

June 30, 2025

Doug Frisco
Environmental Manager
Via Email: doug.frisco@energytransfer.com
101 Technology Drive
Pittsburgh, PA 15275-1005

Re: OP-63-01001
ETC Northeast Pipeline, LLC
Revolution Cryogenic Processing Plant
Smith Township
Washington County

Dear Doug Frisco:

Enclosed please find the initial natural minor state-only operating permit for ETC Northeast Pipeline, LLC's Revolution Cryogenic Processing Plant located in Smith Township, Washington County. This operating permit was issued on June 30, 2025, becomes effective on July 14, 2025, and will expire on June 30, 2030. All monitoring, record keeping, and reporting requirements shall begin on the effective date (July 14, 2025). Please reference the permit number above with any correspondence to the Department concerning this operating permit.

Please be advised that any changes in the name, address, phone number, permit contact, responsible official or similar administrative change during the term of the permit requires an administrative operating permit amendment to be filed to revise the operating permit. All administrative amendments require a fee of \$1,500.00 and must be signed by a Responsible Official.

This authorization does not relieve the applicant from applying for and obtaining any additional permits or approvals from local, state, or federal agencies required for this project. Please be advised that if any other permits are required for this project, they must be issued prior to undertaking the activities described in the permit application. Issuance of the enclosed permit(s) does not indicate an affirmative action on any other pending or future permit applications. If you are uncertain as to whether or not other permits are needed for this project, please use the Department's "Permit Application Consultation Tool" (PACT) which can be found at <http://www.ahs.dep.pa.gov/PACT/>. The online tool is designed to quickly and easily assist potential applicants in determining which types of environmental permits, authorizations or notifications would be needed for specific projects. Based on the user's responses to a series of simple questions, PACT automatically provides an email response with information on permits and other information an applicant should consider.

Any person aggrieved by this action may challenge it in an appropriate legal forum. The state and federal courts are currently split on whether the proper forum to challenge a Department permit, authorization or approval for a facility or activity subject to the Federal Natural Gas Act, 15 U.S.C. § 717 *et seq.*, is the United States Court of Appeals for the Third Circuit or the Pennsylvania Environmental Hearing Board. See *Delaware Riverkeeper Network v. Sec'y, Dep't of Env'tl. Prot.*, 833 F.3d 360 (3d Cir. 2016); *Delaware Riverkeeper Network v. Sec'y, Dep't of Env'tl Prot.*, 903 F.3d 65 (3d Cir. 2018), *cert. denied*, 139 S. Ct. 1648, 203 L. Ed. 899 (2019) and *Cole v. Dep't. of Env'tl Prot.*, 1577 C.D. 2019 WL 2420667 (Pa. Cmwlth Ct. June 15, 2021) (Pet. for Allowance of Appeal pending); *West Rockhill Twp. v. Dep't of Env'tl. Prot.*, No. 1595 C.D. 2019 WL 2426014 (Pa. Cmwlth. June 15, 2021) (Pet. for Allowance of Appeal pending).

You should promptly consult with a lawyer on the steps to take if you wish to challenge this action and to best protect your interests.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE.

If you have any questions concerning the terms and conditions of this permit, please contact me at 412.442.5227.

Sincerely,



Bradley Spayd
Air Quality Engineering Specialist
Air Quality Program

Enclosure

CC: File: 63-01001

Operations (S. Wiedemer)

Harrisburg C.O. (OnBase)



**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

Southwest Regional Office

Air Quality Program



STATE ONLY PERMIT # 63-01001

ETC NORTHEAST PIPELINE LLC
Smith Township, Washington County

Issue Date: June 30, 2025

Expiration Date: June 30, 2030



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR QUALITY PROGRAM

STATE ONLY NATURAL MINOR OPERATING PERMIT

Issue Date: June 30, 2025

Effective Date: July 14, 2025

Expiration Date: June 30, 2030

In accordance with the provisions of the Air Pollution Control Act, the Act of January 8, 1960, P.L. 2119, as amended, and 25 Pa. Code Chapter 127, the Owner, [and Operator if noted] (hereinafter referred to as permittee) identified below is authorized by the Department of Environmental Protection (Department) to operate the air emission source(s) more fully described in this permit. This Facility is subject to all terms and conditions specified in this permit. Nothing in this permit relieves the permittee from its obligations to comply with all applicable Federal, State and Local laws and regulations.

The regulatory or statutory authority for each permit condition is set forth in brackets. All terms and conditions in this permit are federally enforceable unless otherwise designated.

State Only Permit No: 63-01001

Natural Minor

Federal Tax Id - Plant Code: 26-2863376-3

Owner Information

Name: ETC NORTHEAST PIPELINE LLC
Mailing Address: 101 TECHNOLOGY DR
PITTSBURGH, PA 15275-1005

Plant Information

Plant: ETC NORTHEAST PIPELINE/REVOLUTION CRYO PLT
Location: 63 Washington County 63953 Smith Township
SIC Code: 1321 Mining - Natural Gas Liquids

Responsible Official

Name: STEPHEN SCHUMAN
Title: VP-OPERATIONS
Phone: (878) 332 - 2240

Email: Dutch.Schuman@energytransfer.com

Permit Contact Person

Name: DOUG FRISCO
Title: ENVIRONMENTAL MANAGER
Phone: (570) 505 - 3730

Email: doug.frisco@energytransfer.com

[Signature] _____

MARK R. GOROG, P.E., ENVIRONMENTAL PROGRAM MANAGER, SOUTHWEST REGION



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR QUALITY PROGRAM

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Effective Date: July 14, 2025

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Location: 63 Washington County 63953 Smith Township

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Responsible Official

Name: STEPHEN SCHUMAN

Title: VP-OPERATIONS

Phone: (878) 332 - 2240

Email: Dutch.Schuman@energytransfer.com

Permit Contact Person

Name: DOUG FRISCO

Title: ENVIRONMENTAL MANAGER

Phone: (570) 505 - 3730

Email: doug.frisco@energytransfer.com

[Signature] _____

MARK R. GOROG, P.E., ENVIRONMENTAL PROGRAM MANAGER, SOUTHWEST REGION



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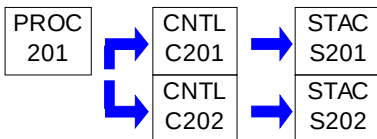
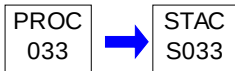
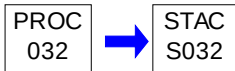
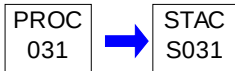
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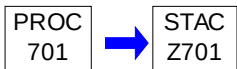
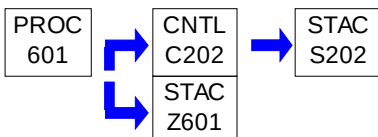
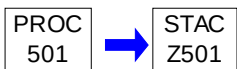
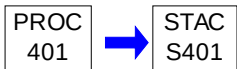
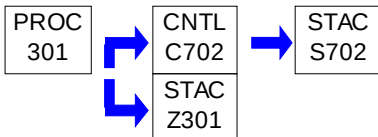
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**SECTION A. Site Inventory List**

Source ID	Source Name	Capacity/Throughput	Fuel/Material
031	40.92 MMBTU/HR HMO HEATER 1	40.600 MCF/HR	Natural Gas
032	40.92 MMBTU/HR HMO HEATER 2	40.600 MCF/HR	Natural Gas
033	40.92 MMBTU/HR HMO HEATER 3	40.600 MCF/HR	Natural Gas
201	200 GPM AMINE UNIT 1	N/A	
204	ELECTRIC COMPRESSOR ROD PACKING	227.000 CF/HR	Natural Gas
301	TANKS/VESSELS	N/A	
401	HEATERS	N/A	Natural Gas
501	PNEUMATIC DEVICES	8.510 CF/HR	AIR-ACTUATED
601	VENTING/BLOWDOWNS	11.270 MCF/HR	Natural Gas
701	FUGITIVES	N/A	Natural Gas
702	TRUCK LOADING	N/A	
801	PIGGING OPERATIONS	N/A	Natural Gas
C201	5.54 MMBTU/HR AMINE UNIT THERMAL OXIDIZER 1	N/A	Natural Gas
C202	906 MMBTU/HR REV CRYO 1 PLANT FLARE	N/A	Natural Gas
C702	1.0 MMBTU/HR TRUCK LOADING COMBUSTOR	N/A	Natural Gas
S031	HMO HEATER 1 STACK		
S032	HMO HEATER 2 STACK		
S033	HMO HEATER 3 STACK		
S201	ELECTRIC COMPRESSOR FUGITIVES		
S202	MSS FLARE EMISSIONS		
S401	HEATER STACK EMISSIONS		
S702	TRUCKLOADING FLARE STACK EMISSIONS		
Z301	TANKS/VESSELS STACK		
Z501	PNEUMATIC DEVICES FUGITIVES		
Z601	VENTING/BLOWDOWN FUGITIVES		
Z701	FUGITIVES STACK		

PERMIT MAPS

**PERMIT MAPS**

**SECTION B. General State Only Requirements****#001 [25 Pa. Code § 121.1]****Definitions.**

Words and terms that are not otherwise defined in this permit shall have the meanings set forth in Section 3 of the Air Pollution Control Act (35 P.S. § 4003) and in 25 Pa. Code § 121.1.

#002 [25 Pa. Code § 127.446]**Operating Permit Duration.**

- (a) This operating permit is issued for a fixed term of five (5) years and shall expire on the date specified on Page 1 of this permit.
- (b) The terms and conditions of the expired permit shall automatically continue pending issuance of a new operating permit, provided the permittee has submitted a timely and complete application and paid applicable fees required under 25 Pa. Code Chapter 127, Subchapter I and the Department is unable, through no fault of the permittee, to issue or deny a new permit before the expiration of the previous permit.

#003 [25 Pa. Code §§ 127.412, 127.413, 127.414, 127.446 & 127.703(b)]**Permit Renewal.**

- (a) The permittee shall submit a timely and complete application for renewal of the operating permit to the appropriate Regional Air Program Manager. The application for renewal of the operating permit shall be submitted at least six (6) months and not more than 18 months before the expiration date of this permit.
- (b) The application for permit renewal shall include the current permit number, a description of any permit revisions that occurred during the permit term, and any applicable requirements that were promulgated and not incorporated into the permit during the permit term. An application is complete if it contains sufficient information to begin processing the application, has the applicable sections completed and has been signed by a responsible official.
- (c) The permittee shall submit with the renewal application a fee for the processing of the application as specified in 25 Pa. Code § 127.703(b). The fees shall be made payable to "The Commonwealth of Pennsylvania Clean Air Fund" and submitted with the fee form to the respective regional office.
- (d) The renewal application shall also include submission of proof that the local municipality and county, in which the facility is located, have been notified in accordance with 25 Pa. Code § 127.413.
- (e) The application for renewal of the operating permit shall also include submission of supplemental compliance review forms in accordance with the requirements of 25 Pa. Code § 127.412(b) and § 127.412(j).
- (f) The permittee, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the permit application, shall promptly submit such supplementary facts or corrected information as necessary to address any requirements that become applicable to the source after the permittee submits a complete application, but prior to the date the Department takes action on the permit application.

#004 [25 Pa. Code § 127.703]**Operating Permit Fees under Subchapter I.**

- (a) The permittee shall pay the annual operating permit maintenance fee according to the following fee schedule in either paragraph (1) or (2) in accordance with 25 Pa. Code § 127.703(d) on or before December 31 of each year for the next calendar year.
 - (1) For a synthetic minor facility, a fee equal to:
 - (i) Four thousand dollars (\$4,000) for calendar years 2021—2025.
 - (ii) Five thousand dollars (\$5,000) for calendar years 2026—2030.
 - (iii) Six thousand three hundred dollars (\$6,300) for the calendar years beginning with 2031.

**SECTION B. General State Only Requirements**

(2) For a facility that is not a synthetic minor, a fee equal to:

- (i) Two thousand dollars (\$2,000) for calendar years 2021—2025.
- (ii) Two thousand five hundred dollars (\$2,500) for calendar years 2026—2030.
- (iii) Three thousand one hundred dollars (\$3,100) for the calendar years beginning with 2031.

(b) The applicable fees shall be made payable to "The Commonwealth of Pennsylvania Clean Air Fund" with the permit number clearly indicated and submitted to the respective regional office.

#005 [25 Pa. Code §§ 127.450 (a)(4) and 127.464]**Transfer of Operating Permits.**

(a) This operating permit may not be transferred to another person, except in cases of transfer-of-ownership that are documented and approved by the Department.

(b) In accordance with 25 Pa. Code § 127.450(a)(4), a change in ownership of the source shall be treated as an administrative amendment if the Department determines that no other change in the permit is required and a written agreement has been submitted to the Department identifying the specific date of the transfer of permit responsibility, coverage and liability between the current and the new permittee and a compliance review form has been submitted to, and the permit transfer has been approved by, the Department.

(c) This operating permit is valid only for those specific sources and the specific source locations described in this permit.

#006 [25 Pa. Code § 127.441 and 35 P.S. § 4008]**Inspection and Entry.**

(a) Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Department or authorized representatives of the Department to perform the following:

(1) Enter at reasonable times upon the permittee's premises where a source is located or emissions related activity is conducted, or where records are kept under the conditions of this permit;

(2) Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;

(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) Sample or monitor, at reasonable times, any substances or parameters, for the purpose of assuring compliance with the permit or applicable requirements as authorized by the Clean Air Act, the Air Pollution Control Act, or the regulations promulgated under the Acts.

(b) Pursuant to 35 P.S. § 4008, no person shall hinder, obstruct, prevent or interfere with the Department or its personnel in the performance of any duty authorized under the Air Pollution Control Act or regulations adopted thereunder including denying the Department access to a source at this facility. Refusal of entry or access may constitute grounds for permit revocation and assessment of criminal and/or civil penalties.

(c) Nothing in this permit condition shall limit the ability of the EPA to inspect or enter the premises of the permittee in accordance with Section 114 or other applicable provisions of the Clean Air Act.

#007 [25 Pa. Code §§ 127.441 & 127.444]**Compliance Requirements.**

(a) The permittee shall comply with the conditions of this operating permit. Noncompliance with this permit constitutes a violation of the Clean Air Act and the Air Pollution Control Act and is grounds for one or more of the following:

**SECTION B. General State Only Requirements**

- (1) Enforcement action
- (2) Permit termination, revocation and reissuance or modification
- (3) Denial of a permit renewal application

(b) A person may not cause or permit the operation of a source which is subject to 25 Pa. Code Article III unless the source(s) and air cleaning devices identified in the application for the plan approval and operating permit and the plan approval issued for the source is operated and maintained in accordance with specifications in the applications and the conditions in the plan approval and operating permit issued by the Department. A person may not cause or permit the operation of an air contamination source subject to 25 Pa. Code Chapter 127 in a manner inconsistent with good operating practices.

(c) For purposes of Sub-condition (b) of this permit condition, the specifications in applications for plan approvals and operating permits are the physical configurations and engineering design details which the Department determines are essential for the permittee's compliance with the applicable requirements in this State-Only permit. Nothing in this sub-condition shall be construed to create an independent affirmative duty upon the permittee to obtain a predetermination from the Department for physical configuration or engineering design detail changes made by the permittee.

#008 [25 Pa. Code § 127.441]**Need to Halt or Reduce Activity Not a Defense.**

It shall not be a defense for the permittee in an enforcement action that it was necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

#009 [25 Pa. Code §§ 127.442(a) & 127.461]**Duty to Provide Information.**

(a) The permittee shall submit reports to the Department containing information the Department may prescribe relative to the operation and maintenance of each source at the facility.

(b) The permittee shall furnish to the Department, in writing, information that the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Department copies of records that the permittee is required to maintain in accordance with this permit.

#010 [25 Pa. Code § 127.461]**Revising an Operating Permit for Cause.**

This operating permit may be terminated, modified, suspended or revoked and reissued if one or more of the following applies:

- (1) The permittee constructs or operates the source subject to the operating permit so that it is in violation of the Air Pollution Control Act, the Clean Air Act, the regulations thereunder, a plan approval, a permit or in a manner that causes air pollution.
- (2) The permittee fails to properly or adequately maintain or repair an air pollution control device or equipment attached to or otherwise made a part of the source.
- (3) The permittee has failed to submit a report required by the operating permit or an applicable regulation.
- (4) The EPA determines that the permit is not in compliance with the Clean Air Act or the regulations thereunder.

#011 [25 Pa. Code §§ 127.450, 127.462, 127.465 & 127.703]**Operating Permit Modifications**

(a) The permittee is authorized to make administrative amendments, minor operating permit modifications and significant operating permit modifications, under this permit, as outlined below:

**SECTION B. General State Only Requirements**

(b) Administrative Amendments. The permittee shall submit the application for administrative operating permit amendments (as defined in 25 Pa. Code § 127.450(a)), according to procedures specified in § 127.450 unless precluded by the Clean Air Act or its regulations.

(c) Minor Operating Permit Modifications. The permittee shall submit the application for minor operating permit modifications (as defined 25 Pa. Code § 121.1) in accordance with 25 Pa. Code § 127.462.

(d) Significant Operating Permit Modifications. The permittee shall submit the application for significant operating permit modifications in accordance with 25 Pa. Code § 127.465.

(e) The applicable fees shall be made payable to "The Commonwealth of Pennsylvania Clean Air Fund" with the permit number clearly indicated and submitted to the respective regional office.

#012 [25 Pa. Code § 127.441]**Severability Clause.**

The provisions of this permit are severable, and if any provision of this permit is determined by a court of competent jurisdiction to be invalid or unenforceable, such a determination will not affect the remaining provisions of this permit.

#013 [25 Pa. Code § 127.449]**De Minimis Emission Increases.**

(a) This permit authorizes de minimis emission increases in accordance with 25 Pa. Code § 127.449 so long as the permittee provides the Department with seven (7) days prior written notice before commencing any de minimis emissions increase. The written notice shall:

(1) Identify and describe the pollutants that will be emitted as a result of the de minimis emissions increase.

(2) Provide emission rates expressed in tons per year and in terms necessary to establish compliance consistent with any applicable requirement.

(b) The Department may disapprove or condition de minimis emission increases at any time.

(c) Except as provided below in (d), the permittee is authorized to make de minimis emission increases (expressed in tons per year) up to the following amounts without the need for a plan approval or prior issuance of a permit modification:

(1) Four tons of carbon monoxide from a single source during the term of the permit and 20 tons of carbon monoxide at the facility during the term of the permit.

(2) One ton of NO_x from a single source during the term of the permit and 5 tons of NO_x at the facility during the term of the permit.

(3) One and six-tenths tons of the oxides of sulfur from a single source during the term of the permit and 8.0 tons of oxides of sulfur at the facility during the term of the permit.

(4) Six-tenths of a ton of PM₁₀ from a single source during the term of the permit and 3.0 tons of PM₁₀ at the facility during the term of the permit. This shall include emissions of a pollutant regulated under Section 112 of the Clean Air Act unless precluded by the Clean Air Act, the regulations thereunder or 25 Pa. Code Article III.

(5) One ton of VOCs from a single source during the term of the permit and 5.0 tons of VOCs at the facility during the term of the permit. This shall include emissions of a pollutant regulated under Section 112 of the Clean Air Act unless precluded by the Clean Air Act, the regulations thereunder or 25 Pa. Code Article III.

(6) Other sources and classes of sources determined to be of minor significance by the Department.

(d) In accordance with § 127.14, the permittee is authorized to install the following minor sources without the need for a plan approval or permit modification:

**SECTION B. General State Only Requirements**

- (1) Air conditioning or ventilation systems not designed to remove pollutants generated or released from other sources.
 - (2) Combustion units rated at 2,500,000 or less Btu per hour of heat input.
 - (3) Combustion units with a rated capacity of less than 10,000,000 Btu per hour heat input fueled by natural gas supplied by a public utility or by commercial fuel oils which are No. 2 or lighter, viscosity less than or equal to 5.82 c St, and which meet the sulfur content requirements of 25 Pa. Code §123.22 (relating to combustion units). For purposes of this permit, commercial fuel oil shall be virgin oil which has no reprocessed, recycled or waste material added.
 - (4) Space heaters which heat by direct heat transfer.
 - (5) Laboratory equipment used exclusively for chemical or physical analysis.
 - (6) Other sources and classes of sources determined to be of minor significance by the Department.
- (e) This permit does not authorize de minimis emission increases if the emissions increase would cause one or more of the following:
- (1) Increase the emissions of a pollutant regulated under Section 112 of the Clean Air Act except as authorized in Subparagraphs (c)(4) and (5) of this permit condition.
 - (2) Subject the facility to the prevention of significant deterioration requirements in 25 Pa. Code Chapter 127, Subchapter D and/or the new source review requirements in Subchapter E.
 - (3) Violate any applicable requirement of this permit, the Air Pollution Control Act, the Clean Air Act, or the regulations promulgated under either of the acts.
- (f) Emissions authorized under this permit condition shall be included in the monitoring, recordkeeping and reporting requirements of this permit.
- (g) Except for de minimis emission increases, installation of minor sources made pursuant to this permit condition and Plan Approval Exemptions under 25 Pa. Code § 127.14 (relating to exemptions), the permittee is prohibited from making changes or engaging in activities that are not specifically authorized under this permit without first applying for a plan approval. In accordance with § 127.14(b), a plan approval is not required for the construction, modification, reactivation, or installation of the sources creating the de minimis emissions increase.
- (h) The permittee may not meet de minimis emission threshold levels by offsetting emission increases or decreases at the same source.

#014 [25 Pa. Code § 127.3]**Operational Flexibility.**

The permittee is authorized to make changes within the facility in accordance with the regulatory provisions outlined in 25 Pa. Code § 127.3 (relating to operational flexibility) to implement the operational flexibility requirements provisions authorized under Section 6.1(i) of the Air Pollution Control Act and the operational flexibility terms and conditions of this permit. The provisions in 25 Pa. Code Chapter 127 which implement the operational flexibility requirements include the following:

- (1) Section 127.14 (relating to exemptions)
- (2) Section 127.447 (relating to alternative operating scenarios)
- (3) Section 127.448 (relating to emissions trading at facilities with Federally enforceable emissions caps)
- (4) Section 127.449 (relating to de minimis emission increases)
- (5) Section 127.450 (relating to administrative operating permit amendments)

**SECTION B. General State Only Requirements**

(6) Section 127.462 (relating to minor operating permit modifications)

(7) Subchapter H (relating to general plan approvals and general operating permits)

#015 [25 Pa. Code § 127.11a]**Reactivation of Sources**

(a) The permittee may not reactivate a source that has been out of operation or production for at least one year unless the reactivation is conducted in accordance with a plan approval granted by the Department or in accordance with reactivation and maintenance plans developed and approved by the Department in accordance with 25 Pa. Code § 127.11a(a).

(b) A source which has been out of operation or production for more than five (5) years but less than 10 years may be reactivated and will not be considered a new source if the permittee satisfies the conditions specified in 25 Pa. Code § 127.11a(b).

#016 [25 Pa. Code § 127.36]**Health Risk-based Emission Standards and Operating Practice Requirements.**

(a) When needed to protect public health, welfare and the environment from emissions of hazardous air pollutants from new and existing sources, the permittee shall comply with the health risk-based emission standards or operating practice requirements imposed by the Department, except as precluded by §§ 6.6(d)(2) and (3) of the Air Pollution Control Act [35 P.S. § 4006.6(d)(2) and (3)].

(b) A person challenging a performance or emission standard established by the Department has the burden to demonstrate that performance or emission standard does not meet the requirements of Section 112 of the Clean Air Act.

#017 [25 Pa. Code § 121.9]**Circumvention.**

No person may permit the use of a device, stack height which exceeds good engineering practice stack height, dispersion technique or other technique which, without resulting in reduction of the total amount of air contaminants emitted, conceals or dilutes an emission of air contaminants which would otherwise be in violation of 25 Pa. Code Article III, except that with prior approval of the Department, the device or technique may be used for control of malodors.

#018 [25 Pa. Code §§ 127.402(d) & 127.442]**Reporting Requirements.**

(a) The permittee shall comply with the applicable reporting requirements of the Clean Air Act, the regulations thereunder, the Air Pollution Control Act and 25 Pa. Code Article III including Chapters 127, 135 and 139.

(b) The permittee shall submit reports to the Department containing information the Department may prescribe relative to the operation and maintenance of any air contamination source.

(c) Reports, test data, monitoring data, notifications and requests for renewal of the permit shall be submitted to the:

Regional Air Program Manager
PA Department of Environmental Protection
(At the address given in the permit transmittal letter, or otherwise notified)

(d) Any records or information including applications, forms, or reports submitted pursuant to this permit condition shall contain a certification by a responsible official as to truth, accuracy and completeness. The certifications submitted under this permit shall require a responsible official of the facility to certify that based on information and belief formed after reasonable inquiry, the statements and information in the documents are true, accurate and complete.

(e) Any records, reports or information submitted to the Department shall be available to the public except for such

**SECTION B. General State Only Requirements**

records, reports or information which meet the confidentiality requirements of § 4013.2 of the Air Pollution Control Act and §§ 112(d) and 114(c) of the Clean Air Act. The permittee may not request a claim of confidentiality for any emissions data generated for the facility.

#019 [25 Pa. Code §§ 127.441(c) & 135.5]**Sampling, Testing and Monitoring Procedures.**

(a) The permittee shall comply with the monitoring, recordkeeping or reporting requirements of 25 Pa. Code Chapter 139 and the other applicable requirements of 25 Pa. Code Article III and additional requirements related to monitoring, reporting and recordkeeping required by the Clean Air Act and the regulations thereunder including the Compliance Assurance Monitoring requirements of 40 CFR Part 64, where applicable.

(b) Unless alternative methodology is required by the Clean Air Act and regulations adopted thereunder, sampling, testing and monitoring required by or used by the permittee to demonstrate compliance with any applicable regulation or permit condition shall be conducted in accordance with the requirements of 25 Pa. Code Chapter 139.

#020 [25 Pa. Code §§ 127.441(c) and 135.5]**Recordkeeping.**

(a) The permittee shall maintain and make available, upon request by the Department, the following records of monitored information:

- (1) The date, place (as defined in the permit) and time of sampling or measurements.
- (2) The dates the analyses were performed.
- (3) The company or entity that performed the analyses.
- (4) The analytical techniques or methods used.
- (5) The results of the analyses.
- (6) The operating conditions as existing at the time of sampling or measurement.

(b) The permittee shall retain records of any required monitoring data and supporting information for at least five (5) years from the date of the monitoring, sample, measurement, report or application. Supporting information includes the calibration data and maintenance records and original strip-chart recordings for continuous monitoring instrumentation, and copies of reports required by the permit.

(c) The permittee shall maintain and make available to the Department upon request, records including computerized records that may be necessary to comply with the reporting, recordkeeping and emission statement requirements in 25 Pa. Code Chapter 135 (relating to reporting of sources). In accordance with 25 Pa. Code Chapter 135, § 135.5, such records may include records of production, fuel usage, maintenance of production or pollution control equipment or other information determined by the Department to be necessary for identification and quantification of potential and actual air contaminant emissions.

#021 [25 Pa. Code § 127.441(a)]**Property Rights.**

This permit does not convey any property rights of any sort, or any exclusive privileges.

#022 [25 Pa. Code § 127.447]**Alternative Operating Scenarios.**

The permittee is authorized to make changes at the facility to implement alternative operating scenarios identified in this permit in accordance with 25 Pa. Code § 127.447.

**SECTION B. General State Only Requirements****#023 [25 Pa. Code §135.3]****Reporting**

(a) If the facility is a Synthetic Minor Facility, the permittee shall submit by March 1 of each year an annual emissions report for the preceding calendar year. The report shall include information for all active previously reported sources, new sources which were first operated during the preceding calendar year, and sources modified during the same period which were not previously reported. All air emissions from the facility should be estimated and reported.

(b) A source owner or operator of a Synthetic Minor Facility may request an extension of time from the Department for the filing of an annual emissions report, and the Department may grant the extension for reasonable cause.

#024 [25 Pa. Code §135.4]**Report Format**

If applicable, the emissions reports shall contain sufficient information to enable the Department to complete its emission inventory. Emissions reports shall be made by the source owner or operator in a format specified by the Department.

**SECTION C. Site Level Requirements****I. RESTRICTIONS.****Emission Restriction(s).****# 001 [25 Pa. Code §121.7]****Prohibition of air pollution.**

No person may permit air pollution as that term is defined in the act.

002 [25 Pa. Code §123.1]**Prohibition of certain fugitive emissions**

(a) No person may permit the emission into the outdoor atmosphere of fugitive air contaminant from a source other than the following:

(1) Construction or demolition of buildings or structures.

(2) Grading, paving and maintenance of roads and streets.

(3) Use of roads and streets. Emissions from material in or on trucks, railroad cars and other vehicular equipment are not considered as emissions from use of roads and streets.

(4) Clearing of land.

(5) Stockpiling of materials.

(6) Open burning operations.

(7) - (8) Not applicable.

(9) Sources and classes of sources other than those identified in paragraphs (1)-(8), for which the operator has obtained a determination from the Department that fugitive emissions from the source, after appropriate control, meet the following requirements:

(i) the emissions are of minor significance with respect to causing air pollution; and

(ii) the emissions are not preventing or interfering with the attainment or maintenance of any ambient air quality standard.

(b) An application form for requesting a determination under either subsection (a)(9) or 129.15(c) is available from the Department. In reviewing these applications, the Department may require the applicant to supply information including, but not limited to, a description of proposed control measures, characteristics of emissions, quantity of emissions, and ambient air quality data and analysis showing the impact of the source on ambient air quality. The applicant shall be required to demonstrate that the requirements of subsections (a)(9) and (c) and 123.2 (relating to fugitive particulate matter) or of the requirements of 129.15(c) have been satisfied. Upon such demonstration, the Department will issue a determination, in writing, either as an operating permit condition, for those sources subject to permit requirements under the act, or as an order containing appropriate conditions and limitations.

(c) [See Work Practice Standards.]

(d) Not applicable.

003 [25 Pa. Code §123.13]**Processes**

(a) Subsections (b) and (c) apply to all processes except combustion units, incinerators and pulp mill smelt dissolving tanks.

(b) Not applicable.

(c) For processes not listed in subsection (b)(1), including but not limited to, coke oven battery waste heat stacks and

**SECTION C. Site Level Requirements**

autogeneous zinc coker waste heat stacks, the following shall apply:

(1) Prohibited emissions. No person may permit the emission into the outdoor atmosphere of particulate matter from any process not listed in subsection (b)(1) in a manner that the concentration of particulate matter in the effluent gas exceeds any of the following:

(i) 0.04 grain per dry standard cubic foot, when the effluent gas volume is less than 150,000 dry standard cubic feet per minute.

(ii) Not applicable.

(2) Not applicable.

(d) Not applicable.

004 [25 Pa. Code §123.2]**Fugitive particulate matter**

A person may not permit fugitive particulate matter to be emitted into the outdoor atmosphere from a source specified in 123.1(a)(1) -- (9) (relating to prohibition of certain fugitive emissions) if such emissions are visible at the point the emissions pass outside the person's property.

005 [25 Pa. Code §123.21]**General**

(a) This section applies to sources except those subject to other provisions of this article, with respect to the control of sulfur compound emissions.

(b) No person may permit the emission into the outdoor atmosphere of sulfur oxides from a source in a manner that the concentration of the sulfur oxides, expressed as SO₂, in the effluent gas exceeds 500 parts per million, by volume, dry basis.

006 [25 Pa. Code §123.31]**Limitations**

(a) Limitations are as follows:

(1) - (2) Not applicable.

(b) A person may not permit the emission into the outdoor atmosphere of any malodorous air contaminants from any source in such a manner that the malodors are detectable outside the property of the person on whose land the source is being operated.

(c) Not applicable.

007 [25 Pa. Code §123.41]**Limitations**

A person may not permit the emission into the outdoor atmosphere of visible air contaminants in such a manner that the opacity of the emission is either of the following:

(1) Equal to or greater than 20% for a period or periods aggregating more than three minutes in any 1 hour.

(2) Equal to or greater than 60% at any time.

**SECTION C. Site Level Requirements****# 008 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

Facility-wide emissions of the pollutants listed below shall not exceed the following limits on a 12-month rolling basis (calculated each month) for all air contamination sources and air cleaning devices:

30.60 TPY NO_x
35.30 TPY CO
29.10 TPY VOC
0.40 TPY SO_x
8.10 TPY PM-10
8.10 TPY PM-2.5
2.60 TPY HAP (Total)
0.10 TPY HCHO
2.33 TPY Hexane

009 [25 Pa. Code §129.14]**Open burning operations**

(a) Air basins. Not applicable.

(b) Outside of air basins. No person may permit the open burning of material in an area outside of air basins in a manner that:

(1) The emissions are visible, at any time, at the point such emissions pass outside the property of the person on whose land the open burning is being conducted.

(2) Malodorous air contaminants from the open burning are detectable outside the property of the person on whose land the open burning is being conducted.

(3) The emissions interfere with the reasonable enjoyment of life or property.

(4) The emissions cause damage to vegetation or property.

(5) The emissions are or may be deleterious to human or animal health.

(c) Exceptions: The requirements of subsections (a) and (b) do not apply where the open burning operations result from:

(1) A fire set to prevent or abate a fire hazard, when approved by the Department and set by or under the supervision of a public officer.

(2) A fire set for the purpose of instructing personnel in fire fighting, when approved by the Department.

(3) A fire set for the prevention and control of disease or pests, when approved by the Department.

(4) A fire set in conjunction with the production of agricultural commodities in their unmanufactured state on the premises of the farm operation.

