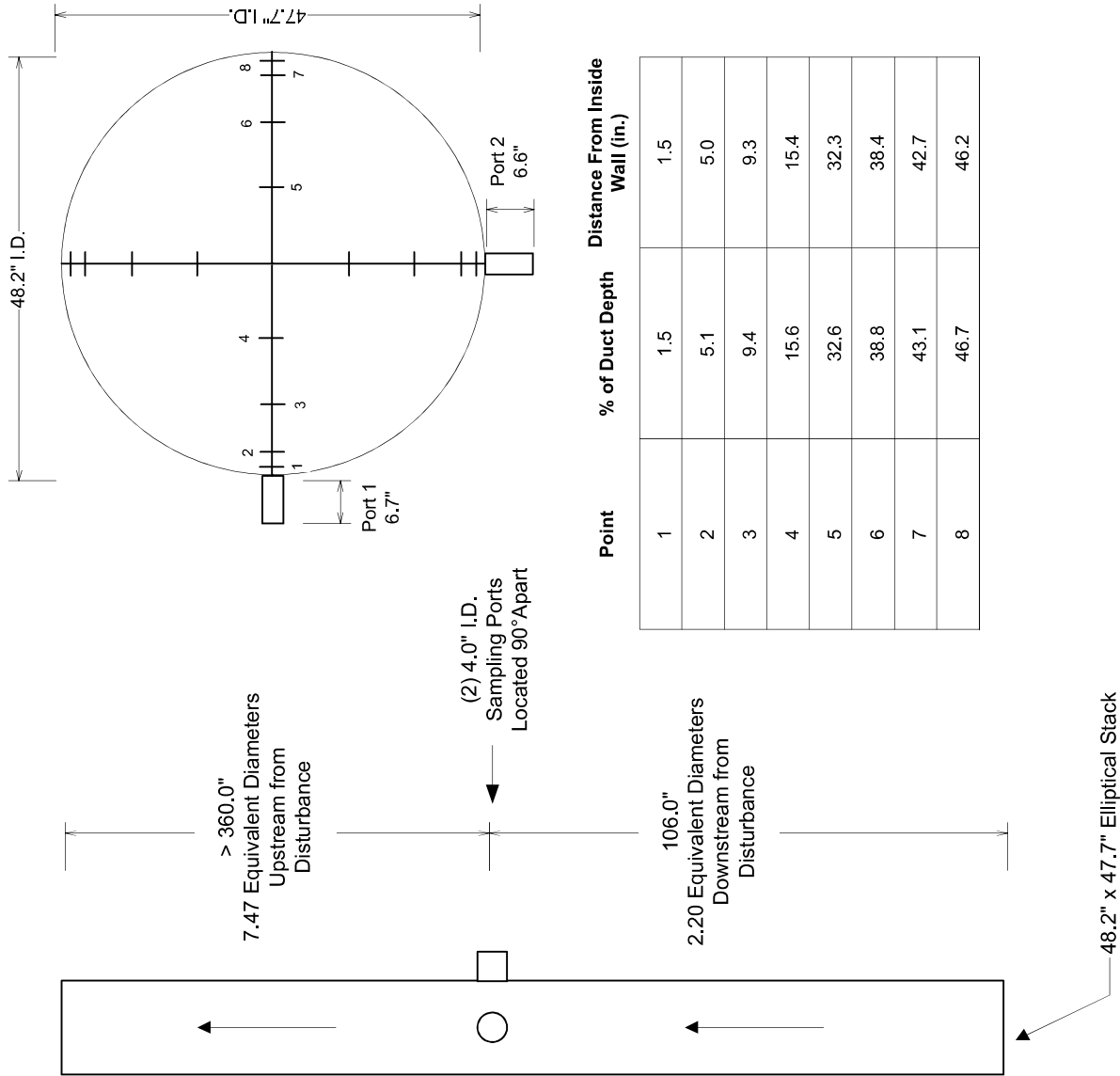


Figure 3.3 - P007/B001 Exhaust Stack Traverse Point Location Drawing

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 Test Methods

4.1.1 EPA Method 1: Sample and Velocity Traverses for Stationary Sources

Principle: To aid in the representative measurement of pollutant emissions and/or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected, and the cross-section of the stack is divided into a number of equal areas. A traverse point is then located within each of these equal areas. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.2 EPA Method 2: Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S)

Principle: The average gas velocity in a stack is determined from the gas density and from measurement of the average velocity head with a Type S (Stausscheibe or reverse type) pitot tube. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.3 EPA Method 3: Gas Analysis for the Determination of Dry Molecular Weight

Principle: 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 CO₂, percent O₂, and if necessary, for percent CO. For dry molecular weight determination a Fyrite analyzer will be used for the analysis. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.4 EPA Method 3B: Gas Analysis for the Determination of Emission Rate Correction Factor or Excess Air

Principle: 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 CO₂, percent O₂, and if necessary, for percent CO. An Orsat analyzer must be used for excess air or emission rate correction factor determination. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.5 EPA Method 4: Determination of Moisture Content in Stack Gases

Principle: A gas sample is extracted at a constant rate from the source; moisture is removed from the sample stream and determined either volumetrically or gravimetrically. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.6 EPA Method 25A: Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer (Concentrations assumed less than 10,000 ppm, Propane/Nitrogen Calibration Gases)

Principle: A gas sample is extracted from the source through a heated sample line, if necessary, 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. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

The sampling trains utilized during this test event are depicted in Figures 4.1 - 4.3.

4.2 Procedures for Obtaining Process Data

Process data was recorded by Emerald Performance Materials personnel utilizing their typical record keeping procedures. Recorded process data was provided to Air Compliance Testing, Inc. personnel at the conclusion of this test event. The process data is located in the Appendix.

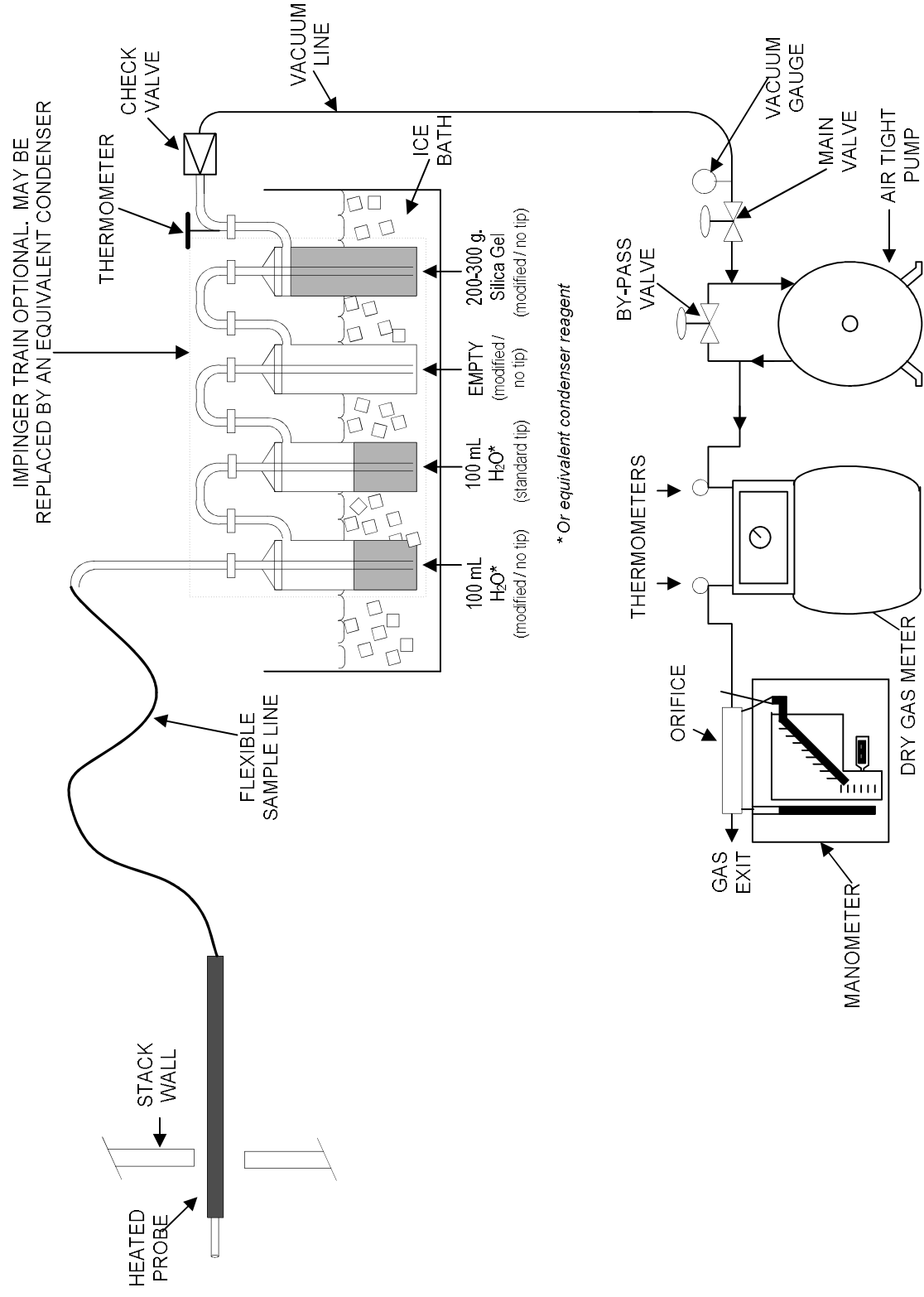


Figure 4.1 - EPA Method 4 (Inlet Location) Sampling Train Schematic

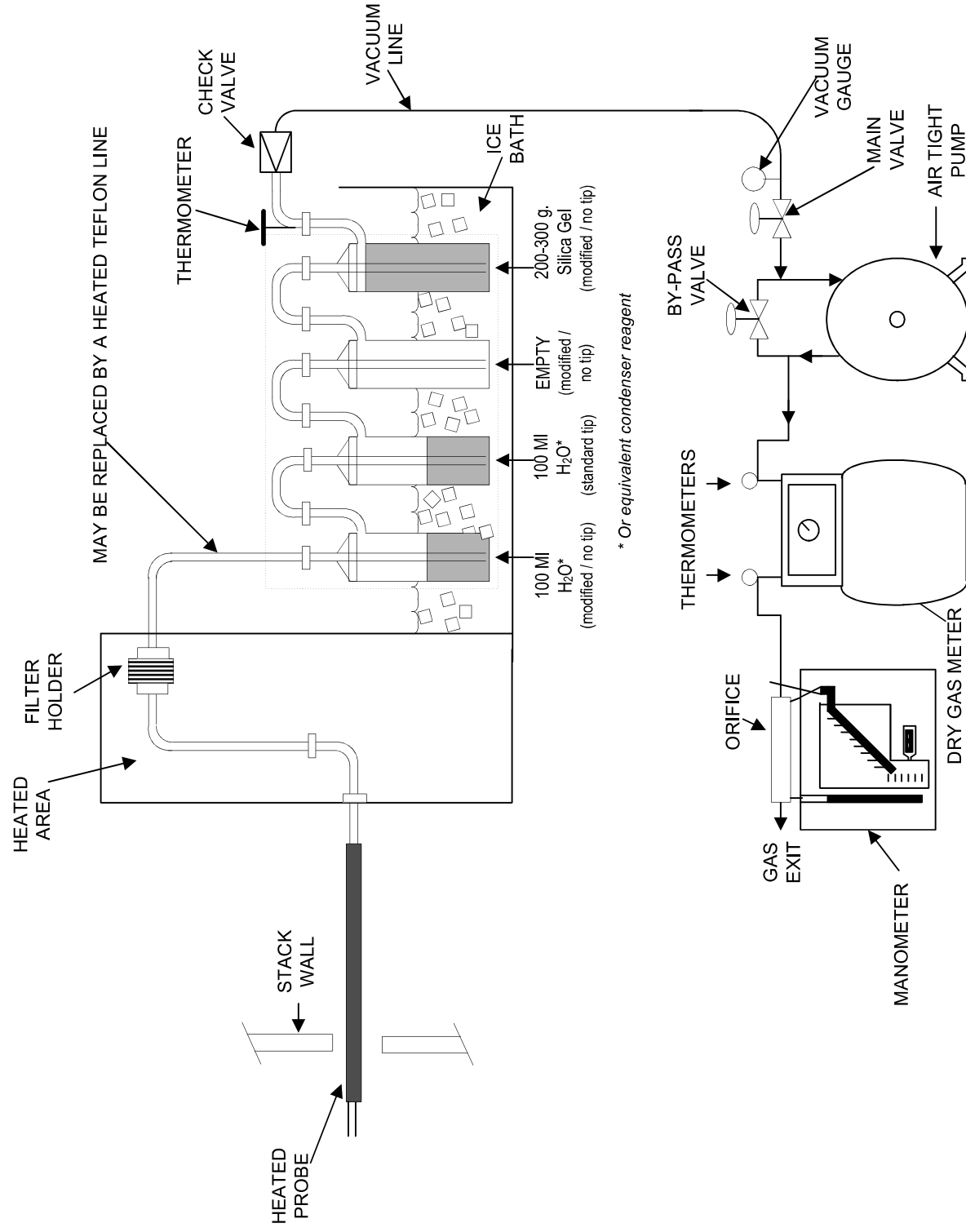


Figure 4.2 - EPA Method 4 (Exhaust Location) Sampling Train Schematic

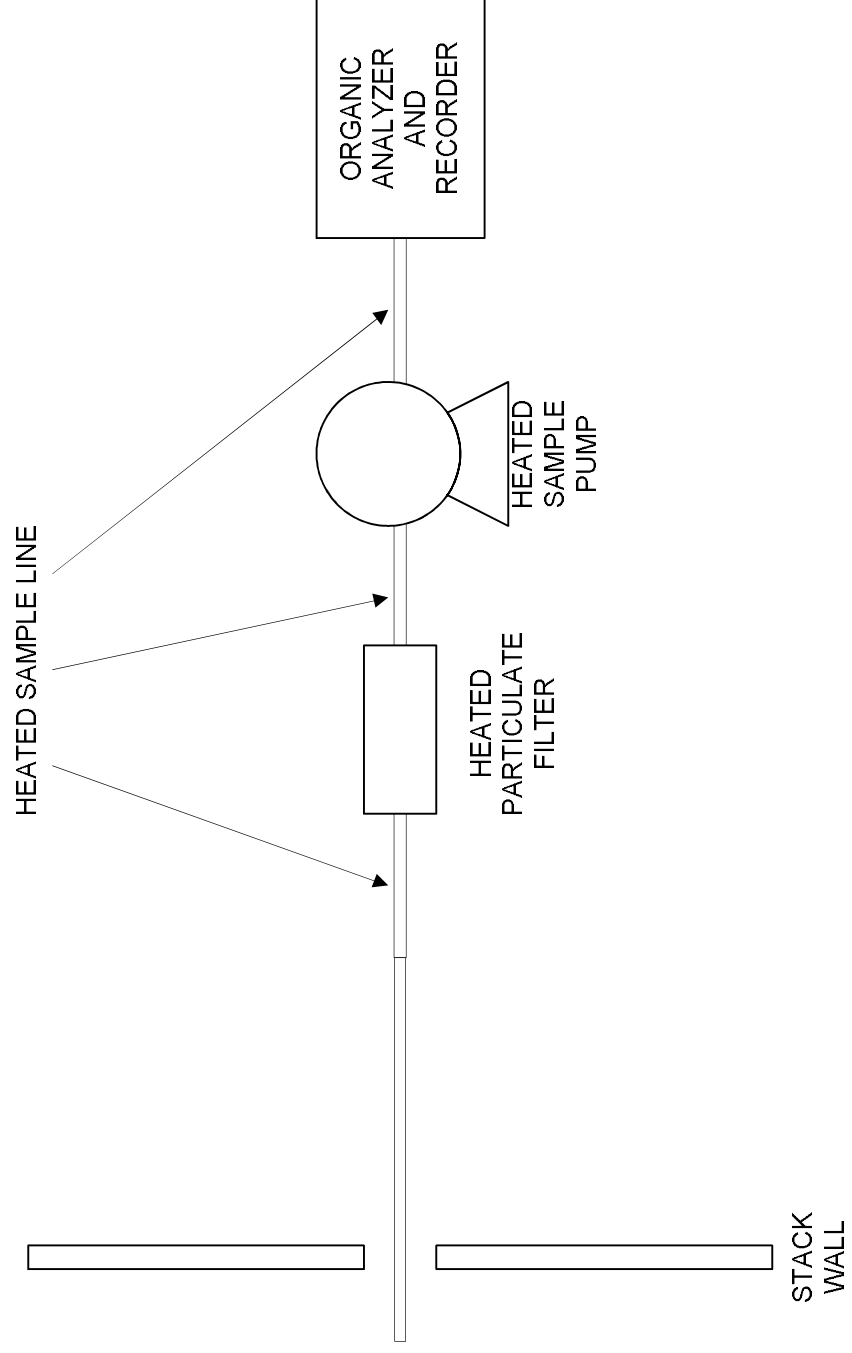


Figure 4.3 - EPA Method 25A Sampling Train Schematic

5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA Audits

Tables 5.1 - 5.5 illustrate the QA audits that were performed during this test.

All meter boxes and sampling trains used during sampling performed within the requirements of their respective methods as is shown in Tables 5.1 and 5.2. All pre-test and post-test leak checks were well below the applicable limit. Minimum metered volumes were also met.

Table 5.3 displays the EPA Method 3 Fyrite and Method 3 Orsat Audits which were performed during this test in accordance with EPA Method 3, Section 10.1 requirements. As shown, all Fyrite analyzer results were within $\pm 0.5\%$ of the respective Audit Gas concentrations.

Tables 5.4 illustrates the FIA calibration audits which were performed during this test (and integral to performing EPA Method 25A correctly) were, except where noted, within the Measurement System Performance Specifications of $\pm 3\%$ of span for the Zero and Calibration Drift Checks, and $\pm 5\%$ of the respective cylinder concentrations for the Calibration Error Checks.

Table 5.5 displays the EPA Method 205 field evaluation of the calibration gas dilution system utilized during this test event. As shown, the average concentration output at each dilution level was within $\pm 2\%$ of the predicted value. The average concentration output of the mid-level gas was also within $\pm 2\%$ of the certified concentration.

5.2 QA/QC Problems

No QA/QC problems occurred during this test event.

Method 4 Sampling Train	P007 Boiler Inlet Duct		
	Run 1	Run 2	Run 3
Leak Rate Observed (Pre/Post) (cfm)	0.000 / 0.000	0.000 / 0.000	0.000 / 0.000
Applicable Method Allowable Leak Rate (cfm)	< 0.020	< 0.020	< 0.020
Acceptable	Yes	Yes	Yes
Volume of Dry Gas Collected (dscf)	31.643	31.553	31.633
Recommended Volume of Dry Gas Collected (dscf)	21.000	21.000	21.000
Acceptable	Yes	Yes	Yes

Method 4 Sampling Train	P007/B001 Exhaust Stack		
	Run 1	Run 2	Run 3
Leak Rate Observed (Pre/Post) (cfm)	0.002 / 0.001	0.003 / 0.000	0.002 / 0.001
Applicable Method Allowable Leak Rate (cfm)	< 0.020	< 0.020	< 0.020
Acceptable	Yes	Yes	Yes
Volume of Dry Gas Collected (dscf)	33.710	33.800	33.846
Recommended Volume of Dry Gas Collected (dscf)	21.000	21.000	21.000
Acceptable	Yes	Yes	Yes

Table 5.1 - Sample Train Audit Results

P007 Boiler Inlet Duct - EPA Method 4 Sampling Train				
Pre-Test Dry Gas Meter Calibration Factor (Y)	Average Post-Test Dry Gas Meter Calibration Check Factor (Yqa)	Post Test Dry Gas Meter Calibration Check Factor Difference From Pre-Test Calibration Factor (%)	Applicable Method Allowable Difference (%)	Acceptable
0.9876	0.9748	-1.30%	5.00%	Yes

P007/B001 Exhaust Stack - EPA Method 4 Sampling Train				
Pre-Test Dry Gas Meter Calibration Factor (Y)	Average Post-Test Dry Gas Meter Calibration Check Factor (Yqa)	Post Test Dry Gas Meter Calibration Check Factor Difference From Pre-Test Calibration Factor (%)	Applicable Method Allowable Difference (%)	Acceptable
1.0160	1.0125	-0.34%	5.00%	Yes

Table 5.2 - Dry Gas Meter Audit Results

P007 Boiler Inlet Duct		
	%CO ₂	%O ₂
Audit Gas Concentration (%)	6.1	5.9
Fyrite Response 1 (%)	6.0	6.0
Fyrite Response 2 (%)	6.0	6.0
Fyrite Response 3 (%)	6.0	6.0
Average (%)	6.0	6.0
Average Within ±0.5%	Yes	Yes

P007/B001 Exhaust Stack		
	%CO ₂	%O ₂
Audit Gas Concentration (%)	6.1	5.9
Orsat Response 1 (%)	6.0	6.1
Orsat Response 2 (%)	5.9	6.0
Orsat Response 3 (%)	5.9	6.0
Average (%)	5.9	6.0
Average Within ±0.5%	Yes	Yes

Audit Gas Cylinder Number:

XC016442B

Table 5.3 - EPA Method 3 Audit Results

P007 Boiler Inlet Duct						
	Run 1	Acceptable per Method 25A	Run 2	Acceptable per Method 25A	Run 3	Acceptable per Method 25A
Analyzer Span During Test Run (ppmv as propane)	3,000.0	YES	3,000.0	YES	3,000.0	YES
Average Stack Gas Concentration (ppmv as propane)	1,381.5	YES	849.8	YES	298.8	YES
Zero Drift (% of Span)	0.17	YES	0.23	YES	0.20	YES
Calibration Drift for Mid-Level Gas (% of Span)	0.37	YES	-0.77	YES	-0.77	YES
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	1.51	YES	1.51	YES	1.51	YES
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-1.20	YES	-1.20	YES	-1.20	YES

P007/B001 Exhaust Stack						
	Run 1	Acceptable per Method 25A	Run 2	Acceptable per Method 25A	Run 3	Acceptable per Method 25A
Analyzer Span During Test Run (ppmv as propane)	30.0	YES	30.0	YES	30.0	YES
Average Stack Gas Concentration (ppmv as propane)	7.1	YES	11.9	YES	18.4	YES
Zero Drift (% of Span)	1.67	YES	2.67	YES	2.00	YES
Calibration Drift for Mid-Level Gas (% of Span)	1.33	YES	1.67	YES	-2.67	YES
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	-3.16	YES	-3.16	YES	-3.16	YES
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-1.33	YES	-1.33	YES	-1.33	YES

Table 5.4 - EPA Method 25A Instrument Calibration and QA

	Calibration Tag Value (ppm)	Dilution Ratio	Predicted Diluted Value (ppm)	Injection 1 Response (ppm)	Injection 2 Response (ppm)	Injection 3 Response (ppm)	Average Response (ppm)	Difference From Predicted (%)	Acceptable (yes/no)
Dilution Level 1	797.0	2.097	380.0	386.0	387.0	388.0	387.0	1.84	yes
Dilution Level 2	797.0	1.328	600.0	603.0	603.0	603.0	603.0	0.50	yes
Mid-Level Gas	377.3	-	-	377.0	376.0	376.0	376.3	-0.26	yes

Analyzer Serial Number: 15G02008

Dilution System Serial Number: 4918

Table 5.5 - EPA Method 205 Gas Dilution System Calibration and QA

Compliance Stack Emission Test Report

Determination of Nitrogen Oxide Emissions and Total Gaseous Organic Destruction Efficiency

EPA Methods 1, 2, 3, 3B, 4, 7E, and 25A

90.67 MMBtu/hr Natural Gas-Fired Boiler No. 1 (B014) and Synthetic Rubber Latex Process (P007)

Test Date(s): May 19, 2015

Source Location: Akron, Ohio

Report Number: 141205.1.0

Report Date: June 15, 2015

Prepared For:

Emerald Performance Materials
240 West Emerling Ave
Akron, Ohio 44301

Prepared By:

Air Compliance

Testing, Inc.

A Division of Montrose Air Quality Services



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June 15, 2015

Kevin Cherney
HS&E Manager CHMM
Emerald Performance Materials
240 West Emerling Ave
Akron, Ohio 44301

Dear Kevin:

The following report provides the results of the compliance emission testing conducted on May 19, 2015. These results are a product of the application of the U.S. EPA Stationary Source Sampling Methods listed in 40 CFR Part 60 Appendix A that were in effect at the time of this test. To the best of my knowledge, this report has been checked for completeness, and the results presented are accurate, error-free, legible, and representative of the actual emissions measured during testing.

Please mail one copy of this report along with any other supportive process operating data collected during this test to your local EPA representative. You should also attach a cover letter (on company letterhead) stating the purpose and the outcome of this test. Additionally, you may address, preferably in a timetable format, any obligations or implications that might be necessary to achieve environmental compliance because of the result of this test.

Please do not hesitate to call if you have any questions or concerns about these test results. On behalf of Air Compliance Testing, I would also like to personally thank you for the opportunity to work with you on this testing project and would enjoy the opportunity to work with you again on any additional future testing projects.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Lisy, Jr.", is written over the signature line.

Robert J. Lisy, Jr.
District Manager

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1.0 INTRODUCTION

1.1 Summary of Test Program

Emerald Performance Materials (Facility ID: 16-77-01-0029), located in Akron, Ohio contracted Air Compliance Testing, Inc. of Cleveland, Ohio to conduct compliance stack emission testing for their Natural Gas-Fired Boiler No. 1 (B014) and Synthetic Rubber Latex Process (P007). Testing was performed pursuant to Ohio Environmental Protection Agency (OEPA) Title V Permit No. P0102593 and Permit-to-Install (PTI) No. P0116928. The testing was performed on May 19, 2015.

Sampling was performed at the B014 Exhaust Stack to determine the emissions of nitrogen oxide (NO_x)(as NO_2). Testing was conducted at >90% "Winter" Load conditions while only B014 was in operation. During this test, emissions from B014 were uncontrolled.

In addition to the testing noted above, simultaneous sampling was performed at the P007 Exhaust Duct and at the P007/B014 Exhaust Stack to determine the total gaseous organic (TGO) destruction efficiency (DE) of the boiler (B014) associated with P007. Testing was conducted during normal P007 operations while B014 was operating at "Summer" Load conditions (low load and low temperature).

The test methods that were conducted during this test were EPA Methods 1, 2, 3, 3B, 4, 7E, and 25A.

1.2 Key Personnel

The key personnel who coordinated this test program (and their phone numbers) were:

Kevin Cherney, HS&E Manager CHMM, Emerald Performance Materials, 330-374-2418

Megan Talcott, Air Quality Engineer, Akron Regional Air Quality Management District, 330-812-3904

Robert Lisy QSTI, District Manager, Air Compliance Testing, Inc., 800-372-2471

Robert Sava, Senior Project Manager, Air Compliance Testing, Inc., 800-372-2471

2.0 SUMMARY AND DISCUSSION OF TEST RESULTS

2.1 Objectives and Test Matrix

The purpose of this test was to determine the emissions of NO_x (as NO₂) at the B014 Exhaust Stack during >90% "Winter" Load conditions while only B014 was in operation. The purpose of this test was also to determine the TGO DE of the boiler associated with P007 during normal P007 operations while B014 was operating at "Summer" Load conditions. Testing was performed pursuant to OEPA Title V Permit No. P0102593 and PTI No. P0116928.

The specific test objectives for this test were to:

NO_x Emissions Testing

Measure the concentration of NO_x at the B014 Exhaust Stack.

Measure the dry standard and actual volumetric flow rate of the stack gas at the B014 Exhaust Stack.

Utilize the above variables to determine the emissions of NO_x (as NO₂) at the B014 Exhaust Stack during >90% "Winter" Load conditions while only B014 was in operation.

Table 2.1.1 presents the sampling and analytical matrix log for this test.

TGO DE Determination

Simultaneously measure the concentration of TGO at the P007 Exhaust Duct and at the P007/B014 Exhaust Stack.

Simultaneously measure the dry standard and actual volumetric flow rate of the stack gas at the inlet and exhaust locations.

Utilize the above variables from the inlet and exhaust locations to determine the TGO DE of the boiler associated with P007 during normal P007 operations while B014 was operating at "Summer" Load conditions.

Table 2.1.2 presents the sampling and analytical matrix log for this test.

2.2 Field Test Changes and Problems

No field test changes or problems occurred during the performance of this test that would bias the accuracy of the results of this test.

2.3 Presentation of Results

NO_x Emissions Testing

Two (2) sampling trains were utilized during each run at the B014 Exhaust Stack to determine the emissions of NO_x (as NO₂). One sampling train measured the stack gas volumetric flow rate, dry molecular weight, and moisture content. The second sampling train measured the concentration of NO_x.

Table 2.2.1 displays the emissions of NO_x (as NO₂) measured at the B014 Exhaust Stack during >90% "Winter" Load conditions while only B014 was in operation.

The graphs that present the raw, uncorrected concentration data measured in the field by the EPA Method 7E sampling systems at the B014 Exhaust Stack are located in the Field Data section of the Appendix.

TGO DE Determination

Two (2) sampling trains were utilized during each run at the P007 Exhaust Duct and P007/B014 Exhaust Stack to determine the TGO DE of the boiler associated with P007. At the P007 Exhaust Duct, one sampling train measured the duct gas dry molecular weight and moisture content while the second sampling train measured the duct gas concentration of TGO. At the P007/B014 Exhaust Stack, one sampling train measured the stack gas dry molecular weight and moisture content while the second sampling train measured the stack gas concentration of TGO. Duct and stack gas volumetric flow rates were measured prior to each emissions sampling run.

Table 2.2.2 displays the TGO DE of the boiler associated with P007 during normal P007 operations while B014 was operating at "Summer" Load conditions.

Concentration values in Table 2.2.2 denoted with a '<' were measured to be below the minimum detection limit (MDL) of the applicable analytical method. Mass emission rates denoted with a '<' in Table 2.2 were calculated utilizing the applicable MDL concentration value instead of the "as measured" concentration value.

The graphs that present the raw, uncorrected concentration data measured in the field by the EPA Method 25A sampling systems at the P007 Exhaust Duct and P007/B014 Exhaust Stack are located in the Field Data section of the Appendix.

EPA TEST METHODS UTILIZED			
		M1/M2 (Flow)	M3B (%O ₂ / %CO ₂)
		M4 (%H ₂ O)	M7E (NO _x)
Date	Run No.	Sampling Location	Sampling Time / Duration (min)
5/19/2015	1	B014 Exhaust Stack	8:25 - 9:03 38
5/19/2015	2	B014 Exhaust Stack	8:20 - 9:32 60
5/19/2015	3	B014 Exhaust Stack	10:36 - 10:49 13
			10:27 - 11:35 60
			12:16 - 12:41 25
			12:15 - 13:20 60
			10:11 - 11:23 60
			12:15 - 13:18 60

All times are Eastern Daylight Time.

Table 2.1.1 - Sampling and Analytical Matrix

EPA TEST METHODS UTILIZED						
		M1/M2 (Flow)	M3 (Dry Mol. Wt.)	M3B (Dry Mol. Wt.)	M4 (%H ₂ O)	M25A (TGO)
Date	Run No.	Sampling Location	Sampling Time / Duration (min)	Sampling Time / Duration (min)	Sampling Time / Duration (min)	Sampling Time / Duration (min)
5/19/2015	1	P007 Exhaust Duct	14:32 - 14:39 7	14:16 - 15:16 60	14:16 - 15:16 60	14:16 - 15:16 60
5/19/2015	2	P007 Exhaust Duct	16:00 - 16:04 4	16:57 - 17:57 60	16:57 - 17:57 60	16:50 - 17:50 60
5/19/2015	3	P007 Exhaust Duct	18:25 - 18:30 5	18:51 - 19:51 60	18:51 - 19:51 60	18:42 - 19:42 60
5/19/2015	1	P007/B014 Exhaust Stack	14:22 - 14:35 13	-	14:16 - 15:22 60	14:16 - 15:16 60
5/19/2015	2	P007/B014 Exhaust Stack	17:06 - 17:20 14	-	16:57 - 18:02 60	16:50 - 17:50 60
5/19/2015	3	P007/B014 Exhaust Stack	19:00 - 19:10 10	-	18:51 - 19:54 60	18:42 - 19:42 60

All times are Eastern Daylight Time.

Table 2.1.2 - Sampling and Analytical Matrix

	B014 Exhaust Stack			
	Run 1	Run 2	Run 3	Average
Boiler Capacity (% of Maximum)*	92.0	92.1	92.4	92.2
Boiler Steam Load (lb/hr)*	69,839	69,908	69,954	69,900
Average Fd-Based NOx Mass Emission Rate (as NO₂), (lb/MMBtu)	0.031	0.030	0.031	0.031
Nitrogen Oxides Mass Emission Rate (lb/hr) (as NO ₂)	2.03	1.99	1.97	2.00
Nitrogen Oxides Concentration (ppmvd)	20.2	19.5	19.5	19.7
Stack Gas Average Flow Rate (acfm)	19,873	20,330	19,893	20,032
Stack Gas Average Flow Rate (scfm)	16,520	16,627	16,587	16,578
Stack Gas Average Flow Rate (dscfm)	14,052	14,191	14,139	14,127
Stack Gas Average Velocity (fpm)	1,942	1,987	1,944	1,958
Stack Gas Average Static Pressure (in-H ₂ O)	-0.01	-0.15	-0.11	-0.09
Stack Gas Average Temperature (°F)	154	165	154	158
Stack Gas Percent by Volume Moisture (%H ₂ O)	14.94	14.65	14.76	14.78
Measured Stack Inner Dimensions (in)†	48 X 30.7	48 X 30.7	48 X 30.7	48 X 30.7
Percent by Volume Carbon Dioxide in Stack Gas (%-dry)	7.53	7.63	7.27	7.48
Percent by Volume Oxygen in Stack Gas (%-dry)	6.90	6.67	7.33	6.97
Percent by Volume Nitrogen in Stack Gas (%-dry)	85.57	85.70	85.40	85.56

* Process data was provided by Emerald Performance Materials' Facility Personnel.

† The B014 Exhaust Stack was rectangular in shape.

Table 2.2.1 - EPA Method 7E Emission Results

	P007 Exhaust Duct				P007/B014 Exhaust Stack			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
Boiler Firebox Temperature (°F)*	-	-	-	-	1,221	1,232	1,229	1,227
TGO Destruction Efficiency (%)	-	-	-	-	>99.05	>99.80	>99.79	>99.55
TGO Mass Emission Rate (lb/hr as propane)†	10.2	50.0	46.4	35.5	<0.097	<0.098	<0.096	<0.097
TGO Concentration (ppmvw as propane)‡	262	1,291	1,209	921	<1.80	<1.80	<1.80	<1.80
Stack Gas Average Flow Rate (acfm)	6,012	5,967	5,780	5,920	9,010	9,051	8,915	8,992
Stack Gas Average Flow Rate (scfm)	5,668	5,636	5,589	5,631	7,867	7,958	7,793	7,873
Stack Gas Average Flow Rate (dscfm)	5,586	5,572	5,444	5,534	6,988	7,119	7,014	7,040
Stack Gas Average Velocity (fpm)	1,996	1,981	1,919	1,965	880	884	871	879
Stack Gas Average Static Pressure (in-H ₂ O)	0.63	0.52	0.53	0.56	-0.05	-0.03	-0.03	-0.04
Stack Gas Average Temperature (°F)	83	83	70	79	126	121	125	124
Stack Gas Percent by Volume Moisture (%H ₂ O)	1.45	1.12	2.58	1.72	11.16	10.54	10.00	10.57
Measured Stack Inner Dimensions (in.)‡	23.6 X 23.4	23.6 X 23.4	23.6 X 23.4	23.6 X 23.4	48 X 30.7	48 X 30.7	48 X 30.7	48 X 30.7
Percent by Volume Carbon Dioxide in Stack Gas (%-dry)	0.00	0.00	0.00	0.00	5.73	5.60	5.77	5.70
Percent by Volume Oxygen in Stack Gas (%-dry)	20.83	20.25	20.67	20.58	10.40	10.03	10.10	10.18
Percent by Volume Nitrogen in Stack Gas (%-dry)	79.17	79.75	79.33	79.42	83.87	84.37	84.13	84.12

* Process data was provided by Emerald Performance Materials' Facility Personnel.

† The "<" symbol indicates that compound was not present in quantities above the Minimum Detection Limit (MDL) of the analytical method.

‡ The P007 Exhaust/ B014 Inlet Duct was elliptical in shape and the B014 Exhaust Stack was rectangular in shape.

Table 2.2.2 - EPA Method 25A Emission Results

3.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

3.1 Process Description and Operation

Emerald Performance Materials produces advanced specialty chemicals, polymer-based formulations, and chemical additives for a broad range of consumer and industrial applications. Emerald Performance Materials operates a 90.67 MMBtu/hr Natural Gas-Fired Boiler (B014) and a Synthetic Rubber Latex Process (P007) at their Akron, Ohio facility. B014 was in operation during the NO_x emissions test. B014 and P007 were in operation for the TGO DE test.

Figures 3.1 and 3.2 depict the process and sampling location schematics.

3.2 Control Equipment Description

During NO_x emissions testing, the emissions from B014 were uncontrolled.

During TGO DE determination, the emissions from the P007 were controlled by B014.

3.3 Flue Gas Sampling Locations

NO_x Emissions Testing

3.3.1 B014 Exhaust Stack

The B014 Exhaust Stack was rectangular in shape with a measured depth of 30.7-inches and a measured width of 48.0-inches. The stack was oriented on the vertical plane and was accessed by manlift. Four (4) 4.0-inch I.D. sampling ports were located equidistant from one another at a location that met EPA Method 1, Section 11.1.1 criteria. Prior to emissions testing, the stack was traversed to verify the absence of cyclonic flow. An average yaw angle of 6.9° was measured. Therefore, the sampling location also met EPA Method 1, Section 11.4.2 criteria. Prior to emissions sampling the stack was traversed for stack gas volumetric flow rate. During emissions sampling the stack was traversed for NO_x concentration determination. A single point in the stack was utilized for dry molecular weight and moisture content determination.

TGO DE Determination

3.3.2.1 P007 Exhaust Duct

The P007 Exhaust Duct was elliptical in shape with measured inner diameters of 23.6-inches and 23.4-inches. The duct was oriented in the horizontal plane and was accessed from a ladder. One 3.8-inch I.D. sampling port and a second 2.7-inch I.D. sampling port were located 90° apart from one another at a location that met EPA Method 1, Section 11.1.1 criteria. Prior to emissions sampling, the duct was traversed to verify the absence of cyclonic flow. An average yaw angle of 3.0° was measured. Therefore, the sampling location also met EPA Method 1, Section 11.4.2 criteria. Prior to emissions sampling the duct was traversed for duct gas volumetric flow rate. During emissions sampling, a single point, located within the central 10% of the stack cross-sectional area, was utilized for TGO concentration determination. A second single point in the duct was utilized for dry molecular weight and moisture content determination.

3.3.2.2 P007/B014 Exhaust Stack

Prior to emissions sampling the stack was traversed for stack gas volumetric flow rate. During emissions sampling, a single point, located within the central 10% of the stack cross-sectional area, was utilized for TGO concentration determination. A second single point in the stack was utilized for dry molecular weight and moisture content determination.

Figures 3.3 - 3.5 schematically illustrates the traverse point and sample port locations utilized.

3.4 Process Sampling Location

The EPA Reference Test Methods performed did not specifically require that process samples were to be taken during the performance of this testing event. It is in the best knowledge of Air Compliance Testing that no process samples were obtained and therefore no process sampling location was identified in this report.