(5) A fire set for the purpose of burning domestic refuse, when the fire is on the premises of a structure occupied solely as a dwelling by two families or less and when the refuse results from the normal occupancy of such structure.

(6) A fire set solely for recreational or ceremonial purposes.

(7) A fire set solely for cooking food.

(d) Clearing and grubbing wastes. The following is applicable to clearing and grubbing wastes:



SECTION C. Site Level Requirements

(1) As used in this subsection the following terms shall have the following meanings:

Air curtain destructor -- A mechanical device which forcefully projects a curtain of air across a pit in which open burning is being conducted so that combustion efficiency is increased and smoke and other particulate matter are contained.

Clearing and grubbing wastes -- Trees, shrubs, and other native vegetation which are cleared from land during or prior to the process of construction. The term does not include demolition wastes and dirt laden roots.

(2) Subsection (a) notwithstanding, clearing and grubbing wastes may be burned in a basin subject to the following requirements:

(i) Air curtain destructors shall be used when burning clearing and grubbing wastes.

(ii) Each proposed use of air curtain destructors shall be reviewed and approved by the Department in writing with respect to equipment arrangement, design and existing environmental conditions prior to commencement of burning. Proposals approved under this subparagraph need not obtain plan approval or operating permits under Chapter 127 (relating to construction modification, reactivation and operation of sources).

(iii) Approval for use of an air curtain destructor at one site may be granted for a specified period not to exceed 3 months, but may be extended for additional limited periods upon further approval by the Department.

(iv) The Department reserves the right to rescind approval granted if a determination by the Department indicates that an air pollution problem exists.

(3) Subsection (b) notwithstanding clearing and grubbing wastes may be burned outside of an air basin, subject to the following limitations:

(i) Upon receipt of a complaint or determination by the Department that an air pollution problem exists, the Department may order that the open burning cease or comply with subsection (b) of this section.

(ii) Authorization for open burning under this paragraph does not apply to clearing and grubbing wastes transported from an air basin for disposal outside of an air basin.

(4) During an air pollution episode, open burning is limited by Chapter 137 (relating to air pollution episodes) and shall cease as specified in such chapter.

II. TESTING REQUIREMENTS.

010 [25 Pa. Code §127.441]

Operating permit terms and conditions.

The Owner/Operator shall submit a pre-test protocol to the Department for review at least 90 days prior to the performance of any EPA reference method stack test. The test report may be submitted via PSIMS*Online at <https://www.depgreenport.state.pa.us/ecomm/Login.jsp>. All proposed performance test methods shall be identified in the pre-test protocol.

The Department Source Testing Manual is available at this web address:
<http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4563>

(a) At least 90 calendar days prior to commencing an emissions testing program, a test protocol shall be submitted to the Department for review and approval. The test protocol shall meet all applicable requirements specified in the most current version of the Department's Source Testing Manual.

(b) When testing of a source is required on a recurring basis, a single procedural protocol may be submitted for approval; thereafter, a letter, submitted at least 90 calendar days prior to commencing an emissions testing program, referencing the

**SECTION C. Site Level Requirements**

previously approved procedural protocol is sufficient if the letter is approved by the Department. The letter shall be submitted as required in paragraph (a). If modifications are made to the process(es), if a different stack testing company is used, or if an applicable section of the stack test manual has been revised since the approval, a new protocol shall be submitted for approval.

(c) At least 15 calendar days prior to commencing an emission testing program, notification as to the date and time of testing shall be given to the Department in accordance with paragraph (h) of this condition.

(d) If the proposed testing did not occur per the required notification in paragraph (b) above, an electronic mail notification shall be sent within 15 calendar days after the expected completion date of the onsite testing to the Department, in accordance with paragraph (h) of this condition, indicating why the proposed completion date of the on-site testing was not adhered to.

(e) A complete test report shall be submitted to the Department no later than 60 calendar days after completion of the onsite testing portion of an emission test program.

(1) The test report shall include a summary of the emission results on the first page of the report indicating if each pollutant measured is within permitted limits and a statement of compliance or non-compliance with all applicable permit conditions.

(2) The summary results will include, at a minimum, the following information:

(A) A statement that the owner or operator has reviewed the report from the emissions testing body and agrees with the findings.

(B) Permit number(s) and condition(s) which are the basis for the evaluation.

(C) Summary of results with respect to each applicable permit condition.

(D) Statement of compliance or non-compliance with each applicable permit condition.

(f) Pursuant to 25 Pa. Code § 139.3, all submittals shall meet all applicable requirements specified in the most current version of the Department's Source Testing Manual.

(g) All testing shall be performed in accordance with the provisions of Chapter 139 of the Rules and Regulations of the Department of Environmental Protection.

(h) Pursuant to 25 Pa. Code §§ 139.53(a)(1) and 139.53(a)(3):

(1) All submittals, except test notifications & portable emission monitor tests, shall be accomplished through PSIMS*Online, available through <https://www.depgreenport.state.pa.us/ecommm/Login.jsp>, if it is available.

(2) For test notifications & portable analyzer results, or if internet submittal cannot be accomplished, one electronic copy of the test submission (notifications, protocols, reports, supplemental information, etc.) shall be sent to both PSIMS Administration in Central Office and to the Regional Office AQ Program Manager at the following addresses.

CENTRAL OFFICE:
RA-EPstacktesting@pa.gov

SOUTHWEST REGIONAL OFFICE:
RA-EPSWstacktesting@pa.gov

(i) The permittee shall ensure all federal reporting requirements contained in the applicable subpart of 40 CFR are followed, including timelines more stringent than those contained herein. In the event of an inconsistency or any conflicting requirements between state and the federal, the most stringent provision, term, condition, method or rule shall be used by default.

**SECTION C. Site Level Requirements****(j) Actions Related to Noncompliance Demonstrated by a Stack Test:**

(1) If the results of a stack test, performed as required by this approval, exceed the level specified in any condition of this approval, the Permittee shall take appropriate corrective actions. Within 30 days of the Permittee receiving the stack test results, a written description of the corrective actions shall be submitted to the Department. The Permittee shall take appropriate action to minimize emissions from the affected facility while the corrective actions are being implemented. The Department shall notify the Permittee within 30 days, if the corrective actions taken are deficient. Within 30 days of receipt of the notice of deficiency, the Permittee shall submit a description of additional corrective actions to the Department. The Department reserves the authority to use enforcement activities to resolve noncompliant stack tests.

(2) If the results of the required stack test exceed any limit defined in this permit, the test was not performed in accordance with the stack test protocol or the source and/or air cleaning device was not operated in accordance with the permit, then another stack test shall be performed to determine compliance. Within 120 days of the Permittee receiving the original stack test results, a retest shall be performed. The Department may extend the retesting deadline if the Permittee demonstrates, to the Department's satisfaction, that retesting within 120 days is not practicable. Failure of the second test to demonstrate compliance with the limits in the permit, not performing the test in accordance with the stack test protocol or not operating the source and/or air cleaning device in accordance with the permit may be grounds for immediate revocation of the permit to operate the affected source.

III. MONITORING REQUIREMENTS.**# 011 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

A facility-wide inspection shall be conducted at a minimum of once per day when the Facility is visited by the Owner/Operator. The facility-wide inspection shall be conducted for the presence of the following:

- a. Visible stack emissions;
- b. Fugitive emissions; and
- c. Potentially objectionable odors at the property line.

These observations are to ensure continued compliance with source-specific visible emission limitations, fugitive emissions prohibited under 25 Pa. Code §123.1 or §123.2, and potentially objectionable odors prohibited under 25 Pa. Code §123.31. Observations for visible stack emissions shall be conducted during daylight hours and all observations shall be conducted while sources are in operation. If any visible stack emissions, fugitive emissions, or potentially objectionable odors are apparent, the Owner/Operator shall take corrective action.

012 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

The Owner/Operator shall conduct a fractional gas analysis performed on the inlet gas to the facility at a minimum of once per quarter of each calendar year. Each sample shall be collected no sooner than 30 days from the previous sample.

IV. RECORDKEEPING REQUIREMENTS.**# 013 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

Records of each daily inspection for visible stack, fugitive, and potentially objectionable odors when the site is visited by the Owner/Operator shall be maintained in a log, or electronically, and at the minimum include the date, time, name and title of the observer, along with any corrective action taken as a result.

014 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

All logs and required records shall be maintained either on site, electronically, or at an alternative location acceptable to the Department, for a minimum of five (5) years and shall be made available to the Department upon request.

**SECTION C. Site Level Requirements****# 015 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The Owner/Operator shall maintain the following records:

- a. Monthly hours of operation and monthly fuel consumption for each air cleaning device, including each flare, combustor, and regenerative thermal oxidizer.
- b. Monthly fuel consumption for each 40.92 MMBtu/hr HMO heater, 6.22 MMBtu/hr NGL Dehy Regen Heater, 8.5 MMBtu/hr Regenerator Gas Heater, and combined fuel consumption for all catalytic heaters.
- c. Records including a description of testing methods, results, appropriate operating data collected during tests, and a copy of the calculations performed to determine compliance with emission standards for each air contamination source or air cleaning device subject to performance testing or portable analyzer testing requirements.
- d. Copies of the report that demonstrates that the HMO heaters were operating at rated capacities during performance testing.
- e. Copies of the manufacturer's recommended maintenance schedule for all air contamination sources and air cleaning devices including, but not limited to, each amine sweetening unit, heater, flare, combustor, regenerative thermal oxidizer, and electric compressors.
- f. Records of any maintenance conducted on each air contamination source and air cleaning device including, but not limited to, each amine sweetening unit, heater, flare, combustor, regenerative thermal oxidizer, and electric compressors.
- g. Records of the total daily throughput (per 24-hour period) through the amine sweetening unit.
- h. Records of total throughput through each condensate tank (by volume) on a 12-month rolling basis (calculated monthly).
- i. Records of the date, time, duration, volume of gas released, and emissions from each blowdown and emergency shutdown at the facility.
- j. Records of each visible stack, fugitive, and potentially objectionable odor inspection shall be maintained in a log and at a minimum include the date, time, name and title of the observer, along with any corrective action taken as a result.
- k. Records of any leak detected and associated repair activity through the leak detection and repair or maintenance program.
- l. Facility-wide 12-month rolling totals, calculated monthly, of the following pollutants: NO_x, CO, VOC, SO_x, PM-10, PM-2.5, HAPs (including but not limited to benzene, formaldehyde, hexane, and methanol) and greenhouse gases as CO₂ equivalent (CO₂e).
- m. Records of pigging events including, but not necessarily limited to, information on:
 - (i) The identification, location, and date of construction of each pig launcher or receiver.
 - (ii) Records of each pigging operation including the identification of the pig chamber used, the date and time of the pigging operation, and the type and volume of liquids cleared.
 - (iii) The launcher or receiver pressure prior to venting to the atmosphere, and prior to routing emissions to a flare, where applicable.
 - (iv) Gas composition data representative of the composition of gas at the pig chambers.
 - (v) The emissions calculation for each pig chamber, using the Department's spreadsheet found at <http://files.dep.state.pa.us/> or other equivalent method.
- n. Records of the location, date of installation, and manufacturer's specifications for each pump.
- o. Records of construction documentation, including, but not limited to, the following:

**SECTION C. Site Level Requirements**

- (i) Record of construction documentation that indicate new and reworked valves, piping, compressor systems, and pump systems conform to American Petroleum Institute (API), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), or equivalent code
- (ii) Record of construction indicating that new underground drain piping shall be welded.
- (iii) Record of construction showing that piping connections are welded, flanged, or screwed (if two-inch diameter or smaller).
- (iv) A list of all difficult-to-monitor or unsafe-to-monitor components at the facility.
- (v) A record of hydraulic testing, gas testing, or gas analyzer results on new or reworked piping connections.

p. For each tanker truck load-out operation, the owner or operator shall maintain the following records:

- (i) The identification, location, and date of construction of each vapor recovery load-out system;
- (ii) Records of each tanker truck load-out operation including the date and time of the liquids load-out, the type and volume of liquids loaded, the truck collection efficiency based on an annual leak test or demonstrating a minimum 99% control of VOC emissions.
- (iii) Liquid loadout volumes on a 12-month rolling basis (calculated monthly).
- (iv) The emissions calculation for each tanker truck load-out operation in accordance with 25 Pa. Code §135.5.

q. For each control device, the owner or operator shall maintain the following records:

- (i) For non-manufacturer-tested models, the owner or operator must maintain records in accordance with 40 CFR §60.5420(c)(13) and (14) or §60.5420a(c)(13) and (14) as applicable.
- (ii) For manufacturer-tested models, the owner or operator must maintain records in accordance with 40 CFR §60.5413(d)(12) and (e) or §60.5413a(d)(12) and (e) as applicable.
- (iii) The summary for each complete test report described in Section C, if applicable.

r. The permittee shall, upon the request of the Department, provide fuel analyses, fuel supplier certifications, or fuel samples of the fuel used in any air contamination source or air cleaning device authorized to operate under this state-only operating permit.

s. For each combustion unit, the owner or operator shall maintain the following records, including information on:

- (i) The location of the combustion unit;
- (ii) Either the summary for each complete test report described or the results of each periodic monitoring;
- (iii) The tune-up/inspection records, which shall at a minimum include:
 - (a) The date the tune-up/inspection was conducted;
 - (b) The concentrations in the effluent stream of CO in ppmv and O₂ in volume percent; and
 - (c) A description of any corrective actions taken as part of the tune-up; and
- (iv) The emissions calculations for the combustion unit in accordance with 25 Pa. Code §135.5.

t. Daily gas throughput to the MSS flare and a calculated daily heat content to the MSS flare based on the closed drain gas composition.

u. The applicable recordkeeping requirements of 40 CFR §60.5421a.

v. Copies of quarterly inlet gas sampling.

016 [25 Pa. Code §135.5]**Recordkeeping**

Source owners or operators shall maintain and make available upon request by the Department records including computerized records that may be necessary to comply with §§ 135.3 and 135.21 (relating to reporting; and emission statements). These may include records of production, fuel usage, maintenance of production or pollution control equipment or other information determined by the Department to be necessary for identification and quantification of potential and actual air contaminant emissions. If direct recordkeeping is not possible or practical, sufficient records shall be kept to provide the needed information by indirect means.

**SECTION C. Site Level Requirements****V. REPORTING REQUIREMENTS.****# 017 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

Malfunction reporting shall be conducted as follows:

(a) The permittee shall report malfunctions, emergencies or incidents of excess emissions to the Department. A malfunction is any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. An emergency is any situation arising from sudden and reasonably unforeseeable events beyond the control of the owner or operator of a facility which requires immediate corrective action to restore normal operation and which causes the emission source to exceed emissions, due to unavoidable increases in emissions attributable to the situation. An emergency shall not include situations caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operator error.

(b) When the malfunction, emergency or incident of excess emissions poses an imminent danger to the public health, safety, welfare, or environment, it shall be reported to the Department and the County Emergency Management Agency by telephone within one (1) hour after the discovery of the malfunction, emergency or incident of excess emissions. The owner or operator shall submit a written or emailed report of instances of such malfunctions, emergencies or incidents of excess emissions to the Department within three (3) business days of the telephone report.

(c) The report shall describe the following:

1. Name, permit or authorization number, and location of the facility,
2. Nature and cause of the malfunction, emergency or incident,
3. Date and time when the malfunction, emergency or incident was first observed,
4. Expected duration of excess emissions,
5. Estimated rate of emissions,
6. Corrective actions or preventative measures taken.

(d) Any malfunction, emergency or incident of excess emissions that is not subject to the notice requirements of paragraph (b) of this condition shall be reported to the Department by telephone within 24 hours (or by 4:00 PM of the next business day, whichever is later) of discovery and in writing or by e-mail within five (5) business days of discovery. The report shall contain the same information required by paragraph (c), and any permit specific malfunction reporting requirements.

(e) During an emergency an owner or operator may continue to operate the source at their discretion provided they submit justification for continued operation of a source during the emergency and follow all the notification and reporting requirements in accordance with paragraphs (b)-(d), as applicable, including any permit specific malfunction reporting requirements.

(f) Reports regarding malfunctions, emergencies or incidents of excess emissions shall be submitted to the appropriate DEP Regional Office Air Program Manager.

(g) Any emissions resulted from malfunction or emergency are to be reported in the annual emissions inventory report, if the annual emissions inventory report is required by permit or authorization.

018 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

In accordance with 25 Pa. Code §135.3, the owner or operator of a facility shall submit to the Department via AES*Online or AES*XML at www.dep.greenport.state.pa.us/ by March 1st of each year, a facility inventory report for the preceding calendar year for all sources regulated under this state-only operating permit. The inventory report shall include all emissions information for all sources operated during the preceding calendar year. Emissions data including, but not limited to, the following shall be reported:

- (i) NO_x;
- (ii) CO;
- (iii) SO_x;
- (iv) PM₁₀;

**SECTION C. Site Level Requirements**

- (v) PM_{2.5};
- (vi) VOC;
- (vii) Speciated HAP including, but not limited to, benzene, ethyl benzene, formaldehyde, n-hexane, toluene, isomers and mixtures of xylenes, and 2,2,4-trimethylpentane;
- (viii) Total HAP;
- (ix) CO₂e;
- (x) CH₄; and
- (xi) N₂O.

A source owner or operator may request an extension of time from the Department for the filing of a source report, and the Department may grant the extension for reasonable cause.

019 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

The owner/operator shall submit an annual report to the Department. The annual report is required to be submitted either in electronic format, by hand-delivery, courier, or sent by certified mail, return receipt requested, to the Air Program Manager of the appropriate DEP Regional Office.

The reporting period specified by the owner/operator shall be no later than one year from the start of operations of the facility, unless otherwise approved by the Department. The initial and subsequent annual reports shall be submitted within 60 days of the end of the reporting periods. General information required on all reports includes:

- (i) Company Name;
- (ii) Facility Site Name;
- (iii) The operating permit number;
- (iv) Either:
 - (A) The address of the site; or
 - (B) A description of the site and the location using latitude and longitude coordinates of the site in decimal degrees to an accuracy and precision of 5 decimal degrees using the North American Datum of 1983;
- (v) The beginning and ending dates of the reporting period;
- (vi) A certification form demonstrating annual certification of compliance with the terms and conditions in this state-only operating permit for the previous year, including the emission limitations, standards, or work practices, which must include:
 - (A) The statement: "Based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."; and
 - (B) The signature of the certifying Responsible Official;
- (vii) Identification of each source included in the report;
- (viii) The identification of each term or condition of the state-only operating permit that is the basis of the certification, the compliance status, and the methods used for determining the compliance status of the source, currently and over the reporting period; and
- (ix) The records of the facility's emissions to demonstrate compliance with 25 Pa. Code §135.3 and §135.5.

020 [25 Pa. Code §135.3]**Reporting**

(a) A person who owns or operates a source to which this chapter applies, and who has previously been advised by the Department to submit a source report, shall submit by March 1 of each year a source report for the preceding calendar year. The report shall include information for all previously reported sources, new sources which were first operated during the proceeding calendar year and sources modified during the same period which were not previously reported.

(b) A person who receives initial notification by the Department that a source report is necessary shall submit an initial source report within 60 days after receiving the notification or by March 1 of the year following the year for which the report is required, whichever is later.

**SECTION C. Site Level Requirements**

(c) A source owner or operator may request an extension of time from the Department for the filing of a source report, and the Department may grant the extension for reasonable cause.

VI. WORK PRACTICE REQUIREMENTS.**# 021 [25 Pa. Code §123.1]****Prohibition of certain fugitive emissions**

(c) A person responsible for any source specified in subsections (a)(1) -- (7) or (9) shall take all reasonable actions to prevent particulate matter from becoming airborne. These actions shall include, but not be limited to, the following:

(1) Use, where possible, of water or chemicals for control of dust in the demolition of buildings or structures, construction operations, the grading of roads, or the clearing of land.

(2) Application of asphalt, oil, water or suitable chemicals on dirt roads, material stockpiles and other surfaces which may give rise to airborne dusts.

(3) Paving and maintenance of roadways.

(4) Prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

022 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

All air contamination sources and air cleaning devices authorized under this state-only operating permit shall be operated per the manufacturer's specifications and maintained in accordance with the manufacturer's recommended maintenance schedule.

023 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

The owner/operator shall conduct a winterization procedure at the facility at least once per calendar year. This procedure shall include a log of what procedures were conducted and the date when these procedures occurred. This log shall be maintained for a minimum of five years and shall be made available to the Department upon request.

VII. ADDITIONAL REQUIREMENTS.**# 024 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

If, at any time, the Department has cause to believe that air contaminant emissions from the sources listed in this State-Only Operating Permit may be in excess of the limitations specified in, or established pursuant to this State-Only Operating Permit, the permittee may be required to conduct test methods and procedures deemed necessary by the Department to determine the actual emissions rate. Such testing shall be conducted in accordance with 25 Pa. Code Chapter 139, where applicable, and in accordance with any restrictions or limitations established by the Department at such time as it notifies the company that testing is required.

025 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

In instances of multiple applicable emission limitations or conflicting regulatory requirements, the most stringent emission limitation or requirement applies.

026 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.4]**Subpart A - General Provisions****Address.**

The Facility is subject to New Source Performance Standards from 40 CFR Part 60 Subpart OOOOa. In accordance with 40 CFR §60.4, copies of all requests, reports, applications, submittals, and other communications regarding affected sources

**SECTION C. Site Level Requirements**

shall be forwarded to both the EPA and the Department at the addresses listed below unless otherwise noted or directed by the Department or the EPA.

Associate Director
United States Environmental Protection Agency
Region III, Air and Radiation Division
Permits Branch (3AD10)
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, Pennsylvania 19103-2852

PADEP
Air Quality Program
400 Waterfront Drive
Pittsburgh, PA 15222-4745

027 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.7]**Subpart A - General Provisions****Notification and record keeping.**

The Owner/operator shall provide EPA with the notifications required by 40 CFR §60.7. Required notifications may include but are not necessarily limited to: date of commencement of construction (within 30 days after starting construction), actual start-up date (within 15 days after equipment start-up), physical or operational changes which may increase the emission rate of any air pollutant to which a standard applies (60 days or as soon as practicable before equipment start-up), and opacity observations (within 30 days).

028 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.7]**Subpart A - General Provisions****Notification and record keeping.**

Compliance with mass emission limits established in this authorization may be demonstrated using engineering calculations based on fuel and raw material purchase records, laboratory analyses, manufacturers specifications, source test results, production and operating records, material balance methods, and/or other applicable methods, with written Department approval.

VIII. COMPLIANCE CERTIFICATION.

No additional compliance certifications exist except as provided in other sections of this permit including Section B (relating to State Only General Requirements).

IX. COMPLIANCE SCHEDULE.

#029 30-JUN-25

In accordance with 25 Pa. Code § 127.445, within 30 days of the Department's written approval or alternative timeline specified in a Consent Order & Agreement, the permittee shall complete the Plant Flare Blower System Upgrade project proposed in the May 1, 2025, Control Plan (Revised May 23, 2025).

#030 30-JUN-25

In accordance with 25 Pa. Code § 127.445, within 30 days of the Department's written approval or alternative timeline specified in a Consent Order & Agreement, the permittee shall complete the Plant Flare Tip Replacement project proposed in the May 1, 2025, Control Plan (Revised May 23, 2025).

**SECTION D. Source Level Requirements**

Source ID: 031

Source Name: 40.92 MMBTU/HR HMO HEATER 1

Source Capacity/Throughput:

40.600 MCF/HR

Natural Gas

Conditions for this source occur in the following groups: HMO HEATERS

PROC
031STAC
S031**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

Source ID: 032

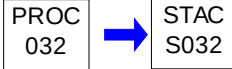
Source Name: 40.92 MMBTU/HR HMO HEATER 2

Source Capacity/Throughput:

40.600 MCF/HR

Natural Gas

Conditions for this source occur in the following groups: HMO HEATERS

**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

Source ID: 033

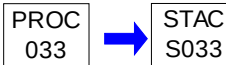
Source Name: 40.92 MMBTU/HR HMO HEATER 3

Source Capacity/Throughput:

40.600 MCF/HR

Natural Gas

Conditions for this source occur in the following groups: HMO HEATERS

**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

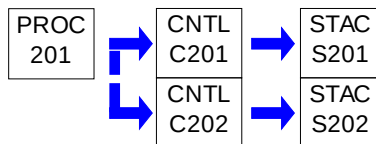
Source ID: 201

Source Name: 200 GPM AMINE UNIT 1

Source Capacity/Throughput:

N/A

Conditions for this source occur in the following groups: ENCLOSED COMBUSTION DEVICES

**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

Source ID: 204

Source Name: ELECTRIC COMPRESSOR ROD PACKING

Source Capacity/Throughput: 227.000 CF/HR Natural Gas

**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

**SECTION D. Source Level Requirements**

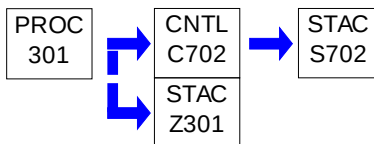
Source ID: 301

Source Name: TANKS/VESSELS

Source Capacity/Throughput:

N/A

Conditions for this source occur in the following groups: ENCLOSED COMBUSTION DEVICES

**I. RESTRICTIONS.****Emission Restriction(s).****# 001 [25 Pa. Code §129.56]****Storage tanks greater than 40,000 gallons capacity containing VOCs**

(a) No person may permit the placing, storing or holding in a stationary tank, reservoir or other container with a capacity greater than 40,000 gallons of volatile organic compounds with a vapor pressure greater than 1.5 psia (10.5 kilopascals) under actual storage conditions unless the tank, reservoir or other container is a pressure tank capable of maintaining working pressures sufficient at all times to prevent vapor or gas loss to the atmosphere or is designed and equipped with one of the following vapor loss control devices:

(1) An external or an internal floating roof. This control equipment may not be permitted if the volatile organic compounds have a vapor pressure of 11 psia (76 kilopascals) or greater under actual storage conditions.

(2) Vapor recovery system. A vapor recovery system, consisting of a vapor gathering system capable of collecting the volatile organic compound vapors and gases discharged and a vapor disposal system capable of processing such volatile organic vapors and gases so as to prevent their emission to the atmosphere. Tank gauging and sampling devices shall be gas-tight except when gauging or sampling is taking place. The vapor recovery system shall be maintained in good working order and recover at least 80% of the vapors emitted by such tank.

(b) An external floating roof shall be fitted with a primary seal and a continuous secondary seal extending from the floating roof to the tank wall (rim-mounted secondary seal). The external floating roof shall meet the following equipment requirements:

(1) Seal closure devices shall meet the following requirements:

(i) There are no visible holes, tears or other openings in the seals or seal fabric.

(ii) The seals are intact and uniformly in place around the circumference of the floating roof between the floating roof and the tank wall.

(iii) For tanks with vapor-mounted primary seals, the accumulated area of gaps exceeding 1/8 inch in width between the secondary seal and the tank wall shall not exceed 1 square inch per foot of tank diameter. Compliance with this subsection shall be determined by physically measuring the length and width of gaps around the entire circumference of the secondary seal in each place where a 1/8 inch uniform diameter probe passes freely (without forcing or binding against the seal) between the seal and tank wall and by summing the area of the individual gaps.

(2) Openings in the external floating roof, except for automatic bleeder vents, rim space vents and leg sleeves, are as follows:

(i) Equipped with covers, seals or lids in the closed position except when the openings are in actual use.

(ii) Equipped with projections into the tank which remain below the liquid surface at all times.

(3) Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports.

**SECTION D. Source Level Requirements**

(4) Rim vents are set to open when the roof is being floated off the leg supports or at the recommended setting of the manufacturer.

(5) Emergency roof drains are provided with slotted membrane fabric covers or equivalent covers which cover at least 90% of the area of the opening.

(c) An internal floating roof shall be fitted with a primary seal and shall comply with the following equipment requirements:

(1) A closure seal or seals, to close the space between the roof edge and tank wall is used.

(2) There are no holes, tears or other openings in the seal or a seal fabric or materials.

(3) Openings except stub drains are equipped with covers, lids or seals such that:

(i) The cover, lid or seal is in the closed position at all times except when in actual use.

(ii) Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports.

(iii) Rim vents, if provided are set to open when the roof is being floated off the roof leg supports or at the recommended setting of the manufacturer.

(d) This section does not apply to petroleum liquid storage vessels which:

(1) Are used to store waxy, heavy pour crude oil.

(2) Have capacities less than 420,000 gallons and are used to store produced crude oil and condensate prior to lease custody transfer.

(e) For the purposes of this section, the petroleum liquid storage vessels listed in this subsection comply with the equipment requirements of this section. These tanks shall comply with the maintenance, inspection and reporting requirements of this section. These petroleum liquid storage vessels are those:

(1) Which contain a petroleum liquid with a true vapor pressure less than 4 psia (27.6 kilopascals) and which are of welded construction and which presently possess a metallic-type shoe seal, a liquid-mounted foam seal, a liquid-mounted liquid filled type seal or other closure device of demonstrated equivalence approved by the Department.

(2) Which are of welded construction, equipped with a metallic-type shoe primary seal and has a secondary seal from the top of the shoe seal to the tank wall (shoe-mounted secondary seal).

(f) The owner or operator of a petroleum liquid storage vessel with a floating roof subject to this regulation shall:

(1) Perform routine inspections annually in order to insure compliance with subsection (b) or (c). The inspection shall include a visual inspection of the secondary seal gap when inspecting external floating roof tanks.

(2) For external floating roof tanks, measure the secondary seal gap annually in accordance with subsection (b)(1)(iii) when the floating roof is equipped with a vapor-mounted primary seal.

(3) Maintain records of the types of volatile petroleum liquids stored, the maximum true vapor pressure of the liquid as stored, and the results of the inspections performed in subsection (f)(1) and (2). Copies of the records shall be retained by the owner or operator for a period of 2 years after the date on which the record was made and shall be made available to the Department upon written or verbal request at a reasonable time.

(g) For volatile organic compounds whose storage temperature is governed by ambient weather conditions, the vapor pressure under actual storage conditions shall be determined using a temperature which is representative of the average storage temperature for the hottest month of the year in which the storage takes place.

**SECTION D. Source Level Requirements**

(h) If a failure is detected during inspections required in this section, the owner or operator, or both, shall repair the items or empty and remove the storage vessel from service within 45 days. If this failure cannot be repaired within 45 days and if the vessel cannot be emptied within 45 days, a 30-day extension may be requested from the Department. A request for an extension shall document that alternate storage capacity is unavailable and specify a schedule of actions the owner or operator will take that will assure that the equipment will be repaired or the vessel will be emptied as soon as possible but within the additional 30-day time requested.

002 [25 Pa. Code §129.57]**Storage tanks less than or equal to 40,000 gallons capacity containing VOCs**

The provisions of this section shall apply to above ground stationary storage tanks with a capacity equal to or greater than 2,000 gallons which contain volatile organic compounds with vapor pressure greater than 1.5 psia (10.5 kilopascals) under actual storage conditions. Storage tanks covered under this section shall have pressure relief valves which are maintained in good operating condition and which are set to release at no less than 0.7 psig (4.8 kilopascals) of pressure or 0.3 psig (2.1 kilopascals) of vacuum or the highest possible pressure and vacuum in accordance with state or local fire codes or the National Fire Prevention Association guidelines or other national consensus standards acceptable to the Department. Section 129.56(g) (relating to storage tanks greater than 40,000 gallons capacity containing volatile organic compounds) applies to this section. Petroleum liquid storage vessels which are used to store produced crude oil and condensate prior to lease custody transfer shall be exempt from the requirements of this section.

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

Source ID: 401

Source Name: HEATERS

Source Capacity/Throughput:

N/A

Natural Gas

PROC
401STAC
S401**I. RESTRICTIONS.****Emission Restriction(s).****# 001 [25 Pa. Code §123.11]****Combustion units**

(a) A person may not permit the emission into the outdoor atmosphere of particulate matter from a combustion unit in excess of the following:

(1) The rate of 0.4 pound per million Btu of heat input, when the heat input to the combustion unit in millions of Btus per hour is greater than 2.5 but less than 50.

(2) - (3) Not applicable.

(b) Not applicable.

002 [25 Pa. Code §123.22]**Combustion units**

(a) Nonair basin areas. Combustion units in nonair basin areas must conform with the following:

(1) General provision. A person may not permit the emission into the outdoor atmosphere of sulfur oxides, expressed as SO₂, from a combustion unit in excess of the rate of 4 pounds per million Btu of heat input over a 1-hour period, except as provided in paragraph (4).

(2) - (4) Not applicable.

(b) - (e) Not applicable.

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

**SECTION D. Source Level Requirements****V. REPORTING REQUIREMENTS.**

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

**SECTION D. Source Level Requirements**

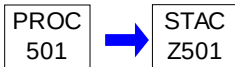
Source ID: 501

Source Name: PNEUMATIC DEVICES

Source Capacity/Throughput:

8.510 CF/HR

AIR-ACTUATED

**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

IV. RECORDKEEPING REQUIREMENTS.

001 [25 Pa. Code §127.441]

Operating permit terms and conditions.

The permittee shall maintain records of the location, date of installation, and manufacturer's specifications for each pump.

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

**SECTION D. Source Level Requirements**

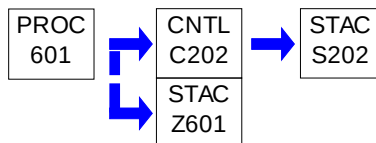
Source ID: 601

Source Name: VENTING/BLOWDOWNS

Source Capacity/Throughput:

11.270 MCF/HR

Natural Gas

**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

IV. RECORDKEEPING REQUIREMENTS.**# 001 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The Owner/Operator shall maintain records of the date, time, duration, volume of natural gas released, and emissions from each blowdown and emergency shutdown at the facility.