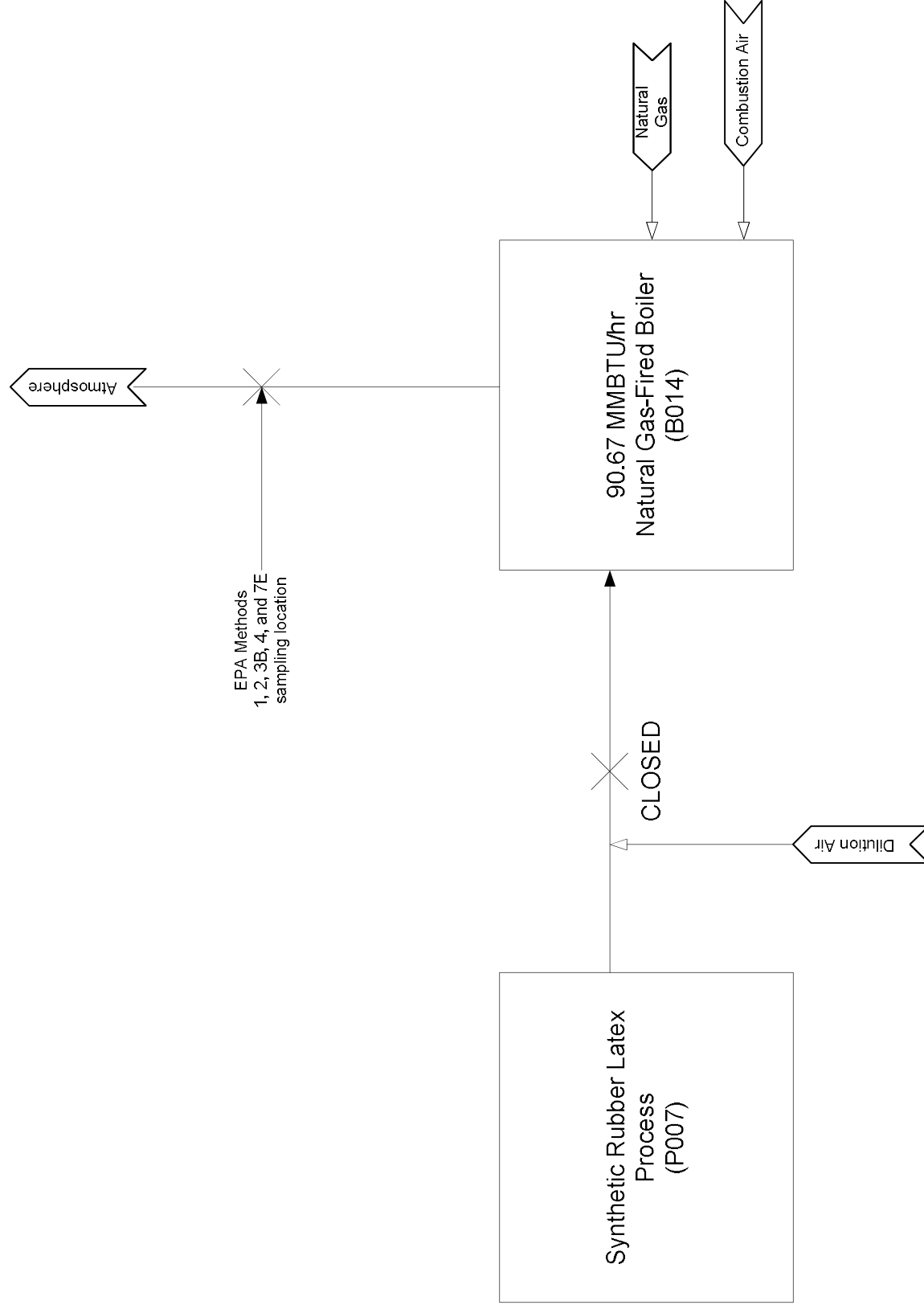


Figure 3.1 - P007/B014 Process and Sampling Location Schematic - P007 Closed

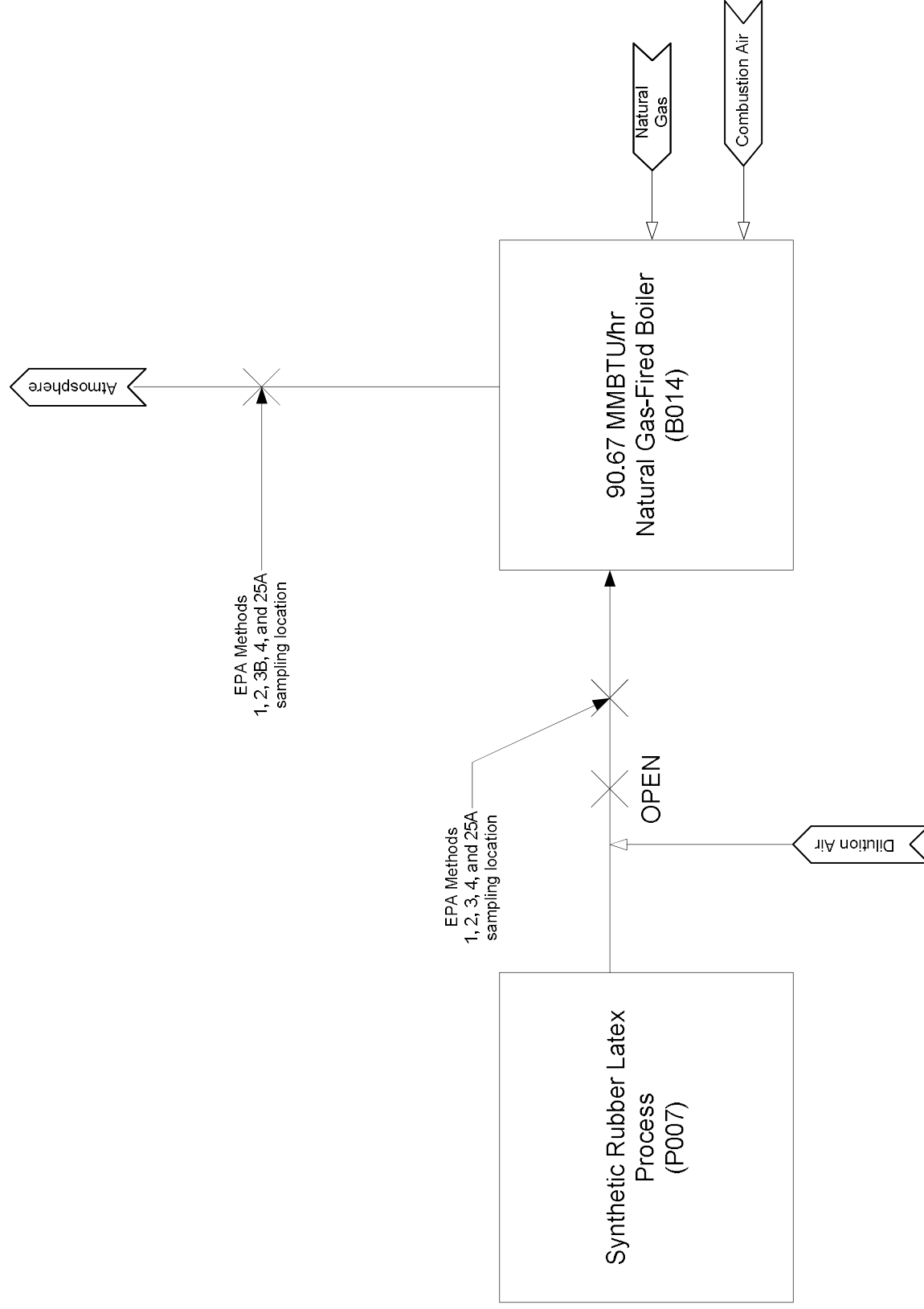


Figure 3.2 - P007/B014 Process and Sampling Location Schematic - P007 Open

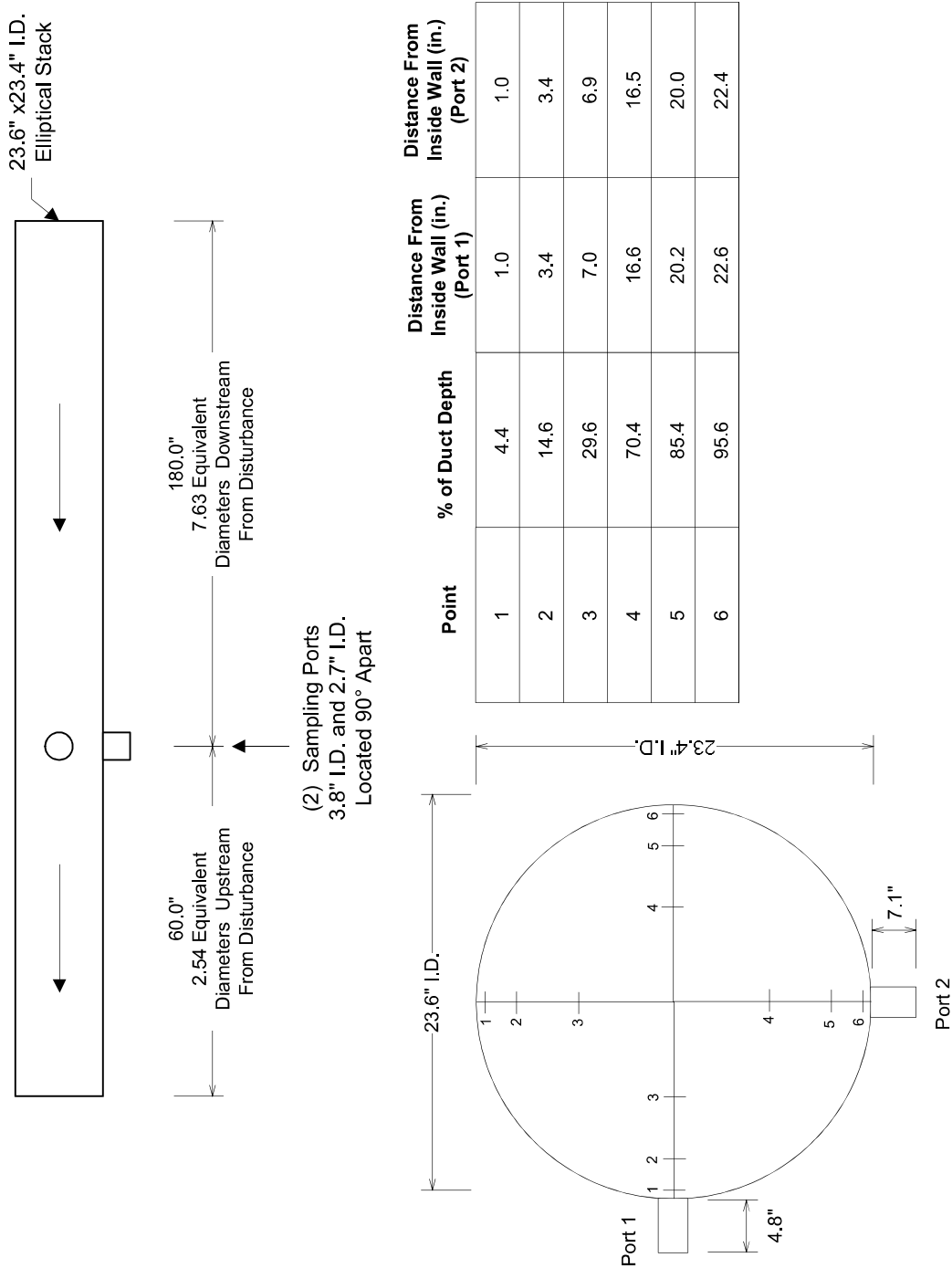


Figure 3.3 - P007 Exhaust Duct Flow and CEMS Traverse Point Location Drawing



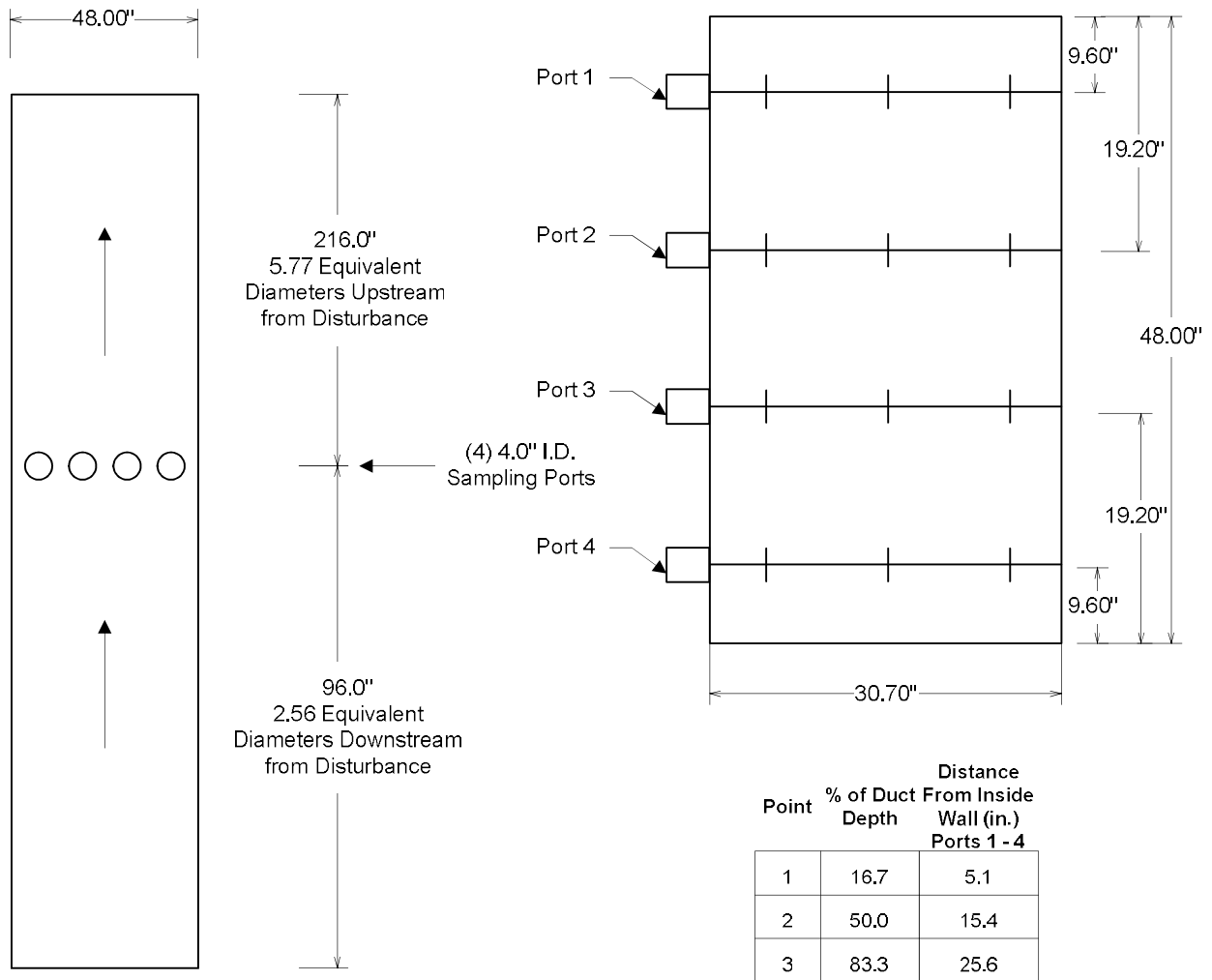


Figure 3.5 - P007/B014 Exhaust Stack CEMS Traverse Point Location Drawing

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 Test Methods

4.1.1 EPA Method 1: Sample and Velocity Traverses for Stationary Sources

Principle: To aid in the representative measurement of pollutant emissions and/or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected, and the cross-section of the stack is divided into a number of equal areas. A traverse point is then located within each of these equal areas. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.2 EPA Method 2: Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S)

Principle: The average gas velocity in a stack is determined from the gas density and from measurement of the average velocity head with a Type S (Stausscheibe or reverse type) pitot tube. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.3 EPA Method 3: Gas Analysis for the Determination of Dry Molecular Weight

Principle: 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 CO₂, percent O₂, and if necessary, for percent CO. For dry molecular weight determination a Fyrite analyzer will be used for the analysis. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.4 EPA Method 3B: Gas Analysis for the Determination of Emission Rate Correction Factor or Excess Air

Principle: 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 CO₂, percent O₂, and if necessary, for percent CO. An Orsat analyzer must be used for excess air or emission rate correction factor determination. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.5 EPA Method 4: Determination of Moisture Content in Stack Gases

Principle: A gas sample is extracted at a constant rate from the source; moisture is removed from the sample stream and determined either volumetrically or gravimetrically. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.6 EPA Method 7E: Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure) (Concentrations assumed less than 2,000ppm)

Principle: A sample is continuously extracted from the effluent stream; a portion of the sample stream is conveyed to an instrumental chemiluminescent analyzer for determination of NO_x concentration. Performance specifications and test procedures are provided to ensure reliable data. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.7 EPA Method 25A: Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer (Concentrations assumed less than 10,000 ppm, Propane/Nitrogen Calibration Gases)

Principle: A gas sample is extracted from the source through a heated sample line, if necessary, 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. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

The sampling trains utilized during this testing project are depicted in Figures 4.1 - 4.4.

4.2 Procedures for Obtaining Process Data

Process data was recorded by Emerald Performance Materials personnel utilizing their typical record keeping procedures. Recorded process data was provided to Air Compliance Testing, Inc. personnel at the conclusion of this test event. The process data is located in Table 2.2.1, Table 2.2.2, and in the Process Data section of the Appendix.

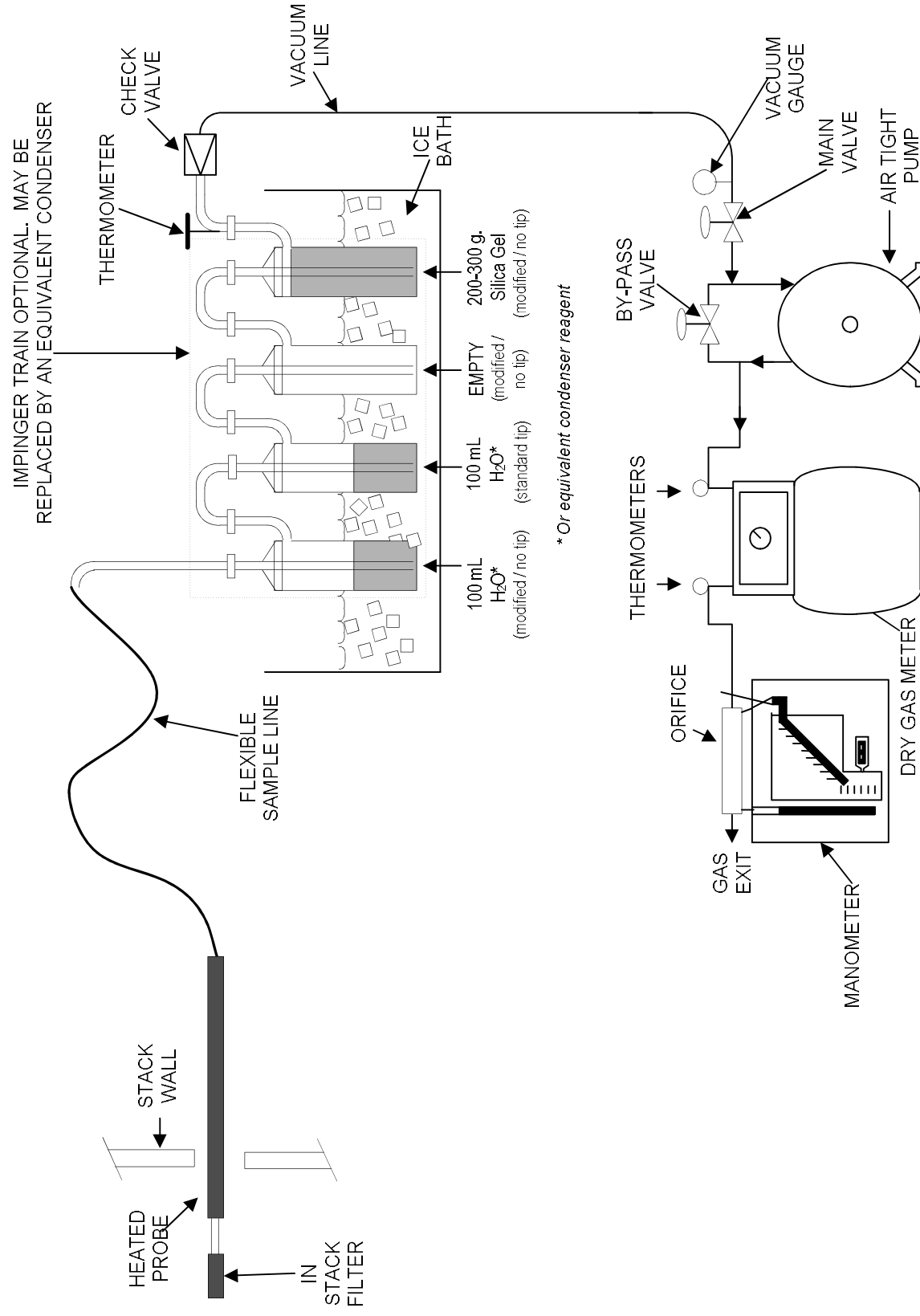


Figure 4.1 - EPA Method 4 Sampling Train Schematic - Inlet Location

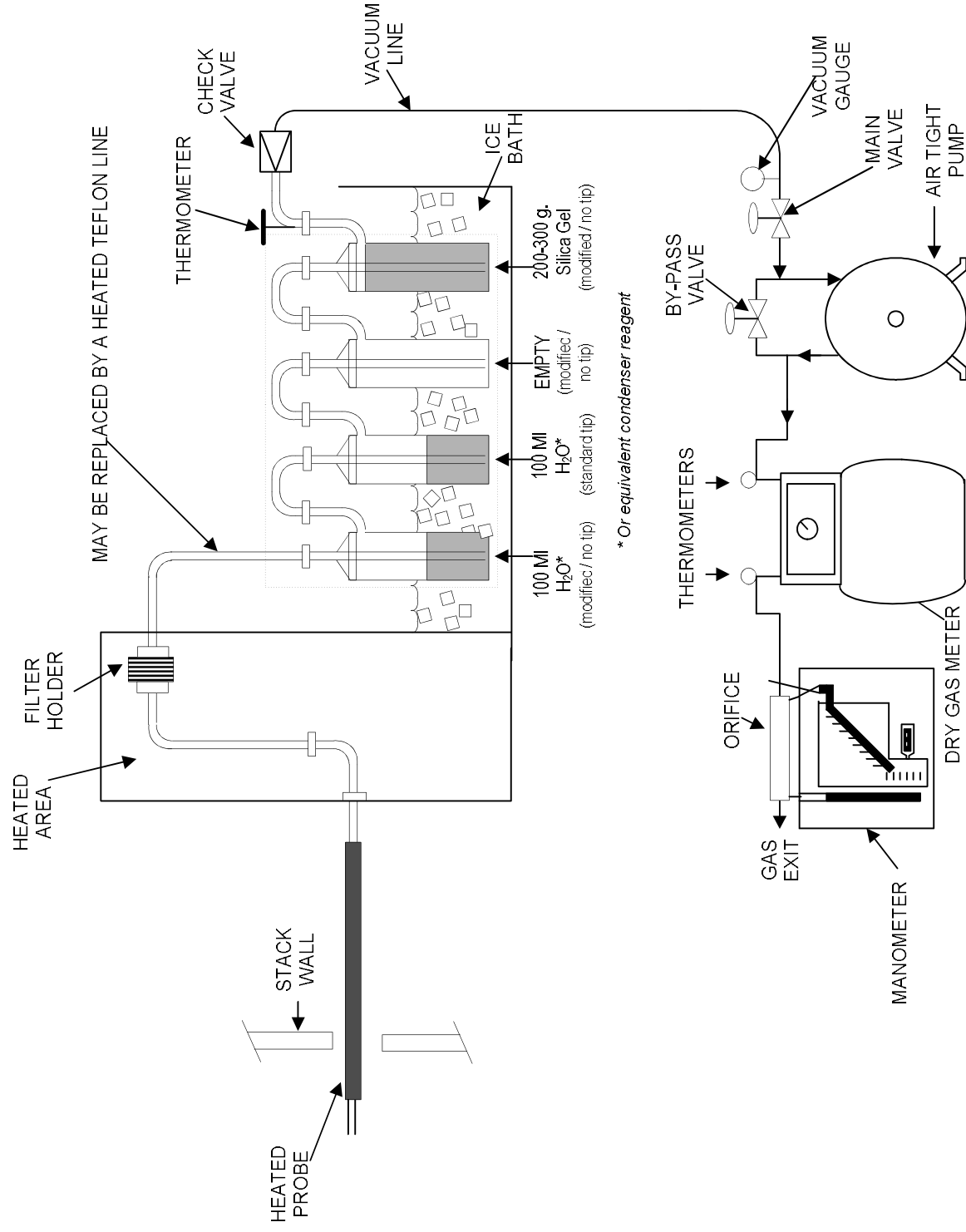


Figure 4.2 - EPA Method 4 Sampling Train Schematic - Exhaust Location

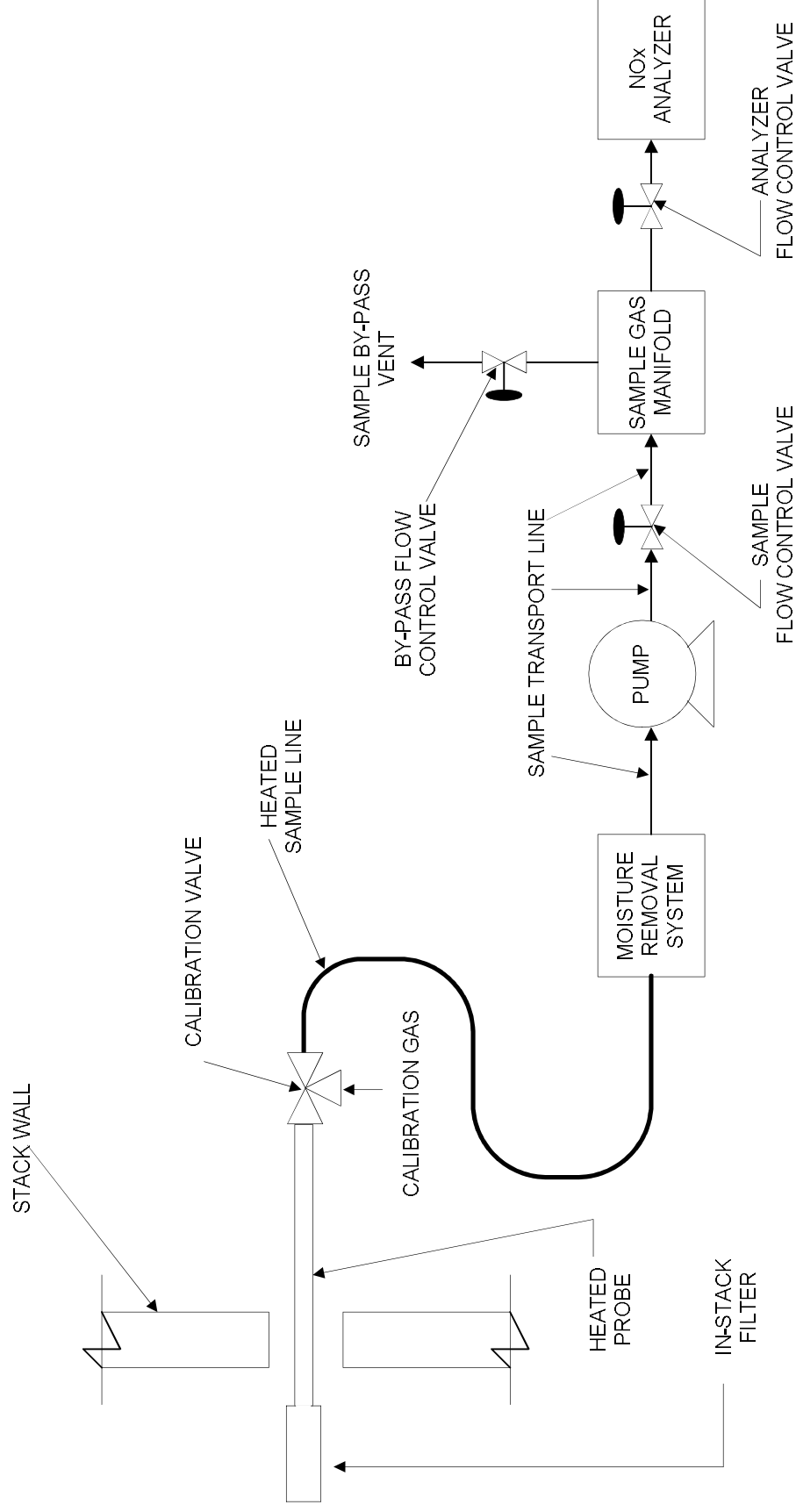


Figure 4.3 - EPA Method 7E Sampling Train Schematic

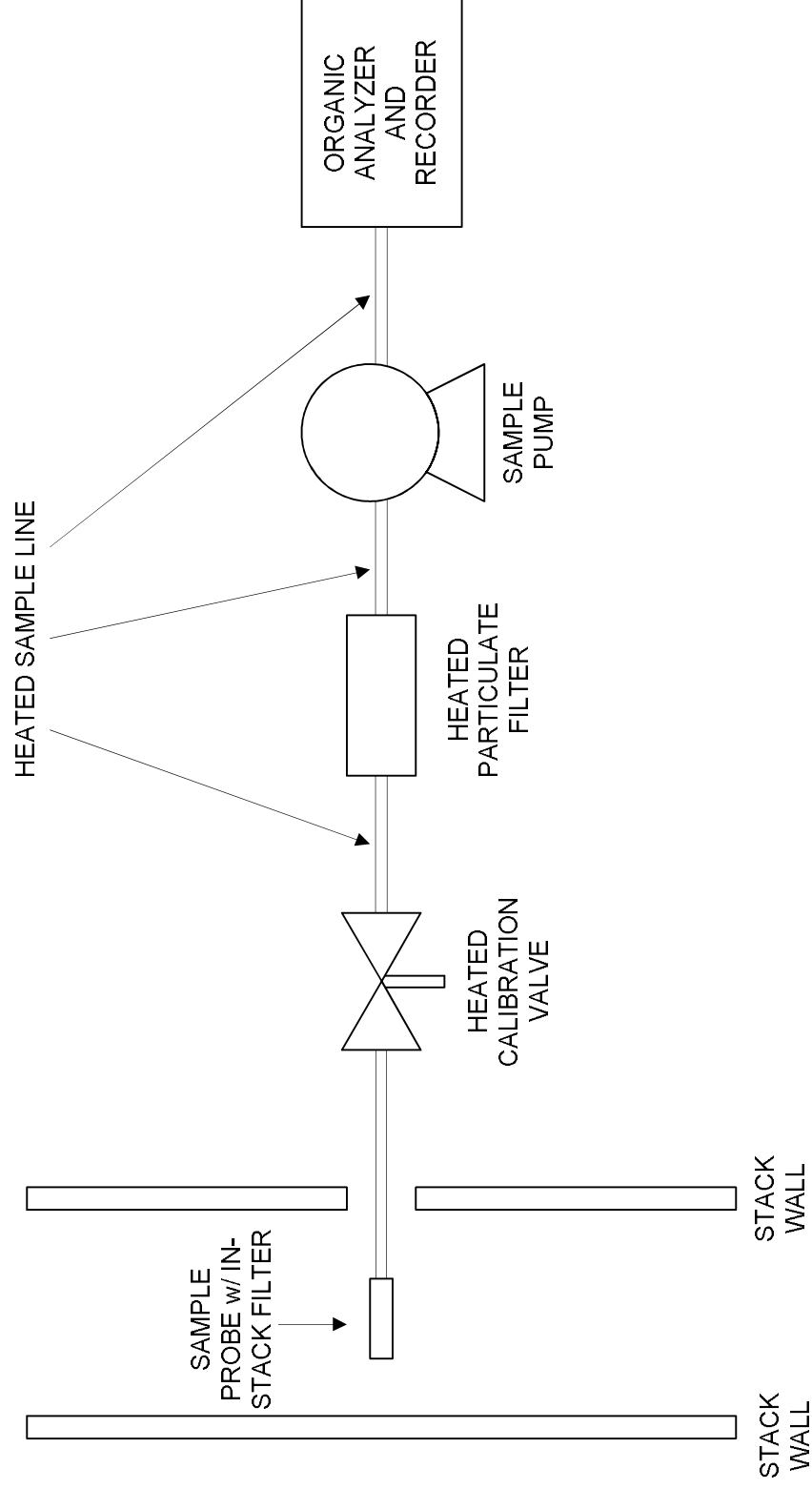


Figure 4.4 - EPA Method 25A Sampling Train Schematic

5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA Audits

Tables 5.1 - 5.7 illustrate the QA audits that were performed during this test.

All meter boxes and sampling trains used during sampling performed within the requirements of their respective methods as is shown in Tables 5.1 and 5.2. All pre-test and post-test leak checks were well below the applicable limit. Minimum metered volumes were also met where applicable.

Table 5.3 displays the EPA Method 3 Orsat and Fyrite Audits which were performed during this test in accordance with EPA Method 3, Section 10.1 requirements. As shown, all Orsat and Fyrite analyzer results were within $\pm 0.5\%$ of the respective Audit Gas concentrations.

Table 5.4 illustrates the nitrogen oxides calibration audits which were performed during this test (and integral to performing EPA Method 7E) were all within the Measurement System Performance Specifications of $\pm 3\%$ of span for the Zero and Calibration Drift Checks, $\pm 5\%$ of span for the System Calibration Bias Checks, and $\pm 2\%$ of span for the Calibration Error Checks.

Table 5.5 illustrate the FIA calibration audits which were performed during this test (and integral to performing EPA Method 25A correctly) were, except where noted, within the Measurement System Performance Specifications of $\pm 3\%$ of span for the Zero and Calibration Drift Checks, and $\pm 5\%$ of the respective cylinder concentrations for the Calibration Error Checks.

Table 5.6 displays the NO₂ to NO converter efficiency check. The converter efficiency check was conducted as per the procedures contained in EPA Method 7E, Section 8.2.4.1 which requires a conversion of at least 90%. As shown an average converter efficiency of 93.25% was achieved for the NO_x analyzer utilized at the P007/B014 Exhaust Stack.

Table 5.7 displays the EPA Method 205 field evaluation of the calibration gas dilution system utilized during this test event. As shown, the average concentration output at each dilution level was within $\pm 2\%$ of the predicted value. The average concentration output of the mid-level gas was also within $\pm 2\%$ of the certified concentration.

5.2 QA/QC Problems

No QA/QC problems occurred during this test event.