V. REPORTING REQUIREMENTS.**# 002 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The owner/operator shall report each emergency shutdown (ESD) event that occurs at this facility in accordance with the malfunction reporting requirements of Section C of this operating permit.

VI. WORK PRACTICE REQUIREMENTS.**# 003 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The Owner/Operator shall minimize blowdown gas generated as a result of equipment maintenance and emergency shutdowns to the extent practical.

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

**SECTION D. Source Level Requirements**

Source ID: 701

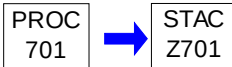
Source Name: FUGITIVES

Source Capacity/Throughput:

N/A

Natural Gas

Conditions for this source occur in the following groups: SUBPART OOOOAREQUIREMENTS

**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.**# 001 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

For each fugitive emissions component constructed and authorized to operate on or after August 8, 2018, the following applies:

(i) No later than 30 days after an emission source commences operation, and at least monthly thereafter, the owner or operator of a facility shall conduct an AVO inspection.

(ii) No later than 60 days after initial startup, and quarterly thereafter, the owner or operator shall conduct an LDAR program using Method 21 in conformance with the 28 VHP program.

(A) The owner or operator may request, in writing, an extension of the LDAR inspection interval from the Air Program Manager of the appropriate DEP Regional Office.

(B) Any fugitive emissions components that are difficult-to-monitor or unsafe-to-monitor must be identified in the monitoring plan in accordance with 40 CFR §60.5397a(b) through (d).

(iii) The detection devices must be operated and maintained in accordance with manufacturer-recommended procedures, as required by the test method, or a Department-approved method.

002 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

(a) For each fugitive emissions component constructed and authorized to operate by the Department on or after February 2, 2013, but prior to August 8, 2018, the following applies:

(i) The owner or operator of the natural gas compression and/or processing facility shall, at a minimum, on a monthly basis perform a leak detection and repair program that includes audible, visual, and olfactory (AVO) inspections.

(ii) Within 180 days after the initial startup of a source, the owner or operator of the facility shall at a minimum, on a quarterly basis, use forward looking infrared (FLIR) cameras or other leak detection monitoring devices approved by the Department for the detection of fugitive leaks. The Department may grant an extension for use of FLIR camera upon receipt of a written request from the owner or operator of the facility documenting the justification for the requested extension.

(iii) If any leak is detected, the owner or operator of the facility shall repair the leak as expeditiously as practicable, but no

**SECTION D. Source Level Requirements**

later than fifteen (15) calendar days after the leak is detected, except as provided in 40 CFR §§ 60.482-60.489. The owner or operator shall record each leak detected and the associated repair activity.

IV. RECORDKEEPING REQUIREMENTS.**# 003 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

For fugitive emissions components, the owner or operator shall maintain the following records:

(a) The fugitive emissions monitoring plan in accordance with 40 CFR §60.5397a(b) through (d).

(b) Records of each monitoring survey which must include:

- (i) The facility name and location;
- (ii) The operating permit number;
- (iii) The date, start time, and end time of the survey;
- (iv) The name of the operator(s) performing the survey;
- (v) The monitoring instrument used;
- (vi) The ambient temperature, sky conditions, and maximum wind speed at the time of the survey;
- (vii) Any deviations from the monitoring plan or a statement that there were none; and
- (viii) Documentation of each fugitive emission including:

(A) The identification of each component from which fugitive emissions were detected;

(B) The instrument reading of each fugitive emissions component that meets the definition of a leak.

(C) The status of repair of each component including:

- (1) The repair methods applied in each attempt to repair the component;
- (2) The tagging or digital photographing of each component not repaired during the monitoring survey in which the fugitive emissions were discovered;
- (3) The reasons a component was placed on delay of repair;
- (4) The date of successful repair of the component; and
- (5) The information on the instrumentation or method used to resurvey the component after repair, if it was not completed during the monitoring survey in which the fugitive emissions were discovered.

004 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

The Owner/Operator shall maintain the following records:

- (1) Record of construction documentation that indicate new and reworked valves, piping, compressor systems, and pump systems conform to American Petroleum Institute (API), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), or equivalent code
- (2) Record of construction indicating that new underground drain piping shall be welded.
- (3) Record of construction showing that piping connections are welded, flanged, or screwed (if two-inch diameter or smaller).
- (4) A list of all difficult-to-monitor or unsafe-to-monitor components at the facility.
- (5) A record of hydraulic testing, gas testing, or gas analyzer results on new or reworked piping connections.

**SECTION D. Source Level Requirements****V. REPORTING REQUIREMENTS.**

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.**# 005 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

(i) Any leak detected from a fugitive emission component shall be repaired by the owner or operator of the facility as expeditiously as practicable. A first attempt at repair must be attempted within 5 calendar days of detection, and repair must be completed no later than 15 calendar days after the leak is detected unless:

(A) The owner or operator must purchase parts, in which case the repair must be completed no later than 10 calendar days after the receipt of the purchased parts; or

(B) The repair or replacement is technically infeasible, would require a vent blowdown, a compressor station, processing plant or transmission station shutdown, or would be unsafe to repair during operation of the unit, in which case the repair or replacement must be completed during the next scheduled compressor station, processing plant or transmission station shutdown, after a planned vent blowdown or within 2 years, whichever is earlier.

(ii) Once a fugitive emission component has been repaired or replaced, the owner or operator must resurvey the component as soon as practicable, but no later than 30 calendar days after the leak is repaired.

(A) For repairs that cannot be made during the monitoring survey when the leak is initially found, either a digital photograph must be taken of the component or the component must be tagged for identification purposes.

(B) A leak is considered repaired if:

- (1) There are no detectable emissions consistent with Section 8.3.2 of 40 CFR Part 60, Appendix A-7, Method 21;
- (2) A leak concentration of less than 500 ppm as methane is detected when the gas leak detector probe inlet is placed at the surface of the component;
- (3) There is no visible leak image when using an OGI camera calibrated at a detection sensitivity level of 60 grams/hour; or
- (4) There is no bubbling at the leak interface using a soap solution bubble test specified in Section 8.3.3 of 40 CFR Part 60, Appendix A-7, Method 21.

(iii) The Department determined that the VOC and methane emissions remaining after the implementation of BAT requirements, including LDAR, are of minor significance with regard to causing air pollution, and will not, on their own, be preventing or interfering with the attainment or maintenance of an ambient air quality standard.

VII. ADDITIONAL REQUIREMENTS.**# 006 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

A leak is defined as:

- (A) Any positive indication, whether audible, visual, or odorous, determined during an AVO inspection;
- (B) Any visible emissions detected by an OGI camera calibrated according to 40 CFR § 60.18 and a detection sensitivity level of 60 grams/hour; or
- (C) A concentration of 500 ppm calibrated as methane or greater detected by an instrument reading.

007 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

For quarterly inspections using a gas leak detector in accordance with 40 CFR Part 60, Appendix A-7, Method 21, the owner

**SECTION D. Source Level Requirements**

or operator may choose to adjust the detection instrument readings to account for the background organic concentration level as determined according to the procedures in Section 8.3.2.

008 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

New and reworked piping connections shall be welded or flanged. Screwed connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within 15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least daily by operating personnel walk-through.

Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period;

(1) a cap, blind flange, plug, or second valve must be installed on the line or valve;

or

(2) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once within the 72 hour period following the creation of the open ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve.

009 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

Hydraulic testing or gas testing of new and reworked piping connections, at no lower than operating pressure, shall be completed before components are returned to service. Alternatively, the components may be monitored for leaks by utilizing an approved gas analyzer within fifteen (15) days of return to services. To obtain leak-free operation, necessary adjustments shall be made.

010 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

Each open-ended line and open-ended valve shall be equipped with an appropriately sized blind flange, cap, plug, or a second valve to seal the line. Both valves shall be closed except during sampling procedures. This condition does not apply if when open-ended line or open-ended valve is out of service and properly follows lockout and tagout procedures.

011 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

For annual emissions reporting purposes, cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the EPA correlation approach or by other methods acceptable to the Department.

012 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

Within ten (10) days of when the most recent leaking component is added to the delay of repair list, the cumulative daily emission calculations, which include every component listed on the delay of repair list shall be updated. If the equation,

**SECTION D. Source Level Requirements**

below, occurs, the Owner/Operator shall notify the department within fifteen (15) days of this determination. Depending on the severity or number of tagged leaks, early shutdown, or other appropriate responses may result:

(Cumulative daily emission rate of all components on the delay of repair list)*(days until the next scheduled unit shutdown)
>= (total emissions from a unit shutdown)

013 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak checking during plant operation.

014 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

For the purposes of this operating permit, a leak is defined as:

- (1) Any positive indication, whether audible, visual, or odorous, determined during an AVO inspection;
- (2) Any visible emissions detected by an OGI camera calibrated according to 40 CFR § 60.18 and a detection sensitivity level of 60 grams/hour; or
- (3) A concentration of 500 ppm calibrated as methane or greater detected by an instrument reading.
- (4) Any equipment or component that is designed to protect the equipment or safety of personnel is not considered a "leak".

A release from any equipment or component designed by the manufacturer to protect the equipment, controller, personnel, to prevent ground water contamination, gas migration, or an emergency is also not considered a leak.

**SECTION D. Source Level Requirements**

Source ID: 702

Source Name: TRUCK LOADING

Source Capacity/Throughput:

N/A

Conditions for this source occur in the following groups: ENCLOSED COMBUSTION DEVICES

**I. RESTRICTIONS.****Control Device Efficiency Restriction(s).****# 001 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

(a) The owner/operator shall ensure that VOC emissions from truck loadout are controlled by a minimum of 99% or meet the requirements of (b) below.

(b) As an alternative to controlling truck loadout VOC emissions by a minimum of 99%, the owner/operator may implement the following annual leak test program:

- (i) Use a vapor balancing system when removing liquids from the storage vessel; and
- (ii) Ensure that each tanker truck that is used to remove liquids from the storage vessel has passed one of the following annual leak tests:

(A) A tanker truck that does not indicate more than 1" H₂O pressure change within 5 minutes after being pressurized to 18" H₂O and after being depressurized to 6" H₂O vacuum has passed a MACT-level test and is assumed to have a collection efficiency of 99.2%.

(B) A tanker truck that does not indicate more than 3" H₂O pressure change within 5 minutes after being pressurized to 18" H₂O and after being depressurized to 6" H₂O vacuum has passed an NSPS-level test and is assumed to have a collection efficiency of 98.7%.

(C) A tanker truck that has passed a leak test performed in accordance with 49 CFR § 180.407 is accepted as equivalent to an NSPS-level collection efficiency of 98.7%.

(D) A tanker truck that has passed a leak test performed in accordance with 40 CFR Part 60, Appendix A-8, Method 27 is accepted as equivalent to an NSPS-level collection efficiency of 98.7%.

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.**# 002 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

For each tanker truck load-out operation, the owner or operator shall maintain the following records:

- (a) The identification, location, and date of construction of each vapor recovery load-out system;
- (b) Records of each tanker truck load-out operation including the date and time of the liquids load-out, the type and volume

**SECTION D. Source Level Requirements**

of liquids loaded, the truck collection efficiency based on an annual leak test or demonstrating a minimum 99% control of VOC emissions.

(c) Liquid loadout volumes on a 12-month rolling basis, calculated monthly.

(d) The emissions calculation for each tanker truck load-out operation in accordance with 25 Pa. Code §135.5.

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

003 [25 Pa. Code §127.441]

Operating permit terms and conditions.

Each 21,000-gallon 2-lb RVP condensate storage tank, each 90,000-gallon 12-lb RVP condensate storage tank (TK-811A & TK-811B), and truck loadout operations shall be controlled by the 1.0 MMBtu/hr truck loading combustor with 0.086 MMBtu/hr pilot at all times while truck loadout operations are occurring.

004 [25 Pa. Code §127.441]

Operating permit terms and conditions.

Truck loadout operations shall use dedicated normal service filled by submerged loading.

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

Source ID: 801

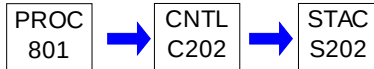
Source Name: PIGGING OPERATIONS

Source Capacity/Throughput:

N/A

Natural Gas

Conditions for this source occur in the following groups: ENCLOSED COMBUSTION DEVICES

**I. RESTRICTIONS.**

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.**# 001 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

For each pigging operation, the owner or operator shall maintain the following records, including information on:

- (a) The identification, location, and date of construction of each pig launcher or receiver;
- (b) Records of each pigging operation including the identification of the pig chamber used, the date and time of the pigging operation, and the type and volume of liquids cleared; and
- (c) The emissions calculation for each pig chamber, using the Department's spreadsheet found at <http://files.dep.state.pa.us/> or other equivalent method.

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.**# 002 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The owner or operator that conducts pigging operations shall employ best management practices to minimize the liquids present in the pig receiver chamber and to minimize emissions from the pig receiver chamber including, but not limited to, installing liquids ramps, installing liquids drain, routing high-pressure chambers to a low-pressure line or vessel, using ball valve type chambers, or using multiple pig chambers, as applicable.



SECTION D. Source Level Requirements

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

Source ID: C201

Source Name: 5.54 MMBTU/HR AMINE UNIT THERMAL OXIDIZER 1

Source Capacity/Throughput:

N/A

Natural Gas

Conditions for this source occur in the following groups: ENCLOSED COMBUSTION DEVICES

I. RESTRICTIONS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

Source ID: C202

Source Name: 906 MMBTU/HR REV CRYO 1 PLANT FLARE

Source Capacity/Throughput:

N/A

Natural Gas

Conditions for this source occur in the following groups: MSS FLARE

I. RESTRICTIONS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION D. Source Level Requirements**

Source ID: C702

Source Name: 1.0 MMBTU/HR TRUCK LOADING COMBUSTOR

Source Capacity/Throughput:

N/A

Natural Gas

Conditions for this source occur in the following groups: ENCLOSED COMBUSTION DEVICES

I. RESTRICTIONS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

IV. RECORDKEEPING REQUIREMENTS.

No additional record keeping requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements) and/or Section E (Source Group Restrictions).

**SECTION E. Source Group Restrictions.**

Group Name: ENCLOSED COMBUSTION DEVICES

Group Description: Requirements from the GP-5 (2018) for Enclosed Combustion Devices

Sources included in this group

ID	Name
201	200 GPM AMINE UNIT 1
301	TANKS/VESSELS
702	TRUCK LOADING
801	PIGGING OPERATIONS
C201	5.54 MMBTU/HR AMINE UNIT THERMAL OXIDIZER 1
C702	1.0 MMBTU/HR TRUCK LOADING COMBUSTOR

I. RESTRICTIONS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

II. TESTING REQUIREMENTS.**# 001 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The owner or operator must conduct performance tests within 180 days of each reauthorization unless:

- (A) The combustion control device is a manufacturer-tested model tested in accordance with 40 CFR § 60.5413(d) or § 60.5413a(d);
- (B) A performance test conducted on a device of the same make and model in similar service at another facility within the Commonwealth approved by the Department may be used to satisfy this requirement;
- (C) The Department uses EPA's National Stack Testing Guidance for stack test waivers. or
- (D) The combustion control device established a correlation between the outlet TOC performance level and the firebox or combustion chamber temperature during the initial performance test.

002 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

If performance testing is required within 180 days of each reauthorization, the owner or operator must conduct performance tests in accordance with the following:

When conducting a performance test, the owner or operator must submit the test protocol described in Section C. The owner or operator should conduct the following test procedures:

- (a) Conduct three test runs of at least one-hour duration while operating the control device within 5% of the required operating temperature.
- (b) Select the sampling port location and the number and location of traverse points at the exhaust using 40 CFR Part 60, Appendix A-1, Method 1 or 1A depending on stack diameter.
 - (i) If demonstrating compliance with a percent reduction requirement, sampling sites must be located at the inlet of the first control device and the outlet of the final control device; or
 - (ii) If demonstrating compliance with an outlet concentration requirement, the sampling site must be located at the outlet of the control device.
- (c) Determine the effluent characteristics including:
 - (i) The flow velocity, stack temperature, static pressure, and barometric pressure using 40 CFR Part 60, Appendix A-1, Method 2 or 2C depending on stack diameter;
 - (ii) The gas density using 40 CFR Part 60, Appendix A-2, Method 3A; and

**SECTION E. Source Group Restrictions.**

- (iii) The moisture content using 40 CFR Part 60, Appendix A-3, Method 4.
- (d) To demonstrate compliance with (b)(i), use 40 CFR Part 60, Appendix A-7, Method 25A to determine the Total Organic Compounds (TOC) and then convert to dry basis using the moisture content from (c)(iii) above and calculate the inlet and outlet mass rates as propane and the percent reduction.
- (e) To demonstrate compliance with (b)(ii), use 40 CFR Part 60, Appendix A-7, Method 25A to determine the TOC and 40 CFR Part 60, Appendix A-6, Method 18 to determine the methane and ethane concentration, and then correct the TOC concentration, minus methane and ethane, for percent oxygen from (c)(ii) above.

III. MONITORING REQUIREMENTS.

No additional monitoring requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

IV. RECORDKEEPING REQUIREMENTS.**# 003 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

For each control device, the owner or operator shall maintain the following records:

- (i) For non-manufacturer-tested models, the owner or operator must maintain records in accordance with 40 CFR §60.5420(c)(13) and (14) or §60.5420a(c)(13) and (14) as applicable.
- (ii) For manufacturer-tested models, the owner or operator must maintain records in accordance with 40 CFR §60.5413(d)(12) and (e) or §60.5413a(d)(12) and (e) as applicable.
- (iii) The summary for each complete test report described in Section C, if applicable.

V. REPORTING REQUIREMENTS.**# 004 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

In the required annual report, the information about each control device in operation during the reporting period shall be done in accordance with 40 CFR §60.5420(b) or §60.5420a(b) as applicable.

VI. WORK PRACTICE REQUIREMENTS.

No additional work practice requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

VII. ADDITIONAL REQUIREMENTS.

No additional requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

**SECTION E. Source Group Restrictions.**

Group Name: HMO HEATERS

Group Description: Combustion Units (Derived from GP-1)

Sources included in this group

ID	Name
031	40.92 MMBTU/HR HMO HEATER 1
032	40.92 MMBTU/HR HMO HEATER 2
033	40.92 MMBTU/HR HMO HEATER 3

I. RESTRICTIONS.**Emission Restriction(s).****# 001 [25 Pa. Code §123.11]****Combustion units**

(a) A person may not permit the emission into the outdoor atmosphere of particulate matter from a combustion unit in excess of the following:

(1) The rate of 0.4 pound per million Btu of heat input, when the heat input to the combustion unit in millions of Btus per hour is greater than 2.5 but less than 50.

(2) - (3) N/A

(b) N/A

002 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

The combustion unit(s) shall be fired only on gas (natural or liquefied petroleum) or No. 2 commercial fuel oil to which there has been no reclaimed or waste oil or other waste materials added.

003 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

The permittee shall construct the combustion units capable of reducing nitrogen oxides (NO_x) and carbon monoxide (CO) emissions to or below:

i. 30 ppm_{dv} NO_x at 3% O₂ and

ii. 300 ppm_{dv} CO at 3% O₂.

004 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.42c]**Subpart Dc - Standards of Performance for Small Industrial- Commercial-Institutional Steam Generating Units
Standard for sulfur dioxide.**

(a) - (g) Not applicable.

(h) For affected facilities listed under paragraphs (h)(1), (2), or (3) of this section, compliance with the emission limits or fuel oil sulfur limits under this section may be determined based on a certification from the fuel supplier, as described under §60.48c(f), as applicable.

(1) Distillate oil-fired affected facilities with heat input capacities between 2.9 and 29 MW (10 and 100 MMBtu/hr).

(2) - (3) Not applicable.

(i) - (j) Not applicable.

**SECTION E. Source Group Restrictions.****II. TESTING REQUIREMENTS.****# 005 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

(a) When conducting periodic monitoring on a combustion unit, the owner or operator may follow the procedures below. If the owner or operator decides to deviate from those procedures, they must submit a request to use an alternate procedure, in writing, at least 60 days prior to performing the periodic monitoring. In the alternate procedure request, the owner or operator must demonstrate the alternate procedure's equivalence to the standard procedure to the satisfaction of the Division of Source Testing and Monitoring.

(b) Standardized Periodic Monitoring Procedure.

(i) Conduct three test runs of at least 20-minutes duration within 10% of 100% peak (or the highest achievable) load.

(ii) Determine NO_x and CO emissions and O₂ concentrations in the exhaust with either an electro-chemical cell portable gas analyzer used and maintained in accordance with the manufacturer's specifications and following the procedures specified in the current version of ASTM D6522 or by following the procedures in this section.

(iii) If the measured NO_x or CO emissions concentrations are in exceedance of the emissions limit, the owner or operator must perform a stack test within 180 days of the periodic monitoring.

(iv) Periodic monitoring for each combustion unit shall be conducted within 180 days of authorization of this state-only operating permit and at a minimum frequency of once every three (3) calendar years thereafter. A performance test may be used in lieu of periodic monitoring.

006 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

(a) When conducting a performance test, the owner or operator must submit the test protocol for review and approval in accordance with Section C, Condition #010.

(b) The owner or operator should conduct the following test procedures.

(i) Conduct three test runs of at least one-hour duration within 10% of 100% peak (or the highest achievable) load.

(ii) Select the sampling port location and the number and location of traverse points at the exhaust using 40 CFR Part 60, Appendix A-1, Method 1 or 1A depending on stack diameter.

(iii) Determine the effluent characteristics including:

(A) The flow velocity, stack temperature, static pressure, and barometric pressure using 40 CFR Part 60, Appendix A-1, Method 2 or 2C depending on stack diameter;

(B) The gas density using 40 CFR Part 60, Appendix A-2, Method 3A; and

(C) The moisture content using 40 CFR Part 60, Appendix A-3, Method 4.

(iv) Simultaneous to the determination of the O₂ concentration in (iii)(B) above, determine:

(A) The NO_x concentration of the exhaust gas using 40 CFR Part 60, Appendix A-4, Method 7E; and

(B) The CO concentration of the exhaust gas using 40 CFR Part 60, Appendix A-4, Method 10.

(c) If at any time the owner or operator operates the combustion unit in excess of the highest achievable load plus 10%, the owner or operator must perform a stack test within 180 days from the anomalous operation.

III. MONITORING REQUIREMENTS.**# 007 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

For each small combustion unit (< 100 MMBtu/hr) constructed and authorized to operate under this state-only operating permit, the owner or operator shall, within 180 days after authorization of this state-only operating permit, conduct either a performance test or periodic monitoring.

**SECTION E. Source Group Restrictions.**

At a minimum frequency of once every three (3) calendar years from the date of the previous performance test or periodic monitoring, the owner or operator shall measure the concentrations in the effluent stream of NO_x and CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable analyzer as long as it is calibrated and operated according to the manufacturer's recommendations, the procedures specified in ASTM D-6522, and the following requirements:

- (i) The portable analyzer shall undergo factory laboratory calibration and cleaning every three years.
- (ii) The portable analyzer shall have on-site calibration checks using certified calibration gases demonstrating the analyzer accuracy requirements specified in ASTM D-6522.
- (iii) In order to verify emissions, the owner or operator shall conduct three, 20-minute test runs recording emissions data at least once each minute.
- (iv) Depending on concentrations observed, fresh air purges should be performed according to manufacturer's recommendations.
- (v) Re-zeroing of the portable analyzer should be performed according to manufacturer's recommendations or at least before every test run.

A performance test may be used in lieu of periodic monitoring.

IV. RECORDKEEPING REQUIREMENTS.**# 008 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The permittee shall, upon the request of the Department, provide fuel analyses, or fuel samples of the fuel used in any combustion unit authorized to operate under this state-only operating permit.

009 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

For each combustion unit, the owner or operator shall maintain the following records, including information on:

- (a) The tune-up/inspection records, which shall at a minimum include:
 - (i) The concentrations of NO_x and CO in the effluent stream in parts per million by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the small combustion unit;
 - (ii) A description of any corrective actions taken as part of the tune-up;
 - (iii) The date(s) the annual tune-up/inspection was conducted;
 - (iv) The factory calibration certification sheets for the portable analyzer; and
 - (v) The type and amount of fuel used over the 12 months prior to the tune-up; and
- (b) The emissions calculations for the combustion unit in accordance with 25 Pa. Code §135.5.

010 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.46c]**Subpart Dc - Standards of Performance for Small Industrial- Commercial-Institutional Steam Generating Units
Emission monitoring for sulfur dioxide**

- (a) - (d) Not applicable.
- (e) The monitoring requirements of paragraphs (a) and (d) of this section shall not apply to affected facilities subject to §60.42c(h)(1), (2), or (3) where the owner or operator of the affected facility seeks to demonstrate compliance with the SO₂ standards based on fuel supplier certification, as described under §60.48c(f), as applicable.
- (f) Not applicable.

**SECTION E. Source Group Restrictions.****# 011 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.48c]****Subpart Dc - Standards of Performance for Small Industrial- Commercial-Institutional Steam Generating Units Reporting and recordkeeping requirements.**

(a) - (e) Not applicable.

(f) Fuel supplier certification shall include the following information:

(1) - (3) Not applicable.

(4) For other fuels:

(i) The name of the supplier of the fuel;

(ii) The potential sulfur emissions rate or maximum potential sulfur emissions rate of the fuel in ng/J heat input; and

(iii) The method used to determine the potential sulfur emissions rate of the fuel.

(g) (1) Except as provided under paragraphs (g)(2) and (g)(3) of this section, the owner or operator of each affected facility shall record and maintain records of the amount of each fuel combusted during each operating day.

(2) As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility that combusts only natural gas, wood, fuels using fuel certification in § 60.48c(f) to demonstrate compliance with the SO₂ standard, fuels not subject to an emissions standard (excluding opacity), or a mixture of these fuels may elect to record and maintain records of the amount of each fuel combusted during each calendar month.

(h) - (j) Not applicable.

V. REPORTING REQUIREMENTS.

No additional reporting requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

VI. WORK PRACTICE REQUIREMENTS.**# 012 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The combustion unit and any associated air cleaning devices shall be:

- a. Operated in such a manner as not to cause air pollution.
- b. Operated and maintained in a manner consistent with good operating and maintenance practices.
- c. Operated and maintained in accordance with the manufacturer's specifications and the applicable terms and conditions of this state-only operating permit.

013 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

For each small combustion unit (< 100 MMBtu/hr) constructed and authorized to operate under this state-only operating permit, the owner or operator shall conduct an annual tune-up/inspection on the small combustion unit. At a minimum the tune-up/inspection shall consist of the following:

- (i) As applicable, inspect the burner, and clean or replace any components of the burner as necessary;
- (ii) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available;
- (iii) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly;

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(iv) Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with the NO_x requirement to which the small combustion unit is subject.

VII. ADDITIONAL REQUIREMENTS.

014 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.40c]

Subpart Dc - Standards of Performance for Small Industrial- Commercial-Institutional Steam Generating Units
Applicability and delegation of authority.

(a) Except as provided in paragraph (d) of this section, the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) or less, but greater than or equal to 2.9 MW (10 MMBtu/hr).

(b) - (i) Not applicable.

**SECTION E. Source Group Restrictions.**

Group Name: MSS FLARE

Group Description: MSS Plant Flare Requirements

Sources included in this group

ID	Name
C202	906 MMBTU/HR REV CRYO 1 PLANT FLARE

I. RESTRICTIONS.**Emission Restriction(s).****# 001 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

Emissions from the MSS flare stack shall not exceed the following emissions on a 12-month rolling basis (calculated monthly):

- a.) 1.65 TPY NO_x;
- b.) 7.52 TPY CO.

II. TESTING REQUIREMENTS.

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

III. MONITORING REQUIREMENTS.**# 002 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The owner or operator shall conduct visible emissions observations using either the methods in paragraph (1) of this section or, alternatively, the methods in paragraph (2) of this section. The owner or operator must record and report any instances where visible emissions are observed for more than 5 minutes during any 2 consecutive hours as specified in §60.18(c)(1).

(1) At least once per day for each day a process is routed to the flare, conduct visible emissions observations using an observation period of 5 minutes using Method 22 at 40 CFR part 60, appendix A-7. If at any time the owner or operator sees visible emissions while a process is routed to the flare, even if the minimum required daily visible emission monitoring has already been performed, the owner or operator shall immediately begin an observation period of 5 minutes using Method 22 at 40 CFR part 60, appendix A-7. If visible emissions are observed for more than one continuous minute during any 5-minute observation period, the observation period using Method 22 at 40 CFR part 60, appendix A-7 must be extended to 2 hours or until 5-minutes of visible emissions are observed. Daily 5-minute Method 22 observations are not required to be conducted for days the flare does not receive any volumetric flow from any process.

(2) Use a video surveillance camera to continuously record (at least one frame every 15 seconds with time and date stamps) images of the flare flame and a reasonable distance above the flare flame at an angle suitable for visual emissions observations. The owner or operator must provide real-time video surveillance camera output to the control room or other continuously manned location where the camera images may be viewed at any time.

003 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

The owner or operator shall operate each flare with a pilot flame present on an individual burner or stage of burners at all times when a process is routed to the flare. Each 15-minute block during which there is at least one minute where no pilot flame on an individual burner or stage of burners is present when a process is routed to the flare is a deviation of the standard. Deviations in different 15-minute blocks from the same event are considered separate deviations. The owner or operator shall monitor for the presence of a pilot flame on an individual burner or stage of burners using a device (including, but not limited to, a thermocouple, ultraviolet beam sensor, or infrared sensor) capable of detecting that the pilot flame(s) is present.

**SECTION E. Source Group Restrictions.****# 004 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

(a) The owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate in the flare header or headers that feed the flare as well as any flare supplemental gas used. Different flow monitoring methods may be used to measure different gaseous streams that make up the flare vent gas provided that the flow rates of all gas streams that contribute to the flare vent gas are determined. If assist air or assist steam is used, the owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate of assist air and/or assist steam used with the flare. If pre-mix assist air and perimeter assist are both used, the owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of separately measuring, calculating, and recording the volumetric flow rate of premix assist air and perimeter assist air used with the flare. Flow monitoring system requirements and acceptable alternatives are provided in paragraphs (1) through (6) of this section.

(1) The flow rate monitoring systems must be able to correct for the temperature and pressure of the system and output parameters in standard conditions (i.e., a temperature of 20°C (68°F) and a pressure of 1 atmosphere).

(2) Mass flow monitors may be used for determining volumetric flow rate of flare vent gas provided the molecular weight of the flare vent gas is determined using compositional analysis so that the mass flow rate can be converted to volumetric flow at standard conditions using the following equation.

$$Q_{vol} = [(Q_{mass})(385.3)]/MWt$$

Where:

Q_{vol} = Volumetric flow rate, standard cubic feet per second.

Q_{mass} = Mass flow rate, pounds per second.

385.3 = Conversion factor, standard cubic feet per pound-mole.

MWt = Molecular weight of the gas at the flow monitoring location, pounds per pound-mole.

(3) Mass flow monitors may be used for determining volumetric flow rate of assist air or assist steam. Use equation in paragraph (2) of this section to convert mass flow rates to volumetric flow rates. Use a molecular weight of 18 pounds per pound-mole for assist steam and use a molecular weight of 29 pounds per pound-mole for assist air.

(4) Continuous pressure/temperature monitoring system(s) and appropriate engineering calculations may be used in lieu of a continuous volumetric flow monitoring systems provided the molecular weight of the gas is known. For assist steam, use a molecular weight of 18 pounds per pound-mole. For assist air, use a molecular weight of 29 pounds per pound-mole. For flare vent gas, molecular weight must be determined using compositional analysis as specified in paragraph (b) of this section.

(5) Continuously monitoring fan speed or power and using fan curves is an acceptable method for continuously monitoring assist air flow rates.

(6) For perimeter assist air intentionally entrained in lower and/or upper steam, the monitored steam flow rate and the maximum design air-to-steam volumetric flow ratio of the entrainment system may be used to determine the assist air flow rate.

(b) The owner or operator shall determine the concentration of individual components in the flare vent gas using either the methods provided in paragraph (b)(1) or (2) of this section. Alternatively, the owner or operator may elect to directly monitor the net heating value of the flare vent gas following the methods provided in paragraphs (b)(3) of this section and, if desired, may directly measure the hydrogen concentration in the flare vent gas following the methods provided in paragraphs (b)(4) of this section. The owner or operator may elect to use different monitoring methods for different gaseous streams that make up the flare vent gas using different methods provided the composition or net heating value of all gas streams that contribute to the flare vent gas are determined.

(1) Except as provided in paragraphs (b)(5) and (6) of this section, the owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of continuously measuring (i.e., at least once every 15-minutes), calculating, and recording the individual component concentrations present in the flare vent gas.

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(2) Except as provided in paragraphs (b)(5) and (6) of this section, the owner or operator shall install, operate, and maintain a grab sampling system capable of collecting an evacuated canister sample for subsequent compositional analysis at least once every eight hours while there is flow of a process to the flare. Subsequent compositional analysis of the samples must be performed according to Method 18 of 40 CFR part 60, appendix A-6, ASTM D6420-99 (Reapproved 2010), ASTM D1945-03 (Reapproved 2010), ASTM D1945-14 or ASTM UOP539-12 (all incorporated by reference—see § 63.14).

(3) Except as provided in paragraphs (b)(5) and (6) of this section, the owner or operator shall install, operate, calibrate, and maintain a calorimeter capable of continuously measuring, calculating, and recording NHWg at standard conditions.