B014 Exhaust Stack			
Method 4 Sampling Train - NO _x	Run 1	Run 2	Run 3
Leak Rate Observed (Pre/Post) (cfm)	0.004 / 0.002	0.015 / 0.001	0.003 / 0.000
Applicable Method Allowable Leak Rate (cfm)	< 0.020	< 0.020	< 0.020
Acceptable	Yes	Yes	Yes
Volume of Dry Gas Collected (dscf)	34.285	34.829	34.824
Recommended Volume of Dry Gas Collected (dscf)	21.000	21.000	21.000
Acceptable	Yes	Yes	Yes

P007 Exhaust Duct			
Method 4 Sampling Train - TGO DE	Run 1	Run 2	Run 3
Leak Rate Observed (Pre/Post) (cfm)	0.000 / 0.000	0.000 / 0.000	0.001 / 0.000
Applicable Method Allowable Leak Rate (cfm)	< 0.020	< 0.020	< 0.020
Acceptable	Yes	Yes	Yes
Volume of Dry Gas Collected (dscf)	31.711	31.922	32.172
Recommended Volume of Dry Gas Collected (dscf)	21.000	21.000	21.000
Acceptable	Yes	Yes	Yes

P007/B014 Exhaust Stack			
Method 4 Sampling Train - TGO DE	Run 1	Run 2	Run 3
Leak Rate Observed (Pre/Post) (cfm)	0.005 / 0.004	0.006 / 0.000	0.002 / 0.001
Applicable Method Allowable Leak Rate (cfm)	< 0.020	< 0.020	< 0.020
Acceptable	Yes	Yes	Yes
Volume of Dry Gas Collected (dscf)	33.996	34.759	34.918
Recommended Volume of Dry Gas Collected (dscf)	21.000	21.000	21.000
Acceptable	Yes	Yes	Yes

Table 5.1 - Sample Train Audit Results

B014 Exhaust Stack - EPA Method 4 Sampling Train - NOx				
Pre-Test Dry Gas Meter Calibration Factor (Y)	Average Post-Test Dry Gas Meter Calibration Check Value (Yqa)	Post Test Dry Gas Meter Calibration Check Value Difference From Pre-Test Calibration Factor (%)	Applicable Method Allowable Difference (%)	Acceptable
1.0102	1.0272	1.69%	5.00%	Yes

P007 Exhaust Duct - EPA Method 4 Sampling Train - TGO DE				
Pre-Test Dry Gas Meter Calibration Factor (Y)	Average Post-Test Dry Gas Meter Calibration Check Value (Yqa)	Post Test Dry Gas Meter Calibration Check Value Difference From Pre-Test Calibration Factor (%)	Applicable Method Allowable Difference (%)	Acceptable
0.9986	0.9929	-0.57%	5.00%	Yes

P007/B014 Exhaust Stack - EPA Method 4 Sampling Train - TGO DE				
Pre-Test Dry Gas Meter Calibration Factor (Y)	Average Post-Test Dry Gas Meter Calibration Check Value (Yqa)	Post Test Dry Gas Meter Calibration Check Value Difference From Pre-Test Calibration Factor (%)	Applicable Method Allowable Difference (%)	Acceptable
1.0102	1.0373	2.68%	5.00%	Yes

Table 5.2 - Dry Gas Meter Audit Results

	Orsat Audit	
	%CO ₂	%O ₂
Audit Gas Concentration (%)	6.1	6.0
Orsat Response 1 (%)	5.5	6.1
Orsat Response 2 (%)	5.7	6.0
Orsat Response 3 (%)	5.7	5.7
Average (%)	5.6	5.9
Average Within ±0.5%	Yes	Yes

	Fyrite Audit	
	%CO ₂	%O ₂
Audit Gas Concentration (%)	6.1	6.0
Fyrite Response 1 (%)	6.5	6.3
Fyrite Response 2 (%)	6.5	6.3
Fyrite Response 3 (%)	6.3	6.3
Average (%)	6.4	6.3
Average Within ±0.5%	Yes	Yes

Audit Gas Cylinder Number: XC016442B

Table 5.3 - EPA Method 3 Audit Results

		B014 Exhaust Stack					
Nitrogen Oxide Analyzer		Run 1	Acceptable	Run 2	Acceptable	Run 3	Acceptable
Analyzer Span During Test Run (ppm)		100	YES	100	YES	100	YES
Initial System Calibration Response for Zero Gas (ppm)		0.2	N/A	0.8	N/A	0.9	N/A
Final System Calibration Response for Zero Gas (ppm)		0.8	N/A	0.9	N/A	0.7	N/A
Actual Concentration of the Upscale Calibration Gas (ppm)		50.0	N/A	50.0	N/A	50.0	N/A
Initial System Calibration Response for Upscale Gas (ppm)		48.3	N/A	49.7	N/A	49.3	N/A
Final System Calibration Response for Upscale Gas (ppm)		49.7	N/A	49.3	N/A	49.8	N/A
Initial System Calibration Bias for Zero Gas (% of Span)		0.10	YES	0.70	YES	0.80	YES
Final System Calibration Bias for Zero Gas (% of Span)		0.70	YES	0.80	YES	0.60	YES
Initial System Calibration Bias for Upscale Gas (% of Span)		-2.00	YES	-0.60	YES	-1.00	YES
Final System Calibration Bias for Upscale Gas (% of Span)		-0.60	YES	-1.00	YES	-0.50	YES
System Drift for Zero Gas (% of Span)		0.60	YES	0.10	YES	-0.20	YES
System Drift for Upscale Gas (% of Span)		1.40	YES	-0.40	YES	0.50	YES
Analyzer Calibration Error for Zero Gas (% of Span)		0.10	YES	0.10	YES	0.10	YES
Analyzer Calibration Error for Mid-Level Gas (% of Span)		0.30	YES	0.30	YES	0.30	YES
Analyzer Calibration Error for High-Level Gas (% of Span)		0.00	YES	0.00	YES	0.00	YES

Table 5.4 - EPA Method 7E Analyzer Calibration and QA

P007 Exhaust Duct						
	Run 1	Acceptable per Method 25A	Run 2	Acceptable per Method 25A	Run 3	Acceptable per Method 25A
Analyzer Span During Test Run (ppmv as propane)	3,000.0	YES	3,000.0	YES	3,000.0	YES
Average Stack Gas Concentration (ppmv as propane)	261.9	YES	1,291.3	YES	1,208.7	YES
Zero Drift (% of Span)	0.10	YES	0.13	YES	0.00	YES
Calibration Drift for Mid-Level Gas (% of Span)	0.10	YES	-0.53	YES	-0.30	YES
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	-4.44	YES	-2.33	YES	-2.33	YES
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	1.03	YES	3.42	YES	4.45	YES

P007/B014 Exhaust Stack						
	Run 1	Acceptable per Method 25A	Run 2	Acceptable per Method 25A	Run 3	Acceptable per Method 25A
Analyzer Span During Test Run (ppmv as propane)	90.0	YES	90.0	YES	90.0	YES
Average Stack Gas Concentration (ppmv as propane)	0.6	YES	-0.1	YES	0.0	YES
Zero Drift (% of Span)	0.78	YES	-0.33	YES	0.22	YES
Calibration Drift for Mid-Level Gas (% of Span)	0.89	YES	1.33	YES	-1.78	YES
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	-1.48	YES	-3.33	YES	-3.33	YES
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-0.44	YES	-3.33	YES	-3.33	YES

Table 5.5 - EPA Method 25A Instrument Calibration and QA

Date / Time	Cylinder Concentration (ppm NO2)	Analyzer Concentration (ppm NOx)	Conversion Efficiency (%)	Required Conversion Efficiency (%)	Acceptable (yes/no)
5/18/2015 15:19	51.46	47.28	91.89	90.00	Yes
5/18/2015 15:20	51.46	47.82	92.93	90.00	Yes
5/18/2015 15:21	51.46	48.07	93.40	90.00	Yes
5/18/2015 15:22	51.46	48.31	93.88	90.00	Yes
5/18/2015 15:23	51.46	48.44	94.14	90.00	Yes
AVERAGE	51.46	47.99	93.25	90.00	Yes

Analyzer Serial Number: U1032

Cylinder Number: CC273299

Table 5.6 - NOx Converter Efficiency Check

	Calibration Tag Value (%)	Dilution Ratio	Predicted Diluted Value (%)	Injection 1 Response (%)	Injection 2 Response (%)	Injection 3 Response (%)	Average Response (%)	Difference From Predicted (%)	Acceptable (yes/no)
Dilution Level 1	23.04	2.076	11.10	11.10	11.20	11.10	11.13	0.30	yes
Dilution Level 2	23.04	1.536	15.00	15.20	15.20	15.20	15.20	1.33	yes
Mid-Level Gas	11.1	-	11.10	11.10	11.10	11.20	11.13	0.30	yes

Analyzer Serial Number: 01420C-949

Dilution System Serial Number: 4918

Table 5.7 - EPA Method 205 Gas Dilution System Calibration and QA

Compliance Stack Emission Test Report

Determination of Total Gaseous Organic Destruction Efficiency

EPA Methods 1, 2, 2D, 3, 4, 25A, and ALT007

Reactive Liquid Polymers Process (P020)

Test Date(s): June 2, 2015

Source Location: Akron, Ohio

Report Number: 150620.1.0

Report Date: July 8, 2015

Prepared For:

Emerald Performance Materials
240 West Emerling Ave
Akron, Ohio 44301

Prepared By:

Air Compliance

Testing, Inc.

A Division of Montrose Air Quality Services



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July 8, 2015

Kevin Cherney
HS&E Manager CHMM
Emerald Performance Materials
240 West Emerling Ave
Akron, Ohio 44301

Dear Kevin:

The following report provides the results of the compliance emission testing conducted on June 2, 2015. These results are a product of the application of the U.S. EPA Stationary Source Sampling Methods listed in 40 CFR Part 60 Appendix A that were in effect at the time of this test. To the best of my knowledge, this report has been checked for completeness, and the results presented are accurate, error-free, legible, and representative of the actual emissions measured during testing.

Please mail one copy of this report along with any other supportive process operating data collected during this test to your local EPA representative. You should also attach a cover letter (on company letterhead) stating the purpose and the outcome of this test. Additionally, you may address, preferably in a timetable format, any obligations or implications that might be necessary to achieve environmental compliance because of the result of this test.

Please do not hesitate to call if you have any questions or concerns about these test results. On behalf of Air Compliance Testing, I would also like to personally thank you for the opportunity to work with you on this testing project and would enjoy the opportunity to work with you again on any additional future testing projects.

Sincerely,

A handwritten signature in black ink, appearing to read "Rob Lisy", written over a horizontal line.

Robert J. Lisy, Jr.
District Manager

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1.0 INTRODUCTION

1.1 Summary of Test Program

Emerald Performance Materials (Facility ID: 16-77-01-0029), located in Akron, Ohio, contracted Air Compliance Testing, Inc. of Cleveland, Ohio, to conduct compliance stack emission testing for their Reactive Liquid Polymers (P020) process. Testing was performed to satisfy the emissions testing requirements pursuant to Ohio Environmental Protection Agency (OEPA) Title V Permit No. P0102593. The testing was performed on June 2, 2015.

Simultaneous sampling was performed at the P020 Thermal Oxidizer (T-OX) Inlet Duct and P020 T-OX Exhaust Stack to determine the total gaseous organic (TGO) destruction efficiency (DE) of the T-OX associated with P020. Testing was conducted during representative (normal) operating conditions. During this test, emissions from P020 were controlled by a T-OX.

The test methods that were conducted during this test were EPA Methods 1, 2, 2D, 3, 4, 25A, 205, and Approved Alternative Method 007 (ALT-007) (Use of Dilution Probes with Instrumental Methods).

1.2 Key Personnel

The key personnel who coordinated this test program (and their phone numbers) were:

Kevin Cherney, Emerald Performance Materials, 330-374-3949

Laura Miracle, Air Quality Engineer, ARAQMD, 330-812-3953

Robert Lisy QSTI, District Manager, Air Compliance Testing, Inc., 800-372-2471

Robert H. Sava, Jr., Technology Development Manager, Air Compliance Testing, Inc. 800-372-2471

2.0 SUMMARY AND DISCUSSION OF TEST RESULTS

2.1 Objectives and Test Matrix

The purpose of this test was to determine the TGO DE of the T-OX associated with P020 during representative (normal) operating conditions. Testing was performed to satisfy the emissions testing requirements pursuant to OEPA Title V Permit No. P0102593.

The specific test objectives for this test were to:

Simultaneously measure the concentration of TGO at the P020 T-OX Inlet Duct and at the P020 T-OX Exhaust Stack.

Simultaneously measure the actual volumetric flow rate of the stack gas at the P020 T-OX Inlet Duct and the dry standard and actual volumetric flow rate of the stack gas at the P020 T-OX Exhaust Stack.

Utilize the above variables to determine the TGO DE of the T-OX associated with P020 during representative (normal) operating conditions.

Table 2.1 presents the sampling and analytical matrix log for this test.

2.2 Field Test Changes and Problems

No field test changes or problems occurred during the performance of this test that would bias the accuracy of the results of this test.

2.3 Presentation of Results

During each run, a single sampling train was utilized at the P020 T-OX Inlet Duct and two (2) sampling trains were utilized at the P020 T-OX Exhaust Stack to determine the TGO DE of the T-OX associated with P020. At the inlet, the sampling train measured the stack gas concentration of TGO while an inline flow rate meter determined the stack gas volumetric flow rate. At the exhaust, one sampling train measured the stack gas dry molecular weight and moisture content while the second sampling train measured the stack gas concentration of TGO. In addition, the stack gas volumetric flow rate was measured during each concentration run.

Table 2.2 displays the TGO DE associated with the P020 measured during representative (normal) operating conditions.

TGO concentration values in Table 2.2 denoted with a '<' were measured to be below the minimum detection limit (MDL) of the applicable analytical method. TGO mass emission rates denoted with a '<' in Table 2.2 were calculated utilizing the applicable MDL concentration value instead of the "as measured" concentration value.

Since more than 10% of the individual DP readings recorded at the P020 T-OX Exhaust Stack during each run were below 0.05 in-H₂O, a more sensitive differential pressure gauge was utilized at this location as per EPA Method 2, Section 6.2. The more sensitive differential pressure gauge had divisions of 0.005 in-H₂O in the inclined scale.

The graphs that follow Table 2.2 present the raw, uncorrected concentration data measured in the field by the flame ionization analyzers (FIA's) utilized at the P020 T-OX Inlet Duct and at the P020 T-OX Exhaust Stack.

		EPA TEST METHODS UTILIZED					
Date	Run No.	Sampling Location	M1/M2 (Flow)	M2D (Flow meter)	M3 (Dry Mol. Wt.)	M4 (%H ₂ O)	M25A (TGO)
6/2/2015	1	P020 T-OX Inlet Duct	-	8:25 - 9:25 60	-	-	8:25 - 9:25 60
6/2/2015	2	P020 T-OX Inlet Duct	-	10:03 - 11:03 60	-	-	10:03 - 11:03 60
6/2/2015	3	P020 T-OX Inlet Duct	-	11:32 - 12:32 60	-	-	11:32 - 12:32 60
6/2/2015	1	P020 T-OX Exhaust Stack	8:31 - 8:41 10	-	8:25 - 9:25 60	8:25 - 9:25 60	8:25 - 9:25 60
6/2/2015	2	P020 T-OX Exhaust Stack	10:05 - 10:26 21	-	10:03 - 11:03 60	10:03 - 11:03 60	10:03 - 11:03 60
6/2/2015	3	P020 T-OX Exhaust Stack	11:22 - 11:34 12	-	11:32 - 12:32 60	11:32 - 12:32 60	11:32 - 12:32 60

All times are Eastern Daylight Time.

Table 2.1 - Sampling and Analytical Matrix

	P020 T-OX Inlet Duct				P020 T-OX Exhaust Stack			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
TGO Destruction Efficiency (%)	-	-	-	-	> 99.9	> 99.9	> 99.9	> 99.9
TGO Mass Emission Rate (lb/hr as propane)*	26.5	20.4	29.9	25.6	< 0.024	< 0.024	< 0.025	< 0.024
TGO Concentration (ppmvd as propane)*	701,543	733,812	726,618	720,658	< 2.0	< 2.0	< 2.0	< 2.0
Stack Gas Average Flow Rate (acfm)	5.4	4.0	5.8	5.1	7,205	6,438	6,919	6,854
Stack Gas Average Flow Rate (scfm)	5.5	4.1	6.0	5.2	1,783	1,723	1,837	1,781
Stack Gas Average Flow Rate (dscfm)	-	-	-	-	1,643	1,601	1,715	1,653
Stack Gas Average Velocity (fpm)	-	-	-	-	1,587	1,418	1,524	1,510
Stack Gas Average Static Pressure (in-H ₂ O)	15.50	12.18	18.55	15.41	-0.12	-0.10	-0.11	-0.11
Stack Gas Average Temperature (°F)	55	58	60	58	1,614	1,459	1,472	1,515
Stack Gas Percent by Volume Moisture (%H ₂ O)	-	-	-	-	7.90	7.07	6.64	7.20
Measured Stack Inner Diameter (in)†	4.00	4.00	4.00	4.00	28.7 X 29	28.7 X 29	28.7 X 29	28.7 X 29
Percent by Volume Carbon Dioxide in Stack Gas (%-dry)	-	-	-	-	4.00	3.17	3.50	3.56
Percent by Volume Oxygen in Stack Gas (%-dry)	-	-	-	-	2.50	2.33	13.33	6.06
Percent by Volume Nitrogen in Stack Gas (%-dry)	-	-	-	-	93.50	94.50	83.17	90.39

* The "<" symbol indicates that compound was not present in quantities above the Minimum Detection Limit (MDL) of the analytical method.

† The P020 T-OX Exhaust Stack was elliptical in shape.

Table 2.2 - Emission Results

3.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

3.1 Process Description and Operation

Emerald Performance Materials is a specialty chemical company. The Reactive Liquid Polymers (RLP) (P020) process utilizes reactors and processing vessels and includes product purification, finishing, and raw material recovery operations. P020 was in operation for this test event.

Figure 3.1 depicts the sampling location schematic.

3.2 Control Equipment Description

During this test, emissions from P020 were controlled by a T-OX.

3.3 Flue Gas Sampling Locations

3.3.1 P020 T-OX Inlet Duct

The P020 T-OX Inlet Duct measured 4-inches in I.D., was oriented in the vertical plane, and was accessed from the ground. The EPA Method 2D gas flow rate meter utilized was located in a position concurrent with EPA Method 2D, Section 8.1. A sampling port was located downstream of the EPA Method 2D gas flow rate meter. During emissions sampling, stack gas volumetric flow rates and pressures were determined at the orifice plate. A single point, located within the central 10% of the stack cross-sectional area, was utilized for TGO concentration determination.

3.3.2 P020 T-OX Exhaust Stack

The P020 T-OX Exhaust Stack was elliptical in shape with measured inner diameters of 28.7-inches and 29.0-inches. The stack was oriented in the vertical plane and was accessed from a permanent platform. Two (2) sampling ports, with inner diameters of 3.9-inches and 1.7-inches, were located 90° apart from one another at a location that met EPA Method 1, Section 11.1.1 criteria. During emissions sampling, the stack was traversed for stack gas volumetric flow rate. A single point was utilized for dry molecular weight and moisture content determinations. A second single point, located within the central 10% of the stack cross-sectional area, was utilized for TGO concentration determination.

Figure 3.2 schematically illustrates the sample port location utilized at the inlet. Figure 3.3 schematically illustrates the traverse point and sample port locations utilized at the exhaust.

3.4 Process Sampling Location

The EPA Reference Test Methods performed did not specifically require that process samples were to be taken during the performance of this testing event. It is in the best knowledge of Air Compliance Testing that no process samples were obtained and therefore no process sampling location was identified in this report.

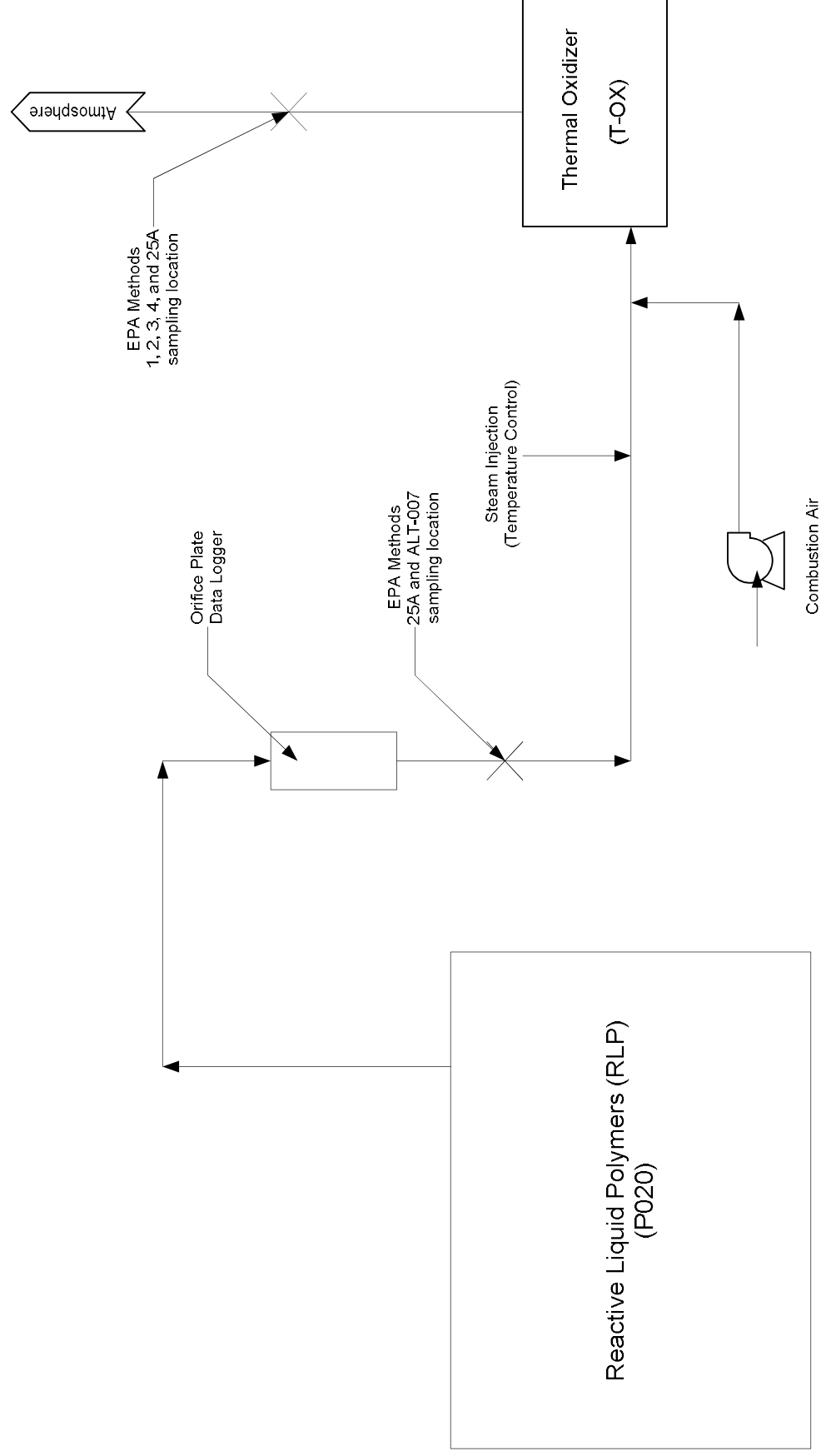


Figure 3.1 - Reactive Liquid Polymers (RLP) (P020) Sampling Location Schematic

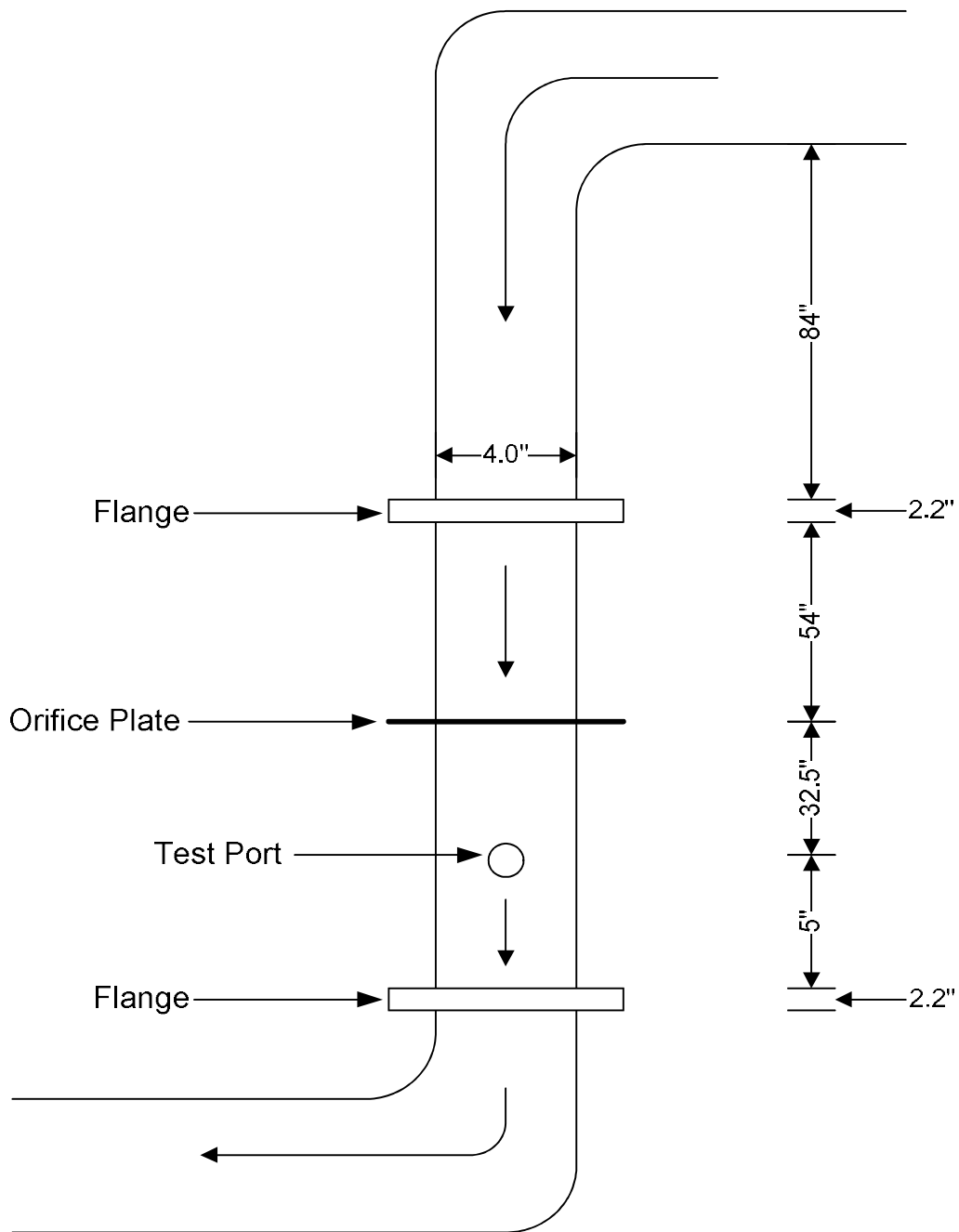


Figure 3.2 - P020 T-OX Inlet Duct Sampling Port Location Drawing

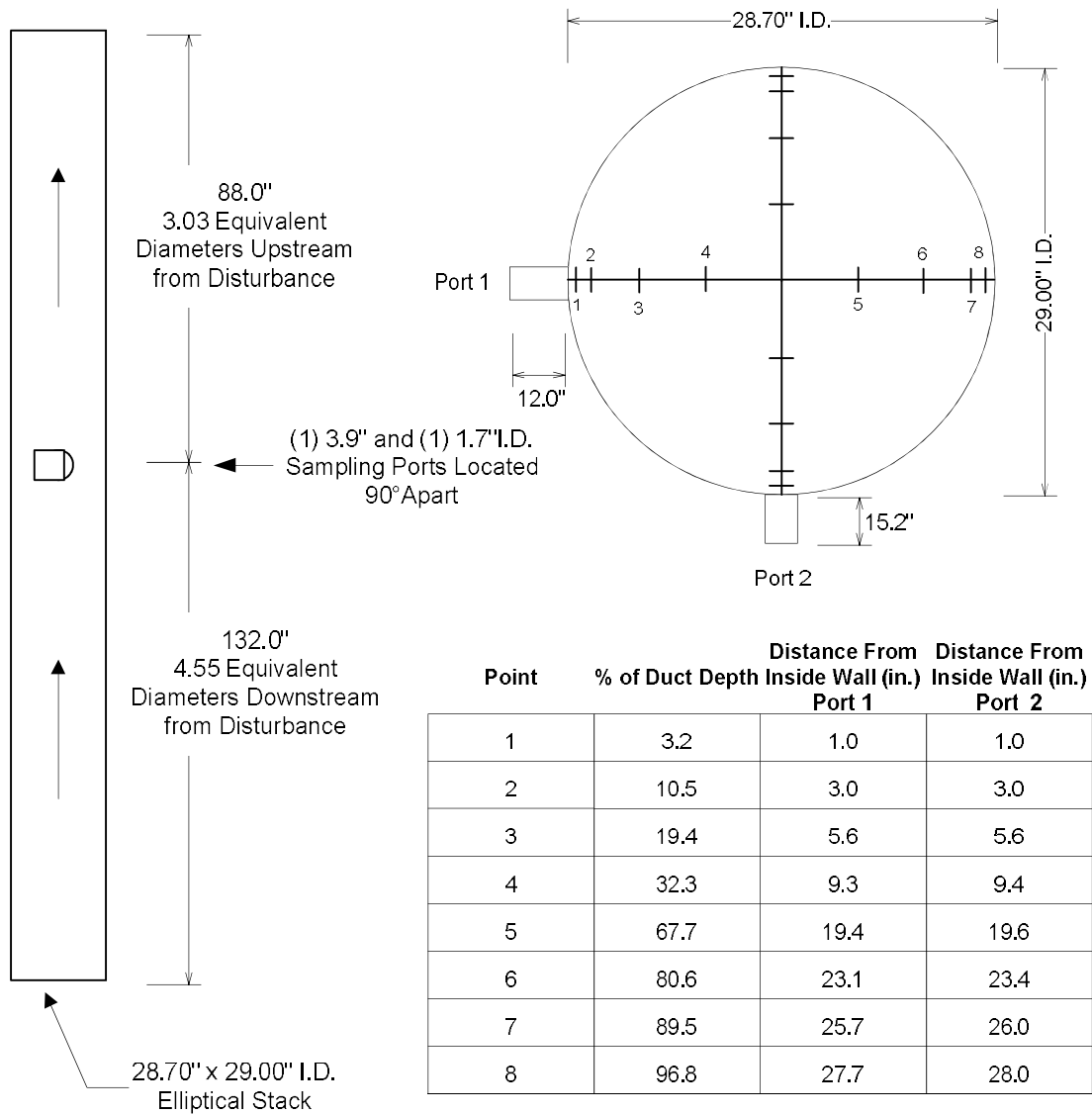


Figure 3.3 - P020 T-OX Exhaust Stack Traverse Point Location Drawing

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 Test Methods

4.1.1 EPA Method 1: *"Sample and Velocity Traverses for Stationary Sources"*

Principle: To aid in the representative measurement of pollutant emissions and/or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected, and the cross-section of the stack is divided into a number of equal areas. A traverse point is then located within each of these equal areas. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.2 EPA Method 2: *"Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S)"*

Principle: The average gas velocity in a stack is determined from the gas density and from measurement of the average velocity head with a Type S (Stausscheibe or reverse type) pitot tube. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.3 EPA Method 2D: *"Measurement of Gas Volume Flow Rates in Small Pipes and Ducts (Flow Meters supplied by client)"*

Principle: A gas flow rate meter is used to measure gas volume flow rate directly. Temperature and pressure measurements are made to allow correction of the volume to standard conditions. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.4 EPA Method 3: *"Gas Analysis for the Determination of Dry Molecular Weight"*

Principle: 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 CO₂, percent O₂, and if necessary, for percent CO. For dry molecular weight determination a Fyrite analyzer will be used for the analysis. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.5 EPA Method 4: *"Determination of Moisture Content in Stack Gases"*

Principle: A gas sample is extracted at a constant rate from the source; moisture is removed from the sample stream and determined either volumetrically or gravimetrically. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.7 EPA Method 25A: *"Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer (Concentrations assumed less than 10,000 ppm, Propane/Nitrogen Calibration Gases)"*

Principle: A gas sample is extracted from the source through a heated sample line, if necessary, 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. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.6 EPA Method ALT007: *"Test Methods 6C, 7E, 3A, 20, and 10 Use of Dilution Probes with Instrumental Methods"*

Principle: The Environmental Protection Agency (EPA) Methods 6C, 7E, 3A, 10, and 20 provide specifications for testing pollutants in stationary source exhausts with instrumental measurement systems. The methods call for the determination of a pollutant concentration on a dry basis. However, increased monitoring of exhaust gas emission standards on a pounds per hour (lbs/hr) basis, has resulted in the use of instrumental reference methods which evaluate concentrations on a wet basis. The dilution probe system has proven its reliability for use in the above EPA methods. The dilution probe system is usually comprised of an ambient concentration analyzer and the dilution probe. Since this system dilutes high moisture stack gas, heating the sample is generally not necessary. Another advantage to non-dilution systems is that lower sample volumes are required. In comparison, non-dilution systems employ sample conditioning systems which physically remove moisture and are usually designed to obtain a dry concentration value. This method was utilized (at the inlet) in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

The sampling trains utilized during this testing project are depicted in Figures 4.1 - 4.3.

4.2 Procedures for Obtaining Process Data

Process data was recorded by Emerald Performance Materials personnel utilizing their typical record keeping procedures. Recorded process data was provided to Air Compliance Testing, Inc. personnel at the conclusion of this test event. The process data is displayed in "Process Data" section of the Appendix

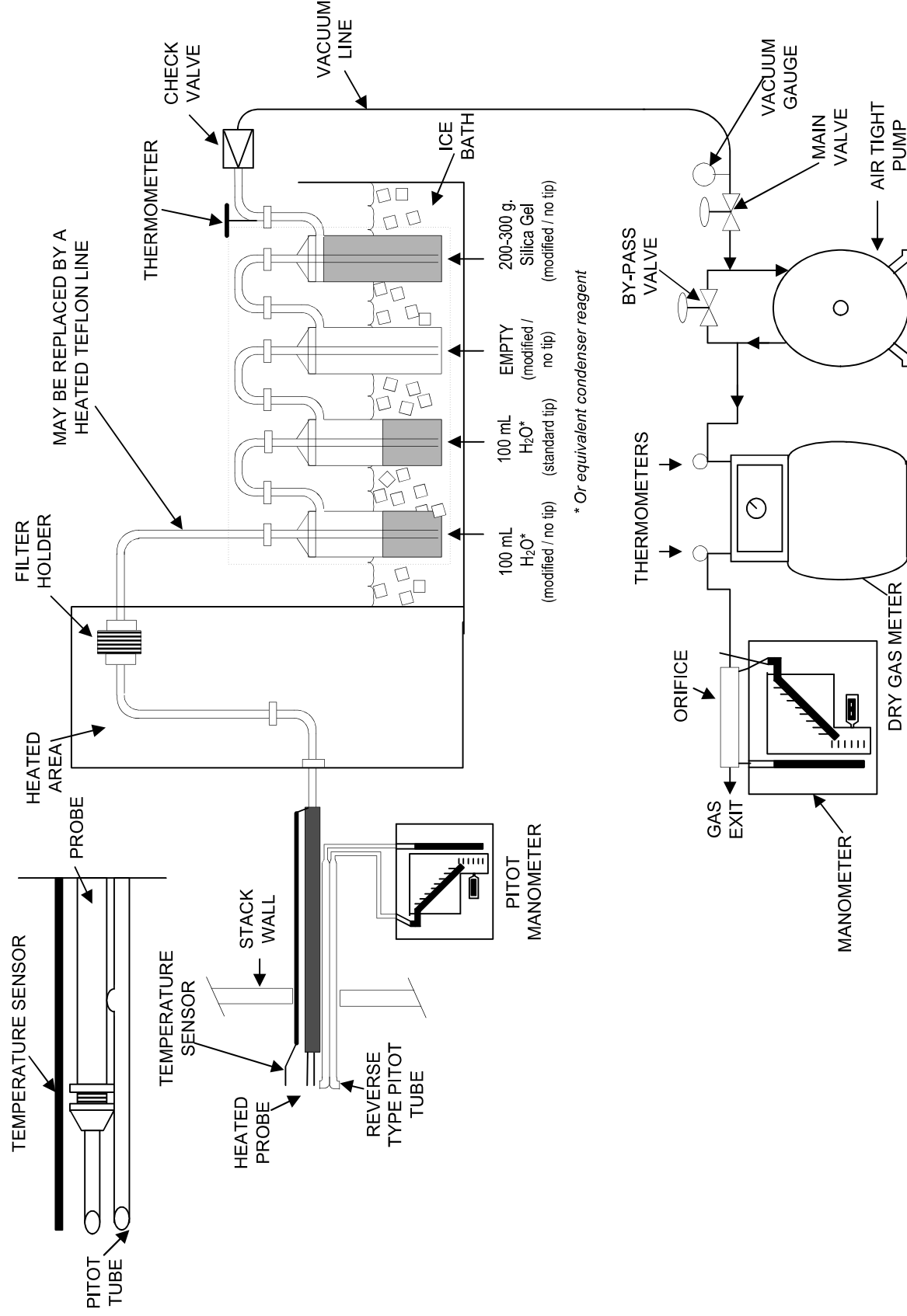


Figure 4.1 - EPA Method 4 Sampling Train Schematic

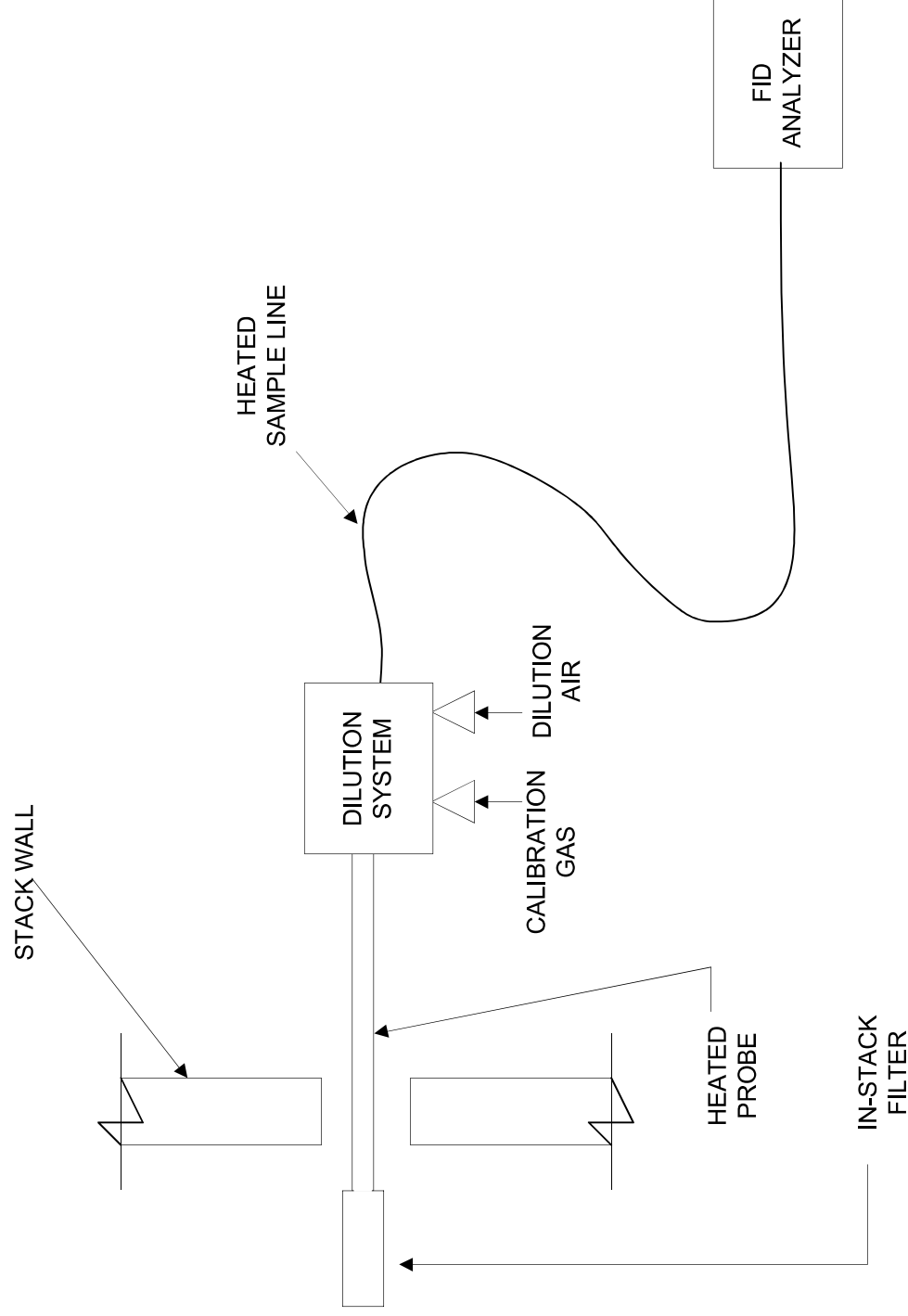


Figure 4.2 - EPA Method 25A Sampling Train Schematic - P020 T-OX Inlet Duct

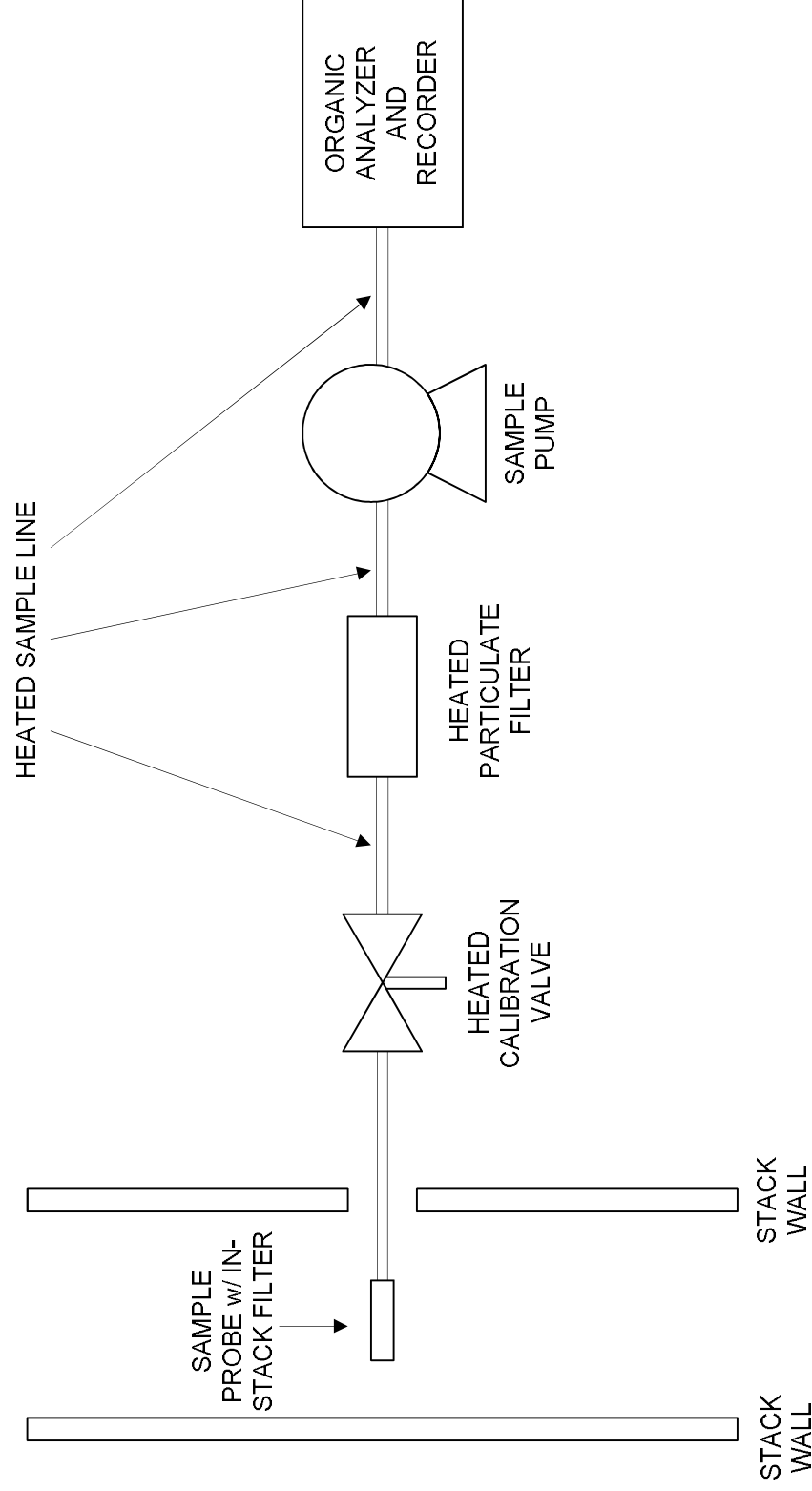


Figure 4.3 - EPA Method 25A Sampling Train Schematic - P020 T-OX Exhaust Stack

5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA Audits

Tables 5.1 - 5.5 illustrate the QA audits that were performed during this test.

All meter boxes and sampling trains used during sampling performed within the requirements of their respective methods as is shown in Tables 5.1 and 5.2. All pre-test and post-test leak checks were well below the applicable limit. Minimum metered volumes were also met where applicable.

Table 5.3 displays the EPA Method 3 Fyrite Audits which were performed during this test in accordance with EPA Method 3, Section 10.1 requirements. As shown, all Fyrite analyzer results were within $\pm 0.5\%$ of the respective Audit Gas concentrations.

Table 5.4 illustrates the FIA calibration audits which were performed during this test (and integral to performing EPA Method 25A correctly) were, except where noted, within the Measurement System Performance Specifications of $\pm 3\%$ of span for the Zero and Calibration Drift Checks, and $\pm 5\%$ of the respective cylinder concentrations for the Calibration Error Checks.

Table 5.5 displays the EPA Method 205 field evaluation of the calibration gas dilution system utilized during this test event. As shown, the average concentration output at each dilution level was within $\pm 2\%$ of the predicted value. The average concentration output of the mid-level gas was also within $\pm 2\%$ of the certified concentration.

5.2 QA/QC Problems

No QA/QC problems occurred during this test event.

Method 4 Sampling Train	P020 T-OX Exhaust Stack		
	Run 1	Run 2	Run 3
Leak Rate Observed (Pre/Post) (cfm)	0.001 / 0.005	0.000 / 0.003	0.005 / 0.004
Applicable Method Allowable Leak Rate (cfm)	< 0.020	< 0.020	< 0.020
Acceptable	Yes	Yes	Yes
Volume of Dry Gas Collected (dscf)	39.132	38.803	39.831
Recommended Volume of Dry Gas Collected (dscf)	21.000	21.000	21.000
Acceptable	Yes	Yes	Yes

Table 5.1 - Sample Train Audit Results

P020 T-OX Exhaust Stack - EPA Method 4 Sampling Train				
Pre-Test Dry Gas Meter Calibration Factor (Y)	Average Post-Test Dry Gas Meter Calibration Check Value (Yqa)	Post Test Dry Gas Meter Calibration Check Value Difference From Pre-Test Calibration Factor (%)	Applicable Method Allowable Difference (%)	Acceptable
1.0089	1.0576	4.83%	5.00%	Yes

Table 5.2 - Dry Gas Meter Audit Results

Audit Gas Concentration (%)	%CO ₂	%O ₂
	6.1	5.9
Fyrite Response 1 (%)	6.0	6.0
Fyrite Response 2 (%)	6.0	5.5
Fyrite Response 3 (%)	6.0	6.0
Average (%)	6.0	5.8
Average Within $\pm 0.5\%$	Yes	Yes

Audit Gas Cylinder Number:

XC016442B

Table 5.3 - EPA Method 3 Audit Results

P020 T-OX Inlet Duct						
	Run 1	Acceptable per Method 25A	Run 2	Acceptable per Method 25A	Run 3	Acceptable per Method 25A
Analyzer Span During Test Run (ppmv as propane)	810,000	YES	750,000	YES	750,000	YES
Average Stack Gas Concentration (ppmv as propane)	701,543	YES	733,812	YES	726,618	YES
Zero Drift (% of Span)	0.06	YES	0.08	YES	0.08	YES
Calibration Drift for Mid-Level Gas (% of Span)	1.77	YES	1.76	YES	1.72	YES
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	-3.45	YES	-3.45	YES	-3.45	YES
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-4.03	YES	-4.03	YES	-4.03	YES

P020 T-OX Exhaust Stack						
	Run 1	Acceptable per Method 25A	Run 2	Acceptable per Method 25A	Run 3	Acceptable per Method 25A
Analyzer Span During Test Run (ppmv as propane)	100.0	YES	100.0	YES	100.0	YES
Average Stack Gas Concentration (ppmv as propane)	-0.1	YES	1.1	YES	0.9	YES
Zero Drift (% of Span)	-1.70	YES	-0.30	YES	-0.40	YES
Calibration Drift for Mid-Level Gas (% of Span)	-2.00	YES	-0.80	YES	-1.30	YES
Calibration Error for Low-Level Gas (% of Cal. Gas Tag Value)	-3.41	YES	-4.74	YES	-3.41	YES
Calibration Error for Mid-Level Gas (% of Cal. Gas Tag Value)	-1.51	YES	-0.71	YES	-1.51	YES

Table 5.4 - EPA Method 25A Instrument Calibration and QA

	Calibration Tag Value (%)	Dilution Ratio	Predicted Diluted Value (%)	Injection 1 Response (%)	Injection 2 Response (%)	Injection 3 Response (%)	Average Response (%)	Difference From Predicted (%)	Acceptable (yes/no)
Dilution Level 1	23.00	1.533	15.0	15.2	15.2	15.2	15.2	1.33	yes
Dilution Level 2	23.00	2.556	9.0	9.0	9.0	9.0	9.0	0.00	yes
Mid-Level Gas	8.997	-	-	8.9	8.9	8.9	8.9	-1.08	yes

Analyzer Serial Number: 01420C-949

Dilution System Serial Number: 4918

Table 5.5 - EPA Method 205 Gas Dilution System Calibration and QA

Attachment C: VOC Emission Calculations



Huntsman Advanced Materials Americas, LLC
Akron, OH
Latex Process (P007)

Basis:

- a. Emissions are based on the quantity of organics to the VGI from the annual mass balance workbooks and the control efficiency of the boilers used as the control devices.
- b. The most recent tested destruction efficiencies for each boiler are:

2015 Destruction Efficiency	Run 1	Run 2	Run 3	Average
B001	99.4%	98.2%	92.9%	96.83%
B014	99.1%	99.8%	99.8%	99.55%

To maintain B001 exempt from NOx RACT requirements, Huntsman has requested to limit emissions to less than 10 ton NOx/yr, which equates to a 19% utilization restriction.