(4) If the owner or operator uses a continuous net heating value monitor according to paragraph (b)(3) of this section, the owner or operator may, at their discretion, install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the hydrogen concentration in the flare vent gas.

(5) Direct compositional or net heating value monitoring is not required for purchased ("pipeline quality") natural gas streams. The net heating value of purchased natural gas streams may be determined using annual or more frequent grab sampling at any one representative location. Alternatively, the net heating value of any purchased natural gas stream can be assumed to be 920 Btu/scf.

(6) Direct compositional or net heating value monitoring is not required for gas streams that have been demonstrated to have consistent composition (or a fixed minimum net heating value).

IV. RECORDKEEPING REQUIREMENTS.**# 005 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

Records of the emissions of criteria pollutants, VOCs, HAPs, and greenhouse gases from the MSS flare shall be maintained on a monthly and on a 12-month rolling basis.

006 [25 Pa. Code §127.441]**Operating permit terms and conditions.**

The permittee shall maintain records of the daily gas throughput for the MSS flare. These records shall be maintained on a monthly and on a 12-month rolling basis.

V. REPORTING REQUIREMENTS.**# 007 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The owner or operator must record and report any instances where visible emissions are observed for more than 5 minutes during any 2 consecutive hours as specified in §60.18(c)(1).

VI. WORK PRACTICE REQUIREMENTS.**# 008 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

The Owner/Operator shall operate the MSS flare in accordance with the manufacturer specifications and the manufacturer's recommended operating parameters to minimize emission of air pollutants.

VII. ADDITIONAL REQUIREMENTS.**# 009 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.18]****Subpart A - General Provisions****General control device requirements.**

(a) Introduction.

(1) This section contains requirements for control devices used to comply with applicable subparts of 40 CFR parts 60 and

**SECTION E. Source Group Restrictions.**

61. The requirements are placed here for administrative convenience and apply only to facilities covered by subparts referring to this section.

(2) This section also contains requirements for an alternative work practice used to identify leaking equipment. This alternative work practice is placed here for administrative convenience and is available to all subparts in 40 CFR parts 60, 61, 63, and 65 that require monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(b) Flares. Paragraphs (c) through (f) apply to flares.

(c)

(1) Flares shall be designed for and operated with no visible emissions as determined by the methods specified in paragraph (f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

(2) Flares shall be operated with a flame present at all times, as determined by the methods specified in paragraph (f).

(3) An owner/operator has the choice of adhering to either the heat content specifications in paragraph (c)(3)(ii) of this section and the maximum tip velocity specifications in paragraph (c)(4) of this section, or adhering to the requirements in paragraph (c)(3)(i) of this section.

(i)

(A) Flares shall be used that have a diameter of 3 inches or greater, are nonassisted, have a hydrogen content of 8.0 percent (by volume), or greater, and are designed for and operated with an exit velocity less than 37.2 m/sec (122 ft/sec) and less than the velocity, V_{max} , as determined by the following equation:

$$V_{max} = (XH2 - K1) * K2$$

Where:

V_{max} = Maximum permitted velocity, m/sec.

K1 = Constant, 6.0 volume-percent hydrogen.

K2 = Constant, 3.9(m/sec)/volume-percent hydrogen.

XH2 = The volume-percent of hydrogen, on a wet basis, as calculated by using the American Society for Testing and Materials (ASTM) Method D1946-77. (Incorporated by reference as specified in § 60.17).

(B) The actual exit velocity of a flare shall be determined by the method specified in paragraph (f)(4) of this section.

(ii) Flares shall be used only with the net heating value of the gas being combusted being 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or with the net heating value of the gas being combusted being 7.45 MJ/scm (200 Btu/scf) or greater if the flare is nonassisted. The net heating value of the gas being combusted shall be determined by the methods specified in paragraph (f)(3) of this section.

(4)

(i) Steam-assisted and nonassisted flares shall be designed for and operated with an exit velocity, as determined by the methods specified in paragraph (f)(4) of this section, less than 18.3 m/sec (60 ft/sec), except as provided in paragraphs (c)(4) (ii) and (iii) of this section.

(ii) Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the methods specified in paragraph (f)(4), equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the methods specified in paragraph (f)(4), less than the velocity, V_{max} , as determined by the method specified in paragraph (f)(5), and less than 122 m/sec (400 ft/sec) are allowed.

(5) Air-assisted flares shall be designed and operated with an exit velocity less than the velocity, V_{max} , as determined by the method specified in paragraph (f)(6).

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(6) Flares used to comply with this section shall be steam-assisted, air-assisted, or nonassisted.

(d) Owners or operators of flares used to comply with the provisions of this subpart shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs. Applicable subparts will provide provisions stating how owners or operators of flares shall monitor these control devices.

(e) Flares used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

(f)

(1) Method 22 of appendix A to this part shall be used to determine the compliance of flares with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22.

(2) The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame.

(3) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$HT = K \sum_{i=1}^n C_i H_i$$

where:

HT = Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C;

$$K = \text{Constant, } (1/\text{ppm})(\text{g mole/scm})(\text{MJ/kcal}) \\ 1.740(10^{-7})$$

Where the standard temperature for (g mole/scm) is 20°C;

C_i = Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946-77 or 90 (Reapproved 1994) (Incorporated by reference as specified in §60.17); and

H_i = Net heat of combustion of sample component i, kcal/g mole at 25°C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382-76 or 88 or D4809-95 (incorporated by reference as specified in §60.17) if published values are not available or cannot be calculated.

(4) The actual exit velocity of a flare shall be determined by dividing the volumetric flowrate (in units of standard temperature and pressure), as determined by Reference Methods 2, 2A, 2C, or 2D as appropriate; by the unobstructed (free) cross sectional area of the flare tip.

(5) The maximum permitted velocity, V_{max}, for flares complying with paragraph (c)(4)(iii) shall be determined by the following equation.

$$\text{Log}_{10} (V_{\text{max}}) = (HT + 28.8)/31.7$$

V_{max} = Maximum permitted velocity, M/sec

28.8 = Constant

31.7 = Constant

HT = The net heating value as determined in paragraph (f)(3).

(6) The maximum permitted velocity, V_{max}, for air-assisted flares shall be determined by the following equation.

$$V_{\text{max}} = 8.706 + 0.7084 (HT)$$

V_{max} = Maximum permitted velocity, m/sec

8.706 = Constant

0.7084 = Constant

HT = The net heating value as determined in paragraph (f)(3).

**SECTION E. Source Group Restrictions.****# 010 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.18]****Subpart A - General Provisions****General control device requirements.**

(g) Alternative work practice for monitoring equipment for leaks. Paragraphs (g), (h), and (i) of this section apply to all equipment for which the applicable subpart requires monitoring with a 40 CFR part 60, appendix A-7, Method 21 monitor, except for closed vent systems, equipment designated as leakless, and equipment identified in the applicable subpart as having no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background. An owner or operator may use an optical gas imaging instrument instead of a 40 CFR part 60, appendix A-7, Method 21 monitor. Requirements in the existing subparts that are specific to the Method 21 instrument do not apply under this section. All other requirements in the applicable subpart that are not addressed in paragraphs (g), (h), and (i) of this section apply to this standard. For example, equipment specification requirements, and non-Method 21 instrument recordkeeping and reporting requirements in the applicable subpart continue to apply. The terms defined in paragraphs (g)(1) through (5) of this section have meanings that are specific to the alternative work practice standard in paragraphs (g), (h), and (i) of this section.

(1) Applicable subpart means the subpart in 40 CFR parts 60, 61, 63, or 65 that requires monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(2) Equipment means pumps, valves, pressure relief valves, compressors, open-ended lines, flanges, connectors, and other equipment covered by the applicable subpart that require monitoring with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(3) Imaging means making visible emissions that may otherwise be invisible to the naked eye.

(4) Optical gas imaging instrument means an instrument that makes visible emissions that may otherwise be invisible to the naked eye.

(5) Repair means that equipment is adjusted, or otherwise altered, in order to eliminate a leak.

(6) Leak means:

(i) Any emissions imaged by the optical gas instrument;

(ii) Indications of liquids dripping;

(iii) Indications by a sensor that a seal or barrier fluid system has failed; or

(iv) Screening results using a 40 CFR part 60, appendix A-7, Method 21 monitor that exceed the leak definition in the applicable subpart to which the equipment is subject.

(h) The alternative work practice standard for monitoring equipment for leaks is available to all subparts in 40 CFR parts 60, 61, 63, and 65 that require monitoring of equipment with a 40 CFR part 60, appendix A-7, Method 21 monitor.

(1) An owner or operator of an affected source subject to CFR parts 60, 61, 63, or 65 can choose to comply with the alternative work practice requirements in paragraph (i) of this section instead of using the 40 CFR part 60, appendix A-7, Method 21 monitor to identify leaking equipment. The owner or operator must document the equipment, process units, and facilities for which the alternative work practice will be used to identify leaks.

(2) Any leak detected when following the leak survey procedure in paragraph (i)(3) of this section must be identified for repair as required in the applicable subpart.

(3) If the alternative work practice is used to identify leaks, re-screening after an attempted repair of leaking equipment must be conducted using either the alternative work practice or the 40 CFR part 60, appendix A-7, Method 21 monitor at the leak definition required in the applicable subpart to which the equipment is subject.

(4) The schedule for repair is as required in the applicable subpart.

(5) When this alternative work practice is used for detecting leaking equipment, choose one of the monitoring frequencies listed in Table 1 to subpart A of this part in lieu of the monitoring frequency specified for regulated equipment in the applicable subpart. Reduced monitoring frequencies for good performance are not applicable when using the alternative work practice.

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(6) When this alternative work practice is used for detecting leaking equipment the following are not applicable for the equipment being monitored:

- (i) Skip period leak detection and repair;
- (ii) Quality improvement plans; or
- (iii) Complying with standards for allowable percentage of valves and pumps to leak.

(7) When the alternative work practice is used to detect leaking equipment, the regulated equipment in paragraph (h)(1)(i) of this section must also be monitored annually using a 40 CFR part 60, appendix A-7, Method 21 monitor at the leak definition required in the applicable subpart. The owner or operator may choose the specific monitoring period (for example, first quarter) to conduct the annual monitoring. Subsequent monitoring must be conducted every 12 months from the initial period. Owners or operators must keep records of the annual Method 21 screening results, as specified in paragraph (i)(4)(vii) of this section.

(i) An owner or operator of an affected source who chooses to use the alternative work practice must comply with the requirements of paragraphs (i)(1) through (i)(5) of this section.

(1) Instrument Specifications. The optical gas imaging instrument must comply with the requirements in (i)(1)(i) and (i)(1)(ii) of this section.

(i) Provide the operator with an image of the potential leak points for each piece of equipment at both the detection sensitivity level and within the distance used in the daily instrument check described in paragraph (i)(2) of this section. The detection sensitivity level depends upon the frequency at which leak monitoring is to be performed.

(ii) Provide a date and time stamp for video records of every monitoring event.

(2) Daily Instrument Check. On a daily basis, and prior to beginning any leak monitoring work, test the optical gas imaging instrument at the mass flow rate determined in paragraph (i)(2)(i) of this section in accordance with the procedure specified in paragraphs (i)(2)(ii) through (i)(2)(iv) of this section for each camera configuration used during monitoring (for example, different lenses used), unless an alternative method to demonstrate daily instrument checks has been approved in accordance with paragraph (i)(2)(v) of this section.

(i) Calculate the mass flow rate to be used in the daily instrument check by following the procedures in paragraphs (i)(2)(i)(A) and (i)(2)(i)(B) of this section.

(A) For a specified population of equipment to be imaged by the instrument, determine the piece of equipment in contact with the lowest mass fraction of chemicals that are detectable, within the distance to be used in paragraph (i)(2)(iv)(B) of this section, at or below the standard detection sensitivity level.

(B) Multiply the standard detection sensitivity level, corresponding to the selected monitoring frequency in Table 1 of subpart A of this part, by the mass fraction of detectable chemicals from the stream identified in paragraph (i)(2)(i)(A) of this section to determine the mass flow rate to be used in the daily instrument check, using the following equation.

$$Edic = (Esds) \sum_{k=1}^k x_i$$

Where:

$Edic$ = Mass flow rate for the daily instrument check, grams per hour

x_i = Mass fraction of detectable chemical(s) i seen by the optical gas imaging instrument, within the distance to be used in paragraph (i)(2)(iv)(B) of this section, at or below the standard detection sensitivity level, $Esds$.

$Esds$ = Standard detection sensitivity level from Table 1 to subpart A, grams per hour

k = Total number of detectable chemicals emitted from the leaking equipment and seen by the optical gas imaging instrument.

(ii) Start the optical gas imaging instrument according to the manufacturer's instructions, ensuring that all appropriate settings conform to the manufacturer's instructions.

(iii) Use any gas chosen by the user that can be viewed by the optical gas imaging instrument and that has a purity of no

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less than 98 percent.

(iv) Establish a mass flow rate by using the following procedures:

(A) Provide a source of gas where it will be in the field of view of the optical gas imaging instrument.

(B) Set up the optical gas imaging instrument at a recorded distance from the outlet or leak orifice of the flow meter that will not be exceeded in the actual performance of the leak survey. Do not exceed the operating parameters of the flow meter.

(C) Open the valve on the flow meter to set a flow rate that will create a mass emission rate equal to the mass rate specified in paragraph (i)(2)(i) of this section while observing the gas flow through the optical gas imaging instrument viewfinder. When an image of the gas emission is seen through the viewfinder at the required emission rate, make a record of the reading on the flow meter.

(v) Repeat the procedures specified in paragraphs (i)(2)(ii) through (i)(2)(iv) of this section for each configuration of the optical gas imaging instrument used during the leak survey.

(vi) To use an alternative method to demonstrate daily instrument checks, apply to the Administrator for approval of the alternative under § 60.13(i).

(3) Leak Survey Procedure. Operate the optical gas imaging instrument to image every regulated piece of equipment selected for this work practice in accordance with the instrument manufacturer's operating parameters. All emissions imaged by the optical gas imaging instrument are considered to be leaks and are subject to repair. All emissions visible to the naked eye are also considered to be leaks and are subject to repair.

(4) Recordkeeping. You must keep the records described in paragraphs (i)(4)(i) through (i)(4)(vii) of this section:

(i) The equipment, processes, and facilities for which the owner or operator chooses to use the alternative work practice.

(ii) The detection sensitivity level selected from Table 1 to subpart A of this part for the optical gas imaging instrument.

(iii) The analysis to determine the piece of equipment in contact with the lowest mass fraction of chemicals that are detectable, as specified in paragraph (i)(2)(i)(A) of this section.

(iv) The technical basis for the mass fraction of detectable chemicals used in the equation in paragraph (i)(2)(i)(B) of this section.

(v) The daily instrument check. Record the distance, per paragraph (i)(2)(iv)(B) of this section, and the flow meter reading, per paragraph (i)(2)(iv)(C) of this section, at which the leak was imaged. Keep a video record of the daily instrument check for each configuration of the optical gas imaging instrument used during the leak survey (for example, the daily instrument check must be conducted for each lens used). The video record must include a time and date stamp for each daily instrument check. The video record must be kept for 5 years.

(vi) Recordkeeping requirements in the applicable subpart. A video record must be used to document the leak survey results. The video record must include a time and date stamp for each monitoring event. A video record can be used to meet the recordkeeping requirements of the applicable subparts if each piece of regulated equipment selected for this work practice can be identified in the video record. The video record must be kept for 5 years.

(vii) The results of the annual Method 21 screening required in paragraph (h)(7) of this section. Records must be kept for all regulated equipment specified in paragraph (h)(1) of this section. Records must identify the equipment screened, the screening value measured by Method 21, the time and date of the screening, and calibration information required in the existing applicable subpart.

(5) Reporting. Submit the reports required in the applicable subpart. Submit the records of the annual Method 21 screening required in paragraph (h)(7) of this section to the Administrator via e-mail to CCG-AWP@EPA.GOV.

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Group Name: SUBPART OOOOA REQUIREMENTS

Group Description: Subpart OOOOa Requirements

Sources included in this group

ID	Name
701	FUGITIVES

I. RESTRICTIONS.**Emission Restriction(s).****# 001 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5370a]**

Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015
When must I comply with this subpart?

(a) You must be in compliance with the standards of this subpart no later than August 2, 2016 or upon startup, whichever is later.

(b) At all times, including periods of startup, shutdown, and malfunction, owners and operators shall maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. The provisions for exemption from compliance during periods of startup, shutdown and malfunctions provided for in 40 CFR 60.8(c) do not apply to this subpart.

002 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5411a]

Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015
What additional requirements must I meet to determine initial compliance for my covers and closed vent systems routine

You must meet the applicable requirements of this section for each cover and closed vent system used to comply with the emission standards for your centrifugal compressor wet seal degassing systems, reciprocating compressors, pneumatic pumps and storage vessels except as provided in paragraph (e) of this section.

(a) - (c) Not applicable.

(d) Closed vent systems requirements for centrifugal compressor wet seal fluid degassing systems, reciprocating compressors, pneumatic pumps and storage vessels using a control device or routing emissions to a process.

(1) You must conduct an assessment that the closed vent system is of sufficient design and capacity to ensure that all emissions from the storage vessel are routed to the control device and that the control device is of sufficient design and capacity to accommodate all emissions from the affected facility and have it certified by a qualified professional engineer in accordance with paragraphs (d)(1)(i) and (ii) of this section.

(i) You must provide the following certification, signed and dated by the qualified professional engineer: "I certify that the closed vent system design and capacity assessment was prepared under my direction or supervision. I further certify that the closed vent system design and capacity assessment was conducted and this report was prepared pursuant to the requirements of subpart OOOOa of 40 CFR part 60. Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that there are penalties for knowingly submitting false information."

(ii) The assessment shall be prepared under the direction or supervision of the qualified professional engineer who signs the certification in paragraph (d)(1)(i) of this section.

(2) [Reserved]

(e) Not applicable.

**SECTION E. Source Group Restrictions.****II. TESTING REQUIREMENTS.**

No additional testing requirements exist except as provided in other sections of this permit including Section B (State Only General Requirements).

III. MONITORING REQUIREMENTS.**# 003 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5401a]****Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015****What are the exceptions to the equipment leak GHG and VOC standards for affected facilities at onshore natural gas processing plants?**

(a) You may comply with the following exceptions to the provisions of § 60.5400a(a) and (b).

(b)

(1) Each pressure relief device in gas/vapor service may be monitored quarterly and within 5 days after each pressure release to detect leaks by the methods specified in § 60.485a(b) except as provided in § 60.5400a(c) and in paragraph (b)(4) of this section, and § 60.482-4a(a) through (c) of subpart VVa of this part.

(2) If an instrument reading of 500 ppm or greater is measured, a leak is detected.

(3)

(i) When a leak is detected, it must be repaired as soon as practicable, but no later than 15 calendar days after it is detected, except as provided in § 60.482-9a.

(ii) A first attempt at repair must be made no later than 5 calendar days after each leak is detected.

(4)

(i) Any pressure relief device that is located in a nonfractionating plant that is monitored only by non-plant personnel may be monitored after a pressure release the next time the monitoring personnel are onsite, instead of within 5 days as specified in paragraph (b)(1) of this section and § 60.482-4a(b)(1).

(ii) No pressure relief device described in paragraph (b)(4)(i) of this section may be allowed to operate for more than 30 days after a pressure release without monitoring.

(c) Sampling connection systems are exempt from the requirements of § 60.482-5a.

(d) - (e) Not applicable.

(f) An owner or operator may use the following provisions instead of § 60.485a(e):

(1) Equipment is in heavy liquid service if the weight percent evaporated is 10 percent or less at 150 °Celsius (302 °Fahrenheit) as determined by ASTM Method D86-96 (incorporated by reference as specified in § 60.17).

(2) Equipment is in light liquid service if the weight percent evaporated is greater than 10 percent at 150 °Celsius (302 °Fahrenheit) as determined by ASTM Method D86-96 (incorporated by reference as specified in § 60.17).

(g) An owner or operator may use the following provisions instead of § 60.485a(b)(2): A calibration drift assessment shall be performed, at a minimum, at the end of each monitoring day. Check the instrument using the same calibration gas(es) that were used to calibrate the instrument before use. Follow the procedures specified in Method 21 of appendix A-7 of this part, Section 10.1, except do not adjust the meter readout to correspond to the calibration gas value. Record the instrument reading for each scale used as specified in § 60.486a(e)(8). Divide these readings by the initial calibration values for each scale and multiply by 100 to express the calibration drift as a percentage. If any calibration drift assessment shows a negative drift of more than 10 percent from the initial calibration value, then all equipment monitored since the last calibration with instrument readings below the appropriate leak definition and above the leak definition multiplied by (100 minus the percent of negative drift/divided by 100) must be re-monitored. If any calibration drift assessment shows a

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positive drift of more than 10 percent from the initial calibration value, then, at the owner/operator's discretion, all equipment since the last calibration with instrument readings above the appropriate leak definition and below the leak definition multiplied by (100 plus the percent of positive drift/divided by 100) may be re-monitored.

004 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5416a]**Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015****What are the initial and continuous cover and closed vent system inspection and monitoring requirements for my centrifugal compressor, reciprocating compressor, pneumatic pump, and storage vessel affected facilities?**

For each closed vent system or cover at your storage vessel, centrifugal compressor, reciprocating compressor and pneumatic pump affected facilities, you must comply with the applicable requirements of paragraphs (a) through (c) of this section, except as provided in paragraph (d) of this section.

(a) Inspections for closed vent systems and covers installed on each centrifugal compressor, reciprocating compressor or pneumatic pump affected facility. Except as provided in paragraphs (b)(11) and (12) of this section, you must inspect each closed vent system according to the procedures and schedule specified in paragraphs (a)(1) and (2) of this section, inspect each cover according to the procedures and schedule specified in paragraph (a)(3) of this section, and inspect each bypass device according to the procedures of paragraph (a)(4) of this section.

(1) For each closed vent system joint, seam, or other connection that is permanently or semi-permanently sealed (e.g., a welded joint between two sections of hard piping or a bolted and gasketed ducting flange), you must meet the requirements specified in paragraphs (a)(1)(i) and (ii) of this section.

(i) Not applicable.

(ii) Conduct annual visual inspections for defects that could result in air emissions. Defects include, but are not limited to, visible cracks, holes, or gaps in piping; loose connections; liquid leaks; or broken or missing caps or other closure devices. You must monitor a component or connection using the test methods and procedures in paragraph (b) of this section to demonstrate that it operates with no detectable emissions following any time the component is repaired or replaced or the connection is unsealed. You must maintain records of the inspection results as specified in § 60.5420a(c)(6).

(2) For closed vent system components other than those specified in paragraph (a)(1) of this section, you must meet the requirements of paragraphs (a)(2)(i) through (iii) of this section.

(i) Not applicable.

(ii) Conduct annual inspections according to the test methods and procedures specified in paragraph (b) of this section to demonstrate that the components or connections operate with no detectable emissions. You must maintain records of the inspection results as specified in § 60.5420a(c)(6).

(iii) Conduct annual visual inspections for defects that could result in air emissions. Defects include, but are not limited to, visible cracks, holes, or gaps in ductwork; loose connections; liquid leaks; or broken or missing caps or other closure devices. You must maintain records of the inspection results as specified in § 60.5420a(c)(6).

(3) - (4) Not applicable.

(b) No detectable emissions test methods and procedures. If you are required to conduct an inspection of a closed vent system or cover at your centrifugal compressor, reciprocating compressor, or pneumatic pump affected facility as specified in paragraphs (a)(1), (2), or (3) of this section, you must meet the requirements of paragraphs (b)(1) through (13) of this section.

(1) You must conduct the no detectable emissions test procedure in accordance with Method 21 of appendix A-7 of this part.

(2) The detection instrument must meet the performance criteria of Method 21 of appendix A-7 of this part, except that the

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instrument response factor criteria in section 8.1.1 of Method 21 must be for the average composition of the fluid and not for each individual organic compound in the stream.

(3) You must calibrate the detection instrument before use on each day of its use by the procedures specified in Method 21 of appendix A-7 of this part.

(4) Calibration gases must be as specified in paragraphs (b)(4)(i) and (ii) of this section.

(i) Zero air (less than 10 parts per million by volume hydrocarbon in air).

(ii) A mixture of methane in air at a concentration less than 10,000 parts per million by volume.

(5) You may choose to adjust or not adjust the detection instrument readings to account for the background organic concentration level. If you choose to adjust the instrument readings for the background level, you must determine the background level value according to the procedures in Method 21 of appendix A-7 of this part.

(6) Your detection instrument must meet the performance criteria specified in paragraphs (b)(6)(i) and (ii) of this section.

(i) Except as provided in paragraph (b)(6)(ii) of this section, the detection instrument must meet the performance criteria of Method 21 of appendix A-7 of this part, except the instrument response factor criteria in section 8.1.1 of Method 21 must be for the average composition of the process fluid, not each individual volatile organic compound in the stream. For process streams that contain nitrogen, air, or other inerts that are not organic hazardous air pollutants or volatile organic compounds, you must calculate the average stream response factor on an inert-free basis.

(ii) If no instrument is available that will meet the performance criteria specified in paragraph (b)(6)(i) of this section, you may adjust the instrument readings by multiplying by the average response factor of the process fluid, calculated on an inert-free basis, as described in paragraph (b)(6)(i) of this section.

(7) You must determine if a potential leak interface operates with no detectable emissions using the applicable procedure specified in paragraph (b)(7)(i) or (ii) of this section.

(i) If you choose not to adjust the detection instrument readings for the background organic concentration level, then you must directly compare the maximum organic concentration value measured by the detection instrument to the applicable value for the potential leak interface as specified in paragraph (b)(8) of this section.

(ii) If you choose to adjust the detection instrument readings for the background organic concentration level, you must compare the value of the arithmetic difference between the maximum organic concentration value measured by the instrument and the background organic concentration value as determined in paragraph (b)(5) of this section with the applicable value for the potential leak interface as specified in paragraph (b)(8) of this section.

(8) A potential leak interface is determined to operate with no detectable organic emissions if the organic concentration value determined in paragraph (b)(7) of this section is less than 500 parts per million by volume.

(9) Repairs. In the event that a leak or defect is detected, you must repair the leak or defect as soon as practicable according to the requirements of paragraphs (b)(9)(i) and (ii) of this section, except as provided in paragraph (b)(10) of this section.

(i) A first attempt at repair must be made no later than 5 calendar days after the leak is detected.

(ii) Repair must be completed no later than 15 calendar days after the leak is detected.

(10) Delay of repair. Delay of repair of a closed vent system or cover for which leaks or defects have been detected is allowed if the repair is technically infeasible without a shutdown, or if you determine that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. You must complete repair of such equipment by the end of the next shutdown.

(11) Unsafe to inspect requirements. You may designate any parts of the closed vent system or cover as unsafe to inspect

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if the requirements in paragraphs (b)(11)(i) and (ii) of this section are met. Unsafe to inspect parts are exempt from the inspection requirements of paragraphs (a)(1) through (3) of this section.

(i) You determine that the equipment is unsafe to inspect because inspecting personnel would be exposed to an imminent or potential danger as a consequence of complying with paragraphs (a)(1), (2), or (3) of this section.

(ii) You have a written plan that requires inspection of the equipment as frequently as practicable during safe-to-inspect times.

(12) Difficult to inspect requirements. You may designate any parts of the closed vent system or cover as difficult to inspect, if the requirements in paragraphs (b)(12)(i) and (ii) of this section are met. Difficult to inspect parts are exempt from the inspection requirements of paragraphs (a)(1) through (3) of this section.

(i) You determine that the equipment cannot be inspected without elevating the inspecting personnel more than 2 meters above a support surface.

(ii) You have a written plan that requires inspection of the equipment at least once every 5 years.

(13) Records. Records shall be maintained as specified in this section and in § 60.5420a(c)(9).

(c) - (d) Not applicable.

IV. RECORDKEEPING REQUIREMENTS.

005 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5421a]

Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015

What are my additional recordkeeping requirements for my affected facility subject to GHG and VOC requirements for onshore natural gas processing plants?

(a) You must comply with the requirements of paragraph (b) of this section in addition to the requirements of § 60.486a.

(b) The following recordkeeping requirements apply to pressure relief devices subject to the requirements of §60.5401a(b)(1).

(1) When each leak is detected as specified in § 60.5401a(b)(2), a weatherproof and readily visible identification, marked with the equipment identification number, must be attached to the leaking equipment. The identification on the pressure relief device may be removed after it has been repaired.

(2) When each leak is detected as specified in § 60.5401a(b)(2), the information specified in paragraphs (b)(2)(i) through (x) of this section must be recorded in a log and shall be kept for 2 years in a readily accessible location:

(i) The instrument and operator identification numbers and the equipment identification number.

(ii) The date the leak was detected and the dates of each attempt to repair the leak.

(iii) Repair methods applied in each attempt to repair the leak.

(iv) "Above 500 ppm" if the maximum instrument reading measured by the methods specified in § 60.5400a(d) after each repair attempt is 500 ppm or greater.

(v) "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.

(vi) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown.

(vii) The expected date of successful repair of the leak if a leak is not repaired within 15 days.

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(viii) Dates of process unit shutdowns that occur while the equipment is unrepaired.

(ix) The date of successful repair of the leak.

(x) A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of §60.482-4a(a). The designation of equipment subject to the provisions of §60.482-4a(a) must be signed by the owner or operator.

V. REPORTING REQUIREMENTS.

006 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5420a]
Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015
What are my notification, reporting, and recordkeeping requirements?

(a) Notifications. You must submit the notifications according to paragraphs (a)(1) and (2) of this section if you own or operate one or more of the affected facilities specified in §60.5365a that was constructed, modified, or reconstructed during the reporting period.

(1) If you own or operate an affected facility that is the group of all equipment within a process unit at an onshore natural gas processing plant, or a sweetening unit, you must submit the notifications required in §§ 60.7(a)(1), (3), and (4) and 60.15(d). If you own or operate a well, centrifugal compressor, reciprocating compressor, pneumatic controller, pneumatic pump, storage vessel, collection of fugitive emissions components at a well site, or collection of fugitive emissions components at a compressor station, you are not required to submit the notifications required in §§ 60.7(a)(1), (3), and (4) and 60.15(d).

(2) - (3) Not applicable.

(b) Reporting requirements. You must submit annual reports containing the information specified in paragraphs (b)(1) through (8) and (12) of this section and performance test reports as specified in paragraph (b)(9) or (10) of this section, if applicable. You must submit annual reports following the procedure specified in paragraph (b)(11) of this section. The initial annual report is due no later than 90 days after the end of the initial compliance period as determined according to § 60.5410a. Subsequent annual reports are due no later than same date each year as the initial annual report. If you own or operate more than one affected facility, you may submit one report for multiple affected facilities provided the report contains all of the information required as specified in paragraphs (b)(1) through (8) and (12) of this section. Annual reports may coincide with title V reports as long as all the required elements of the annual report are included. You may arrange with the Administrator a common schedule on which reports required by this part may be submitted as long as the schedule does not extend the reporting period.

(1) The general information specified in paragraphs (b)(1)(i) through (iv) of this section is required for all reports.

(i) The company name, facility site name associated with the affected facility, U.S. Well ID or U.S. Well ID associated with the affected facility, if applicable, and address of the affected facility. If an address is not available for the site, include a description of the site location and provide the latitude and longitude coordinates of the site in decimal degrees to an accuracy and precision of five (5) decimals of a degree using the North American Datum of 1983.

(ii) An identification of each affected facility being included in the annual report.

(iii) Beginning and ending dates of the reporting period.

(iv) A certification by a certifying official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(2) - (3) Not applicable.

(4) For each reciprocating compressor affected facility, the information specified in paragraphs (b)(4)(i) through (iii) of this section.

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(i) The cumulative number of hours of operation or the number of months since initial startup, since August 2, 2016, or since the previous reciprocating compressor rod packing replacement, whichever is latest. Alternatively, a statement that emissions from the rod packing are being routed to a process through a closed vent system under negative pressure.

(ii) If applicable, for each deviation that occurred during the reporting period and recorded as specified in paragraph (c)(3)(iii) of this section, the date and time the deviation began, duration of the deviation and a description of the deviation.

(iii) If required to comply with § 60.5385a(a)(3), the information in paragraphs (b)(4)(iii)(A) through (C) of this section.

(A) Dates of each inspection required under § 60.5416a(a) and (b);

(B) Each defect or leak identified during each inspection, and date of repair or date of anticipated repair if repair is delayed; and

(C) Date and time of each bypass alarm or each instance the key is checked out if you are subject to the bypass requirements of § 60.5416a(a)(4).

(5) - (8) Not applicable.

(9) Within 60 days after the date of completing each performance test (see § 60.8) required by this subpart, except testing conducted by the manufacturer as specified in § 60.5413a(d), you must submit the results of the performance test following the procedure specified in either paragraph (b)(9)(i) or (ii) of this section.