Therefore, the weighted annual average control efficiency can be no less than: $(0.19 \times 96.8\%) + (0.81 \times 99.5\%) = 99.0\%$

- c. Annual (2019) and daily (2019) emissions are based on the following quantity of gases exhausted to the Boilers and, as a conservative estimate, the tested destruction efficiency for B001.

Constituent	Year	Total (lb/yr)	Max Daily (lb/day)	Ave. Daily (lb/day)
acrylonitrile	2019	17,512	335	98
1,3-butadiene	2019	228,642	2,313	1,178
styrene	2019	5,223	264	35

Emissions Calculations:

Controlled Emissions = (uncontrolled to Boilers, lb) x (1 - control efficiency)

Emissions Summary:

Chemical	2019 Annual			2019 Maximum Daily		2019 Average Daily	
	Uncontrolled Process to Boiler (lb/yr)	Uncontrolled Process to Boiler (ton/yr)	Controlled Emissions (ton/yr)	Uncontrolled Process to Boiler (lb/day)	Controlled Emissions (lb/day)	Uncontrolled Process to Boiler (lb/day)	Controlled Emissions (lb/day)
acrylonitrile	17,512.21	8.76	0.08	335.00	10.62	98.00	3.11
1,3-butadiene	228,642.00	114.32	1.11	2,313.00	73.32	1,178.00	37.34
styrene	5,222.99	2.61	0.03	264.00	8.37	35.00	1.11
Total VOC		125.69	1.22	2,912.00	92.31	1,311.00	41.56
	Based on weighted average control efficiency			Based on control efficiency of B001			
			B001 portion				0.76
			B014 portion				0.46

Huntsman Advanced Materials Americas, LLC
Akron, OH
Latex Fugitives Summary (P007)

Component Type	Chemical State	Total ⁽¹⁾	TCEQ Uncontrolled SOCMF Fugitive Emission Factors (lb/hr/component) ⁽²⁾	Uncontrolled VOC Emissions (ton/yr)	Uncontrolled HAP Emissions (ton/yr)	Control Efficiency (%) ⁽³⁾	Controlled VOC Emissions (ton/yr)	Controlled HAP Emissions (ton/yr)
Agitators	GV	2	0.0439	0.38	0.38	100%	0	0
	LL	20	0.0439	1.5	1.5		0	0
	HL	15	0.0439	0.1	0.05		0	0
Compressors	LL	3	0.5027	0 (non-VOC)	0	100%	0	0
Connectors	GV	1,227	0.0039	20.95	20.95	85%	3.14	3.14
	LL	1,212	0.0005	1.73	1.73		0.26	0.26
	LL	957	0.0005	0 (non-VOC)	0	0%	0	0
	HL	1,520	0.00007	0.01	0.008		0.002	0.001
PRV	GV	30	0.2293	30.13	30.13	100%	0	0
	LL	12	0.0089	0.4	0.4		0	0
	GV	24	0.2293	24.1	24.1	97%	0.72	0.72
	LL	75	0.0089	1.48	1.48		0.04	0.01
	LL	38	0.0089	0 (non-VOC)	0 (non-VOC)	0%	0	0
	HL	32	0.0005	0.002	0.001		0.002	0.001
Pumps	LL	4	0.0439	0.11	0.11	100%	0	0
	HL	4	0.019	0.01	0.002	100%	0	0
Valves	GV	341	0.0132	19.72	19.72	98%	0.39	0.39
	LL	359	0.0089	9.27	9.27		0.19	0.19
	LL	321	0.0089	0 (non-VOC)	0	0%	0	0
	HL	466	0.0005	0.03	0.02	0%	0.03	0.02
Total		6,661	Total	109.91	109.84	Total	4.79	4.78
diethylamine				2E-03	N/A	diethylamine	4E-04	N/A
cumenehydroperoxide				0.03	N/A	cumenehydroperoxide	7E-03	N/A
ethylene				0.03	N/A	ethylene	7E-03	N/A
1,3-butadiene				97.85		1,3-butadiene	4.29	
acrylonitrile				9.88		acrylonitrile	0.40	
styrene				2.11		styrene	0.08	
cumene				0.01		cumene	2E-03	
formaldehyde				6E-06		formaldehyde	3E-06	
naphthalene				7E-06		naphthalene	4E-06	
phenol				1E-03		phenol	8E-04	
quinoline				2E-06		quinoline	1E-06	

lb VOC/day uncontrolled	lb VOC/day controlled
602.25	26.25

- Component counts by stream and stream composition provided by Huntsman for all components in contact with 0.5% VOC or greater in the stream.
- Emission factors from TCEQ Fugitive Guidance APDG 6422 (<https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/fugitive-guidance.pdf>) Table I – Uncontrolled SOCMF Fugitive Emission Factors, SOCMF without Ethylene (C2). No factors were developed for agitators; guidance instructs to use light liquid pump factors. No factors were developed for liquid relief valves; guidance instructs to use light liquid valve factors.
- Control efficiencies for connectors, gas valves, and light liquid valves and pumps in contact with 5% total HAP or greater calculated based on 5-year actual leak rates and equations from the US EPA Protocol for Equipment Leak Emission Estimates (https://19january2021snapshot.epa.gov/sites/static/files/2020-09/documents/protocol_for_equipment_leak_emission_estimates.pdf). All agitators and pumps are considered leakless. PRVs that vent to the process vent system are considered to be 100% controlled. All other PRVs are assumed to have 97% control based on Table V of the TCEQ guidance for the 28VHP and 28CNTA-level monitoring programs, which are equivalent to MACT Subpart H.

Chemical	2019 Annual			2019 Maximum Daily		2019 Average Daily	
	Uncontrolled	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled
	Emissions	Emissions	Emissions	Emissions	Emissions	Emissions	Emissions
	(lb/yr)	(ton/yr)	(ton/yr)	(lb/day)	(lb/day)	(lb/day)	(lb/day)
Latex Equipment Leaks¹							
acrylonitrile	19,758.52	9.9	0.35	54.13	2.22	54.13	2.22
1,3-butadiene	195,695.31	97.8	0.43	536.15	23.49	536.15	23.49
styrene	4,211.78	2.11	0.22	11.54	0.45	11.54	0.45
Total VOC		109.9	1	602.25	26.25	602.25	26.25

1. Uncontrolled annual equipment leak emissions are not available (N/A). Actual 2019 annual equipment leaks are calculated in the LDAR program software, LeakDAS, based on the actual number of leaking components in the year.

Huntsman Advanced Materials Americas, LLC
Akron, OH
Latex Process (P007) - Waste AN Drum Filling

Basis:

a. Waste acrylonitrile recovered from the Latex Process is condensed into the Recovered Acrylonitrile Tank at the end of the Latex Process. This material is then transferred into drums and shipped off site.

b. The transfer process occurs approximately quarterly and consists of 660 gallons of material and takes 4 hours to pump into 55 gallon drums.

This equates to a transfer rate of 3 drums/hour.

c. The maximum composition (wt%) of each component in the waste is used for worst-case emission estimates:

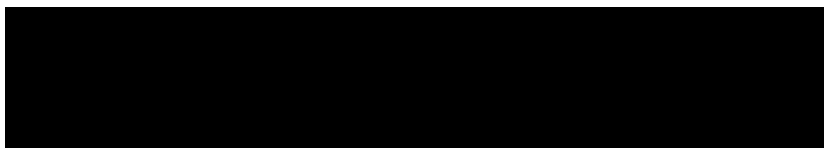
50% acrylonitrile
 10% acetonitrile
 10% propionitrile
 15% styrene
 30% vinylcyclohexene
 10% water

The density is 8.74 lb/gal.

Therefore, one 55-gallon drum holds 480.8 pounds of waste.

d. The actual amount transferred in 2019 is:

Year	Quantity Transferred		
	lb/yr	gal/yr	drums/yr
2019	577,797	66,098	1,202



	lb waste/day	gal/day	drums/day
Ave	1,884.0	215.56	4
Max	3,742.2	428.16	8

Average drums filled per day =

4

Maximum drums filled per day =

8

e. Equations for calculating emissions generated from charging a solvent mixture to an empty vessel are presented in the US EPA Emission Inventory Improvement Program, Volume II, Chapter 16 - Methods for Estimating Air Emissions from Chemical Manufacturing Facilities, August 2007.

Emissions do not include any control for filling into a closed top drum via a wand through the drum bung.

Emission Calculations:

Vessel Size 55 gal
 7.4 ft³
 Batch Size 480.8 lb/drum
 Pump-in-rate 3 gal/min
 Density 65.4 lb/ft³

Step 1. Define conditions of displaced gas.

Component	Composition	Batch Component Mass	MW	Convert Mass to Moles	Liquid Mole Fraction	T			P _i @ T	p _i = X _i P _i @ T
	wt%	lb/drum	lb/lb-mol	mol/drum	X _i	F	C	K	(mm Hg)	(mm Hg)
acrylonitrile	50%	240	53.06	4.53	0.40	100	38	311	176.58	70.99
acetonitrile	10%	48	41.05	1.17	0.10	100	38	311	154.47	16.05
propionitrile	10%	48	55.08	0.87	0.08	100	38	311	75.08	5.82
styrene	15%	72	104.15	0.69	0.06	100	38	311	12.87	0.79
vinylcyclohexene	30%	144	108.18	1.33	0.12	100	38	311	25.58	3.03
water	10%	48	18.02	2.67	0.24	100	38	311	49.21	11.65
Totals				11.27						108.33
Air (Residual)										651.67

Component	Antoine's Coefficients $\log P = A - B/(T+C)$, p (mm Hg), T (C)			MW lb/lb-mol
	A	B	C	
acrylonitrile	7.4083	1477.2856	248.440	53.06
acetonitrile	7.5442	1583.4004	257.887	41.05
propionitrile	7.0634	1275.0453	207.996	55.08
styrene	6.9571	1445.5800	209.440	104.15
vinylcyclohexene	6.8051	1438.9827	228.837	108.18
water	8.0557	1723.6425	233.080	18.02

2. Calculate moles/mass of component in saturated vapor.

$$E_{n,i} = p_i \cdot V_{\text{batch}}/R/T_{\text{sys}}$$

Component	$p_i = X_i P_i$ @ T	V_{batch}	R	Tsys (T)	$E_{n,i}$	MW	Emissions
	(mm Hg)	(ft ³)	(mm Hg ft ³ /lb-mol K)	K	lb-mol/drum	lb/lb-mol	lb/drum
acrylonitrile	70.99	7.4	998.9	310.93	0.002	53.06	0.09
acetonitrile	16.05	7.4	998.9	310.93	0.0004	41.05	0.02
propionitrile	5.82	7.4	998.9	310.93	0.0001	55.08	0.008
styrene	0.79	7.4	998.9	310.93	0.00002	104.15	0.002
vinylcyclohexene	3.03	7.4	998.9	310.93	0.00007	108.18	0.008
water	11.65	7.4	998.9	310.93	0.0003	18.02	0.005

Emissions Summary:

Emissions (lb/hr) = (drum filling rate, drums/hr) x (emission rate, lb/drum)

Emissions (lb/yr) = (annual drums filled, drums/yr) x (emission rate, lb/drum)

Component	Emissions		
	2019 (ton/yr)	Maximum (lb/day)	Average (lb/day)
acrylonitrile	5E-02	0.69	0.35
acetonitrile	9E-03	0.12	0.06
propionitrile	5E-03	0.06	0.03
styrene	1E-03	0.02	0.01
vinylcyclohexene	5E-03	0.06	0.03
water	3E-03	0.04	0.02
Total VOC	0.07	0.95	0.48

Huntsman Advanced Materials Americas, LLC
Akron, OH
Latex Process (P007) - Product Loading

Loading Losses

Basis:

- a. Products are loaded into rail, truck, tote, and drums by submerged loading into a clean tank.
- b. Emissions from packaging and loading are estimated using the loading loss equation in AP-42 Section 5.2 "*Transportation and Marketing of Petroleum Liquids*", (06/08)

$$L_L = \text{loading loss equation, lb/1,000 gal liquid loaded} = 12.46 * (SPM/T) * (1 - \text{eff}/100)$$

where:

S = saturation factor (see Table 5.2-1)
P = true vapor pressure of material, psia
M = molecular weight of vapors, lb/lb-mol
T = temperature of material (at ambient conditions), °R
eff = overall reduction efficiency, %

Chemical	MW (lb/lbmol)	Product Throughput (lb/yr)		Notes/Basis
		2019		
acrylonitrile	53.06		0.003%	
styrene	104.15		0.004%	
polymer	200.00		25.8%	
water	18.02		71.4%	
non-monomer	200.00		2.8%	
Total			100%	
hr/yr				
vapor pressure (mm Hg)		18		Vapor pressure of product = 18 mmHg (based on 4 products)
vapor pressure (psia)		0.35		
pump rate (lb/hr)		10,200		Pump rate = (varies/not the same pump) AOD ~170 lb/min
rail load size (lb/rail car)		186,000		Size of avg rail car = 186,000 lb
(gal/rail car)		22,302		
batch duration (hr/batch)		18		
density (lb/gal)		8.34		Density of product = 1+ -.2
throughput (gal/yr)				
S (splash loading: dedicated normal service)		1.45		Assume splash as worst case
P		0.35		
M		57.14		
T (°F)		100		
T (°R)		560		
eff		0		
Loading Loss (L _L) (lb/1,000 gal)		0.64		
VOC Emissions (ton/yr)				
acrylonitrile emissions (ton/yr)				
styrene emissions (ton/yr)				

Hose Losses

Basis:

a. Assume during the loading process that a quantity of product equal to the volume of the transfer hose is spilled and the organic components evaporate.

The product can be loaded to a tanker truck or rail car. These calculations assume all product is loaded to a tanker truck to estimate worst case emissions.

b. The total tanker truck load is: 42,000 lb; therefore, there would be the following number of tanker truck loads per year:

2019

c. The transfer hose is assumed to be 8 feet long and 2 inches in diameter.

Therefore, the total volume of the hose is 0.2 ft³.

d. The average composition of the product is:

Chemical	MW	Composition		T			VP at T	
	(lb/lbmol)	(wt%)	(mol%)=(vol%)	C	F	R	(mmHg)	(psi)
acrylonitrile	53.06	0.003%	0.00%	38	100	560	178.2	3.4
styrene	104.15	0.004%	0.00%	38	100	560	13.3	0.3
polymer	200.00	25.80%	7.37%	38	100	560	--	--
water	18.02	71.43%	226.53%	38	100	560	--	--
non-monomer	200.00	2.76%	0.79%	38	100	560	--	--
Average	57.14							

Emissions Calculations:

$$PV = (m/MW)RT$$

$$m = PVMW/RT$$

$$m \text{ (lb/hose)} = \frac{(\text{VP of chemical, psi}) \times [(\text{volume hose, ft}^3/\text{hose}) \times \text{chemical vol}\%] \times (\text{molecular weight of chemical, lb/lb-mol})}{(10.73 \text{ psia} \cdot \text{ft}^3/\text{lb-mol} \cdot ^\circ\text{R}) \times (T, R)}$$

Emissions Summary:

	2019
Tanker Transfers	
Emissions per hose (lb/hose)	
acrylonitrile	1.6E-07
styrene	1.6E-08
Total emissions (lb/yr)	
acrylonitrile	
styrene	
Total VOC	

Daily Emissions

Maximum Daily Production:

=
=
=
=

Average Daily Production:

=
=
=
=



Total Overall Emissions

Chemical	Emissions		
	2019 (ton/yr)	Maximum (lb/day)	Average (lb/day)
acrylonitrile			
styrene			
Total VOC			

Huntsman Advanced Materials Americas, LLC
Akron, OH
Latex Wastewater Treatment System

Pollutant	Potential Emissions (lb/day)							Total (ton/yr)
	Round Sump Emission Point	T-12 Treatment Tank Emission Point	T-14 Filter Feed Tank Emission Point	T-16 Receiver Tank Emission Point	T-15 Separator Tank Emission Point	T-17 Cooling Recirculation Tank Emission Point	Total (lb/day)	
1,3-butadiene	6E-05	8E-04	8E-04	7E-03	3E-03	2E-03	1E-02	2E-03
acrylonitrile	5E-07	1E-05	1E-05	3E-06	3E-06	3E-06	3E-05	6E-06
benzonitrile	1E-07	3E-06	3E-06	5E-07	5E-07	5E-07	7E-06	1E-06
styrene	1E-05	2E-04	2E-04	3E-04	3E-04	3E-04	1E-03	2E-04
Total	7E-05	1E-03	9E-04	7E-03	4E-03	2E-03	1E-02	3E-03

Huntsman Advanced Materials Americas, LLC
Akron, OH
RLP Process (P020)
Maximum Annual VOC Emissions

Basis:

- a. Emissions are based on the quantity of organics to the TOX from the annual mass balance workbooks and the control efficiency of the TOX.
- b. The most recent tested destruction efficiencies for the TOX is:

2015 Destruction Efficiency	Run 1	Run 2	Run 3	Average
TOX	99.9%	99.9%	99.9%	99.9%

- c. Annual (2023) and daily (2023) emissions are based on the following quantity of gases exhausted to the TOX and the tested destruction efficiency.

Constituent	Year	Total (lb/yr)	Max Daily (lb/day)	Ave. Daily (lb/day)
acetone	2023	74,940	619.09	201
acrylonitrile	2023	4,567	14.52	13.4
ADVA - acetone portion	2023	2,800	9.919	8.19
ADVA - acid portion (non-VOC)	2023	1,200	4.251	3.51
1,3-butadiene	2023	300,448	1,382.76	805.9
styrene	2023	0	0	0
anti-oxidant	2023	0	0	0
acrylic acid	2023	0	0	0
triethyl amine	2023	0	3.26	2.4

Emissions Calculations:

Controlled Emissions = (uncontrolled to TOX, lb) x (1 - control efficiency)

Emissions Summary:

Chemical	2023 Annual			2023 Maximum Daily		2023 Average Daily	
	Uncontrolled Process to TOX (lb/yr)	Uncontrolled Process to TOX (ton/yr)	Controlled Emissions (ton/yr)	Uncontrolled Process to TOX (lb/day)	Controlled Emissions (lb/day)	Uncontrolled Process to TOX (lb/day)	Controlled Emissions (lb/day)
acetone	77,740	39	0.04	629.01	0.63	209.19	0.21
acrylonitrile	4,567	2.28	0.002	14.52	0.01	13.40	0.01
1,3-butadiene	300,448	150.22	0.15	1,382.76	1.38	805.90	0.81
styrene	0	0	0.00	0	0.00	0	0.00
triethyl amine	0	0	0.00	3.26	0.003	2.40	0.002
Total VOC		152.51	0.15	1,400.5	1.40	821.7	0.82

Huntsman Advanced Materials Americas, LLC
Akron, OH
RLP Fugitives Summary (P020)

Component Type	Chemical State	Total ⁽¹⁾	TCEQ Uncontrolled SOCMI Fugitive Emission Factors (lb/hr/component) ⁽²⁾	Uncontrolled VOC Emissions (ton/yr)	Uncontrolled HAP Emissions (ton/yr)	Control Efficiency (%) ⁽³⁾	Controlled VOC Emissions (ton/yr)	Controlled HAP Emissions (ton/yr)
Agitators	LL	12	0.0439	0.47	0.38	100%	0	0
Compressors	GV	2	0.5027	4.4	4.4	100%	0	0
Connectors	GV	405	0.0039	2.52	2.32	90%	0.25	0.23
	LL	2,437	0.0005	3.52	3.41		0.35	0.34
	GV	106	0.0039	0.3	0.04	0%	0.3	0.04
	LL	2,070	0.0005	0.55	0.05		0.55	0.05
PRV	GV	2	0.2293	1.06	1	100%	0	0
	LL	31	0.0089	0.85	0.79		0	0
	GV	13	0.2293	8.19	7.85	97%	0.25	0.24
	LL	44	0.0089	1.19	1.17		0.04	0.03
	GV	3	0.2293	0.81	0.14	0%	0.81	0.14
	LL	28	0.0089	0.14	0.02		0.14	0.02
Pumps	GV	1	0.0439	0.01	0.01	100%	0	0
	LL	39	0.0439	3.13	2.42		0	0
Valves	GV	171	0.0132	4.78	4.54	99%	0.05	0.05
	LL	727	0.0089	18.51	17.92		0.19	0.18
	GV	26	0.0132	0.24	0.03	0%	0.24	0.03
	LL	650	0.0089	2.98	0.3		2.98	0.3
Total		6,767	Total	53.66	46.79	Total	6.14	1.65
vinyl cyclohexene				2.59	N/A	vinyl cyclohexene	2.22	N/A
cyclohexene carbonitrile				1.34	N/A	cyclohexene carbonitrile	0.75	N/A
aminoethyl piperazine				2.95	N/A	aminoethyl piperazine	1.52	N/A
1,3-butadiene				33.50		1,3-butadiene	0.87	
acrylonitrile				8.69		acrylonitrile	0.26	
styrene				3.42		styrene	0.06	
hydrogen cyanide				0.49		hydrogen cyanide	0.35	
acrylic acid				8E-04		acrylic acid	2E-05	
triethylamine				0.58		triethylamine	0.02	
acetone cyanohydrin				0.12		acetone cyanohydrin	0.09	

lb VOC/day uncontrolled	lb VOC/day controlled
294.03	33.64

- Component counts by stream and stream composition provided by Huntsman for all components in contact with 0.5% VOC or greater in the stream.
- Emission factors from TCEQ Fugitive Guidance APDG 6422 (<https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/fugitive-guidance.pdf>) Table I – Uncontrolled SOCMI Fugitive Emission Factors, SOCMI without Ethylene (C2). No factors were developed for agitators; guidance instructs to use light liquid pump factors. No factors were developed for liquid relief valves; guidance instructs to use light liquid valve factors.
- Control efficiencies for connectors, gas valves, and light liquid valves and pumps in contact with 5% total HAP or greater calculated based on 5-year actual leak rates and equations from the US EPA Protocol for Equipment Leak Emission Estimates (https://19january2021snapshot.epa.gov/sites/static/files/2020-09/documents/protocol_for_equipment_leak_emission_estimates.pdf). All agitators and pumps are considered leakless. PRVs that vent to the process vent system are considered to be 100% controlled. All other PRVs are assumed to have 97% control based on Table V of the TCEQ guidance for the 28VHP and 28CNTA-level monitoring programs, which are equivalent to MACT Subpart H.

Chemical	2023 Annual			2023 Maximum Daily		2023 Average Daily	
	Uncontrolled Emissions (lb/yr)	Uncontrolled Emissions (ton/yr)	Controlled Emissions (ton/yr)	Uncontrolled Emissions (lb/day)	Controlled Emissions (lb/day)	Uncontrolled Emissions (lb/day)	Controlled Emissions (lb/day)
RLP Equipment Leaks¹							
acrylonitrile	17,382.64	8.7	0.05	47.62	1.44	47.62	1.44
1,3-butadiene	66,994.94	33.5	0.14	183.55	4.75	183.55	4.75
styrene	6,845.20	3.42	0.01	18.75	0.35	18.75	0.35
Total VOC		53.7	0.2	294.03	33.64	294.03	33.64

1. Uncontrolled annual equipment leak emissions are not available (N/A). Actual 2023 annual equipment leaks are calculated in the LDAR program software, LeakDAS, based on the actual number of leaking components in the year.

Huntsman Advanced Materials Americas, LLC
Akron, OH
RLP Process (P020) - Product Loading

Loading Losses

Basis:

- a. Products are loaded into tote and drums by submerged loading into a clean vessel.
- b. Emissions from packaging and loading are estimated using the loading loss equation in AP-42 Section 5.2 "*Transportation and Marketing of Petroleum Liquids*", (06/08)

$$L_L = \text{loading loss equation, lb/1,000 gal liquid loaded} = 12.46 * (SPM/T) * (1 - \text{eff}/100)$$

where:

S = saturation factor (see Table 5.2-1)
P = true vapor pressure of material, psia
M = molecular weight of vapors, lb/lb-mol
T = temperature of material (at ambient conditions), °R
eff = overall reduction efficiency, %

Chemical	MW (lb/lbmol)	Product Throughput (lb/yr)		Notes/Basis
		2023		
acrylonitrile	53.06		0.003%	Assume maximum residual acrylonitrile of 30 ppmw
other non-volatile	200.00		99.997%	
Total				
vapor pressure (mm Hg)		83		Conservative - Vapor pressure of pure acrylonitrile at 20 C
vapor pressure (psia)		1.61		
pump rate (lb/hr)		1,800		Pump rate = 1000-1800 lb/hr
tote size (gal/tote)		250		Packaged into totes and drums only; assume 250 gal tote
(lb/tote)		1,877		
batch duration (hr/batch)		1.04		
density (lb/gal)		7.51		Relative density ~.9 + - .08
throughput (gal/yr)				
S (splash loading: dedicated normal service)		1.45		Assume splash as worst case
P		1.61		
M		200.00		
T (°F)		100		
T (°R)		560		
eff		0		
Loading Loss (L _L) (lb/1,000 gal)		10.36		
acrylonitrile emissions (ton/yr)				

Hose Losses

Basis:

a. Assume during the loading process that a quantity of product equal to the volume of the transfer hose is spilled and the organic components evaporate.

The product can be loaded to a tote or drum. These calculations assume all product is loaded to a drum to estimate worst case emissions.

b. The total drum load is: 413 lb; therefore, there would be the following number of drum loads per year:

2023

c. The transfer hose is assumed to be 8 feet long and 2 inches in diameter.

Therefore, the total volume of the hose is 0.2 ft³.

d. The average composition of the product is:

Chemical	MW	Composition		T			VP at T	
	(lb/lbmol)	(wt%)	(mol%)=(vol%)	C	F	R	(mmHg)	(psi)
acrylonitrile	53.06	0.003%	0.01%	38	100	560	178.2	3.45
polymer	200.00	99.997%	99.99%	38	100	560	--	--
Average	200.00							

Emissions Calculations:

$$PV = (m/MW)RT$$

$$m = PVMW/RT$$

$$m \text{ (lb/hose)} = \frac{(\text{VP of chemical, psi}) \times [(\text{volume hose, ft}^3/\text{hose}) \times \text{chemical vol}\%] \times (\text{molecular weight of chemical, lb/lb-mol})}{(10.73 \text{ psia} \cdot \text{ft}^3/\text{lb-mol} \cdot ^\circ\text{R}) \times (T, R)}$$

Emissions Summary:

	2023
Drum Transfers	
Emissions per hose (lb/hose)	
acrylonitrile	6.0E-07
Total VOC	6.0E-07
Total emissions (lb/yr)	
acrylonitrile	
Total VOC	

Daily Emissions

Maximum Daily Production:

=
=
=
=

Average Daily Production:

=
=
=
=

Total Overall Emissions

Chemical	Emissions		
	2023 (ton/yr)	Maximum Daily (lb/day)	Average Daily (lb/day)
acrylonitrile			
Total VOC			

Huntsman Advanced Materials Americas, LLC
Akron, OH
RLP Process (P020) - Recovered Material Loading

Loading Losses

Basis:

- a. Products are loaded into tank truck by submerged loading into a clean tank with vapor balance.
- b. Emissions from packaging and loading are estimated using the loading loss equation in AP-42 Section 5.2 "Transportation and Marketing of Petroleum Liquids", (06/08)

$$L_L = \text{loading loss equation, lb/1,000 gal liquid loaded} = 12.46 * (SPM/T) * (1 - \text{eff}/100)$$

where:

S = saturation factor (see Table 5.2-1)
P = true vapor pressure of material, psia
M = molecular weight of vapors, lb/lb-mol
T = temperature of material (at ambient conditions), °R
eff = overall reduction efficiency, %

Chemical	MW (lb/lbmol)	Product Throughput (lb/yr)		Notes/Basis
		2023		
butadiene	54.09			
acetone	58.08			
Total				
vapor pressure (mm Hg)		185		Assume Vapor pressure of acetone at 20 C
vapor pressure (psia)		3.58		
pump rate (lb/hr)		1,800		Assume pump rate = 1000-1800 lb/hr
tank truck size (gal/tank truck)				
(lb/tank truck)				
batch duration (hr/batch)		23.33		
density (lb/gal)		6.54		Assume density of acetone
throughput (gal/yr)				
S (splash loading: dedicated normal service)		1.45		Assume splash as worst case
P		3.58		
M		56.71		
T (°F)		100		
T (°R)		559.67		
eff		90%		Conservative control efficiency to account for vapor balance
Loading Loss (L _L) (lb/1,000 gal)		0.66		
OC Emissions (ton/yr)				
VOC Emissions (ton/yr)				
butadiene emissions (ton/yr)				
acetone emissions (ton/yr)				

Hose Losses

Basis:

- a. Assume during the loading process that a quantity of product equal to the volume of the transfer hose is spilled and the organic components evaporate.
- b. The total tanker truck load is: 42,000 lb; therefore, there would be the following number of tanker truck loads per year:

2023

- c. The transfer hose is assumed to be 8 feet long and 2 inches in diameter.

Therefore, the total volume of the hose is 0.2 ft³.

- d. The average composition of the product is:

Chemical	MW (lb/lbmol)	Composition		T			VP at T	
		(wt%)	(mol%)= (vol%)	C	F	R	(mmHg)	(psi)
butadiene	54.09			38	100	560	1,824.0	35.3
acetone	58.08			38	100	560	1,824.0	35.3
Average	56.71							

Emissions Calculations:

$$PV = (m/MW)RT$$

$$m = PVMW/RT$$

$$m \text{ (lb/hose)} = \frac{(VP \text{ of chemical, psi}) \times [(volume \text{ hose, ft}^3/hose) \times chemical \text{ vol}\%] \times (molecular \text{ weight of chemical, lb/lb-mol})}{(10.73 \text{ psia} \cdot ft^3/lb-mol \cdot ^\circ R) \times (T, R)}$$

Emissions Summary:

	2023
Tanker Transfers	
Emissions per hose (lb/hose)	
butadiene	0.02
acetone	4E-02
Total VOC	0.02
Total emissions (lb/yr)	
butadiene	
acetone	
Total VOC	

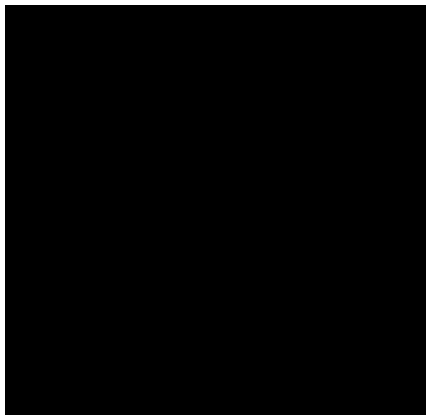
Daily Emissions

Maximum Daily Production:

=
=
=
=
=
=
=

Average Daily Production:

=
=
=
=
=
=
=



Total Overall Emissions

Chemical	Emissions	
	Uncontrolled 2023 (ton/yr)	Controlled 2023 (ton/yr)
butadiene		
acetone		
Total VOC		
Total HAP		

Huntsman Advanced Materials Americas, LLC
Akron, OH
RLP Process (P020) - Dimer Tank Filling

Basis:

a. Dimer is transferred into one of two hazardous waste tanks. One tank is 3,450 gallons and the second tank is 1,100 gallons.

b. Displaced vapors are exhausted to the TOX for control of organics.

The control efficiency of the TOX is 99.9%

c. The maximum composition (wt%) of each component in the waste is used for worst-case emission estimates:

7%	acrylonitrile
70%	acetone
30%	3-cyclohexene-1-carbonitrile
7%	vinylcyclohexene
20%	water

The density of the Dimer is 9.45 lb/gal.

Therefore, the large tank holds 32,617 pounds of waste, which is 0.12 lb waste/lb product.

d. The actual amount transferred in 2023 is:

Year	lb/yr	gal/yr	Quantity Transferred				
			transfers/yr to large tank	Max Daily (lb/day)	Max Daily (transfers/day)	Ave Daily (lb/day)	Ave Daily (transfers/day)
2023	926,017	97,947	28	8,958	1.0	3,408	1

e. Equations for calculating emissions generated from charging a solvent mixture to an empty vessel are presented in the US EPA Emission Inventory Improvement Program, Volume II, Chapter 16 - Methods for Estimating Air Emissions from Chemical Manufacturing Facilities, August 2007.

Emission Calculations:

Vessel Size	3,450	gal
	461.2	ft ³
Batch Size	32,617	lb/tank
Pump-in-rate	50	gal/min
	1.15	hours to fill the large tank
Density	70.7	lb/ft ³

Step 1. Define conditions of displaced gas.

Component	Composition	Batch Component Mass	MW	Convert Mass to Moles	Liquid Mole Fraction	T			P _i @ T	p _i = X _i P _i @ T
	wt%	lb/large tank	lb/lb-mol	mol/tank	Xi	F	C	K	(mm Hg)	(mm Hg)
acrylonitrile	7%	2,283	53.06	43.03	0.05	100	38	311	176.58	8.34
acetone	70%	22,832	58.08	393.11	0.43	100	38	311	388.28	167.61
3-cyclohexene-1-carbonitrile	30%	9,785	107.15	91.32	0.10	100	38	311	1.08	0.11
vinylcyclohexene	7%	2,283	108.18	21.11	0.02	100	38	311	25.58	0.59
water	20%	6,523	18.02	362.10	0.40	100	38	311	49.21	19.57
Totals				910.67						196.22
Air (Residual)										563.78

Component	Antoine's Coefficients log P = A - B/(T+C), p (mm Hg), T (C)			MW
	A	B	C	lb/lb-mol
acrylonitrile	7.4083	1477.2856	248.440	53.06
acetone	7.3174	1315.6735	240.479	58.08
3-cyclohexene-1-carbonitrile	7.7859	2097.9464	232.863	107.15
vinylcyclohexene	6.8051	1438.9827	228.837	108.18
water	8.0557	1723.6425	233.080	18.02

Assumed Antoine's Coefficients for N-methylaniline (100-61-8)

2. Calculate moles/mass of component in saturated vapor.

$$E_{n,i} = p_i \cdot V_{\text{batch}} / R / T_{\text{sys}}$$

Component	p _i = X _i P _i @ T	V _{batch}	R	T _{sys} (T)	E _{n,i}	MW	Uncontrolled Emissions	Controlled Emissions
	(mm Hg)	(ft ³)	(mm Hg ft ³ / lb-mol K)	K	lb-mol / tank	lb/lb-mol	lb/tank	lb/tank
acrylonitrile	8.34	461.2	998.9	310.93	0.012	53.06	0.66	0.00
acetone	167.61	461.2	998.9	310.93	0.2489	58.08	14.46	0.01
3-cyclohexene-1-carbonitrile	0.11	461.2	998.9	310.93	0.0002	107.15	0.02	0.00
vinylcyclohexene	0.59	461.2	998.9	310.93	0.00088	108.18	0.10	0.000
water	19.57	461.2	998.9	310.93	0.0291	18.02	0.52	0.00

Emissions Summary:

Emissions (lb/hr) = (emission rate, lb/tank) / (hours/tank)

Emissions (lb/yr) = (annual tanks filled, tanks/yr) x (emission rate, lb/tank)

Component	Emissions					
	Uncontrolled 2023 (ton/yr)	Controlled 2023 (ton/yr)	Uncontrolled Max Daily (lb/day)	Controlled Max Daily (lb/day)	Uncontrolled Ave Daily (lb/day)	Controlled Ave Daily (lb/day)
acrylonitrile	9E-03	9E-06	0.66	7E-04	0.66	7E-04
acetone	0.21	0.00	14.46	0.01	14.46	0.01
3-cyclohexene-1-carbonitrile	2E-04	2E-07	0.02	2E-05	0.02	2E-05
vinylcyclohexene	1E-03	1E-06	0.10	1E-04	0.10	1E-04
water	7E-03	7E-06	0.52	5E-04	0.52	5E-04
Total VOC	0.01	1E-05	0.77	8E-04	0.77	8E-04

Huntsman Advanced Materials Americas, LLC
Akron, OH
RLP Process (P020) - Dimer into Tank Truck

Loading Losses

Basis:

- a. Products are loaded into tote and drums by submerged loading into a clean vessel.
- b. Emissions from packaging and loading are estimated using the loading loss equation in AP-42 Section 5.2 "Transportation and Marketing of Petroleum Liquids", (06/08)

$$L_L = \text{loading loss equation, lb/1,000 gal liquid loaded} = 12.46 * (SPM/T)^{(1-\text{eff}/100)}$$

where:

S = saturation factor (see Table 5.2-1)
P = true vapor pressure of material, psia
M = molecular weight of vapors, lb/lb-mol
T = temperature of material (at ambient conditions), °R
eff = overall reduction efficiency, %

The ratio of waste to product is 0.01 lb waste/lb product.

Max daily in 2023 (lb/day) 932 which equals no more than 1 truck/day.
Ave daily in 2023 (lb/day) 355 which equals no more than 1 truck/day.

Chemical	MW (lb/lbmol)	Product Throughput (lb/yr)		Notes/Basis
		2023		
acrylonitrile	53.06	64,821	7%	
acetone	58.08	648,212	70%	
3-cyclohexene-1-carbonitrile	107.15	277,805	30%	
vinylcyclohexene	108.18	64,821	7%	
water	18.02	185,203	20%	
Total		926,017		
vapor pressure (mm Hg)		196		Estimated based on mixture composition
vapor pressure (psia)		3.80		
pump rate (lb/hr)		28,363		Transfer rate = 50 gpm
tank truck size (gal/truck)		4,550		Assume load is total of both Dimer tanks
(lb/truck)		43,017		
batch duration (hr/batch)		1.52		
density (lb/gal)		9.45		Relative density ~.9 + - .08
throughput (gal/yr)		97,947		
S (splash loading: dedicated normal service)		1.45		Assume splash as worst case
P		3.80		
M		87.69		
T (°F)		100		
T (°R)		559.67		
eff		95%		Vapors to carbon drum = 95% efficient
Loading Loss (L _L) (lb/1,000 gal)		0.54		controlled
OC Emissions (ton/yr)		3E-02		
VOC Emissions (ton/yr)		0.008		
acrylonitrile emissions (ton/yr)		2E-03		
acetone emissions (ton/yr)		0.02		
3-cyclohexene-1-carbonitrile emissions (ton/yr)		8E-03		
vinylcyclohexene emissions (ton/yr)		2E-03		

Hose Losses

Basis:

a. Assume during the loading process that a quantity of product equal to the volume of the transfer hose is spilled and the organic components evaporate.

b. The total tank truck load is: 43,017 lb; therefore, there would be the following number of tank truck loads per year:

2023
22

c. The transfer hose is assumed to be 8 feet long and 2 inches in diameter.

Therefore, the total volume of the hose is 0.2 ft³.

d. The average composition of the product is:

Chemical	MW	Composition		T			VP at T	
	(lb/lbmol)	(wt%)	(mol%)=(vol%)	C	F	R	(mmHg)	(psi)
acrylonitrile	53.06	7%	12%	38	100	560	178.2	3.45
acetone	58.08	70%	106%	38	100	560	391.7	7.58
3-cyclohexene-1-carbonitrile	107.15	30%	25%	38	100	560	1.1	0.02
vinylcyclohexene	108.18	7%	6%	38	100	560	25.8	0.50
water	18.02	20%	97%	38	100	560	--	--
Average	87.69							

Emissions Calculations:

$$PV = (m/MW)RT$$

$$m = PVMW/RT$$

$$m \text{ (lb/hose)} = \frac{(\text{VP of chemical, psi}) \times [(\text{volume hose, ft}^3/\text{hose}) \times \text{chemical vol}\%] \times (\text{molecular weight of chemical, lb/lb-mol})}{(10.73 \text{ psia} \cdot \text{ft}^3/\text{lb-mol} \cdot ^\circ\text{R}) \times (T, R)}$$

Emissions Summary:

	2023
Tank Truck Transfers	22
Emissions per hose (lb/hose)	
acrylonitrile	6.1E-04
acetone	1.4E-02
3-cyclohexene-1-carbonitrile	1.6E-05
vinylcyclohexene	8.9E-05
Total VOC	7.2E-04
Total emissions (lb/yr)	
acrylonitrile	1E-02
acetone	3E-01
3-cyclohexene-1-carbonitrile	3E-04
vinylcyclohexene	2E-03
Total VOC	2E-02

Total Overall Emissions

Component	Emissions					
	Uncontrolled 2023 (ton/yr)	Controlled 2023 (ton/yr)	Uncontrolled Max Daily (lb/day)	Controlled Max Daily (lb/day)	Uncontrolled Ave Daily (lb/day)	Controlled Ave Daily (lb/day)
acrylonitrile	0.04	2E-03	0.07	0.004	0.03	0.002
acetone	0.37	0.02	0.76	0.05	0.30	0.03
3-cyclohexene-1-carbonitrile	0.16	8E-03	0.32	0.02	0.12	0.01
vinylcyclohexene	0.04	2E-03	0.07	0.004	0.03	0.002
Total VOC	0.23	0.01	0.47	0.02	0.18	0.01

Huntsman Advanced Materials Americas, LLC
Akron, OH
RLP Wastewater Treatment System

Pollutant	Potential Emissions (lb/day)				Total (ton/yr)
	2k Sump Emission point	Interceptor Sump Emission Point	10k Sump Emission Point	Total	
acrylonitrile	4E-05	2E-04	4E-04	7E-04	3E-07
benzonitrile	4E-07	2E-06	4E-06	7E-06	3E-09
1,3-butadiene	8E-06	4E-05	1E-04	1E-04	7E-08
styrene	1E-06	8E-06	2E-05	3E-05	1E-08
Total	5E-05	2E-04	6E-04	9E-04	4E-07

Attachment D: RBLC Summary Table



Table D-1: RBLC Summary Table

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
*LA-0403	Shintech Louisiana, LLC - Shintech Plaquemine Plant 4	LA	2821	12/16/2024	Vinyl chloride monomer (VCM) manufacturing facility that will also produce intermediate products, chlorine and caustic soda (NaOH) as coproducts, and ethylene dichloride (EDC).	Intermediate, By-product, and Wastewater Storage Tanks		Thermal oxidizer		BACT-PSD; Operating Permit
						Acidic Washing Water and Caustic Washing Water from Direct Chlorination	Comply with 40 CFR 63 Subpart G	Thermal oxidizer	95	BACT-PSD; Operating Permit
						By-Product Wastewater from OHC Train 1, 2, 3, and 4	Comply with 40 CFR 61 Subpart F and 40 CFR 63 Subpart G	Thermal oxidizer	95	BACT-PSD; Operating Permit
						Gas Thermal Oxidizer	Good combustion practices			BACT-PSD; Operating Permit
						By-Product Tank Loading Racks		Thermal oxidizer		BACT-PSD; Operating Permit
						Bio Fugitive Emissions	Maintain the concentration of pollutants in the wastewater pits below the thresholds for a Group 1 wastewater stream as defined in 40 CFR 63.101			BACT-PSD; Operating Permit
						VCM Unit Fugitive Emissions	Compliance with 40 CFR 63 Subpart H	LDAR		BACT-PSD; Operating Permit
*LA-0406	Mitsubishi Chemical America, Inc. - Geismar Site	LA	2821	7/24/2024	A new 385,000 tons/year MMA Production facility.	Equipment Leaks	LDAR TCEQ28 and 40 CFR 63 Subpart H	LDAR		BACT-PSD
						Process Vents	Closed vent system followed by combustion devices			BACT-PSD
						Storage Tanks	Equip with fixed roofs			BACT-PSD
						Storage Tanks	Equip with fixed roofs	Closed vent system followed by (1) thermal oxidizers and scrubber or (2) flare.		BACT-PSD

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
*PA-0342	Braskem Amer Inc. - Marcus Hook	PA	2821	9/13/2025		102A, Plant 1 Polypropylene Manufacturing Sources		Flare	98	RACT; Operating Permit
						102B, Plant 1 Polypropylene Manufacturing Sources		Flare	98	RACT; Operating Permit
						Propylene splitter Process & Cavern 4		Flare	98	RACT; New Source Performance Standards (NSPS)
						Propylene Unloading Rack		Flare	98	RACT; NSPS
*TX-0944	Formosa Plastics Corporation - Point Comfort Plant - OLI, OLII, GHU, PPU, FRAC-II	TX	2821	11/24/2025	Olefins I, Olefins II, Gasoline Hydrotreater Unit, Propylene Purification Unit, and Natural Gas Liquids Fractionation Units modified by the Flare Improvement Project	Process Vents		Multiple Flares cross-piped. Includes new Enclosed Ground Flares	98	BACT-PSD; NSPS, Maximum Achievable Control Technology (MACT), Operating Permit
						Storage Tanks				BACT-PSD; NSPS, MACT, Operating Permit
*TX-0946	Formosa Plastics Corporation - Point Comfort Plant - PPI	TX	2821	11/24/2025	Polypropylene Plant I's Flare Improvement Project involves changes to the elevated flare and construction of four new low pressure enclosed ground flares.	Process Vents PPI	Controlled by existing elevated flares and cross piping with new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
*TX-0947	Formosa Plastics Corporation - Point Comfort Plant - PPII	TX	2821	11/24/2025	Polypropylene Plant II's Flare Improvement Project involves changes to the elevated flare and construction of four new low pressure enclosed ground flares.	Process Vents PPII	Controlled by existing elevated flares and cross piping with new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
						Fugitives	28 VHP	LDAR		BACT-PSD; NSPS, MACT, Operating Permit
						Storage Tanks PPII	Controlled by existing elevated flares and cross piping with new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
*TX-0948	Formosa Plastics Corporation - Point Comfort Plant - HDPE I	TX	2821	11/24/2025	The High Density Polyethylene Plant I's Flare Improvement Project involves changes to the elevated flare and construction of four new low pressure enclosed ground flares.	PROCESS VENTS HDPE I	Controlled by existing elevated flares and cross piping with new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
*TX-0949	Formosa Plastics Corporation - Point Comfort Plant - LLDPE	TX	2821	11/24/2025	The Linear Low Density Polyethylene Plant Flare Improvement Project involves changes to the elevated flare and construction of four new low pressure enclosed ground flares.	LLDPE Process Vents	Controlled by existing elevated flares and cross piping with new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
						Fugitives	28 VHP	LDAR		BACT-PSD; NSPS, MACT, Operating Permit
						Storage Tanks	Controlled by existing elevated flares and new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
*TX-0950	Formosa Plastics Corporation - Point Comfort Plant - HDPE II	TX	2821	11/24/2025	The High Density Polyethylene II plant's Flare Improvement Project involves changes to the elevated flare, construction of four new low pressure enclosed ground flares to comply with the EPA Residual Risk and Technology Review rulemakings, additional fugitive components, update the malfunction, startup, and shutdown (MSS) flaring emissions and establish emission caps for the flares.	HDPE II PROCESS VENTS	Controlled by existing elevated flares and cross piping with new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
						Fugitives	28 VHP	LDAR		BACT-PSD
						Storage Tanks	Controlled by existing elevated flares and cross piping with new enclosed ground flares		98	BACT-PSD; NSPS, MACT, Operating Permit
*TX-0951	Formosa Plastics Corporation - Point Comfort Plant - UT3	TX	2821	11/24/2025	The UT3 plant Flare Improvement Project involves changes to the elevated flare, construction of four new low pressure enclosed ground flares to comply with the EPA Residual Risk and Technology Review rulemakings, additional fugitive components, update the MSS flaring emissions and establish emission caps for the flares.	PROCESS VENTS UT3	Controlled by existing elevated flares and cross piping with new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
						Fugitives	28 VHP	LDAR		BACT-PSD; NSPS, MACT, Operating Permit