(i) For data collected using test methods supported by the EPA's Electronic Reporting Tool (ERT) as listed on the EPA's ERT website (<https://www.epa.gov/electronic-reporting-air-emissions/electronic-reporting-tool-ert>) at the time of the test, you must submit the results of the performance test to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI), except as outlined in this paragraph (b)(9)(i). (CEDRI can be accessed through the EPA's Central Data Exchange (CDX) (<https://cdx.epa.gov/>).) Performance test data must be submitted in a file format generated through the use of the EPA's ERT or an alternate electronic file format consistent with the extensible markup language (XML) schema listed on the EPA's ERT website. The EPA will make all the information submitted through CEDRI available to the public without further notice to you. Do not use CEDRI to submit information you claim as confidential business information (CBI). Although we do not expect persons to assert a claim of CBI, if you wish to assert a CBI claim, you must submit a complete file generated through the use of the EPA's ERT or an alternate electronic file consistent with the XML schema listed on the EPA's ERT website, including information claimed to be CBI, to the EPA following the procedures in paragraphs (b)(9)(i)(A) and (B) of this section. Clearly mark the part or all of the information that you claim to be CBI. Information not marked as CBI may be authorized for public release without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. All CBI claims must be asserted at the time of submission. Anything submitted using CEDRI cannot later be claimed CBI. Furthermore, under CAA section 114(c), emissions data is not entitled to confidential treatment, and the EPA is required to make emissions data available to the public. Thus, emissions data will not be protected as CBI and will be made publicly available. The same ERT or alternate file submitted to the CBI office with the CBI omitted must be submitted to the EPA via the EPA's CDX as described earlier in this paragraph (b)(9)(i).

(A) The preferred method to receive CBI is for it to be transmitted electronically using email attachments, File Transfer Protocol, or other online file sharing services. Electronic submissions must be transmitted directly to the OAQPS CBI Office at the email address oaqpscbi@epa.gov, and as described above, should include clear CBI markings. ERT files should be flagged to the attention of the Group Leader, Measurement Policy Group. If assistance is needed with submitting large electronic files that exceed the file size limit for email attachments, and if you do not have your own file sharing service, please email oaqpscbi@epa.gov to request a file transfer link.

(B) If you cannot transmit the file electronically, you may send CBI information through the postal service to the following address: U.S. EPA, Attn: OAQPS Document Control Officer and Measurement Policy Group Leader, Mail Drop: C404-02, 109 T.W. Alexander Drive, P.O. Box 12055, RTP, NC 27711. The mailed CBI material should be double wrapped and clearly marked. Any CBI markings should not show through the outer envelope.

(ii) For data collected using test methods that are not supported by the EPA's ERT as listed on the EPA's ERT website at the time of the test, you must submit the results of the performance test to the Administrator at the appropriate address listed in § 60.4.

(10) For combustion control devices tested by the manufacturer in accordance with § 60.5413a(d), an electronic copy of the

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performance test results required by § 60.5413a(d) shall be submitted via email to Oil__and__Gas__PT@EPA.GOV unless the test results for that model of combustion control device are posted at the following website: epa.gov/airquality/oilandgas/.

(11) You must submit reports to the EPA via CEDRI, except as outlined in this paragraph (b)(11). CEDRI can be accessed through the EPA's CDX (<https://cdx.epa.gov/>). You must use the appropriate electronic report template on the CEDRI website for this subpart (<https://www.epa.gov/electronic-reporting-air-emissions/cedri/>). If the reporting form specific to this subpart is not available on the CEDRI website at the time that the report is due, you must submit the report to the Administrator at the appropriate address listed in § 60.4. Once the form has been available in CEDRI for at least 90 calendar days, you must begin submitting all subsequent reports via CEDRI. The date reporting forms become available will be listed on the CEDRI website. Unless the Administrator or delegated state agency or other authority has approved a different schedule for submission of reports, the reports must be submitted by the deadlines specified in this subpart, regardless of the method in which the reports are submitted. The EPA will make all the information submitted through CEDRI available to the public without further notice to you. Do not use CEDRI to submit information you claim as CBI. Although we do not expect persons to assert a claim of CBI, if you wish to assert a CBI claim for some of the information in the report, submit a complete file using the appropriate electronic report template on the CEDRI website, including information claimed to be CBI, to the EPA following the procedures in paragraphs (b)(11)(i) and (ii) of this section. Clearly mark the part or all of the information that you claim to be CBI. Information not marked as CBI may be authorized for public release without prior notice. Information marked as CBI will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. All CBI claims must be asserted at the time of submission. Anything submitted using CEDRI cannot later be claimed CBI. Furthermore, under CAA section 114(c), emissions data is not entitled to confidential treatment, and the EPA is required to make emissions data available to the public. Thus, emissions data will not be protected as CBI and will be made publicly available. Submit the same file submitted to the CBI office with the CBI omitted must be submitted to the EPA via the EPA's CDX as described earlier in this paragraph (b)(11).

(i) The preferred method to receive CBI is for it to be transmitted electronically using email attachments, File Transfer Protocol, or other online file sharing services. Electronic submissions must be transmitted directly to the OAQPS CBI Office at the email address oaqpscbi@epa.gov, and as described above, should include clear CBI markings. Files should be flagged to the attention of the Oil and Natural Gas Sector Lead. If assistance is needed with submitting large electronic files that exceed the file size limit for email attachments, and if you do not have your own file sharing service, please email oaqpscbi@epa.gov to request a file transfer link.

(ii) If you cannot transmit the file electronically, you may send CBI information through the postal service to the following address: U.S. EPA, Attn: OAQPS Document Control Officer and Oil and Natural Gas Sector Lead, Mail Drop: C404-02, 109 T.W. Alexander Drive, P.O. Box 12055, RTP, NC 27711. The mailed CBI material should be double wrapped and clearly marked. Any CBI markings should not show through the outer envelope.

(12) You must submit the certification signed by the qualified professional engineer or in-house engineer according to § 60.5411a(d) for each closed vent system routing to a control device or process.

(13) If you are required to electronically submit a report through CEDRI in the EPA's CDX, you may assert a claim of EPA system outage for failure to timely comply with the reporting requirement. To assert a claim of EPA system outage, you must meet the requirements outlined in paragraphs (b)(13)(i) through (vi) of this section.

(i) You must have been or will be precluded from accessing CEDRI and submitting a required report within the time prescribed due to an outage of either the EPA's CEDRI or CDX systems.

(ii) The outage must have occurred within the period of time beginning 5 business days prior to the date that the submission is due.

(iii) The outage may be planned or unplanned.

(iv) You must submit notification to the Administrator in writing as soon as possible following the date you first knew, or through due diligence should have known, that the event may cause or caused a delay in reporting.

(v) You must provide to the Administrator a written description identifying:

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(A) The date(s) and time(s) when CDX or CEDRI was accessed and the system was unavailable;

(B) A rationale for attributing the delay in reporting beyond the regulatory deadline to the EPA system outage;

(C) Measures taken or to be taken to minimize the delay in reporting; and

(D) The date by which you propose to report, or if you have already met the reporting requirement at the time of the notification, the date you reported.

(vi) The decision to accept the claim of EPA system outage and allow an extension to the reporting deadline is solely within the discretion of the Administrator.

(vii) In any circumstance, the report must be submitted electronically as soon as possible after the outage is resolved.

(14) If you are required to electronically submit a report through CEDRI in the EPA's CDX, the owner or operator may assert a claim of force majeure for failure to timely comply with the reporting requirement. To assert a claim of force majeure, you must meet the requirements outlined in paragraphs (b)(14)(i) through (v) of this section.

(i) You may submit a claim if a force majeure event is about to occur, occurs, or has occurred or there are lingering effects from such an event within the period of time beginning 5 business days prior to the date the submission is due. For the purposes of this section, a force majeure event is defined as an event that will be or has been caused by circumstances beyond the control of the affected facility, its contractors, or any entity controlled by the affected facility that prevents you from complying with the requirement to submit a report electronically within the time period prescribed. Examples of such events are acts of nature (e.g., hurricanes, earthquakes, or floods), acts of war or terrorism, or equipment failure or safety hazard beyond the control of the affected facility (e.g., large scale power outage).

(ii) You must submit notification to the Administrator in writing as soon as possible following the date you first knew, or through due diligence should have known, that the event may cause or caused a delay in reporting.

(iii) You must provide to the Administrator:

(A) A written description of the force majeure event;

(B) A rationale for attributing the delay in reporting beyond the regulatory deadline to the force majeure event;

(C) Measures taken or to be taken to minimize the delay in reporting; and

(D) The date by which you propose to report, or if you have already met the reporting requirement at the time of the notification, the date you reported.

(iv) The decision to accept the claim of force majeure and allow an extension to the reporting deadline is solely within the discretion of the Administrator.

(v) In any circumstance, the reporting must occur as soon as possible after the force majeure event occurs.

(c) Recordkeeping requirements. You must maintain the records identified as specified in § 60.7(f) and in paragraphs (c)(1) through (18) of this section. All records required by this subpart must be maintained either onsite or at the nearest local field office for at least 5 years. Any records required to be maintained by this subpart that are submitted electronically via the EPA's CDX may be maintained in electronic format.

(1) - (2) Not applicable.

(3) For each reciprocating compressor affected facility, you must maintain the records in paragraphs (c)(3)(i) through (iii) of this section.

(i) Records of the cumulative number of hours of operation or number of months since initial startup, since August 2, 2016, or since the previous replacement of the reciprocating compressor rod packing, whichever is latest. Alternatively, a

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statement that emissions from the rod packing are being routed to a process through a closed vent system under negative pressure.

(ii) Records of the date and time of each reciprocating compressor rod packing replacement, or date of installation of a rod packing emissions collection system and closed vent system as specified in § 60.5385a(a)(3).

(iii) Records of deviations in cases where the reciprocating compressor was not operated in compliance with the requirements specified in § 60.5385a, including the date and time the deviation began, duration of the deviation, and a description of the deviation.

(4) - (5) Not applicable.

(6) Records of each closed vent system inspection required under § 60.5416a(a)(1) and (2) and (b) for centrifugal compressors and reciprocating compressors, § 60.5416a(c)(1) for storage vessels, or § 60.5416a(e) for pneumatic pumps as required in paragraphs (c)(6)(i) through (iii) of this section.

(i) A record of each closed vent system inspection or no detectable emissions monitoring survey. You must include an identification number for each closed vent system (or other unique identification description selected by you) and the date of the inspection.

(ii) For each defect or leak detected during inspections required by § 60.5416a(a)(1) and (2), (b), (c)(1), or (d), you must record the location of the defect or leak, a description of the defect or the maximum concentration reading obtained if using Method 21 of appendix A-7 of this part, the date of detection, and the date the repair to correct the defect or leak is completed.

(iii) If repair of the defect is delayed as described in § 60.5416a(b)(10), you must record the reason for the delay and the date you expect to complete the repair.

(7) - (13) Not applicable.

(14) A log of records as specified in § 60.5412a(d)(1)(iii), for all inspection, repair, and maintenance activities for each control device failing the visible emissions test.

(15) - (16) Not applicable.

(17) For each closed vent system routing to a control device or process, the records of the assessment conducted according to § 60.5411a(d):

(i) A copy of the assessment conducted according to § 60.5411a(d)(1);

(ii) A copy of the certification according to § 60.5411a(d)(1)(i); and

(iii) The owner or operator shall retain copies of all certifications, assessments, and any related records for a period of 5 years, and make them available if directed by the delegated authority.

(18) A copy of each performance test submitted under paragraph (b)(9) of this section.

007 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5422a]**Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015****What are my additional reporting requirements for my affected facility subject to GHG and VOC requirements for onshore natural gas processing plants?**

(a) You must comply with the requirements of paragraphs (b) and (c) of this section in addition to the requirements of § 60.487a(a), (b)(1) through (3) and (5), and (c)(2)(i) through (iv) and (vi) through (vii). You must submit semiannual reports to the EPA via the Compliance and Emissions Data Reporting Interface (CEDRI). (CEDRI can be accessed through the EPA's Central Data Exchange (CDX) (<https://cdx.epa.gov/>)). Use the appropriate electronic report in CEDRI for this subpart or an alternate electronic file format consistent with the extensible markup language (XML) schema listed on the CEDRI website (<https://www3.epa.gov/ttn/chief/cedri/>). If the reporting form specific to this subpart is not available in CEDRI at the

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time that the report is due, submit the report to the Administrator at the appropriate address listed in §60.4. Once the form has been available in CEDRI for at least 90 days, you must begin submitting all subsequent reports via CEDRI. The report must be submitted by the deadline specified in this subpart, regardless of the method in which the report is submitted.

(b) An owner or operator must include the following information in the initial semiannual report in addition to the information required in §60.487a(b)(1) through (3) and (5): Number of pressure relief devices subject to the requirements of §60.5401a(b) except for those pressure relief devices designated for no detectable emissions under the provisions of §60.482-4a(a) and those pressure relief devices complying with §60.482-4a(c).

(c) An owner or operator must include the information specified in paragraphs (c)(1) and (2) of this section in all semiannual reports in addition to the information required in §60.487a(c)(2)(i) through (iv) and (vii) through (viii):

- (1) Number of pressure relief devices for which leaks were detected as required in §60.5401a(b)(2); and
- (2) Number of pressure relief devices for which leaks were not repaired as required in §60.5401a(b)(3).

VI. WORK PRACTICE REQUIREMENTS.**# 008 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5385a]****Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015****What GHG and VOC standards apply to reciprocating compressor affected facilities?**

You must reduce GHG (in the form of a limitation on emissions of methane) and VOC emissions by complying with the standards in paragraphs (a) through (d) of this section for each reciprocating compressor affected facility.

(a) You must replace the reciprocating compressor rod packing according to either paragraph (a)(1) or (2) of this section, or you must comply with paragraph (a)(3) of this section.

(1) On or before the compressor has operated for 26,000 hours. The number of hours of operation must be continuously monitored beginning upon initial startup of your reciprocating compressor affected facility, or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.

(2) Prior to 36 months from the date of the most recent rod packing replacement, or 36 months from the date of startup for a new reciprocating compressor for which the rod packing has not yet been replaced.

(3) Collect the methane and VOC emissions from the rod packing using a rod packing emissions collection system that operates under negative pressure and route the rod packing emissions to a process through a closed vent system that meets the requirements of § 60.5411a(a) and (d).

(b) You must demonstrate initial compliance with standards that apply to reciprocating compressor affected facilities as required by § 60.5410a(c).

(c) You must demonstrate continuous compliance with standards that apply to reciprocating compressor affected facilities as required by § 60.5415a(c).

(d) You must perform the reporting as required by § 60.5420a(b)(1) and (4) and the recordkeeping as required by § 60.5420a(c)(3), (6) through (9), and (17), as applicable.

009 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5415a]**Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015****How do I demonstrate continuous compliance with the standards for my well, centrifugal compressor, reciprocating compressor, pneumatic controller, pneumatic pump,...and affected facilities at onshore natural gas processing plants?**

(a) - (b) Not applicable.

(c) For each reciprocating compressor affected facility complying with § 60.5385a(a)(1) or (2), you must demonstrate continuous compliance according to paragraphs (c)(1) through (3) of this section. For each reciprocating compressor

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affected facility complying with § 60.5385a(a)(3), you must demonstrate continuous compliance according to paragraph (c)(4) of this section.

(1) You must continuously monitor the number of hours of operation for each reciprocating compressor affected facility or track the number of months since initial startup or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.

(2) You must submit the annual reports as required in § 60.5420a(b)(1) and (4) and maintain records as required in § 60.5420a(c)(3).

(3) You must replace the reciprocating compressor rod packing on or before the total number of hours of operation reaches 26,000 hours or the number of months since the most recent rod packing replacement reaches 36 months.

(4) You must operate the rod packing emissions collection system under negative pressure and continuously comply with the cover and closed vent requirements in § 60.5416a(a) and (b).

(d) - (h) Not applicable.

VII. ADDITIONAL REQUIREMENTS.**# 010 [25 Pa. Code §127.441]****Operating permit terms and conditions.**

In accordance with 40 CFR §60.5371a, this section applies to super-emitter events. For purposes of this section, a super-emitter event is defined as any emissions event that is located at or near an oil and gas facility (e.g., individual well site, natural gas processing plant or compressor station) and that is detected using remote detection methods and has a quantified emission rate of 100 kg/hr of methane or greater. Upon receiving a notification of a super emitter event issued by the EPA under §60.5371b(c) in subpart OOOOb of this part, owners or operators must take the actions listed in paragraphs (a) and (b) of this section. Within 5 calendar days of receiving a notification from the EPA of a super-emitter event, the owner or operator of an oil and natural gas facility (e.g., a well site, centralized production facility, natural gas processing plant, or compressor station) must initiate a super-emitter event investigation.

(a) Identification of super-emitter events.

(1) If you do not own or operate an oil and natural gas facility within 50 meters from the latitude and longitude provided in the notification subject to the regulation under this subpart, report this result to the EPA under paragraph 60.5371b(e). Your super-emitter event investigation is deemed complete under this subpart.

(2) If you own or operate an oil and natural gas facility within 50 meters from the latitude and longitude provided in the notification, and there is an affected facility or associated equipment subject to this subpart onsite, you must investigate to determine the source of the super-emitter event in accordance with paragraph (a)(2) of this section, maintain records of your investigation, and report the results in accordance with paragraph (b) of this section.

(3) The investigation required by paragraph (a)(2) of this section may include but is not limited to the actions specified below in paragraphs (a)(3)(i) through (iv) of this section.

(i) Review any maintenance activities or process activities from the affected facilities subject to regulation under this subpart, starting from the date of detection of the super-emitter event as identified in the notification, until the date of investigation, to determine if the activities indicate any potential source(s) of the super-emitter event emissions.

(ii) Review all monitoring data from control devices (e.g., flares) from the affected facilities subject to regulation under this subpart from the initial date of detection of the super-emitter event as identified in the notification, until the date of receiving the notification from the EPA to identify malfunctions of control devices or periods when the control devices were not in compliance with applicable requirements and that indicate a potential source of the super-emitter event emissions.

(iii) If you conducted a fugitive emissions survey in accordance with §60.5397a between the initial date of detection of the super-emitter event as identified in the notification and the date the notification from the EPA was received, review the results of the survey to identify any potential source(s) of the super-emitter event emissions.

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(iv) Screen the entire facility with OGI, Method 21 of appendix A-7 to this part, or an alternative test method(s) approved per § 60.5398b(d) of subpart OOOOb of this part, to determine if a super-emitter event is present.

(b) Super-emitter event report. You must submit the results of the super-emitter event investigation conducted under paragraph (a) of this section to the EPA in accordance with paragraph (b)(1) of this section. If the super-emitter event (i.e., emission at 100 kg/hr of methane or more) is ongoing at the time of this initial report, submit the additional information in accordance with paragraph (b)(2) of this section. You must attest to the information included in the report as specified in paragraph (b)(3) of this section.

(1) Within 15 days of receiving a notification from the EPA under § 60.5371b(c), you must submit a report of the super-emitter event investigation conducted under paragraph (a) of this section through the Super-Emitter Program Portal, at www.epa.gov/super-emitter. You must include the applicable information in paragraphs (b)(1)(i) through (viii) of this section in the report. If you have identified a demonstrable error in the notification, the report may include a statement of the demonstrable error.

(i) Notification Report ID of the super-emitter event notification (which is provided in the EPA notification).

(ii) Identification of whether you are the owner or operator of an oil and natural gas facility within 50 meters from the latitude and longitude provided in the EPA notification. If you do not own or operate an oil and natural gas facility within 50 meters from the latitude and longitude provided in the EPA notification, you are not required to report the information in paragraphs (b)(1)(iii) through (viii) of this section.

(iii) General identification information for the facility, including facility name, the physical address, applicable ID Number (e.g., EPA ID Number, API Well ID Number), the owner or operator or responsible official (where applicable), and their email address.

(iv) Identification of whether there is an affected facility or associated equipment subject to regulation under this subpart at this oil and natural gas facility.

(v) Indication of whether you were able to identify the source of the super-emitter event. If you indicate you were unable to identify the source of the super-emitter event, you must certify that all applicable investigations specified in paragraphs (a)(2)(i) through (iv) of this section have been conducted for all affected facilities and associated equipment subject to regulation under this subpart that are at this oil and natural gas facility, and you have determined that these affected facilities and associated equipment are not the source of the super-emitter event. If you indicate that you were not able to identify the source of the super-emitter event, you are not required to report the information in paragraphs (b)(1)(vi) through (viii) of this section.

(vi) The source(s) of the super-emitter event.

(vii) Identification of whether the source of the super-emitter event is an affected facility or associated equipment subject to regulation under of this subpart. If the source of the super-emitter event is an affected facility or associated equipment subject to regulation under this subpart, identify the applicable regulation(s) under this subpart.

(viii) Indication of whether the super-emitter event is ongoing at the time of the initial report submittal (i.e., emissions at 100 kg/hr of methane or more).

(A) If the super-emitter event is not ongoing at the time of the initial report submittal, provide the actual (or if not known, estimated) date and time the super-emitter event ended.

(B) If the super-emitter event is ongoing at the time of the initial report submittal, provide a short narrative of your plan to end the super-emitter event, including the targeted end date for the efforts to be completed and the super-emitter event ended.

(2) If the super-emitter event is ongoing at the time of the initial report submittal, within 5 business days of the date the super-emitter event ends you must update your initial report through the Super-Emitter Program Portal, to provide the end date and time of the super-emitter event.

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(3) You must sign the following attestation when submitting data into the Super-Emitter Program Portal: "I certify that the information provided in this report regarding the specified super-emitter event was prepared under my direction or supervision. I further certify that the investigations were conducted, and this report was prepared pursuant to the requirements of § 60.5371a(a) and (b). Based on my professional knowledge and experience, and inquiry of personnel involved in the assessment, the certification submitted herein is true, accurate, and complete. I am aware that knowingly false statements may be punishable by fine or imprisonment."

**# 011 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5365a]
Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction,
Modification or Reconstruction Commenced After September 18, 2015
Am I subject to this subpart?**

You are subject to the applicable provisions of this subpart if you are the owner or operator of one or more of the onshore affected facilities listed in paragraphs (a) through (j) of this section, that is located within the Crude Oil and Natural Gas source category, as defined in § 60.5430a, for which you commence construction, modification, or reconstruction after September 18, 2015, and on or before December 6, 2022. Facilities located inside and including the Local Distribution Company (LDC) custody transfer station are not subject to this subpart. An affected facility must continue to comply with the requirements of this subpart until it begins complying with a more stringent requirement, that applies to the same affected facility, in an approved, and effective, state or Federal plan that implements subpart OOOOc of this part, or modifies or reconstructs after December 6, 2022, and thus becomes subject to subpart OOOOb of this part.

(a) - (b) Not applicable.

(c) Each reciprocating compressor affected facility, which is a single reciprocating compressor. A reciprocating compressor located at a well site, or an adjacent well site and servicing more than one well site, is not an affected facility under this subpart.

(d) - (e) Not applicable.

(f) The group of all equipment within a process unit at an onshore natural gas processing plant is an affected facility.

(1) Addition or replacement of equipment for the purpose of process improvement that is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart.

(2) Equipment associated with a compressor station, dehydration unit, sweetening unit, underground storage vessel, field gas gathering system, or liquefied natural gas unit is covered by §§ 60.5400a, 60.5401a, 60.5402a, 60.5421a, and 60.5422a if it is located at an onshore natural gas processing plant. Equipment not located at the onshore natural gas processing plant site is exempt from the provisions of §§ 60.5400a, 60.5401a, 60.5402a, 60.5421a, and 60.5422a.

(3) Not applicable.

(g) Sweetening units located at onshore natural gas processing plants that commenced construction, modification, or reconstruction after September 18, 2015, and on or before November 16, 2020, and sweetening units that commence construction, modification, or reconstruction after November 16, 2020.

(1) Each sweetening unit that processes natural gas produced from either onshore or offshore wells is an affected facility, and

(2) Each sweetening unit that processes natural gas followed by a sulfur recovery unit is an affected facility.

(3) Facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H₂S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in § 60.5423a(c) but are not required to comply with §§ 60.5405a through 60.5407a and §§ 60.5410a(g) and 60.5415a(g).

(4) Not applicable.

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(h) - (j) Not applicable.

012 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5400]**Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution
What equipment leak standards apply to affected facilities at an onshore natural gas processing plant?**

This section applies to the group of all equipment, except compressors, within a process unit.

(a) You must comply with the requirements of §§ 60.482-1a(a), (b), and (d), 60.482-2a, and 60.482-4a through 60.482-11a, except as provided in § 60.5401.

(b) You may elect to comply with the requirements of §§ 60.483-1a and 60.483-2a, as an alternative.

(c) You may apply to the Administrator for permission to use an alternative means of emission limitation that achieves a reduction in emissions of VOC at least equivalent to that achieved by the controls required in this subpart according to the requirements of § 60.5402 of this subpart.

(d) You must comply with the provisions of § 60.485a of this part except as provided in paragraph (f) of this section.

(e) You must comply with the provisions of §§ 60.486a and 60.487a of this part except as provided in §§ 60.5401, 60.5421, and 60.5422 of this part.

(f) You must use the following provision instead of § 60.485a(d)(1): Each piece of equipment is presumed to be in VOC service or in wet gas service unless an owner or operator demonstrates that the piece of equipment is not in VOC service or in wet gas service. For a piece of equipment to be considered not in VOC service, it must be determined that the VOC content can be reasonably expected never to exceed 10.0 percent by weight. For a piece of equipment to be considered in wet gas service, it must be determined that it contains or contacts the field gas before the extraction step in the process. For purposes of determining the percent VOC content of the process fluid that is contained in or contacts a piece of equipment, procedures that conform to the methods described in ASTM E169-93, E168-92, or E260-96 (incorporated by reference as specified in § 60.17) must be used.

013 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5402a]**Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015****What are the alternative means of emission limitations for GHG and VOC equipment leaks from onshore natural gas processing plants?**

(a) If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in GHG and VOC emissions at least equivalent to the reduction in GHG and VOC emissions achieved under any design, equipment, work practice or operational standard, the Administrator will publish, in the Federal Register, a notice permitting the use of that alternative means for the purpose of compliance with that standard. The notice may condition permission on requirements related to the operation and maintenance of the alternative means.

(b) Any notice under paragraph (a) of this section must be published only after notice and an opportunity for a public hearing.

(c) The Administrator will consider applications under this section from either owners or operators of affected facilities, or manufacturers of control equipment.

(d) An application submitted under paragraph (c) of this section must meet the following criteria:

(1) The applicant must collect, verify and submit test data, covering a period of at least 12 months, necessary to support the finding in paragraph (a) of this section.

(2) The application must include operation, maintenance and other provisions necessary to assure reduction in methane and VOC emissions at least equivalent to the reduction in methane and VOC emissions achieved under the design, equipment, work practice or operational standard in paragraph (a) of this section by including the information specified in

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paragraphs (d)(1)(i) through (x) of this section.

- (i) A description of the technology or process.
 - (ii) The monitoring instrument and measurement technology or process.
 - (iii) A description of performance based procedures (i.e. method) and data quality indicators for precision and bias; the method detection limit of the technology or process.
 - (iv) The action criteria and level at which a fugitive emission exists.
 - (v) Any initial and ongoing quality assurance/quality control measures.
 - (vi) Timeframes for conducting ongoing quality assurance/quality control.
 - (vii) Field data verifying viability and detection capabilities of the technology or process.
 - (viii) Frequency of measurements.
 - (ix) Minimum data availability.
 - (x) Any restrictions for using the technology or process.
- (3) The application must include initial and continuous compliance procedures including recordkeeping and reporting.

014 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5425a]
Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015
What parts of the General Provisions apply to me?

Table 3 to this subpart shows which parts of the General Provisions in §60.1 through §60.19 apply to you.

015 [40 CFR Part 60 Standards of Performance for New Stationary Sources §40 CFR 60.5430a]
Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015
What definitions apply to this subpart?

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act, in subpart A or subpart VVa of part 60; and the terms shall have the specific meanings given them under 40 CFR 60.5430a.

**SECTION F. Alternative Operation Requirements.**

No Alternative Operations exist for this State Only facility.

**SECTION G. Emission Restriction Summary.**

No emission restrictions listed in this section of the permit.



SECTION H. Miscellaneous.

This state-only operating permit grants ETC Northeast Pipeline, LLC authorization to continue operating the following sources:

- Sources 031-033, three (3) 40.92 MMBtu/hr HMO heaters;
- Source 201, one (1) 200 gpm amine sweetening unit controlled by a 1.07 MMBtu/hr thermal oxidizer and MSS plant flare;
- Source 204, Rod Packing Emissions from three (3) Electric Compressors controlled by a 1.0 MMBtu/hr thermal oxidizer;
- Source 301, two (2) 90,000-gallon condensate tanks, two (2) 21,000 2-lb RVP tanks controlled by a 1.0 MMBtu/hr truck loading combustor, and miscellaneous storage tanks with varying capacities between 500 and 16,800-gallons;
- Source 401, one (1) 6.22 MMBtu/hr NGL dehydration regenerator heater, one (1) 8.5 MMBtu/hr regenerator gas heater, and fifteen (15) catalytic heaters totaling 0.85 MMBtu/hr;
- Source 501, Pneumatic Devices, consisting of two (2) air-actuated intermittent-bleed pneumatic devices;
- Source 601, Venting/Blowdowns, including a residue compressor (electric), stabilizer compressor downtime (electric), moisture analyzer, VRU compressor blowdowns, facility maintenance, a stabilizer compressor (electric), and miscellaneous blowdowns;
- Source 701, Fugitives, consisting of fugitive emission components such as valves, flanges, connectors, open-ended lines, etc.;
- Source 702, Truck Loadout, controlled by a 1.0 MMBtu/hr combustor with associated 0.086 MMBtu/hr pilot;
- Source 801, Pigging Operations, consisting of one (1) pig receiver and one (1) pig launcher controlled by the MSS plant flare; and
- One (1) maintenance, startup, and shutdown (MSS) facility flare rated at 906 MMBtu/hr.



***** End of Report *****

COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Southwest Regional Office

TO AQ Case File SOOP-63-01001

FROM Bradley D. Spayd /BDS
Air Quality Engineering Specialist
Air Quality Program

THROUGH Thomas J. Joseph, P.E. /TJJ Mark R. Gorog, P.E. /MRG
Environmental Engineer Manager Program Manager
Air Quality Program Air Quality Program

DATE October 22, 2024

Re: Review Memorandum of Natural Minor State-Only Operating Permit Application
ETC Northeast Pipeline, LLC
Revolution Cryogenic Plant
Smith Township
Washington County

APS 1090694 AUTH 1443667 PF 805136 (State-Only Operating Permit Application)

Background:

ETC Northeast Pipeline, LLC (“ETC”) owns and operates the Revolution Cryogenic Plant (“Rev Cryo”) located at 76 Rover Lane, Bulger, PA 15019 in Smith Township, Washington County (40.4140816, -80.3500418). The facility is a natural gas processing plant.

The permittee conducts non-FERC-regulated midstream natural gas gathering and processing business. Activities include constructing and operating non-FERC-regulated, intrastate gathering lines and compression facilities; transporting natural gas from well sites to natural gas processing facilities or interconnections with interstate natural gas transmission pipelines; constructing and operating natural gas processing facilities; transporting natural gas to interconnection points on interstate transmission pipelines; transporting natural gas liquids to interstate liquid pipelines.

The primary air contamination sources at the facility consist of a 200 MMscfd cryogenic processing unit, an amine treatment unit controlled by a thermal oxidizer, various heaters, a condensate stabilization unit, condensate storage tanks, condensate truck loading controlled by a combustor, a facility-wide flare, and miscellaneous storage tanks, piping, and components.

The Revolution Cryogenic plant is currently permitted under *General Plan Approval and/or General Operating Permit BAQ-GPA/GP5, Natural Gas Compression Stations, Processing Plants, and Transmission Stations*, permit GP5-63-01001A (also under AG5-63-00004A) and permitted under GP1-63-01001A (*Small Gas and No. 2 Oil-Fired Combustion Units*) for a boiler and a number of heaters, both of which were authorized for use on August 7, 2018. The plant was first authorized for construction, installation, and operation on August 3, 2016, under GP5-63-01001 and had expanded operations authorized in 2018 under GP5-63-01001A.

Under the expansion project permitted under GP5-63-01001A on August 7, 2018, the following equipment was authorized for installation and operation:

- One (1) new stabilizer.
- One (1) new 11.3 MMBtu/hr enclosed combustor to control rod packing emissions from both the existing and new stabilizer overhead reciprocating compressors.
- One (1) new 200 MMscfd amine sweetening unit with still vent controlled by a 5.54 MMBtu/hr thermal oxidizer and flash gas controlled by the new MSS plant flare.
- New natural gas fractionation process equipment
 - De-methanizer (Cryogenic Unit on process flow diagram)
 - De-ethanizer (NGL Frac on process flow diagram)
- New Storage tanks:
 - Two (2) 500-gallon horizontal methanol tanks
 - One (1) 16,800-gallon fixed roof water tank
 - One (1) 4,200-gallon fixed roof amine drain tank
 - One (1) 4,000-gallon fixed roof open drain tank
- One (1) new 906 MMBtu/hr Maintenance, Startup, Shutdown (MSS) Plant Flare
- Three (3) 5,000-bhp electric-driven residue gas reciprocating compressors
- Additional fugitive emissions from component leaks.

Concurrent with the 2018 expansion project, ETC proposed to install and operate the following heaters associated with the processing plant under GP1-63-01001A:

- Three (3) 40.92 MMBtu/hr Tulsa Heaters, Inc. natural gas-fired heat medium oil (HMO) heaters with fuel gas recirculation.

Although the facility is currently permitted under GP5-63-01001A and GP1-63-01001A, respectively, for the existing equipment on site, the new equipment listed above were never constructed, and the expansion project was abandoned at that time.

The following equipment was previously authorized under GP5-63-01001 on August 3, 2016, and was included under GP5-63-01001A:

- One (1) stabilizer
- One (1) 200 MMscfd amine sweetening unit with still vent controlled by a 5.54 MMBtu/hr thermal oxidizer
- Natural gas fractionation process equipment
 - De-methanizer
 - De-ethanizer
- Storage tanks
 - Two (2) 90,000-gallon 12-lb pressurized condensate tanks
 - Two (2) 21,000-gallon 2-lb fixed roof condensate tanks
 - Two (2) 500-gallon horizontal methanol tanks
 - Twenty-four (24) new/used compressor oil/liquids tanks (280 to 11,760-gallon capacities)
 - Two (2) 21,000-gallon fixed roof slop tank
 - One (1) 16,800-gallon R.O. fixed roof water tank
 - One (1) 8,820-gallon fixed roof amine tank
 - One (1) 4,200-gallon fixed roof amine drain tank
 - One (1) 5,000-gallon pressurized propane tank
 - One (1) 4,000-gallon fixed roof open drain tank
- One (1) 488 MMBtu/hr Maintenance, Startup, Shutdown (MSS) plant flare (currently rated up to 906 MMBtu/hr).
- One (1) 11.3 MMBtu/hr combustor for controlling truck loading.
- Three (3) 5,000 bhp electric-driven residue gas reciprocating compressors.

- Fugitive emissions from component leaks.

The following heaters previously authorized under GP1-63-01001 on August 3, 2016, were included under GP1-63-01001A:

- Three (3) 40.92 MMBtu/hr Tulsa Heaters, Inc. natural gas-fired heat medium oil (HMO) heaters with fuel gas recirculation.

The facility also includes the following sources which were determined to be exempt from plan approval requirements under 25 Pa. Code §127.14(d) listed as No. 39 in the Department's Plan Approval and Operating Permit Exemptions list under 25 Pa. Code §127.14(a)(8):

- Two (2) 6.22 MMBtu/hr natural gas-fired NGL dehydration regenerator heaters;
- Two (2) 8.5 MMBtu/hr natural gas-fired regenerator gas heater;
- The facility also includes the following pigging activities which were determined to be exempt from plan approval and operating permit requirements on August 3, 2016, as determined through a Request for Determination (RFD) under 25 Pa. Code §127.14(d) listed as No. 44 in the Department's Plan Approval and Operating Permit Exemptions list under 25 Pa. Code §127.14(a)(8).
 - One (1) 30" high pressure Bluestone to Rev Cryo pig receiver controlled by the enclosed plant flare.
 - One (1) 12" C₃+ (propane+) Rev Cryo to C₃+ Storage Facility pig launcher controlled by the enclosed plant flare.

Table I shows subsidiaries of ETC Northeast Pipeline, LLC that operate in Pennsylvania. Table II shows ETC-owned permitted facilities in Pennsylvania as of the date of application submittal.

Table I:

Subsidiaries with Operations in Pennsylvania of Parent Company Energy Transfer Partners, L.P. of Applicant ETC Northeast Pipeline, LLC

Entity Name	Entity Main Address	Jurisdiction	FEIN #	Relationship to Applicant
Regency Marcellus Gas Gathering LLC	101 West Third Street, 3 rd Flr Williamsport, PA 17701	DE	27-2142725	Subsidiary of applicant
ETC Northeast Field Services, LLC	6051 Wallace Road, Ste 300 Wexford, PA 15090	DE	35-2497449	Subsidiary of applicant
ET Rover Pipeline LLC	1300 Main Street, Houston, TX 77002	DE	46-5655475	Indirect subsidiary of ultimate parent and Member, Rover Pipeline LLC joint venture
Rover Pipeline LLC	1300 Main Street, Houston, TX 77002	DE	47-1958303	Joint Venture of ET Rover Pipeline LLC and a non-affiliated company, AE-MidCo Rover, LLC
Energy Transfer Marketing & Terminals L.P.	8111 Westchester Drive, Dallas, TX 75225	TX	23-3102655	Indirect subsidiary of ultimate parent
Sunoco Pipeline L.P.	8111 Westchester Drive, Dallas, TX 75225	TX	23-3102656	Indirect subsidiary of ultimate parent
ETC Production LLC	8111 Westchester Drive, Dallas, TX 75225	DE	88-1911493	Indirect subsidiary of ultimate parent

Table II:

Names, Locations, and Permits for ETC Northeast Pipeline, LLC and Subsidiary Entities in Pennsylvania

Facility	Company Name	Location	Permit No.	Permit Issuance	Permit Expiration
AUBURN	Regency Marcellus Gas Gathering, LLC	Auburn Twp., Susquehanna Co.	AG5-58-00015A	11/12/2019	11/30/2024
BARTO	Regency NEPA Gas Gathering, LLC	Penn Twp., Lycoming Co.	GP5-41-02G	06/10/2022	06/10/2027
BRADFORD	Regency Marcellus Gas Gathering, LLC	West Burlington, Twp. Bradford Co.	GP5-05-04G	05/16/2023	05/16/2028
BOBST MOUNTAIN	Regency Marcellus Gas Gathering, LLC	Cogan House Twp. Lycoming Co.	GP5-41-651B	07/05/2018	07/05/2023
CANOE RUN	Regency Marcellus Gas Gathering, LLC	Mifflin Twp., Lycoming Co.	AG5-41-00001A	05/22/2023	05/22/2028
CHAPIN	Regency Marcellus Gas Gathering, LLC	Monroe Twp., Wyoming Co.	GP5-66-003A	01/31/2023	01/31/2028
HIRKEY	Regency Marcellus Gas Gathering, LLC	Washington Twp., Wyoming Co.	66-00010	07/08/2020	07/08/2025
LONE WALNUT	Regency Marcellus Gas Gathering, LLC	Cummings Twp. Lycoming Co.	AG5-41-00012A	07/23/2020	7/23/2025
MEHOOPANY	Regency Marcellus Gas Gathering, LLC	Washington Twp. Wyoming Co.	AG5-66-00003A	09/05/2018	09/05/2023
MILESKY	Regency Marcellus Gas Gathering, LLC	Center Twp., Green Co.	GP5-30-00216B	11/20/2019	11/20/2024
OGONTZ EAST	Regency Marcellus Gas Gathering, LLC	Cummings Twp. Lycoming Co.	AG5-41-00016A	08/16/2021	08/16/2026
OGONTZ WEST	Regency Marcellus Gas Gathering, LLC	Cummings Twp. Lycoming Co.	AG5-41-00015A	07/22/2021	07/22/2026
POORMAN	Regency Marcellus Gas Gathering, LLC	Gallagher Twp., Clinton Co.	AG5-18-00001A	09/06/2019	09/06/2024
QUAKER	Regency Marcellus Gas Gathering, LLC	Fairfield Twp., Lycoming Co.	AG5-41-00004A	08/20/2021	08/20/2026
RED BEND	Regency Marcellus Gas Gathering, LLC	Cogan House Twp. Lycoming Co.	GP5-41-700A	06/10/2022	06/10/2027
ROUPP	Regency Marcellus Gas Gathering, LLC	Mifflin Twp., Lycoming Co.	AGP-41-00018A	10/14/2021	10/14/2026
SEVERCOOL	Regency Marcellus Gas Gathering, LLC	Forkston Twp., Wyoming Co.	AG5-66-00001A	07/18/2018	07/18/2023
SUSQUEHANNA EAST	Regency Marcellus Gas Gathering, LLC	Lathrop Twp., Susquehanna Co.	GP5-58-005A	03/31/2023	03/31/2028
TAYLOR	Regency Marcellus Gas Gathering, LLC	Canton Twp., Bradford Co.	GP5-08-391A	01/10/2022	01/10/2027
TEEL	Regency Marcellus Gas Gathering, LLC	Springville Twp., Susquehanna Co.	GP5-58-002A	02/28/2023	02/28/2028
GALAXY	ETC Northeast Pipeline, LLC	Parker Twp., Butler Co.	AG5-10-00005A	12/01/2021	12/01/2026
REVOLUTION CRYO	ETC Northeast Pipeline, LLC	Smith Twp., Washington Co.	GP-1-63-01001A	08/07/2018	08/07/2023
			GP5-63-01001A	08/07/2018	08/07/2023
PIKE	ETC Northeast Field Services, LLC	New Sewickley Twp., Beaver Co.	04-00741A	11/05/2021	11/05/2026
FREEDOM	ETC Northeast Field Services, LLC	New Sewickley Twp., Beaver Co.	GP5-04-00744A	02/01/2023	02/01/2028

After a December 25, 2022 fire at the facility that resulted in a replacement amine sweetening unit, the Department requested that the facility be permitted under a state-only operating permit rather than under a general permit when the next general permit renewal application would have been due (August 8, 2023), since the most recent revision of the Department's GP-5 no longer allows for the operation of amine sweetening units.

On June 9, 2023, the Department received a state-only operating permit application for this facility prepared by Trinity Consultants on behalf of ETC Northeast Pipeline, LLC that is the subject of this review.

The most recent full compliance evaluation (FCE) inspection was conducted on November 28, 2023, by Pamela Trovato, former Air Quality Specialist. No violations were noted during the inspection. The most recent administrative inspection was conducted on January 22, 2024, also by Pamela Trovato. No violations were noted during the inspection.

Table III shows air contamination sources and air cleaning devices at the Revolution Cryogenic Plant processing plant.

Table III:
Emission Sources and Controls

Source ID	Description ⁶		Capacity/Rating	Make & Model	Control I	Control II	SCC	Department Authorization	Date of Authorization
031	40.92 MMBtu/hr HMO Heater 1		40.92 MMBtu/hr; 355.3 MMscf/yr	Tulsa Heaters, Inc. (Zeeco Burners) with Vertical Cylindrical GSLF Free-Jet Segmented Ring Burners	---	---	10200602	GP1-63-01001/ GP1-63-01001A	08/03/2016/ 08/07/2018
032	40.92 MMBtu/hr HMO Heater 2		40.92 MMBtu/hr; 355.3 MMscf/yr	Tulsa Heaters, Inc. (Zeeco Burners) with Vertical Cylindrical GSLF Free-Jet Segmented Ring Burners	---	---		GP1-63-01001/ GP1-63-01001A	08/03/2016/ 08/07/2018
033	40.92 MMBtu/hr HMO Heater 3		40.92 MMBtu/hr; 355.3 MMscf/yr	Tulsa Heaters, Inc. (Zeeco Burners) with Vertical Cylindrical GSLF Free-Jet Segmented Ring Burners	---	---		GP1-63-01001/ GP1-63-01001A	08/03/2016/ 08/07/2018
201	200 MMscfd Amine Unit 1 ⁵		200 MMscfd	---	C201: 1.07 MMBtu/hr Amine Unit Thermal Oxidizer 1 for Still Vent (0.27 MMBtu/hr pilot) ²	C202-1: 906 MMBtu/hr Rev Cryo 1 Plant Flare w/ 0.34 MMBtu/hr pilot ³	31000404	GP5-63-01001	08/03/2016
204	Electric Compressor Rod Packing		1,985,454 scf/yr	---	C204: 11.3 MMBtu/hr Rod Packing Combustor	---	31000299	GP5-63-01001	08/03/2016
301	Tanks/Vessels	90,000-gallon Condensate Tanks (Each) TK-811A and TK-811B	90,000-gallon (each)	---	---	---	31000214	GP5-63-01001	08/03/2016
		21,000-gallon 2-lb RVP Condensate Tanks (Each)	21,000-gallon (each)	---	C702: Truck Loading Combustor: 1.0 MMBtu/hr (pilot rating), 0.086 MMBtu/hr (flare rating) ¹	---		GP5-63-01001	08/03/2016
		Miscellaneous Tanks	500-16,800-gallons each	---	---	---		GP5-63-01001/ GP5-63-01001A	08/03/2016/ 08/08/2018
401	Heaters	NGL Dehy Regen Heater (HTR-001)	6.22 MMBtu/hr; 54 MMscf/yr	---	---	---	10200602	GP5-63-01001	08/03/2016
		Regenerator Gas Heater (HTR-002)	8.5 MMBtu/hr; 73.8 MMscf/yr	---	---	---		GP5-63-01001	08/03/2016
		Fifteen (15) Catalytic Heaters	0.85 MMBtu/hr (Combined); 7.3 MMscf/yr (Combined)	---	---	---		GP5-63-01001	08/03/2016
501	Pneumatic Devices		13,164 scf/yr	---	---	---	31000299	GP5-63-01001	08/03/2016
601	Venting/Blowdowns ⁴		98,719,919 scf/yr	---	---	C202-1: 906 MMBtu/hr Rev Cryo 1 Plant Flare	31000299	GP5-63-01001	08/03/2016
701	Fugitives		926,863 scf/yr pre-control/27,300 lbs gas leak rate/yr from fugitive emission components post-control;	---	---	---	31000220	GP5-63-01001	08/03/2016
702	Truck Loadout		1,308,994 bbl/yr truck unloading; 79,748 bbl/yr slop hauling	---	C702: Truck Loading Combustor: 1.0 MMBtu/hr (flare loading), 0.086 MMBtu/hr (pilot rating) ¹	---	31000299	GP5-63-01001	08/03/2016
801	Pigging Operations		1,460,000 scf/yr	---	---	C202-1: 906 MMBtu/hr Rev Cryo 1 Plant Flare	31000299	RFD-63-01001	08/08/2016
FLARE-001	MSS Flare (FLARE-001)		906 MMBtu/hr	---	---	---	30600904	GP5-63-01001	08/03/2016
COMB-001	Combustor for Tank & Loading (COMB-001)		1.0 MMBtu/hr	---	---	---	30600904	GP5-63-01001	08/03/2016
THERM-001	Thermal Oxidizer/Rod Packing Combustor (THERM-001)		11.3 MMBtu/hr	---	---	---	30600904	GP5-63-01001	08/03/2016

¹ 100% Capture Eff.; 99% DE of VOCs and HAPs (Manuf. Specs).

² 100% capture eff. 99% DE of VOCs and HAPs

³ 98% DE of VOCs and HAPs (Manuf. Specs).

⁴ 96% to Flare; 4% as Fugitive.

⁵ About 73% of the amine unit total exhaust comprises of the regen vent going to the thermal oxidizer. The remaining 27% is flash gas routed to the MSS flare.

⁶ The enclosed 11.3 MMBtu/hr rod packing combustor, the MSS flare, a second amine sweetening unit, and some miscellaneous storage tanks and associated fugitive emission components were authorized under GP5-63-01001A. The second amine sweetening unit and three (3) additional heaters authorized under GP5-63-01001 were never constructed.

Requests for Determinations and Miscellaneous:

RFD-63-01001: On the same date as GP5-63-01001 and GP1-63-01001 were authorized, August 3, 2016, the Department also determined that the pig launcher and receiver controlled by an enclosed flare were exempt from Plan Approval and Operating Permit requirements as determined through a Request for Determination (RFD) under 25 Pa. Code §127.14(d) listed as No. 44 in the Department's Plan Approval and Operating Permit Exemptions list under 25 Pa. Code §127.14(a)(8).

RFD-63-01001A: On June 14, 2018, the Department received an RFD application for truck loading of C₃+ product due to delays on the C₃+ pipeline. The company proposed to load C₃+ product by truck for up to 90 days while the pipeline was completed.

RFD-63-01001B: On July 13, 2022, the Department approved a request for determination (RFD) for the use of the amine unit flash gas as fuel or have it routed to the flare; the replacement of several exempt above ground oil tanks with double walled tanks; equipping the 2-lb RVP Condensate Tanks and the Amine Tank with gas blankets; routing the 2-lb RVP Condensate Tanks to the exiting truck loading combustor; and the use of a moisture analyzer on the mol sieve dehydration process. These changes were determined to be exempt from plan approval requirements per 25 Pa. Code §127.14(d) listed as No. 44 in the Department's *Air Quality Permit Exemptions* (275-2101-003, July 1, 2021) under 25 Pa. Code §127.14(a)(8).

It was the understanding of the Department that the mol sieve process includes three (3) columns where the gas feed is cycled through adsorption, regeneration, and cooling vessels; the mol sieve process itself is not vented; however, a moisture analyzer associated with the mol sieve tests a small slipstream of natural gas that is ultimately vented; the moisture analyzer vent is estimated to vent at a rate of 5 scfh; and that the combined impact of these changes were less than 2.7 tons of VOC, 1,000 lbs of any single HAP, nor 1.0 ton of total HAP in any consecutive 12-month period.

RFD-63-01001C (RFD 4471): On May 8, 2023, the Department determined that a project to repair an existing Amine Unit at the site at the ETC Northeast Pipeline, LLC facility located in Smith Township, Washington County did not qualify the Amine Unit as a new source and was exempt from plan approval requirements. This determination was made based on the list of sources qualifying for exemption in the Department's Published Notice of Plan Approval and Operating Permit Exemptions under 25 Pa. Code §127.14(a)(8) as established in accordance with §127.14(d) and the definition of a new source as listed under 25 Pa Code §121.1. Specifically, the project qualifies for plan approval exemption under item No. 44 - "Any source granted an exemption by the Department through the execution of an RFD form." It is the Department's understanding that the facility is currently permitted under GP5-63-01001A (aka AG5-63-0004A) and GP1-63-01001A both authorized for use on August 7, 2018, under the 2015 version of GP-5; that information provided by ETC in January and February 2023 was accurate and correct including, but not limited to, the fixed capital costs of new components associated with replacement and repairs of the existing Amine Unit were below fifty percent of the fixed capital cost that would be required to construct an entirely new Amine Unit; that neither potential nor actual air emissions at the facility would increase as a result of this project; and that the project will not trigger the requirements of 25 Pa. Code Chapter 127 Subchapters D and E (relating to prevention of significant deterioration of air quality and new source review).

Miscellaneous: Between September 10, 2024 and September 17, 2024, the facility had planned maintenance activity for flare tip replacement which was a physical change qualifying for exemption under 25 Pa. Code §127.14(a)(9). An RFD was not required for this activity. A temporary flare was on site during this time.

Testing and Reporting:

On March 29, 2022, the Department conditionally approved testing for NO_x, CO, and O₂ emissions of the three (3) HMO heaters (Sources 031-033) for testing that occurred on April 25, 2022. Testing was conducted by Testing Compliance Solutions, LLC (TCS) using EPA Methods EPA Methods 1, 3A, 7E, 10 and 205 for compliance with GP1-63-01001A requirements. The GP-1 emission limits are 30 ppm_{dv} at 3% O₂ and 300 ppm_{dv} at 3% O₂ for CO. According to the Department's April 25, 2022 inspection report, "The test taking place was a retest for an original test conducted on 4/6-7/2021. ETC discovered that the stack testing company did not monitor the correct parameters and self-reported this issue to the Department. The stack test company was supposed to be monitoring fuel gas flow rate from the control room but instead was monitoring it from fuel meters located on the units. [Company Representative] informed me that the fuel meters on the units have been replaced and are operating as designed."

The Department's September 30, 2022, memorandum from the Department's Division of Source Testing noted the following: "The NO_x/CO results are acceptable for determining compliance at, or below, the 3-hour average heat input (HI) achieved during testing. However, the results are not acceptable for determining compliance above the HI (3-hour average) achieved during testing (83-87% of the rated heat input). Since the maximum routine HI for each boiler was not provided, it is unclear if testing was conducted in accordance with 25 PA Code 139.11(1). If not, a restriction on the HI, or other actions by mutual agreement with regional staff, is recommended."

A December 17, 2021, review memorandum from the Department's Division of Source Testing described the following:

On April 6 - 7, 2021, Alliance Source Testing, LLC conducted a baseline test to determine the (1) combustion gas net heating value (EPA Method Alt-100), exit velocity (EPA Method 2D), and fugitive emissions (FE; EPA Method 22) from a 488 MMBtu/hour Rev Cryo 1 Plant Flare, used to control the emissions from the Revolution Cryo Plant maintenance, startup, and shutdown operations; and (2) nitrogen oxides (NO_x; EPA Method 7E) and carbon monoxide (CO; EPA Method 10) emissions from 40.92 MMBtu/hour HMO Heaters (Source IDs: 031 – 033).

The memorandum noted that the results were acceptable to the Department.

On April 11, 2019, the Department of Environmental Protection (DEP) received a pre-test protocol for the baseline testing to determine the (1) combustion gas net heating value, exit velocity, and visible emissions (VE) from a 488 MMBtu/hour Rev Cryo 1 Plant Flare (Source ID: C202), used to control the emissions from the ETC Northeast Pipeline/Revolution Cryo Plant maintenance, startup, and shutdown operations; and (2) nitrogen oxides (NO_x) and carbon monoxide (CO) emissions from 40.92 MMBtu/hour HMO Heaters 1 – 3 (Source IDs: 031 – 033). The protocol was acceptable to the Department.

Additional testing records and reports can be found in the Department's PSIMS system or paper records.

Reporting, Compliance History, and Violations:

The following air quality notice of violations were included in the compliance review form in the application subject to this review, with the most recent action in July 2024 being added.

Table IV:
Compliance Review Summary

Date	Plan Approval/Operating Permit No.	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date
07/2024	AG5-63- 01001A	Visible emissions exceedance from flare/Heater test not conducted in accordance with GP-1	CACP	Corrected
07/28/22	AG5-63- 01001A	Visible emissions exceedance from flare	NOV	Corrected
07/07/22	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected
02/03/22	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected
01/10/22	AG5-63-01001A	Heater emission test not conducted at adequate operating load	NOV	Corrective action schedule submitted to DEP
11/12/21	AG5-63-01001A	Visible emissions exceedances from flare	CACP	Corrected, CACP for multiple NOV's.
10/12/21	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected
03/15/21	AG5-63- 01001A	Visible emissions and opacity exceedance from flare	NOV	Corrected
03/10/21	AG5-63- 01001A	Visible emissions exceedance from flare	NOV	Corrected
01/25/21	AG5-63- 01001A	Visible emissions exceedance from flare	NOV	Corrected
01/15/21	AG5-63- 01001A	Visible emissions exceedance from flare	NOV	Corrected
11/17/20	AG5-63- 01001A	Failure to conduct Method 22 observation	NOV	Corrected

Recent Shutdown, Deviation, or Malfunction Events:

Recent deviation events from 2024 are described below. Other deviations, malfunction reports, or emergency shutdown events prior to 2024 are available in Departmental records.

On June 27, 2024, the Department was notified by ETC that at approximately 8:35 p.m. on the day prior, an upset condition with the de-ethanizer unit at Rev Cryo caused a flaring event that lasted until approximately 11:34 p.m.

On September 10, 2024, a power loss to the flare blower caused visible emissions to occur from the main plant flare for approximately 10 minutes. Power was restored via a generator to bring the blower back into service. Method 22 observations were subsequently performed.

Also occurring on September 10, 2024, a temporary flare was placed into service while the main plant flare was out of service for maintenance and replacement of the flare tip. Visible emissions occurred during the operation of the temporary flare until it was brought out of service at approximately 4:15 pm on September 13, 2024 when the main plant flare was placed back into service. Method 9 observations of the flare were conducted on September 11th and 12th, and the opacity readings ranged from 5-15%.

On September 14, 2024, starting in the morning, intermittent low-opacity visible emissions were observed coming from the main plant flare. These intermittent visible emission events occurred from September 14, 2024 to September 17, 2024. ETC reported the visible emissions to the Department on September 16, 2024 via phone. ETC continued tuning and troubleshooting and engaged the flare manufacturer to adjust settings for a newly installed flare tip. ETC notified the Department of this change, and it was to reduce the potential for visible emissions at low BTU, high flow rates. However, once the flare tip was changed, visible emissions have been observed for high BTU, low flow rates. ETC is continuing to work with the flare manufacturer on this issue. On September 23, 2024, at approximately 1:10 p.m., visible emissions were observed coming from the flare at until 1:30 p.m. This occurred during the blowdown of the refrigeration compressors. Method 22 observations were subsequently performed. The Department conducted a site visit on October 2, 2024. The Department was notified on October 4, 2024, about another visible emission observation event.

Single Source Determination:

Stationary sources should be evaluated for aggregation to determine major source status with respect to New Source Review (NSR) and Title V (major source) permitting. Aggregation based on the EPA's definition of "stationary source" and "building, structure, facility, or installation," as defined in 40 CFR §52.21(b)(5) and (6) [81 FR 35622, dated June 3, 2016] which stated to be considered a single source, the following three criteria must be met:

- Criterion 1: The pollutant-emitting activities must belong to the same industrial grouping, meaning that they have the same first two digits of the Standard Industrial Classification (SIC). For onshore activities, the SIC Major Group is 13 – *Oil and Gas Extraction*.
- Criterion 2: The pollutant-emitting activities must be under common control.
- Criterion 3: The pollutant-emitting activities must be located on one or more contiguous or adjacent properties. The EPA considers pollutant-emitting activities for onshore activities, under SIC Major Group 13, as adjacent if they are located on the same surface site or located on one or more surface sites that are located within one quarter (¼) of a mile of one another, as measured from the center of the equipment on the surface site, and share equipment. "Surface site," as defined in 40 CFR §63.761, means any combination of one or more graded pad sites, gravel pad sites, foundations, platforms, or the immediate physical location upon which equipment is physically affixed.

However, per the 25 Pa. Code §121.1 definition of a *facility*, which the AQ Program follows, only two criteria must be met for a source that is not subject to Prevention of Significant Deterioration requirements:

- Criterion 1: The pollutant-emitting activities must be under common control.
- Criterion 2: The pollutant-emitting activities must be located on one or more contiguous or adjacent properties. The EPA considers pollutant-emitting activities for onshore activities, under SIC Major Group 13, as adjacent if they are located on the same surface site or located on one or more surface sites that are located within one quarter (¼) of a mile of one another, as measured from the center of the equipment on the surface site, and share equipment. "Surface site," as defined in 40 CFR §63.761, means any combination of one or more graded pad sites, gravel pad sites, foundations, platforms, or the immediate physical location upon which equipment is physically affixed.

The air contamination sources at the Rev Cryo Plant are owned and operated by ETC Northeast Pipeline, LLC, thereby satisfying Criteria 1 above. For Criterion 2, there are no ETC-owned or operated emissions sources within one quarter (¼) of a mile of the site, satisfying Criterion 2. Consequently, there are no other stationary air contamination sources to be aggregated with this facility for the purposes of permitting.

Regulatory Analysis:

Any facility authorized to operate under a GP-5 or a state-only operating permit must be operated in such a manner as to not cause air pollution as defined in 25 Pa. Code §121.1, operated and maintained in a manner consistent with good operating and maintenance practices, operated and maintained in accordance with the manufacturer's specifications, and the specifications and applicable terms and conditions of the GP-5 or state-only operating permit. Furthermore, nothing in the proposed state-only operating permit or currently authorized GP-5 relieves the owner or operator from the obligation to comply with all applicable Federal, State, and local laws and regulations, which may include New Source Performance Standards (NSPS) in 40 CFR Part 60 (incorporated by reference in 25 Pa. Code §122.3) and National Emission Standards for Hazardous Air Pollutants (NESHAPs) codified under 40 CFR Parts 61 and 63 (incorporated by reference in 25 Pa. Code §124.3 and §127.35, respectively).

Best available technology is defined in 25 Pa. Code §121.1 as the "equipment, devices, methods or techniques as determined by the Department which will prevent, reduce or control emissions of air contaminants to the maximum degree possible and which are available or may be made available." Best available technology applies at the time of authorization to construct, install, and temporarily operate air contamination sources via a plan approval or a general operating permit and can include various control technologies such as implementation of oxidation catalysts, control by an enclosed flare, emission limitations, or work practice standards, among others. A best available technology evaluation is outside the scope of this review because no new sources or modifications are being proposed in this application, and such a change may require a plan approval application to authorize the construction, installation, and temporary operation of such sources.

25 Pa. Code §135.3 requires annual AES emission reports if requested by the Department. The 2013 version of the Department's GP-5 and subsequent revisions included §135.3, and the Department requires all oil and gas facilities to report. The permittee has historically and continues to track actual emissions from the facility on a monthly and on a 12-month rolling basis, with annual AES emission inventory reports being submitted by March 1st of each year, unless an extension has been granted by the Department in writing. The facility first started reporting in 2018 for the 2017 reporting year. The facility will be required to continue submitting these annual AES emission reports for all air contamination sources at this facility.

The report must include all emissions information for all previously reported sources and new sources which were first operated during the preceding calendar year. Emissions data including, but not limited to the following, shall be reported: carbon monoxide - oxides of nitrogen (NO_x) -particulate matter less than 10 micrometers in diameter (PM-10), particulate matter less than 2.5 micrometers in diameter (PM-2.5), sulfur dioxide, volatile organic compounds, total hazardous air pollutants (HAP), speciated individual HAP emissions, and greenhouse gases, expressed as CO₂e.

The requirements of 25 Pa. Code §135.3 and associated recordkeeping requirements of §135.5 will be included in the facility-wide requirements of Section C of the proposed state-only operating permit.

Per 25 Pa. Code §127.441, a facility-wide inspection shall be conducted at a minimum of once per day when the Facility is visited by the Owner/Operator. The facility-wide inspection shall be conducted for the presence of the following:

- a. Visible stack emissions;
- b. Fugitive emissions; and
- c. Potentially objectionable odors at the property line.

These observations are to ensure continued compliance with source-specific visible emission limitations, fugitive emissions prohibited under 25 Pa. Code §123.1 or §123.2, and potentially objectionable odors

prohibited under 25 Pa. Code §123.31. Observations for visible stack emissions shall be conducted during daylight hours and all observations shall be conducted while sources are in operation. If any visible stack emissions, fugitive emissions, or potentially objectionable odors are apparent, the Owner/Operator shall take corrective action.

Previous versions of the GP-5 included visible emission limitations, prohibited potentially objectionable odors in accordance with 25 Pa. Code §123.31, and prohibited fugitive emissions in accordance with §123.1 and §123.2. Proposed requirements in this state-only operating permit will be at least as stringent as those in the currently authorized GP-5.

25 Pa. Code §129.14 specifies requirements related to open burning. The facility is not located in an air basin and is therefore subject to the limited open burning requirements of §129.14(b).

Per 25 Pa. Code §127.441, record keeping requirements at this facility will include monthly hours of operation for each air contamination sources and air cleaning device, monthly fuel consumption for each air contamination sources and air cleaning device, annual throughput for the condensate storage tanks, facility-wide inspections for visible stack, fugitive, and potentially objectionable odors, records of maintenance performed, and tracking actual emissions of criteria pollutants, certain HAPs, and greenhouse gases (GHGs) on a monthly and 12-month rolling basis, among others.

For malfunction reporting, ETC is required to notify the Department by telephone within twenty-four (24) hours of the discovery of any malfunction at the Rev Cryo plant or any malfunction of an associated air cleaning device that results in, or may possibly result in, the emission of air contaminants in excess of any applicable limitation or that otherwise results in noncompliance with the requirements of the currently authorized GP-5, GP-1, or the proposed state-only operating permit, if authorized by the Department.

Applicable GP-1 Requirements to the Small Gas & No. 2 Oil Fired Combustion Units

The applicant has three (3) previously installed 40.92 MMBtu/hr natural gas-fired heaters. The term “heater” is somewhat of a misnomer in this context, as heaters heat by direct heat transfer, whereas the three (3) HMO heaters at this facility meet the definition of a combustion unit/boiler since they heat by indirect heat transfer. The applicable requirements of the GP-1, described below, will be included in the proposed state-only operating permit for this facility.

Per GP-1 Condition 4, “... The combustion unit and any associated air cleaning devices shall be:

- a. Operated in such a manner as not to cause air pollution.
- b. Operated and maintained in a manner consistent with good operating and maintenance practices.
- c. Operated and maintained in accordance with the manufacturer's specifications and the applicable terms and conditions of this Small Combustion Unit General Permit.”

Per GP-1 Condition 7, no later than one hundred and eighty (180) days after initial start-up, the permittee shall demonstrate compliance with the following emission limitations for NO_x and CO established in Condition 17:

Table V:
GP-1 Emission Limits

Pollutant	GP-1 Emission Limitations	Applicable Emission Limitations Established Under GP1-63-01001A
	ppmdv@3%O ₂	ppmdv@3%O ₂
NO _x	30	30
CO	300	49

*Emission rates based upon the manufacturer guarantee.

The applicant proposed to demonstrate compliance with the emission limitations by either stack testing or Department approved portable analyzer within 180 days of initial startup, in accordance with GP-1 Condition 7. As noted, stack testing occurred on April 25, 2022, and the results were deemed acceptable to the Department per a Division of Source Testing review memorandum dated September 30, 2022.

Per GP-1 Condition 16.a. “The permittee shall install and maintain the necessary meter(s) to determine and to record amount of fuel usage.” The facility has meters to track and record the fuel consumption from these units.

25 Pa. Code §§ 123.1, 123.2, and 123.31 - Prohibition of certain fugitive emissions, fugitive particulate matter, and odor emission limitations apply to the heaters, though these requirements apply to all air contamination sources and air cleaning devices at the facility and will therefore be included under the site-wide requirements of Section C in the proposed operating permit.

Per 25 Pa. Code §123.11(a)(1), particulate matter emissions shall not exceed 0.4 lbs/MMBtu of heat input, when the heat input to the combustion unit in millions of Btus per hour is greater than 2.5 but less than 50. Consequently, the three 40.92 MMBtu/hr heaters would be limited to 16.37 lb/hr. However, based on the manufacturer’s guaranteed emission rate, the proposed particulate matter emission rate (both as total PM, PM-10, and PM-2.5) will be 0.014 lbs PM-10/MMBtu, equating to 0.57 lbs/hr and 2.51 TPY PM-10, and assuming PM-10 is equal to PM-2.5, this also equates to 0.57 lbs/hr and 2.51 TPY PM-2.5.