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
*TX-0952	Formosa Plastics Corporation - Point Comfort Plant	TX	2821	11/24/2025	The Traffic Facility is the storage and loading/unloading operating for the production units at the site. The Flare Improvement Project involves changes to the elevated flare, construction of four new low pressure enclosed ground flares to comply with the EPA Residual Risk and Technology Review rulemakings, additional fugitive components, update the MSS flaring emissions and establish emission caps for the flares.	Storage Tanks	Controlled by existing elevated flares and new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
						TRANSFER RACKS	Controlled by existing elevated flares and new enclosed ground flares	Flares	98	BACT-PSD; NSPS, MACT, Operating Permit
IN-0345	Evonik Corporation Tippecanoe Laboratories	IN	2833	12/17/2021	Bulk Chemical Manufacturing	Prod. Ops. - Process Vents		RTO	98	BACT-PSD; NSPS, NESHAP
						Support Ops. - Solv. Rec. Process Vents		RTO	98	BACT-PSD; NSPS, NESHAP
						Support Ops - Storage Tanks		RTO	98	BACT-PSD; NSPS, NESHAP
						Support Ops. - Indiv. Drain Systems		RTO or direct incineration	98	BACT-PSD; NSPS, NESHAP
						Support Ops - Waste Containers	Work practices and inspections			BACT-PSD; NSPS, NESHAP, MACT
						Equipment Leaks/Fugitive	Monthly sensory based monitoring			BACT-PSD; NSPS, NESHAP
KY-0112	Westlake Vinyls, Inc. - PVC Plant	KY	2821	11/13/2020			LDAR Program - Leak is defined as reading of 500ppmv; BACT includes proper labeling and following the requirements in 40 CFR 63, Subpart UU and following good work practices	LDAR		BACT-PSD; MACT

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
LA-0295	EQUISTAR CHEMICALS, LP - WESTLAKE FACILITY	LA	2821	7/12/2016	Polypropylene manufacturing facility	Facility Fugitive Emissions (FUG 4)	Leak detection and repair (LDAR): LAC 33:III.2122	LDAR		BACT-PSD; Operating Permit, NSPS
						Bulk Storage Vents	Good design and operating practices. Vents are subject to 40 CFR 60 Subpart DDD; 0.01 lb/hr (hourly max)			BACT-PSD; Operating Permit, NSPS
LA-0339	Shintech Louisiana, LLC - Plaquemines Plant 3	LA	2821	1/19/2021	Construct a PVC production unit (PVC-2 Unit) at the Shintech Plaquemine Plant 3	Scrubbers	Steam stripper; 89.8 ppm			BACT-PSD
						Thermal Oxidizers	Good combustion practices; 99.9 % DRE			BACT-PSD
						Reactors	Compliance with 40 CFR 60 Subpart HHHHHHHH			BACT-PSD
						Fugitives (FUG0021)	Compliance with 40 CFR 60 Subpart HHHHHHHH			BACT-PSD
LA-0379	Shintech Louisiana, LLC - Plaquemines Plant 1	LA	2821	5/4/2021	Shintech Plaquemine Plant 1 (SPP-1) is a vertically integrated polyvinyl chloride (PVC) manufacturing facility that also produces intermediate products, including chlorine (and caustic soda (NaOH) as a byproduct), ethylene dichloride (EDC), and vinyl chloride monomer (VCM). Process units include a Chlor-Alkali unit (C/A Unit), a VCM Unit, and a PVC Unit.	Scrubber C	Wet scrubber; 10.42 lb/hr Comply with 40 CFR 63 Subpart HHHHHHHH.			BACT-PSD; NESHAP
						PVC Unit Fugitive Emissions 2	Comply with 40 CFR 63 Subpart H			BACT-PSD; NESHAP
LA-0389	Shintech Louisiana, LLC - Plaquemines Plant 3	LA	2821	10/20/2022	Shintech Plaquemine Plant 3 (SPP-3) is designed as a vertically integrated polyvinyl chloride (PVC) and vinyl chloride monomer (VCM) manufacturing facility that also produces intermediate products, including chlorine (and caustic soda (NaOH) as a byproduct) and ethylene dichloride (EDC).	Boiler C and D	Good combustion practices			BACT-PSD; Operating Permit
						Hydrochloric Acid Production Furnace	Good combustion practices			BACT-PSD; Operating Permit
						Storage Tanks				BACT-PSD; Operating Permit
						2P-16 - Reactors	Compliance with 40 CFR 63 Subpart HHHHHHHH			BACT-PSD; Operating Permit
						Measuring Tanks				BACT-PSD; Operating Permit
						Make-up Tank				BACT-PSD; Operating Permit
						VCM Unit Fugitive Emissions	Compliance with 40 CFR 63 Subpart H	LDAR		BACT-PSD; NESHAP, Operating Permit
						VCM Unit Fugitive Emissions	Compliance with 40 CFR 63 Subpart F	LDAR		BACT-PSD; NESHAP, Operating Permit

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
						Fugitive Emission (Bio)	Compliance with 40 CFR 63 Subpart H	LDAR		BACT-PSD; NESHAP, Operating Permit
						PVC Unit Fugitive Emissions	Compliance with 40 CFR 63 Subpart HHHHHHH			BACT-PSD; NESHAP, Operating Permit
						Gas Thermal Oxidizer CAP				BACT-PSD; Operating Permit
						Gas Thermal Oxidizer A and B	Good operating practices.			BACT-PSD; Operating Permit
SC-0182	FIBER INDUSTRIES LLC	SC	2821	10/31/2017	The facility manufacture Polyethylene Terephthalate (PET)	Wastewater Treatment Plant	Proper operation and maintenance of process and control device (steam stripper) to maintain low VOC concentration entering WWTP			BACT-PSD
						Monomer Plants and Polymerization Lines	Vapor Phase Destruction System consisting of three boilers and 3 process heaters			BACT-PSD; NESHAP
						Process Vents	Compliance with 40 CFR 63.1315 and Good Work Practice			BACT-PSD; NESHAP
						Storage tanks	Proper Tank Design, Operation, and Maintenance			BACT-PSD
						Spinning Lines	Low-VOC content finishing materials and good work practices. Maintenance of tanks at a constant volume and temperature.			BACT-PSD
						Staple Finishing Lines	Low-VOC content finishing materials and good work practices. Maintenance of tanks at a constant volume and temperature.			BACT-PSD
						Fugitives	Use of leakless types of components to replace individual chronically leaking components where possible	LDAR		BACT-PSD; NESHAP
						Die Head Cleaning	Good Work Practices. Ovens and Heaters for cleaning residues			BACT-PSD
TX-0784	Equistar Chemicals, LP - LB-1 Polyethylene Unit	TX	2821	2/19/2016	Polyethylene production unit	Polyethylene Production	Flare combusting waste gas and natural gas; Subparts A, DDD, & VVa; Chapter 115, Subchapter H. The flare is expected to achieve VOC destruction efficiency of at least 99 percent for compounds up to 3 carbons, and at least 98 percent for all other compounds.	Flare	98	LAER; SIP, NSPS

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
TX-0793	Equistar Chemicals, LP - Bayport Polypropylene Plant	TX	2821	4/4/2016	Polypropylene Production Units	Polypropylene Production Units (Polymerization)	The flares are expected to achieve a VOC destruction efficiency of at least 99% (as previously permitted raw materials have three or fewer carbons). Flares are approved as control devices due to the VOC concentration, together with the variability in flow rate and composition; A, DDD, VV; Chapter 115, Subchapter H.	Flare	99	LAER; NSPS
TX-0804	INVISTA S.A R.L. - ADN UNIT	TX	2821	7/15/2016	Invista is amending the permit to allow for the following changes: Improvement of the distributed control system and implementation of advanced process controls for the adiponitrile (ADN) unit and reliability, availability, and efficiency improvements, including equipment replacement among other things	Equipment Leak Fugitives	LDAR program (TCEQ 28VHP).	LDAR		BACT-PSD; SIP
						Storage Tanks 10TFX022 and 10TFX057	Flare	Flare	98	BACT-PSD; SIP
TX-0813	Rextac, LLC - Odessa Petrochemical Plant	TX	2821	11/22/2016	Petrochemical Manufacturing Facility	FUGITIVES	Quarterly instrumental monitoring of accessible pumps, compressors and valves in vapor or light liquid service, with leak definitions of 500 ppmv (valves) and 2,000 ppmv (pump and compressor seals). Upon detection of a leak, a first attempt to repair must be made within 5 days, and repairs must be completed within 15 days.	LDAR		BACT-PSD; NSPS
							NSPS DDD			
							Emissions minimized by limited venting, and waste stream controlled by flare. The flare must conform to 40 CFR Â§ 60.18 requirements. Vent stream composition and flow must be continuously monitored to demonstrate compliance.	Flare	98	BACT-PSD; NSPS
							NSPS DDD			
TX-0888	CHEVRON PHILLIPS CHEMICAL COMPANY LP - ORANGE	TX	2821	4/23/2020	An initial new source review (NSR), PSD, and greenhouse gas (GHG) project to construct and operate an Olefins Unit, two Polyethylene (PE) Units, and auxiliary support facilities. This permit will consist of furnaces, boilers, heaters, storage tanks, emergency engines, fugitive piping,	FUGITIVE COMPONENTS	28 VHP, 28CNTA, 28PI leak detection and repair (LDAR) programs	LDAR		BACT-PSD; NSPS, NESHAP
							NSPS VVa			
							NESHAP J & V			

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
	POLYETHYLENE PLANT				thermal oxidizers, flares, cooling towers, wastewater treatment plant, loadout facilities, miscellaneous auxiliary support facilities, and associated MSS.	Ethylene Treater Regeneration Vents & Process Vents	Route emission back into the process or to flares. Any uncontrolled venting to the atmosphere will be limited to 20 ppmv of VOC.20 ppmv uncontrolled; MACT FFFF.	Process/flare	98	BACT-PSD; MACT
						WASTEWATER TREATMENT PLANT	Best management practices for capture and prevention			BACT-PSD
						TRUCK LOADING	Loading of vapors with vapor pressures less than 0.5 psia will be vented to atmosphere. Loading of vapors with vapor pressures greater than 0.5 psia will be routed to the flares for control with a 98.7% capture efficiency and 98% DRE.	Flare	98	BACT-PSD; NSPS
						Polyethylene Product Residual Filters, Pellet Dewatering Dryers, and Pellet Loading, Process Vents	Limiting amount of VOC per million pounds of pellets; Extruder vent emissions will be controlled using two thermal oxidizers; NSPS DDD, NNN,RRR; MACT FFFF	Thermal oxidizers	99.9	BACT-PSD
TX-0901	Equistar Chemicals, LP - EQUISTAR CHEMICALS LA PORTE COMPLEX	TX	2821	11/6/2020	Authorize retrospective increases to the emission routed to the LB-1 Flare and to authorize future increases of additional supplemental natural gas to the LB-1 Flare to meet a potential EPA consent decree	Process Vents (EPN: LBFLARE)	Flare - 99% DRE for all VOC up to three carbons and 98% DRE for all other VOCs	Flare	98	LAER; NSPS, MACT
						MSS Vessel Clearing to Atmosphere	Best practices. Purging/clearing with nitrogen to boiler or flare control, then venting of VOC at a concentration of no more than 10,000 ppmv.			LAER; NSPS, MACT, SIP
TX-0929	Formosa Plastics Corporation - Point Comfort Plant	TX	2821	10/15/2021	As-built design specifications for the PE3 Plant which includes updates to previously authorized emission sources. The changes to VOC emissions in the project are: • create downstream pellet handling annual VOC CAP in the Table 1a and MAERT (EPNs: PE3-07, PE3-08A, PE3-08B, PE3-02A, and PE3-02B) • revise fugitive component counts ; • revise fugitive component connector monitoring option to annual (TCEQ CNTA) program.	PROCESS VENTS				BACT-PSD; NSPS, MACT
						PROCESS VENTS				BACT-PSD
						SITE WIDE EQUIPMENT MSS	Temporary Flare for MSS Emissions.		98	BACT-PSD; NSPS, MACT
						Polyethylene 3 (PE3) Unit		Flare and thermal oxidizers	98	BACT-PSD; NSPS, MACT

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
TX-0945	Formosa Plastics Corporation - Point Comfort Plant OL3	TX	2821	4/6/2023	Olefins 3 Flare Improvement Project involves changes to the elevated flare, construction of four new low pressure enclosed ground flares to comply with the EPA Residual Risk and Technology Review rulemakings, additional fugitive components, update the MSS flaring emissions and establish emission caps for the flares.	PROCESS VENTS OL3	Controlled by existing elevated flares and cross piping with new enclosed ground flares	Flare	98	BACT-PSD; NSPS, MACT, Operating Permit
						FUGITIVES	28 VHP LDAR	LDAR		BACT-PSD; NSPS, MACT, Operating Permit
						STORAGE TANKS	Controlled by existing elevated flares and cross piping new enclosed ground flares	Flare	98	BACT-PSD; NSPS, MACT, Operating Permit
TX-0962	Formosa Plastics Corporation - Point Comfort Plant	TX	2821	9/22/2023	construct and operate a new Hexene Plant under Permit 170552 at the existing FPC TX Complex. The Hexene Plant includes various storage tanks, truck and railcar loading, drum and container loading, an emergency engine, piping fugitives, and a thermal oxidizer.	Hexene Plant reactor	THERMAL OXIDIZER OR FLARE	TO or flare	98	BACT-PSD
						Hexene Plant distillation columns	THERMAL OXIDIZER OR FLARE	TO or flare	98	BACT-PSD
						Triethylaluminum (TEA) catalyst handling	The TEA catalyst preparation drum vents to a mineral oil seal drum to dissolve the displaced TEA catalyst vapors and protect it from contacting moisture in the air. Good air pollution prevention practices and safe operating practices are used.			BACT-PSD
						Process Equipment Openings for MSS activities	Equipment is degassed to a flare or thermal oxidizer until VOC concentration in the equipment is 10,000 ppmv VOC or 10% of the LEL of the representative compound.	TO or flare		BACT-PSD
						Fixed roof storage tanks	Bottom fill, exterior surfaces are painted white. All tanks are routed to control (thermal oxidizer or flare).	TO or flare	98	BACT-PSD
						Plant tank openings for MSS activities	Equipment is degassed to a flare or thermal oxidizer until VOC concentration in the equipment is 10,000 ppmv VOC or 10% of the LEL of the representative compound.	TO or flare	98	BACT-PSD
						Tank truck loading	Submerged loading.	Flare	98	BACT-PSD
						Hexene railcar loading	Submerged loading.	Flare	98	BACT-PSD

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
						Polyethylene wax loading and cooling	Polyethylene wax must be heated to facilitate flow into drums. Splash loading is used due to viscous, low VOC vapor pressure material (less than 0.01 psia). Containers are cooled and covered as soon as practicable to minimize emissions.			BACT-PSD
TX-0965	CHEVRON PHILLIPS CHEMICAL COMPANY LP - ORANGE PLANT	TX	2821	12/29/2023	Construct an ethylene derivative unit at an existing polyethylene production facility, including associated storage, unloading, loading, piping fugitives, and misc. auxiliary equipment required for the production, with additional waste gas sent to the flare.	FUGITIVES	28VHP & 28CNTA LDAR	LDAR		BACT-PSD; NSPS, MACT, SIP
						PROCESS VENTS	Flare is used for VOC control of process vents, meets 60.18	Flare	98	BACT-PSD; NSPS, MACT, SIP
						PROCESS VENTS MSS	Equipment containing VOC with a vapor pressure of 0.5 psia or greater will be purged to the flare until the concentration in the equipment vapor space is reduced to either 10% of the LEL or 10,000 ppmv prior to opening to the atmosphere.	Flare	98	BACT-PSD; NSPS, MACT, SIP
						Internal Floating Roof Storage Tank	Equipped with a submerged fill pipe. For MSS, the tanks will be routed to control while degassing. The control must be maintained until the VOC concentration is less than 10,000 ppmv VOC.	Flare	98	BACT-PSD; NSPS, MACT, SIP
						Fixed Roof Storage Tanks	Store materials with vapor pressures below 0.5 psia. The tanks will be equipped with a submerged fill pipe and the uninsulated exterior surfaces will be painted white. For MSS, the liquid will be sent to a covered vessel for draining. The vapor stream will be controlled until there is no standing liquid or the VOC vapor pressure is less than 0.02 psia.			BACT-PSD; NSPS, MACT, SIP
						RAILCAR LOADING	Material that has a vapor pressure below 0.5 psia. Loading will be conducted via submerged fill.			BACT-PSD; NSPS, MACT, SIP

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
						TRUCK LOADING	Conducted via submerged fill. The material that has a vapor pressure of less than 0.5 psia, will be uncontrolled. For material with a vapor pressure of 0.5 psia or greater, the emissions will be routed to the flare (EPN 58) with a 99.2% collection efficiency and 98% destruction efficiency. Leak testing of tank trucks in accordance with 40 CFR Part 63, Subpart R is required.	Flare	98	BACT-PSD; NSPS, MACT, SIP
TX-0966	Equistar Chemicals, LP - Equistar Laporte Complex	TX	2821	11/14/2023	Changes to the LB-1 process unit based on actual construction and operation, including increasing the waste gas flow to the LB-1 Flare (EPN LBFLARE) and updates to fugitive piping component counts (EPN LBFUG).	RAW MATERIAL VESSEL VENTS	Waste streams are preferentially routed to the site utility boilers as fuel rather than to the LB-I Flare. The LB-1 Flare will be used to control routine waste streams during times of boiler outage or unavailability and when the streams cannot be recycled from polyethylene production. The boilers achieve 99.97% control of VOC in the fuel streams.	Boilers/flare	98	LAER; NSPS
						REGENERATION VENTS	Waste streams are preferentially routed to the site utility boilers as fuel rather than to the LB-I Flare. The LB-1 Flare will be used to control routine waste streams during times of boiler outage or unavailability and when the streams cannot be recycled from polyethylene production. The boilers achieve 99.97% control of VOC in the fuel streams.	Boilers/flare	98	LAER; NSPS
						DEGASSING PROCESS STREAMS	Waste streams are preferentially routed to the site utility boilers as fuel rather than to the LB-I Flare. The LB-1 Flare will be used to control routine waste streams during times of boiler outage or unavailability and when the streams cannot be recycled from polyethylene production. The boilers achieve 99.97% control of VOC in the fuel streams.	Boilers/flare	98	LAER

RBLC ID	Facility Name	Facility State	SIC Code	Permit Issuance Date	Facility Description	Process Name	Control Note	Control Method	% Efficiency	Basis; Other Applicable Requirements
						LARGE EQUIPMENT AND VESSEL PURGING	Waste streams are preferentially routed to the site utility boilers as fuel rather than to the LB-1 Flare. The LB-1 Flare will be used to control routine waste streams during times of boiler outage or unavailability and when the streams cannot be recycled from polyethylene production. The boilers achieve 99.97% control of VOC in the fuel streams. Equipment is purged with nitrogen, isolated, and the VOC concentration is reduced to less than 10,000 ppmv before the equipment is opened to the atmosphere.		98	LAER

Public Notice
Ohio Environmental Protection Agency
Draft State Implementation Plan
VOC Reasonably Available Control Technology (RACT)
for Huntsman Advanced Materials Americas, LLC (Facility ID 1677010029)

Summit County

Notice is hereby given that the Director of the Ohio Environmental Protection Agency, (Ohio EPA) is submitting to the United States Environmental Protection Agency (U.S. EPA) Reasonably Available Control Technology (RACT) for Huntsman Advanced Materials Americas, LLC (Facility ID 1677010029) for approval into Ohio's state implementation plan (SIP) for the 2015 ozone National Ambient Air Quality Standard (NAAQS).

On March 17, 2025, Ohio submitted a revision to Ohio's SIP to address RACT requirements for the 2015 8-hour ozone NAAQS. As noted in this submittal, OAC rule 3745-21-11(B) requires facilities that have the potential to emit of fifty tons per year or more, but less than one hundred tons per year of volatile organic compounds (VOC) and are located in nonattainment counties to submit a RACT study for sources not controlled by Ohio's CTG regulations in OAC Chapter 3745-21 or by categorical non-CTG RACT in OAC rules 3745-21-12, 3745-21-14, 3745-21-16, 3745-21-21 and 3745-21-25.

Ohio is now submitting source-specific VOC RACT for Huntsman Advanced Materials Americas, LLC (Facility ID 1677010029) for approval into Ohio's SIP. This facility is located in the Cleveland 2015 ozone maintenance area and has no prior existing source-specific RACT established in OAC rule 3745-21-09.

The updated RACT Study was submitted per OAC rule 3745-21-11(B). Ohio has determined that the updated RACT study, along with supplemental information submitted subsequently, is sufficient to justify capturing and venting VOCs from the latex process (P007) to a control device (boiler) that achieves 99% control (with a backup device at 93% control) and capturing and venting VOCs for their RLP process (P020) to a control device that achieves 99% control as RACT under the 2015 ozone standard.

Ohio EPA is now requesting approval of the proposed RACT for Huntsman Advanced Materials Americas, LLC into Ohio's SIP.

Ohio EPA is seeking public comment to satisfy U.S. EPA requirements for public involvement in SIP related activities in accordance with 40 CFR 51.102.

The public comment period will run until November 2, 2026. Written comments should be submitted at: <https://ohioepa.commentinput.com> - Search by entering the permit #'s

(P0140979 for P007 and P0140980 for P020 for Huntsman Advanced Materials Americas, LLC) in the "Search Projects" search box.

A public hearing on this action may be requested by contacting Kathryn Jobe at 614-728-0671 or kathryn.jobe@epa.ohio.gov no later than 30 days from the draft public notice. If a public hearing is requested, a new notification will be published to identify the time and location of the public hearing. The public hearing will be held at least 30 days after the date of the new notification.

All interested persons are entitled to comment on these changes. All comments submitted to the above address by the close of business 30 days from when the draft public notice is issued will be considered by Ohio EPA prior to final action on this action. Written statements submitted after this time period may be considered as time and circumstances permit but will not be part of the official record.

Questions or comments about this document should be directed to Kathryn Jobe at 614-728-0671 or kathryn.jobe@epa.ohio.gov.



DATE

Ms. Anne Vogel
Regional Administrator
U.S. EPA, Region 5
77 West Jackson Blvd.
Chicago, Illinois 60604

Re: Revision to Ohio's Reasonably Available Control Technology (RACT) State Implementation Plan for the 2015 Ozone National Ambient Air Quality Standards – Source-Specific Volatile Organic Compounds (VOC) RACT for Huntsman Advanced Materials Americas, LLC (Facility ID 1677010029)

Dear Administrator Vogel:

On March 17, 2025, Ohio submitted a revision to Ohio's State Implementation Plan (SIP) to address Reasonably Available Control Technology (RACT) requirements for the 2015 8-hour ozone National Ambient Air Quality Standards (NAAQS) for areas classified as serious. As noted in this submittal, Ohio EPA adopted requirements in OAC rule 3745-21-11 for facilities in the nonattainment areas that emit fifty tons per year or more, but less than one hundred tons per year of VOC from sources not controlled by Ohio's CTG regulations in OAC Chapter 3745-21 or by categorical non-CTG RACT in OAC rules 3745-21-12, 3745-21-14, 3745-21-16, 3745-21-21 and 3745-21-25 to submit an updated RACT study within one year of the effective date of the rule. Upon review of the RACT study, Ohio EPA evaluated if the RACT proposed by the facility is appropriate to satisfy RACT requirements under the 2015 ozone standard.

Ohio is now submitting source-specific VOC RACT for Huntsman Advanced Materials Americas, LLC (Facility ID 1677010029) for approval into Ohio's SIP. This facility is located in the Cleveland 2015 ozone maintenance area and has no prior existing source-specific RACT established in OAC rule 3745-21-09.

The updated VOC RACT Study was submitted per OAC rule 3745-21-11. Ohio has determined that the updated RACT study, along with supplemental information submitted subsequently, is sufficient to justify capturing and venting VOCs from the latex process (P007) to a control device (boiler) that achieves 99% control (with a backup device at 93% control) and capturing and venting VOCs for their RLP process (P020) to a control device that achieves 99% control as RACT under the 2015 ozone standard. In addition, both processes will implement a leak detection and repair program. The RACT

study is provided in Appendix A, and the permit that incorporated RACT is provided as Appendix B. Within the permit, we have highlighted the terms and conditions associated with RACT and request only those provisions are subject to this SIP revision request. Appendix C provides the permit strategy write-up for the permit.

Ohio held a public comment period on Ohio's RACT determination from October 1 to November 2, 2026. Appendix D contains the public notice. ***[Ohio's response to comments received during the public comment period is in Appendix E/No comments were received during the public comment period].***

This SIP does not include the relaxation of any existing requirements and therefore will not interfere with the attainment or maintenance of the NAAQS in accordance with section 110(l) of the CAA.

Ohio EPA is now requesting approval of the proposed RACT for Huntsman Advanced Materials Americas, LLC into Ohio's SIP.

Ohio EPA is submitting this SIP via U.S. EPA's State Planning Electronic Collaboration System (SPECS). If you have questions, please contact Jennifer Van Vlerah in our Division of Air Pollution Control at (614) 644-3696.

Sincerely,

John Logue
Director

Cc: Bob Hodanbosi, Chief, Division of Air Pollution Control, Ohio EPA

Enclosures