Per 25 Pa. Code §123.22(d), SO₂ emissions shall not exceed one (1) lb SO₂/MMBtu of heat input, when the heat input to the combustion unit in millions of Btus per hour is greater than 2.5 but less than 50. The 40.92 MMBtu/hr heaters are consequently limited to 40.92 lbs SO_x/hr by regulation. Based on AP-42 emission factors, the proposed SO₂ emission rate is 0.02 lbs/hr and 0.11 TPY SO₂.

Per 25 Pa. Code §123.41 person may not permit the emission into the outdoor atmosphere of visible air contaminants in such a manner that the opacity of the emission is equal to or greater than 20% for a period or periods aggregating more than 3 minutes in any hour; or equal to or greater than 60% at any time. This regulation applies to all air contamination sources and air cleaning devices at this facility unless more stringent visible emission or opacity requirements have been established as BAT. This regulation will be included in Section C of the proposed operating permit.

NSPS from 40 CFR 60 Subpart Dc-Standards of performance for small industrial-Commercial-Institutional Steam Generating Units applies to the “steam generating units” at this facility. Per 40 CFR §60.40c(a), this subpart applies to each steam generating unit for which construction... commenced after June 9, 1989 and that has a maximum design heat input capacity of 100 MMBtu/hr or less, but greater than or equal to 10 MMBtu/hr. Per 40 CFR §60.41c, “*steam generating unit*” means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium...” The HMO heaters have a capacity of 40.92 MMBtu/hr, meet the definition of a steam generating unit, and were constructed after June 9, 1989; therefore, this subpart applies.

The owner or operator of each affected facility shall submit notification of the date of construction or reconstruction and actual startup, as provided by §60.7 of this part. This notification shall include the design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.

The owner or operator shall comply with the recordkeeping and certification requirements in accordance with 40 CFR §§60.46c(e), 60.42c(h) and 60.48c(f)(l) (i.e. the permittee may use the fuel supplier certification to demonstrate compliance). The owner or operator shall maintain daily fuel consumption records in accordance with 40 CFR §60.48c(g).

NESHAPS for Industrial, Commercial, and Institutional Boilers Area Sources from 40 CFR Part 63 Subpart DDDDD does not apply to the 40.92 MMBtu/hr heaters (that meet the definition of a boiler since they heat by indirect heat transfer) at this facility. Per 40 CFR §63.7485, you are subject to this subpart if you own or operate a boiler at a major source of HAP. The facility is an area source of HAP; therefore, this subpart does not apply.

NESHAPS for Industrial, Commercial, and Institutional Boilers Area Sources from 40 CFR Part 63 Subpart JJJJJ does not apply to the three (3) 40.92 MMBtu/hr HMO heaters (that meet the definition of a boiler since they heat by indirect heat transfer). In accordance with 40 CFR §63.11195(e), a gas-fired boiler as defined in this subpart is not subject to this subpart. *Gas-fired boiler* includes any boiler that burns gaseous fuels not combined with any solid fuels and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year. If the proposed boiler only combusts natural gas in accordance with the above definition, this subpart does not apply. The HMO heaters (i.e. boilers) will combust natural gas only, therefore this subpart does not apply.

General Permit BAQ-GPA/GP-5: Natural Gas Compression and/or Processing Facilities

Outside of the three (3) previously installed 40.92 MMBtu/hr natural gas-fired heaters that meet the definition of a combustion unit permitted under the GP-1, all other air contamination sources and air cleaning devices at this facility are currently permitted under a GP-5. The applicable requirements of the GP-5, described below, will be included in the proposed state-only operating permit for this facility.

Some general requirements from the GP-5 that will be retained for the state-only operating permit are for the owner or operator of the facility to keep records to verify compliance with facility-wide emission limitations and to maintain monthly and 12-month rolling sums of actual emissions. All required records at the facility shall be retained for a minimum of five (5) years and shall be made available to the Department upon request unless otherwise specified in the operating permit or by law. The Department reserves the right to request additional information necessary to determine compliance with the state-only operating permit.

Section B. Natural Gas-Fired Spark Ignition Internal Combustion Engines

GP-5 Section B - Requirements for Natural Gas-Fired Spark Ignition Internal Combustion Engines - There are no applicable requirements under this section since there are no natural gas-fired engines at this facility. All reciprocating compressors are electrically-driven with power supplied from the grid and therefore do not meet the definition of an internal combustion engine. As such, the new source performance standards under 40 CFR Part 60 Subpart JJJJ do not apply. Similarly, the requirements of 40 CFR Part 60 Subparts ZZZZ and IIII also do not apply.

Section C. Natural Gas-Fired Simple Cycle Gas Turbines

GP-5 Section C - Requirements for Natural Gas-Fired Simple Cycle Gas Turbines - There are no applicable requirements under this section since there are no natural gas-fired turbines at this facility. As such, NSPS 40 CFR Part 60 Subpart KKKK does not apply.

Section D. Natural Gas Compressors

GP-5 Section D-Requirements for Natural Gas Compressors -The owner or operator of natural gas compressors shall comply with the applicable requirements specified in 40 CFR Part 60, Subpart OOOO. Since the issuance date of the Department's GP-5 on January 16, 2015, EPA promulgated NSPS Subpart OOOOa, which the reciprocating compressors at this facility are subject to.

NSPS from 40 CFR Part 60 Subpart OOOO-Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015 will not apply to the compressors since they were constructed after September 18, 2015.

NSPS from 40 CFR Part 60 Subpart OOOOa--Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015 applies to the previously authorized reciprocating compressors. Per 40 CFR §60.5365a(c), each reciprocating compressor which commences construction after September 18, 2015, is considered an affected facility.

Per 40 CFR §60.5385a(a), the compressor rod packing is required to be replaced according to either paragraph (a)(1) or (2) of this section, or comply with paragraph (a)(3) of this section, as detailed below:

- (1) On or before the compressor has operated for 26,000 hours. The number of hours of operation must be continuously monitored beginning upon initial startup of your reciprocating compressor affected facility, or the date of the most recent reciprocating compressor rod packing replacement, whichever is later.
- (2) Prior to 36 months from the date of the most recent rod packing replacement, or 36 months from the date of startup for a new reciprocating compressor for which the rod packing has not yet been replaced.
- (3) Collect the methane and VOC emissions from the rod packing using a rod packing emissions collection system that operates under negative pressure and route the rod packing emissions to a process through a closed vent system that meets the requirements of §60.541 la(a) and (d).

Per 40 CFR §60.5370a(a), ETC is required to be in compliance with the standards of this subpart upon startup. ETC uses an 11.3 MMBtu/hr rod packing combustor to comply with this section of this subpart.

GP-5 Section E - Requirements For Storage Vessels/Storage Tanks - The owner or operator of each storage vessel/storage tank shall also comply with the applicable requirements specified in 40 CFR Part 60, Subparts Kb and OOOO and 40 CFR Part 63, Subpart HH.

40 CFR Part 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, does not apply to the storage tanks at this facility. Although the storage tanks were constructed after the applicability date of July 23, 1984, per 40 CFR §60.440b(d)(4), “This subpart does not apply to... vessels with a design capacity less than or equal to 1,589.874 cubic meters (m³) [10,000-bbl] used for petroleum or condensate stored, processed, or treated before custody transfer.” The largest storage

tanks at this facility are the condensate tanks which are 90,000 gallons (approximately 341 m³) each, and therefore below the applicability threshold of this subpart.

The applicable section of NSPS Subpart OOOO does not apply to the storage vessels at this facility since they commenced construction after September 18, 2015. Furthermore, the VOC emissions from each storage vessel are less than the applicability threshold of 6.0 TPY VOC per 40 CFR §60.5365(e).

Although constructed after September 18, 2015, the applicable section of 40 CFR Part 60 Subpart OOOOa will not apply to the storage vessels since the VOC emissions are less than 6 TPY. Per 40 CFR §60.5365a(e), each storage vessel affected facility is a single storage vessel with the potential for VOC emissions equal to or greater than 6 TPY. The VOC emissions from each storage vessel are less than 6 TPY; therefore, this subpart does not apply.

NESHAPS from 40 CFR Part 63 Subpart HH - Oil and Natural Gas Production Facilities does not apply to the storage tanks at this facility. Per 40 CFR 670(b)(2), for area sources, this subpart only applies to the owners and operators of TEG dehydration units and does not apply to storage vessels. There are no TEG dehydration units on site.

GP-5 Section E Condition 2 In accordance with 25 Pa. Code §127.1 and §127.12(a)(5), the owner or operator of each storage tank with a capacity greater than 40,000 gallons shall also comply with the requirements in 25 Pa. Code §129.56. In accordance with 25 Pa. Code §129.56(a), no person may permit the placing, storing or holding in a stationary tank, reservoir or other container with a capacity greater than 40,000 gallons of volatile organic compounds with a vapor pressure greater than 1.5 psia unless the tank, reservoir or other container is a pressure tank capable of maintaining working pressures sufficient at all times to prevent vapor or gas loss to the atmosphere or is designed and equipped with: (1) an external or an internal floating roof; or (2) vapor recovery system. The two (2) previously authorized 12-lb condensate tanks are greater than 40,000 gallons and therefore are subject to §129.56. The two (2) 12-lb condensate tanks *satisfy the requirements of this section since they are capable of maintaining working pressures sufficient at all times to prevent vapor or gas loss to the atmosphere.* In the event of a malfunction or emergency, potential vapors from the PSV on the tanks will be routed to the plant flare.

25 Pa. Code §129.57 applies to storage tanks between 2,000 and 40,000 gallons with a vapor pressure equal to or greater than 1.5 psia. Storage tanks covered under this section shall have pressure relief valves which are maintained in good operating condition and shall be set to release at no less than 0.7 psig of pressure or 0.3 psig of vacuum or the highest possible pressure and vacuum.

According to the applicant the miscellaneous tanks at this facility with a capacity less than or equal to 40,000 gallons will have vapor pressure less than 1.5 psia, therefore this section does not apply. This section does not apply to the methanol tank since the capacity is less than 2,000 gallons.

Section F. Glycol Dehydrators

GP-5 Section F - Requirements for Glycol Dehydrators - There are no applicable requirements under this section since there are no glycol dehydrators at this facility. As such, 40 CFR Part 63 Subpart HH does not apply.

Section G and H. Processing Plants and Equipment Leaks

GP-5 Section G - Requirements for Onshore Natural Gas Processing Plants applies to this facility because it meets the definition of a natural gas processing plant since it engages in the extraction of natural gas liquids from field gas. In accordance with 25 Pa. Code §127.11 and §127.12(a)(5), the owner or operator of a

fractionation unit located at an onshore natural gas processing plant shall comply with 40 CFR Part 60, Subpart KKK- Standards of Performance for Equipment Leaks of VOCs from Onshore Natural Gas Processing Plants. The owner or operator shall also comply with the applicable requirements specified in 40 CFR Part 60, Subpart OOOOa which became effective on August 2, 2016.

NSPS from 40 CFR Part 60, Subpart KKK-Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984, and on or Before August 23, 2011 does not apply to the processing plant since it was constructed after August 23, 2011.

Per 40 CFR §60.630(a):

- (1) The provisions of this subpart apply to affected facilities in onshore natural gas processing plants.
- (2) A compressor in VOC service or in wet gas service is an affected facility.
- (3) The group of all equipment except compressors (defined in §60.631) within a process unit is an affected facility.

Natural gas processing plant (gas plant) is defined under 40 CFR §60.631 as any processing site engaged in the extraction of natural gas liquids (NGLs; defined as hydrocarbons, such as ethane, propane, butane, and pentane) from field gas, fractionation of mixed natural gas liquids to natural gas products, or both. According to the background document for Subpart KKK, extraction implies application of a forced process (e.g. refrigeration) to the gas to remove NGLs, and was intended to *exclude* passive separation of NGLs from field gas due to temperature or pressure changes as the gas is transported from the underground reserve to the surface, or temperature or pressure changes as the gas passes through a process vessel located at the surface.

In wet gas service is defined under 40 CFR §60.631 as a piece of equipment containing or contacting field gas before the extraction step in the process (which would imply that natural gas liquids extraction equipment is incorporated at the same facility).

Process unit is defined under 40 CFR §60.631 as equipment assembled for the extraction of natural gas liquids from field gas, the fractionation of the liquids into natural gas products, or other operations associated with the processing of natural gas products.

The facility does engage in natural gas processing and meets the definition of a natural gas processing plant, however, since it was constructed after the applicability date of August 23, 2011, this subpart does not apply.

40 CFR Part 60, Subpart LLL – Standards of Performance for SO₂ Emissions from Onshore Natural Gas Processing for Which Construction, Reconstruction, or Modification Commenced After January 20, 1984 and on or Before August 23, 2011 does not apply to this facility for the same reason as above for Subpart KKK, since the natural gas processing plant was constructed after August 23, 2011.

NSPS from 40 CFR Part 60 Subpart OOOO - Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution for which Construction, Modification or Reconstruction Commenced after August 23, 2011, and on or before September 18, 2015 does not apply since the plant was constructed after September 18, 2015.

40 CFR Part 60 Subpart OOOOa – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015 applies to an affected facility listed in paragraphs (a) through (j) of 40 CFR §60.5365a that were constructed, modified, or reconstructed after September 18, 2015. Per 40 CFR §60.5365a(f), the group of all equipment within a process unit is considered an affected facility. Per 40 CFR §60.5430a, “*Process unit* means components assembled for

the extraction of natural gas liquids from field gas, the fractionation of the liquids into natural gas products, or other operations associated with the processing of natural gas products...”

Rev Cryo includes equipment to extract natural gas liquids from field gas (separators and fractionation equipment), therefore the site is considered a *gas processing plant* subject to the leak detection and repair (LDAR) requirements of this subpart.

ETC is required to monitor and repair all fugitive emission components. NSPS Subpart OOOOa adopts several of the provisions from NSPS Subpart VVa with additional exemptions and requirements. Subpart VVa establishes leak definitions and monitoring frequencies for equipment, monitoring procedures in accordance with Method 21 or sensory monitoring, repair requirements for leaking equipment, and resurvey of equipment to ensure successful repair. Associated recordkeeping and reporting using EPA’s Compliance and Emissions Data Reporting Interface also applies.

Per 40 CFR 60.5365a(g)(3), sweetening units located at a natural gas processing plant that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H₂S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423a(c) but are not required to comply with the control requirements of §60.5405a through §60.5407a and §60.5410a(g) and §60.5415a(g) of this subpart. The amine unit at this facility removes CO₂ from the gas, not H₂S. H₂S emissions are dependent upon the sulfur content of the gas. There is no sulfur in the gas and therefore no associated H₂S emissions are expected. In accordance with §60.5423a(c), “To certify that a facility is exempt from the control requirements of these standards, for each facility with a design capacity less than 2 LT/D of H₂S in the acid gas (expressed as sulfur) you must keep, for the life of the facility, an analysis demonstrating that the facility’s design capacity is less than 2 LT/D of H₂S expressed as sulfur.” ETC keeps such records onsite.

The requirements of **40 CFR Part 60 Subpart OOOOb—Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022**, will not apply since no Subpart OOOOb-affected facilities will have commenced construction, modification, or reconstruction after December 6, 2022.

The requirements of **40 CFR Part 60 Subpart OOOOc—Emissions Guidelines for Greenhouse Gas Emissions from Existing Crude Oil and Natural Gas Facilities** (whether the “model rule” portion of Subpart OOOOc in §§60.5385c—60.5430c or State standards established pursuant to §§60.5360c—60.5481c of Subpart OOOOc) will apply to designated facilities of which construction, modification, or reconstruction commenced on or before December 6, 2022, and no later than 36 months after publication of the notice of final rulemaking for Subpart OOOOc in the *Federal Register*, which occurred on March 8, 2024 (March 8, 2027). Per §60.5386c, Subpart OOOOc-designated facilities include each *well, centrifugal compressor, reciprocating compressor, process controller, pump, and storage vessel, process unit, and fugitive emission component* as these terms are defined in 40 CFR §60.5430c. The specific applicable requirements will be determined after the Department’s submittal of its plan to implement the emission guidelines of Subpart OOOOc.

GP-5 Section H - Requirements for Equipment Leaks - In addition to the requirements of NSPS Subpart OOOOa, ETC is required to meet the requirements of Section H of the GP-5, which will be carried over into the proposed state-only operating permit. Requirements include monthly audible, visual, and olfactory (AVO) inspections as well as initial (within 180 days after initial startup) and subsequent quarterly leak detection (LDAR) using a monitoring device approved by the Department for the detection of fugitive leaks.

According to the response to questions 4 and 5 of Department's FAQ- Implementation of GP-5 and Exemption No. 383, “DEP considers a “leak” as any release of gaseous hydrocarbons that is determined by Audible, Visual, and Olfactory (“AVO”) inspection, which is required to be performed on a monthly basis by the GP-5. DEP also considers a “leak” as any release of gaseous hydrocarbons that will be detected by a Forward Looking

Infrared (FLIR) camera or any gas leak detection device, which is required to be used on a quarterly basis under GP-5.

However, any equipment or component that is designed to protect the equipment or safety of personnel is not considered a “leak”. A release from any equipment or component designed by the manufacturer to protect the equipment, controller, personnel, to prevent ground water contamination, gas migration, or an emergency is also not considered a leak.

The owner or operator may use any gas detection device approved by the Department to detect leaks. Condition H.2 in the GP-5 authorizes the use of any technology for leak detection as an alternate to FLIR provided it is approved by DEP following a case-by-case evaluation of the device or technology.”

If any leak is detected, ETC shall repair the leak as expeditiously as practicable, but no later than fifteen (15) days after the leak is detected, except as provided in 40 CFR § 60.482-9. ETC shall record each leak detected and the associated repair activity. These records shall be retained for a minimum of five (5) years and shall be made available to the Department upon request.

Section I. Pneumatic Controllers

GP-5 Section I - Requirements for Pneumatic Controllers - The owner or operator of each pneumatic controller affected facility shall also comply with the applicable requirements specified in 40 CFR Part 60, Subpart OOOOa. According to the applicant, the facility has two (2) Inboard Stroke intermittent-bleed pneumatic controllers with a Bettis/G5020 double acting actuator that are air-actuated.

Per the 2018 GP-5, Section I, (a) For each natural gas-driven pneumatic diaphragm pump constructed and authorized to operate on or after September 18, 2015, but prior to August 8, 2018, the owner and operator shall meet the applicable requirements of 40 CFR §60.5365a(h)(1) and §60.5393a(a) and (c) through (e). 40 CFR §60.5365a(h)(1) defines a *pneumatic pump affected facility* as “a single natural gas-driven diaphragm pump.” In accordance with §60.5365, each pneumatic pump affected facility at a natural gas processing plant must have a natural gas emission rate of zero, and if a control device is used, the system must be a closed-vent system. Since the two intermittent-bleed pneumatic devices are air-actuated, they are meeting this requirement.

(b) For each natural gas-driven pneumatic pump constructed and authorized to operate on or after August 8, 2018, the owner or operator of a pump with:

- (i) A methane emission rate of less than 200 tpy, a VOC emission rate of less than 2.7 tpy, a single HAP emission rate less than 0.5 tpy, and a total HAP emission rate less than 1.0 tpy, shall meet the applicable requirements of 40 CFR §60.5365a(h)(1) and §60.5393a(a) and (c) through (e).
- (ii) A methane emission rate of 200 tpy or greater, a VOC emission rate of 2.7 tpy or greater, a single HAP emission rate of 0.5 tpy or greater, or a total HAP emission rate of 1.0 tpy or greater, shall route all vapor through a closed vent system to a control device that reduces methane, VOC, and HAP emissions by 95% or more by meeting the applicable requirements of Section J.

The permittee shall maintain records of the location, date of installation, and manufacturer’s specifications for each pump as well as emission calculations for each pneumatic controller.

40 CFR Part 63 Subpart HHH National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities does not apply to this facility. Per §63.1270(a), “This subpart applies to owners and operators of natural gas transmission and storage facilities that transport or store natural gas prior to entering the pipeline to a local distribution company or to a final end user (if there is no local distribution

company), and that are major sources of hazardous air pollutants (HAP) emissions as defined in §63.1271. Based on the information in the application subject to this review, this facility is not a major source of HAPs and is not categorized as a transmission and storage facility. As such, this subpart does not apply.

Emissions and Control:

Natural Minor versus Synthetic Minor Permit Designation:

25 Pa. Code §121.1 defines *potential-to-emit* as the following:

The maximum capacity of a source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and limitations on hours of operation or on the type or amount of material combusted, stored or processed shall be treated as part of the design if the limitation or the effect it would have on emissions is Federally enforceable or legally and practicably enforceable by an operating permit condition...

Air quality case-by-case operating permits in the Commonwealth classify facilities under one of three exclusive types: natural minor, synthetic minor, or major source (i.e. Title V). More stringent requirements and regulations may apply to a facility based on this classification.¹

A natural minor facility is one in which the potential-to-emit for criteria pollutants, VOCs, and HAPs are below major source (i.e. Title V) emission thresholds *with* the use of air cleaning devices and *without* requiring the use of Federally enforceable and legally and practically enforceable permit limitations to reduce the facility's potential-to-emit to below major source thresholds.

Per 25 Pa. Code §121.1, a *synthetic minor facility* is defined as follows:

...an air contamination source subject to Federally enforceable conditions that limit the facility's potential to emit to less than the major facility thresholds specified in the definition of 'Title V facility'.

In other words, if a facility has an unrestricted potential-to-emit that exceeds the major source thresholds, the potential-to-emit can be restricted to less than the major source thresholds, provided that requirements in the operating permit are Federally enforceable and legally and practically enforceable. This may include, but is not limited to, air cleaning devices, operating hour restrictions, throughput restrictions, monitoring, reporting, and recordkeeping requirements, or tracking actual emissions on a 12-month rolling basis, among others.

A *major facility* is defined in 25 Pa. Code §121.1 as the following, in relevant part:

- ...(i) A facility which emits, or has the potential-to-emit, 100 TPY [tons per year] or more of a regulated NSR pollutant, except that lower emissions thresholds apply as follows:
 - (A) Not applicable.
 - (B) Fifty TPY of VOCs in an area within an ozone transport region except for a severe or extreme nonattainment area for ozone.
 - (C) – (K) Not applicable.
- (ii) For the purposes of applying the requirements of Chapter 127, Subchapter E to the owner or operator of a facility located in an ozone nonattainment area or in an ozone transport region which emits or has the potential to emit NO_x, as follows:
 - (A) One hundred TPY or more of NO_x in an ozone nonattainment area classified as marginal, basic or moderate.
 - (B) – (F) Not applicable.
- (iii) Not applicable.
- (iv) A facility which is major for VOCs or NO_x is considered major for ozone.
- (v) Not applicable.

¹ Facilities may also be permitted under general permits (GPs) if they meet certain requirements, though this would not be a case-by-case operating permit.

The entirety of the Commonwealth of Pennsylvania is designated by the EPA as a part of the Northeast Ozone Transport Region. As such, this carries the same designation as an area in moderate non-attainment for ozone. Since VOCs and NO_x are precursors to forming ground-level ozone, regulating emissions of NO_x and VOCs act as proxies for reducing ground-level ozone formation. Major source emission thresholds in moderate non-attainment areas for ozone are 50.0 TPY VOCs and 100.0 TPY NO_x. For all other criteria pollutants, the major source thresholds are 100.0 TPY SO_x, CO, PM-10, and PM-2.5. For hazardous air pollutants, the major source thresholds are 25.0 TPY of all combined HAPs and 10.0 TPY of any one individual HAP from a single facility.

Based on the potential-to-emit of criteria pollutants, VOCs, and HAPs, the facility is classified as either a natural minor, synthetic minor, or major source.²

Per the aforementioned definition of potential-to-emit, the calculation of potential-to-emit includes the maximum capacity of a source under physical and operational design and *includes* the use of air pollution control equipment (i.e. air cleaning devices). The classification of a facility as a natural minor, synthetic minor, or major facility is based on the potential-to-emit.

The potential-to-emit calculations at the Revolution Cryogenic plant include the maximum capacity of a source to emit pollutants under its respective physical and operational design and includes air pollution control equipment such as the use of combustor for truck loading and the amine unit thermal oxidizer. Because this facility's potential-to-emit is below major source thresholds and does not require additional Federally enforceable and legally and practicably enforceable permit conditions to reduce the potential-to-emit to below major source thresholds, this facility can be permitted as a natural minor.

Processing – Stabilization:

The existing stabilizer unit processes natural gas condensates received from the inlet pipeline system as well as condensates received via truck. The existing system consists of two distillation columns that work in series, the first takes the raw condensate and by running through the distillation tower produces a stable condensate that will be used as a feedstock for the second column. The overhead vapors off this first column are compressed and sent to the cryogenic system inlet. The second column takes stable condensate from the first column and will be further distilled to produce a product that is a marketable stabilized condensate with an RVP of approximately two (2) psi. The overhead vapor from this column will be a C₃⁺ product that will be condensed and pumped into the C₃⁺ pipeline along with the main plant C₃⁺ product.

Processing – Cryogenic Separation and Fractionation:

The gas stream entering the existing cryogenic unit will include natural gas from the pipeline and flash vapors from the stabilizer unit. The gas will be chilled to cryogenic temperatures first by mechanical refrigeration and then by expansion (where the pressure drop causes further reduction in temperature). Chilling the gas stream causes natural gas liquids (NGL) to condense out of the gas stream. The chilled gas/liquid stream is sent to the deMethanizer tower where the NGL will be collected in the bottoms of the tower (which feeds into the deEthanizer unit) and the vapor off the top of the tower is a marketable natural gas stream (residue gas) and is routed to the compressors for delivery to the residue gas pipeline.

² The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for six main pollutants, also known as "criteria" pollutants. The six criteria pollutants are as follows: carbon monoxide (CO), lead (Pb), ground-level ozone (O₃, which is regulated through NO_x and VOCs since NO_x and VOCs are precursors to ozone formation), particulate matter (as PM-10 and PM-2.5), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). "NAAQS Table". U.S. EPA. 7 Feb. 2024. Last accessed on 18 Sept. 2024. <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

The de-ethanizer will produce a marketable ethane product and a separate C₃+ products. The bottoms stream from the de-methanizer will enter the de-ethanizer tower where it will be separated such that the lighter ethane product leaves the top of the tower, gets condensed, and pumped into the ethane (C₂) product pipeline. The heavier components (a propane + mixture) will collect at the bottom of the de-ethanizer tower and get pumped into the C₃+ product pipeline.

The de-methanizer and de-ethanizer are closed systems that do not have a direct vent to the atmosphere. The HMO Heaters provide heat to the fractionation process. The fractionation equipment also contains process safety vents (PSV) and maintenance depressurization vents which are routed to the flare.

The natural gas throughput rating of the cryogenic unit is 200 MMscfd (station design inlet). The permittee noted in the application that on a short-term basis, the station may be able to operate up to 220 MMscfd and consequently, the potential emissions affected by gas throughput capacity reflect this rate as provided in the potential-to-emit calculations in the application.

The natural gas liquid (NGL) throughput capacity for the cryogenic unit is as follows:

- 8,420,112 gal/year 2-lb Condensate produced.
- 18,000 BPD C₂ produced (275 MMgal/year) produced.
- 13,500 BPD C₃+ produces (207 MMgal/year) produced.

Sources 201 and 203: Amine Units

The Amine Unit will remove CO₂ from the NGLs by putting the NGL stream in contact with a lean amine solution in a contactor tower. The amine solution has a natural affinity for CO₂ by absorption. The rich amine solution leaving the contactor tower (containing the CO₂) will be sent to a flash tank and an amine regeneration system where through heat and distillation the CO₂ will be removed from the amine solution.

The amine regeneration system includes an amine stripper tower and a small reboiler heater. Note that a small amount of hydrocarbons will also be absorbed in the amine solution at the contactor tower and these hydrocarbons will be liberated from the rich amine by the amine regeneration system. The existing amine unit vent is controlled by a thermal oxidizer (THERM-001). For the existing amine units, the flash tank vent is routed to the associated HMO Heaters for use as fuel and any excess flash gas will be controlled by the respective facility flare (FLARE-001). Potential-to-emit calculations assumed that all flash gas was routed to the flare.

Potential emissions for the amine unit were split via the still vent and the flash gas, with the still vent being controlled by the thermal oxidizer rated at a 99% destruction efficiency of VOCs and HAPs, and the flash gas being controlled by the maintenance, startup, and shutdown (MSS) plant flare, which is rated at a 98% destruction efficiency for VOCs and HAPs. The potential emissions for this air contamination device were based on the exhaust of the control devices, which were modeled using Bryan Research & Engineering, LLC ProMax[®] modeling software. The maximum still vent flow rate to the thermal oxidizer is 380 lbs/hr, and for the flash gas, 139 lbs/hr. Potential emissions were based on 8,760 hours of operation per year.

Source 301: Condensate and Miscellaneous Storage Tanks

Storage of stabilized condensate occurs in two (2) existing storage tanks (TK-811A and TK-811B). Loadout from the storage tanks is controlled by an existing enclosed combustor (COMB-001). Storage tanks of various sizes will be utilized to store materials such as engine oil, compressor oil, amine, produced water, slop, and methanol. In accordance with 25 Pa. Code §127.14(a)(8) exemption no. 15, storage vessels for volatile organic compounds (which do not contain HAP) which have capacities less than 10,000 gallons are exempt from Plan Approval. Therefore, some of the non-HAP containing storage tanks are exempt.

Table VI:
Storage Tank Emissions

Source	Capacity	Tank Contents	Tank Type	Annual Throughput		No. of Tanks	VOC		HAPs		Methane		CO ₂	
	Gal			Gal/yr (each)	bbl/day (each)		lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY
Condensate Tanks (U-406A & U-406B)	90,000	Pressurized Condensate	Bullet (Pressurized)	27,488,880	1,793	2	---	0.77	---	---	---	---	---	---
2-lb TVP Condensate Tank (TK-811A & TK-811B)	21,000	2-lb Condensate	Fixed Roof w/ Gas Blanket Controlled by COMB-001	8,420,112	549	2	0.21	0.90	0.01	0.04	0.10	0.45	---	---
Methanol Tank	500	Methyl Alcohol	Horizontal	6,000	0.39	1	0.00	0.01	0.00	0.01	---	---	---	---
Oil Tanks	280-11,760	New/Used Compressor Oil & Liquids	Fixed Roof/Horizontal	274,008	17.87	10	0.00	0.00	0.00	0.00	---	---	---	---
Slop Tank	Varies	Waste Fluids	Fixed Roof	558,240	36.41	6	0.04	0.18	0.00	0.01	0.16	0.70	0.06	0.26
R.O. Water Storage Tank	16,800	R.O. Water	Fixed Roof	201,600	---	2	---	---	---	---	---	---	---	---
Amine Storage Tank	8,820	Amine/Water	Fixed Roof w/ Gas Blanket	105,840	---	1	0.00	0.01	0.00	0.00	0.01	0.05	---	---
Amine Drain Tank	4,200	Amine/Water	Fixed Roof	50,400	---	2	---	---	---	---	---	---	---	---
Propane Storage Tank	5,000	Propane	Pressurized	N/A (Pressurized)	---	1	---	---	---	---	---	---	---	---
Open Drain Tank	4,000	Oil/Water Mixture (assume 1% Condensate)	Fixed Roof	24,000	0.10	2	0.04	0.20	0.00	0.00	---	---	---	---
Total:	---	---	---	37,129,080	2,397	29	0.30	2.07	0.01	0.06	0.27	1.20	0.06	0.26

1. ProMax® was used to estimate methanol, lube oil, and slop tank emissions.

2. Miscellaneous tanks may include tanks for TEG and MEG. Vapor pressure for these two liquids so low that emissions assumed to be negligible.

3. AP-42 Chapter 7 formulas used to calculate emissions from 2-lb condensate tanks and slop tanks using parameters/compositions as calculated via Promax® software.

4. Tank emissions are calculated on maximum expected throughput (if known). For smaller tanks, calculations conservatively assume one turnover per month (open drain tank is once every other month).

5. No emissions result from high pressure condensate pressurized tanks under normal operations. Truck unloading calculations are included here; please see unloading calculations tables for detail.

6. The following tanks will be equipped with a residue gas blanket for safety: 2-lb stabilized condensate and amine.

7. Stabilized condensate tank emissions will be controlled by the truck loading combustor at 99%. Loading emissions for 2-lb condensate tank are included here; please see loading calculations tables for detail.

8. Emissions include working and breathing losses.

Source 401: Heaters

Source 401 consists of a number of heaters and regenerators. These sources were determined to be exempt from plan approval but not operating permit requirements under 25 Pa. Code §127.14(d) listed as No. 39 in the Department's Plan Approval and Operating Permit Exemptions list under 25 Pa. Code §127.14(a)(8). Natural gas-fired indirect heaters provide process heat to the processing units as well as the condensate stabilizers. The heaters are capable of operating continuously.

Source HTR-001: 6.22 MMBtu/hr Dehydration Unit Regenerator Heater

This heater is part of the natural gas liquid dehydration process where the natural gas liquid stream is stripped of all water. The heaters are used in the regeneration of the mole sieve beds where it heats the natural gas liquid stream as it circulates through the bed being regenerated. The heated natural gas liquid vaporizes the water in the bed where it is then condensed downstream and removed from the stream. Once the bed is free of water, the regeneration system goes into stand-by or switches to the next bed as needed to be regenerated.

The facility designates the 6.22 MMBtu/hr dehydration unit regenerator heater as HTR-001. Emissions of criteria pollutants from this source were based on AP-42, Table 1.4-1 emission factors (for NO_x and CO) and Table 1.4-2 emission factors for VOC, SO_x, PM-10, and PM-2.5 (FIL + CON). HAP emissions were calculated using emission factors from Tables 1.4-3 and 1.4-4, and greenhouse gases were calculated using 40 CFR Part 98, Tables C-1 & C-2. This chapter of AP-42 provides emission factors related to natural gas combustion. Potential emissions were based on a higher heating value of 1,009 Btu/scf, a heat input of 6.22 MMBtu/hr, a potential fuel consumption of 54,487 MMBtu/hr and 54.0 MMscf/yr, and 8,760 hours of operation per year.

Source HTR-002: 8.50 MMBtu/hr Regenerator Gas Heater

This heater is part of the inlet gas mole sieve dehydration process where the gas stream is stripped of all water. The heater is used in the regeneration of the mole sieve beds where it heats the gas stream as it circulates through the bed being regenerated. The heated gas vaporizes the water in the bed which is then condensed downstream and removed from the stream. Once the bed is free of water, the regeneration system goes into stand-by or switches to the next bed as needed to be regenerated. The mole sieve dehydration process itself will be a closed system that does not vent to the atmosphere.

The facility designates the 8.50 MMBtu/hr regenerator gas heater as HTR-002. Prior general permits authorized up to two (2) of these heaters, though one (1) heater is currently on site. Emissions from this source were calculated using the same methodology as for HTR-001, the dehydration unit regenerator heater. This source has an annual fuel consumption of 73.8 MMscf/yr and 74,480 MMBtu/yr.

Sources HTR-003 – HTR-005: Three (3) 40.92 MMBtu/hr HMO Heaters

The facility designates three (3) 40.92 MMBtu/hr HMO heaters as HTR-003, HTR-004, and HTR-005, respectively. These sources are permitted under the Department's GP-1 (where individual heat inputs are greater than 10 MMBtu/hr and less than 50 MMBtu/hr).

These heaters are part of the hot oil system which provide heat to various uses throughout the plant. The uses include the inlet gas preheater, condensate stabilization system, deMethanizer trim reboiler, deEthanizer reboiler, and Amine regeneration reboiler.

Each of the three (3) heaters are rated at 40.92 MMBtu/hr with an annual fuel consumption of 355.3 MMscf/yr. Emissions of NO_x, CO, PM-10, and PM-2.5 were based on the manufacturer's guarantee. Emissions of VOCs and SO_x were based on AP-42, Table 1.4-2 emission factors and Tables 1.4-3 and 1.4-4 for HAPs. Greenhouse

gases were calculated using 40 CFR Part 98, Tables C-1 & C-2. Like the other heaters, calculations assumed 8,760 hours of operation per year and a higher heating value of 1,009 Btu/scf.

Sources HTR-006: Catalytic Heaters

The facility designates fifteen (15) 0.06 MMBtu/hr catalytic heaters as HTR-006. These sources have also been permitted under the Department's GP-1 (where individual heat inputs are greater than 10 MMBtu/hr and less than 50 MMBtu/hr) along with the three (3) HMO Heaters referenced above. These heaters serve to heat various buildings and processes within the Revolution Cryogenic Plant. Each of the fifteen (15) units are rated at 0.06 MMBtu/hr (0.85 MMBtu/hr combined), with an annual fuel consumption of 0.5 MMscf/yr/unit at 8,760 hours of operation per year. Similar to the HMO Heaters, potential emissions of NO_x, CO, PM-10, and PM-2.5 from the catalytic heaters were based on the manufacturer's guarantee. Emissions of VOCs and SO_x were based on AP-42, Table 1.4-2 emission factors and Tables 1.4-3 and 1.4-4 for HAPs. Greenhouse gases were calculated using 40 CFR Part 98, Tables C-1 & C-2. Like the other heaters, a higher heating value of 1,009 Btu/scf was used.

Source 501: Pneumatic Devices

The facility has two (2) Inboard Stroke intermittent-bleed pneumatic controllers with a Bettis/G5020 double acting actuator. Although the pneumatics are air-actuated (and required to be per Subpart OOOOa), gas loss was calculated using the manufacturer's controller data and engineering estimates for the volumes of associated tubing. Emissions were based on the volume of gas lost per actuation, the estimated number of actuations per year, a representative gas analysis, Table 2-4 of the EPA Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017) for VOC and HAPs, and 40 CFR Part 98, Table W-1A for greenhouse gases.

Table VII:
Emissions from Pneumatic Controllers

Type of Compressors	Number of Devices	Volume of Gas Per Actuation	Actuations /Yr	Total Volume of Gas Emitted	Potential VOC Emissions	Potential HAP Emissions	Potential CO ₂ Emissions	Potential CH ₄ Emissions
---	---	scf/each	actuations/yr	scf/yr	TPY	TPY	TPY	TPY
(2) Intermittent Bleed Controllers	2	63	104	13,164	0.07	0.00	0.00	0.21

Source 601: Venting/Blowdowns & Electric Compressors

Equipment blowdowns release gas to the atmosphere. Blowdowns occur when a piece of equipment such as an engine, compressor, or filter need to be emptied to allow for maintenance in a safe manner. Blowdowns may be limited to specific pieces of equipment, such as a single compressor engine, whereas an emergency shutdown (ESD) is the evacuation of process gas from all or most of the air contamination sources and air cleaning devices at the facility.

Rev Cryo utilizes reciprocating and screw compressors at various points in the process. Existing electric drive reciprocating compressors are utilized to compress residue gas for transport in the pipeline. Reciprocating compressors are also utilized to compress overhead vapors from the existing stabilizer (routed to the cryogenic unit). The existing stabilizer overhead reciprocating compressors are equipped with a closed vent system to capture rod packing emissions and control them in an enclosed combustor (COMB-001).

Using estimated volumes of equipment and a site-specific gas analysis, emissions from venting and blowdowns were collectively estimated to be 13.70 TPY VOC, 0.86 TPY total HAP, and 964 TPY CO₂e. Assuming ten (10) minutes per blowdown event, this equates to twenty-two (22) hours per year of active blowdowns, or 132 blowdown events per year.

Table VIII:
Emissions from Venting/Blowdowns

Blowdown Emissions Sources	No. of Units	Events/yr	Gas Volume/Event	Controlled by Flare?	Potential Volume Emitted	Actual Volume Emitted	Potential VOC Emissions	Potential HAP Emissions	Potential CO ₂ Emissions ¹	Potential CH ₄ Emissions ¹
---	---	---	scf	Y/N	scf/yr	scf/yr	TPY	TPY	TPY	TPY
Residue Compressor (Electric)	3	72	55,000	Y	3,960,000	79,200	0.001	0.00	0.01	1.65
Stabilizer Compressor Downtime (Electric)	---	---	---	Y	1,286,930	25,739	0.84	0.00	0.00	0.11
Moisture Analyzer	---	---	---	N	131,400	131,400	0.73	0.05	0.04	2.11
VRU Compressor Blowdowns	1	24	50	Y	1,200	24	0.00	0.00	0.00	0.00
Facility Maintenance	---	---	---	N	300,000	300,000	1.66	0.11	0.09	4.83
Stabilizer Compressor (Electric)	3	36	10,000	Y	360,000	7,200	0.23	0.00	0.00	0.03
Miscellaneous Blowdowns	---	---	---	Y	92,592,000	1,851,840	10.24	0.70	0.54	29.79
Total:	7	132	65,050	---	98,631,530	2,395,403	13.70	0.86	0.67	38.52

¹ VOC, HAP, CH₄, and CO₂ emissions are based on fractions of these pollutants as follows:

	Wt % VOC	Wt % HAP	Wt. % CO ₂	Wt % CH ₄	MW
Residue Gas	0.06	0.00	0.80	96.68	16.31
Stabilizer Overhead	66.01	0.22	0.01	8.67	37.34
Inlet Gas	19.76	1.34	1.03	57.48	21.21

² The gas volumes are estimated based on facility design and standard engineering calculations.

³ Per footnote in Section H10 of GP-5 Application Form and GP-5 Application Instructions (Revised 1/2015), emissions include blowdowns.

⁴ Where applicable, emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.

⁵ GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).

There are also a few other sources of venting at this facility, including flare purge gas, closed drain vapors, and eleven (11) gas chromatography (GC) analyzers.

Table IX:
Miscellaneous Venting Emissions

Blowdown Emissions Sources	Controlled by Flare?	Total Volume NG	Actual Volume NG Emitted	Potential VOC Emissions	Potential HAP Emissions	Potential CO ₂ Emissions ⁷	Potential CH ₄ Emissions ⁷
---	Y/N	scf/yr	scf/yr	TPY	TPY	TPY	TPY
Flare Purge Gas	Y	3,801,840	76,037	0.00	0.00	0.01	1.58
Closed Drain Vapors	Y	200,000	4,000	0.00	0.00	0.00	0.08
GC Venting (AE-101)	N	928	928	0.00	0.00	0.00	0.04
GC Venting (AE-102)	N	928	928	0.00	0.00	0.00	0.05
GC Venting (AE-103)	N	928	928	0.02	0.00	0.00	0.00
GC Venting (AE-104)	N	464	464	0.01	0.00	0.00	0.00
GC Venting (AE-105)	N	928	928	0.00	0.00	0.00	0.00
GC Venting (AE-106)	N	464	464	0.03	0.00	0.00	0.00
GC Venting (AE-107)	N	928	928	0.06	0.00	0.00	0.00
GC Venting (AE-108)	N	928	928	0.00	0.00	0.00	0.00
GC Venting (AE-109)	N	---	---	---	---	---	---
GC Venting (AE-110)	N	928	928	0.06	0.00	0.00	0.00
GC Venting (AE-111)	N	928	928	0.01	0.00	0.00	0.02
Total:	---	4,010,192	88,389	0.19	0.00	0.01	1.77

1. Uncombusted CH₄ and CO₂ emissions are based on fractions of these pollutants as follows:

945

	Vol % CO ₂	Vol % CH ₄
Residue Gas	0.298	98.312
Inlet Gas	0.498	76.098
C3+ Liquids	0.000	0.000
C2 Liquids	0.010	1.220

1. The gas volumes are estimated based on facility design and standard engineering calculations (utilizing Equation W-14B from 40 CR 98 Subpart W where appropriate).

2. Per footnote in Section H11 of GP-5 Application Form and GP-5 Application Instructions (Revised 1/2015), emissions include pigging operations and pipeline purging/venting.

3. Total purge gas to flare: 434 scfh

4. Where applicable, emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.

5. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).

6. Density as follows:
C3+ and C2 liquid lines conservatively assume gas (vapor) composition is identical to liquid composition
Value for 'lb VOC/scf' of total gas = Sum of (vol%/100 * MW (lb/lb-mol) /
379 scf/lb-mol) for each VOC constituent CO : 0.0526
kg/ft³ for CO at 60 °F and 14.7 psia

2

2

CH : 0.0192 kg/ft³ for CH at 60 °F and 14.7 psia

4

4

VOC: 2.40E-05 lb VOC/ft³ of total gas (residue gas) HAP: 1.73E-09 lb HAP/ft³ of total gas (residue gas) VOC: 1.11E-02 lb VOC/ft³ of total gas (inlet gas) HAP: 7.52E-04 lb HAP/ft³ of total gas (inlet gas) VOC: 1.43E-01 lb VOC/ft³ of total gas (C3+ liquid vapors) HAP: 1.21E-02 lb HAP/ft³ of total gas (C3+ liquid vapors)

8. Mol sieve instrumentation vent data:

3

Number of Units

5

SCF/hr, per unit

All emissions related to unplanned ESDs, should any occur, are required to be reported both as a malfunction and in annual AES emission inventory reports. Additionally, all malfunctions are evaluated for potential enforcement action.

The Department has included the following requirement for malfunction notifications in Section C of the proposed operating permit, in relevant part:

[The (malfunction) report shall describe the following] 7. the 12-month rolling sum of emissions (including, but not limited to, criteria pollutants, VOCs, benzene, methanol, formaldehyde, greenhouse gases, and total HAPs), including any emission increases that occurred as a result of the malfunction event.

This requirement will allow an evaluation of the facility's actual emissions after each reportable malfunction event in relation to the facility-wide emission limitations.

ETC is required to report all malfunction events (e.g. emergency shutdowns) that occur and must track actual emissions on a 12-month rolling basis including any emissions resulting from malfunction events. Any emissions resulting from malfunction events are to be included in annual emission inventory reports (AES reports). In addition, the Department evaluates each malfunction notification for possible enforcement action.

It should be noted that only a subset of VOCs, HAPs, and greenhouse gases would be emitted directly from emergency shutdown events. NO_x, CO, HCHO, and other criteria pollutants are a result of the combustion of the natural gas rather than from venting during an emergency shutdown event. NO_x, CO, HCHO, and other criteria pollutants are not present in the inlet representative gas analysis included in the application subject to this review. The representative gas analysis included in the application lists the composition of the inlet natural gas stream to be various VOCs, HAPs, and greenhouse gases. Hence, only a subset of VOCs, HAPs, and greenhouse gases would be directly emitted from these events.

Sources 701: Fugitive Emission Sources

Source 701 comprises of fugitive emissions from component leaks, meaning fugitive emissions from valves, flanges, open-ended lines, connectors, pump seals, etc. Based on the proposed design criteria of the facility, there are approximately 34,279 fugitive emission components at this facility. Potential emissions of VOC and HAPs from fugitive component leaks were estimated using emission factors from Table 2-4 from EPA's Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017, November 1995) and a site-specific gas analysis. Emissions of greenhouse gases from fugitive emission components were calculated using the equations in 40 CFR 98, Table W-1A.

In addition, ETC implements the TCEQ 28VHP LDAR program with reductions found in APDG 6422v2, Revised 07/2022. The LDAR program implemented requires quarterly monitoring of components and welded or flanged connections. TCEQ estimated the reductions based on the average difference between Table 2.4 and Table 2.5 in the EPA 453/R-95-017, November 1995 document. The 28VHP Program includes boilerplate conditions that an operator must follow in order to claim the 28VHP reduction factors. This includes construction of both new and reworked piping, valves, pump systems, and compressor systems conforming to applicable codes and for piping connections to be welded or flanged. Per construction documentation provided by ETC, the facility was constructed in accordance with AWS D1.1 which specifies welding code. By following code, and by welding and flanging piping to certain standards (apart from screwing connections for piping less than 2-inches in diameter), the Department acknowledges the 28VHP program for the Revolution Cryogenic facility. By welding instead of screwing a connection together, the weld theoretically removes the connections and forms one pipe. In addition, ETC will follow the GP-5 BAT definition of fugitive leak for all components of 500 ppm.

The potential-to-emit after using estimated control efficiencies from an LDAR program for fugitive emission components are 5.11 TPY VOC, 0.30 TPY total HAP, 1,735 TPY CO_{2e}.

Source 204: Rod Packing

The permittee also included emissions from rod packing in overall fugitive emissions from the facility under Source 701 in the application but are designated as Source 204 for purposes of this review. Rod packing emissions from the electric compressors are controlled by an 11.3 MMBtu/hr enclosed combustor. The potential-to-emit of rod packing was calculated to be the following:

Table X:
Emissions from Rod Packing

Type of Compressors	Number of Compressors	Number of Throws per Compressor	Leak Factor	Total Volume NG Emitted	VOC	HAP	CO ₂	CH ₄
---	---	---	scf/hr/throw	scf/yr	TPY	TPY	TPY	TPY
Residue Compressor (Electric)	3	6	11.5	1,813,320	0.02	0.00	0.31	37.72
Stabilizer Compressor (Electric)	3	2	11.5	30,222	0.98	0.00	0.00	0.13
Centrifugal Dry Compressor Seal	1	1	16.2	141,912	0.78	0.05	0.04	2.28
Total:	7	9	39.2	1,985,454	1.79	0.06	0.36	40.14

- 1.) Emission factors from http://www.epa.gov/gasstar/documents/l1_rodpack.pdf.
- 2.) Stabilizer rod packing VRU control: 95%.
- 3.) Centrifugal compressor vendor data for seal rate (scfm): 0.27.
- 4.) VOC, HAP, CH₄, and CO₂ emissions are based on weight percent fractions from the gas analysis.

The combined potential-to-emit from fugitive emission components and rod packing at this facility are estimated to be 6.90 TPY VOC.

Source 702: Truck Loadout

For the purposes of this review, truck loadout has been designated as Source 702.

Table XI:
Condensate Loading & Unloading

Source	Description	No. of Trucks/Day	Truck Size	Avg. Daily Throughput	Annual Throughput	Trucks/Yr	True Vapor Pressure	VOC	
---	---	---	bbl	bbl/day	bbl/yr	---	psia	lbs/truck	TPY
Truck Loading Combustor (COMB-001)	Truck Hose Disconnect of High-Pressure Condensate Unloading	25	180	3,586.00	1,308,994.00	7,272	14.70	0.21	0.77
	Slop Hauling	---	---	218.49	79,748.57	---	---	---	2.54
	2-lb Condensate Hauling	---	---	1,098.51	400,957.72	---	---	---	0.29
Total Pre-Control:	---	---	---	4,903.00	1,789,700.29	---	---	---	3.60

1. Estimated typical parameters from similar loading operations.
2. The hose will be capped as soon as it is disconnected from the truck. It is assumed that all of the vapor from the soft hose is released (worst case emissions) and all of the vapor from the pipe above atmospheric pressure (14.7 psia) or gauge pressure is released. The vapor area released is calculated by taking the volume of the hose and piping multiplied by the pressure fraction released. The entire volume of the hose is assumed to be released, but only the pressure above atmospheric or gauge pressure of the pipe.
3. Per HYSIS scenario for facility. Conservatively assumes the liquid molecular weight as the vapor molecular weight and vapor pressure equal to atmospheric.
4. Slop Hauling and 2-lb Condensate Hauling loading losses of 1.52 lbs/1,000 gallons. Uncontrolled 2-lb condensate hauling emissions are 12.76 TPY VOC. Emissions are controlled by C702, an 11.2 MMBtu/hr Truck Loading Combustor.

Source 801: Pigging

The existing facility has one (1) 30" station inlet pig receiver and one (1) 12" C₃+ pipeline pig launcher, with control by the enclosed plant flare. Potential emissions estimated 73 receiving events per year at 20,000 scf of natural gas vented per event, and four (4) receiving events per year at 834 lbs of gas vented per event. The total potential volume of gas released from pigging operations were estimated to be 1,460,000 scf/yr. Actual volumes of gas released from pigging operations are approximately 69,216 scf/yr. Chamber volumes were based on facility design. Emissions were based on the chamber volumes and anticipated volumes of gas released, the gas composition, and the gas density. Potential emissions from pigging operations were calculated to be 0.43 TPY VOC, 0.03 TPY total HAP, 0.03 TPY CO₂, and 1.11 TPY CH₄.

Table XII:
Emissions from Pigging

Sources	Events/Yr	Gas Volume per Event	Total Mass per Event	Controlled by Flare?	Total Volume NG	Total Mass	Actual Volume NG Emitted	Potential VOC Emissions	Potential HAP Emissions	Potential CO ₂ Emissions ⁷	Potential CH ₄ Emissions ⁷
---	---	scf	lbs	Y/N	scf/yr	lbs/yr	scf/yr	TPY	TPY	TPY	TPY
Pig Receiving 30" Station Receiver	73	20,000	---	Y	1,460,000	---	69,016	0.38	0.03	0.02	1.11
Pig Launching 12" C ₃ + Launcher	4	---	834	Y	---	3,337	200	0.05	0.00	0.01	0.00
Total:	77	20,00	834	Y	1,460,000	3,337	69,216	0.43	0.03	0.03	1.11

In addition, the permittee will be required to employ best management practices to minimize the liquids present in the pig receiver chamber and to minimize emissions from the pig receiver chamber. These best management practices shall include, but not be limited to, the following:

- 1.) Connecting each high-pressure pig launcher and receiver by jumper lines to a low-pressure gathering line;
- 2.) Operating jumper lines to depressurize such launcher and receivers prior to opening the launcher or receiver hatch;
- 3.) Installing and using pig ramps in pig receivers;
- 4.) Installing liquids drain;
- 5.) Using ball valve type chambers or multiple pig chambers when appropriate; and
- 6.) Ensuring that the pigging chambers are charged with gas when conducting quarterly leak detection and repair (LDAR) monitoring.

Control Device C202-2 (Flare-001): Maintenance, Startup, and Shutdown (MSS) Flare

Emissions of NO_x, CO, and SO_x from the maintenance, startup, and shutdown (MSS) flare were calculated using AP-42, Section 13.5 emission factors for industrial flares. The flare is a non-smoking flare and is expected to have no particulate emissions. Greenhouse gas emissions were calculated using emission factors from 40 CFR Part 60 Subpart 98, Tables C-1 and C-2. Emissions of NO_x, SO_x, CO, and GHGs are a result of combustion in the flare. The flare is rated at a 98% destruction efficiency of VOCs and HAPs. The calculated loading to the flare is 906 MMBtu/hr and has an associated 0.34 MMBtu/hr pilot that consumes 337 scf/hr.

The MSS flare controls purge gas, residue gas from compressor blowdowns, closed drain vapors, pigging vapors (30" receiver and 12" launcher), amine unit flash gas, stabilizer rod packing, stabilizer compressor

blowdowns, and venting. Purge gas is required for the operation of the flare, and the purge gas composition was based on a ProMax® run at design conditions and normal facility operating conditions. The amine unit flash tank gas is used as fuel for the HMO heaters, and any excess gas is routed to the MSS flare. The calculations conservatively assumed that all of the flash tank gas is sent to the flare.

Control Device C204 (COMB-001): Combustor for Truck Liquid Loading of 2-lb Condensate

Emissions of criteria pollutants and HAPs from the combustor controlling truck loadout of 2-lb condensate were calculated using AP-42, Section 1.4 emission factors for natural gas combustion. Greenhouse gas emissions were calculated using equations from 40 CFR Part 60 Subpart 98, Tables C-1 and C-2. The air cleaning device is rated at a 99% destruction efficiency of VOC and HAPs, with a calculated loading of 1.0 MMBtu/hr and 5,937.65 MMBtu/yr and an estimated 1,150 hour of operation per year. The pilot light consumes 85 scf/hr and is rated at 0.086 MMBtu/hr. The pilot light is continuously lit and was assumed to run at 8,760 hours of operation per year for purposes of potential-to-emit calculations. This air cleaning device controls truck vapors, displaced blanket gas, and displaced tank vapors.

Control Device C201 (THERM-001): Thermal Oxidizer Controlling Amine Vent

Emissions of criteria pollutants and HAPs from the thermal oxidizer controlling the amine vent were calculated using AP-42, Section 1.4 emission factors for natural gas combustion. Greenhouse gas emissions were calculated using equations from 40 CFR Part 60 Subpart 98, Tables C-1 and C-2. The air cleaning device is rated at a 99% destruction efficiency of VOC and HAPs, with a calculated loading of 1.07 MMBtu/hr and 9,396 MMBtu/yr and an estimated 8,760 hours of operation per year. The pilot light consumes 266 scf/hr and is rated at 0.27 MMBtu/hr. The pilot light is continuously lit and was assumed to run at 8,760 hours of operation per year for purposes of potential-to-emit calculations. Gas composition data from the amine vent stream were modeled using ProMax® software.

Table XIII:
Site-Specific Gas Analysis at the Plant Inlet

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N ₂	0.3787	0.4996	28.01
METHANE	76.0979	57.4840	16.04
CO ₂	0.4983	1.0327	44.01
ETHANE	14.9106	21.1114	30.07
PROPANE	5.0034	10.3888	44.10
I-BUTANE	0.5582	1.5276	58.12
N-BUTANE	1.3655	3.7371	58.12
I-PENTANE	0.2890	0.9820	72.15
N-PENTANE	0.3787	1.2867	72.15
I-HEXANES	---	---	86.18
N-HEXANE	0.2591	1.0515	86.18
BENZENE	0.0022	0.0081	78.11
CYCLOHEXANE	0.0130	0.0513	84.16
HEPTANES	0.0857	0.4044	100.21
TOLUENE	0.0030	0.0130	92.14
2,2,4 Trimethylpentane	0.0498	0.2680	114.23
N-OCTANE	0.0054	0.0289	114.24
E-BENZENE	0.0002	0.0010	106.17
m,o,&p-XYLENE	---	---	106.16
I-NONANES	0.0007	0.0042	128.20
N-NONANE	---	---	128.20
I-DECANES	0.0011	0.0073	142.29
N-DECANE	---	---	142.29
I-UNDECANES +	---	---	142.29
Totals:	99.9010	99.8880	---
TOC (Total):	99.0240	98.3550	---
VOC (Total):	8.0150	19.7600	---
HAP (Total):	0.3140	1.3420	---

HHV: 1,152 Btu/scf

Table XIV:
Facility-Wide Potential-to-Emit by Source

Source	Description		Capacity	Pollutants																					
				VOC		NO _x		CO		Methanol (CH ₃ OH)		Formaldehyde (CH ₂ O)		Benzene (C ₆ H ₆)		Total HAPs		PM ₁₀		PM _{2.5}		SO _x		GHG (CO ₂ e)	
				lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY	lbs/hr	TPY
031	HMO Heater (HTR-003)		40.92 MMBtu/hr	0.22	0.98	1.64	7.17	1.64	7.17	---	---	0.00	0.01	0.00	0.00	0.08	0.34	0.57	2.51	0.57	2.51	0.02	0.11	4,792	20,991
032	HMO Heater (HTR-004)		40.92 MMBtu/hr	0.22	0.98	1.64	7.17	1.64	7.17	---	---	0.00	0.01	0.00	0.00	0.08	0.34	0.57	2.51	0.57	2.51	0.02	0.11	4,792	20,991
033	HMO Heater (HTR-005)		40.92 MMBtu/hr	0.22	0.98	1.64	7.17	1.64	7.17	---	---	0.00	0.01	0.00	0.00	0.08	0.34	0.57	2.51	0.57	2.51	0.02	0.11	4,792	20,991
201	Amine Vent (AMINE-001)		200 MMscfd	0.55	2.42	---	---	---	---	0.00	0.01	---	---	0.00	0.01	0.03	0.12	---	---	---	---	---	---	343	1,504
204	Rod Packing		1,985,454 scf/yr	---	1.79	---	---	---	---	---	---	---	---	---	---	0.06	---	---	---	---	---	---	---	---	1,004
301	Storage Tanks*	90,000-gallon Condensate Tanks (Each)	90,000-gal (each)	0.30	2.07	---	---	---	---	0.00	0.01	---	---	---	---	0.01	0.06	---	---	---	---	---	---	0.27	1.20
		21,000-gallon 2-lb RVP Condensate Tanks (Each)	21,000-gal (each)																						
		Miscellaneous Tanks	500-16,800-gallons each																						
401	NGL Dehy Regen Heater (HTR-001)		6.22 MMBtu/hr; 54 MMscf/yr	0.03	0.15	0.62	2.70	0.52	2.27	---	---	0.00	0.00	0.00	0.00	0.01	0.05	0.05	0.21	0.05	0.21	0.00	0.02	728	3,191
	Regenerator Gas Heater (HTR-002)		8.5 MMBtu/hr; 73.8 MMscf/yr	0.05	0.20	0.84	3.69	0.71	3.10	---	---	0.00	0.00	0.00	0.00	0.02	0.07	0.06	0.28	0.06	0.28	0.01	0.02	996	4,360
	Fifteen (15) Catalytic Heaters		0.85 MMBtu/hr (Total); 7.3 MMscf/yr	0.00	0.02	0.03	0.15	0.03	0.15	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7	31
501	Pneumatic Devices (2 air-actuated intermittent-bleed)		13,164 scf/yr	0.02	0.07	---	---	---	---	---	---	---	---	---	---	0.00	0.00	---	---	---	---	---	---	1.21	5.30
601	Venting/Blowdowns**		98,719,919 scf/yr	---	13.81	---	---	---	---	---	---	---	---	---	---	0.86	---	---	---	---	---	---	---	230	1,008
701	Fugitive Emissions - Component Leaks		27,300 lbs/yr post-control	1.58	5.11	---	---	---	---	---	---	---	---	---	---	0.07	0.30	---	---	---	---	---	---	396	1,735
702	Truck Loadout/Combustor for Tank Loading		---	---	0.04	0.11	0.33	0.09	0.28	---	---	---	---	---	---	0.00	0.01	0.01	0.02	0.01	0.02	0.00	0.00	1,171	2,495
801	Pigging Operations		1,460,000 scf/yr	---	0.43	---	---	---	---	---	---	---	---	---	---	---	0.03	---	---	---	---	---	---	---	28
FLARE-001	MSS Flare (FLARE-001)**		---	---	---	61.66	1.65	281.08	7.52	---	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.53	0.01	76,305	2,974
THERM-001	Thermal Oxidizer (THERM-001)		---	---	---	0.13	0.58	0.11	0.48	---	---	---	---	---	---	---	---	0.01	0.04	0.01	0.04	0.00	0.00	158	692
Total:	---		---	3.19	28.94	68.30	30.60	287.44	35.30	0.01	0.03	0.01	0.05	0.00	0.01	0.37	2.51	1.85	8.09	1.85	8.09	0.62	0.38	94,712	82,000

* Truck loading (truck hose disconnect 0.77 TPY VOC, slop hauling 2.54 TPY VOC, and 2-lb condensate hauling 0.29 TPY VOC, totaling 3.60 TPY VOC) are minor at approximately 0.04 TPY VOC after the 99% destruction efficiency from the combustor is applied. Emissions summed with the storage tank emissions on the table “Storage Tank Emissions Calculations” on page 89 of the application.

** Includes residue compressor (electric), stabilizer compressor downtime (electric), moisture analyzer, VRU compressor blowdowns, facility maintenance, stabilizer compressor (electric), gas chromatography, and miscellaneous blowdowns. High lb/hr rate of NOx and CO from the MSS flare relative to TPY values assume maximum short-term, high flow situations such as an ESD.

1. PM-10 and PM-2.5 emissions are filterable + condensable.

2. Emissions from loading and unloading of condensate are included in Storage Tanks totals.

3. Short-term emissions rates from limited duration activities (ex. pigging, compressor blowdowns) are not included in the 'lb/hr' values. All potential emissions are, however, included in the 'TPY' value.

4. Facility flare based on limited operations; estimated 53.5 hours of operation per year.

Table XV:
Facility-Wide Actual and Potential Emissions by Pollutant

Pollutant	Potential Emissions (lbs/hr)	Potential Emissions (TPY)	2023 Actual Emissions (TPY) ^c
NO _x	68.30	30.60	13.12
CO	287.44	35.30	17.84
VOC	3.19	29.09	13.60
SO ₂	0.62	0.38	0.16
PM-10 ^b	1.85	8.09	0.93
HAP (Total)	0.37	2.51	0.79
Formaldehyde	0.01	0.05	0.01
Benzene	0.00	0.01	0.01
Hexane ^d	0.34	2.33	0.74
Methanol	0.01	0.03	0.01
CO ₂ e ^a	94,484	80,998	33,495

^aBased on CO₂e equivalents of CH₄, N₂O, and CO₂ as reported in the 2022 AES report. ^bAssume PM-10 = PM-2.5. Includes PM-FIL and PM-CON. ^cAs reported. ^dUsed a ratio, so this is an approximate PTE for hexane.

Conclusion:

I have completed my review of the initial state-only operating permit application for the ETC Northeast Pipeline, LLC natural gas processing plant located in Smith Township, Washington County. The applicant has met the regulatory requirements associated with this application submittal. The attached permit reflects the terms and conditions as described in the permit application. I recommend that ETC Northeast Pipeline, LLC be granted authorization to operate the following sources:

- Sources 031-033, three (3) 40.92 MMBtu/hr HMO heaters;
- Source 201, one (1) 200 MMscfd amine sweetening unit controlled by a 1.07 MMBtu/hr thermal oxidizer;
- Source 204, Rod Packing controlled by an 11.3 MMBtu/hr combustor;
- Source 301, two (2) 90,000-gallon condensate tanks, two (2) 21,000 2-lb RVP tanks controlled by a 1.0 MMBtu/hr truck loading combustor, and miscellaneous storage tanks with varying capacities between 500 and 16,800-gallons;
- Source 401, one (1) 6.22 MMBtu/hr NGL dehydration regenerator heater, one (1) 8.5 MMBtu/hr regenerator gas heater, and fifteen (15) catalytic heaters totaling 0.85 MMBtu/hr;
- Source 501, Pneumatic Devices, consisting of two (2) intermittent-bleed pneumatic devices;
- Source 601, Venting/Blowdowns, including residue compressor (electric), stabilizer compressor downtime (electric), moisture analyzer, VRU compressor blowdowns, facility maintenance, stabilizer compressor (electric), and miscellaneous blowdowns;
- Source 701, Fugitives, consisting of fugitive emission components (valves, flanges, connectors, etc.);
- Source 702, Truck Loadout controlled by a 1.0 MMBtu/hr truck loading combustor;
- Source 801, Pigging Operations, consisting of one (1) pig receiver and one (1) pig launcher; and
- One (1) maintenance, startup, and shutdown (MSS) facility flare rated at 906 MMBtu/hr.

I recommend the issuance of a natural minor state-only operating permit for this facility upon completion of the public comment period. Notice of intent to issue this state-only operating permit will be published in the *Pennsylvania Bulletin*. The company, the Air Quality District Supervisor, and the Air Quality inspector will be provided with this proposed state-only operating permit.



Pennsylvania
**Department of
Environmental Protection**

MEMO

TO Air Quality Permit File **TV-63-01001**

FROM Bradley D. Spayd /BDS
Air Quality Engineering Specialist
Air Quality Program

THROUGH Thomas J. Joseph, P.E. /TJJ
Environmental Engineer Manager
Air Quality Program

Mark R. Gorog, P.E. /MRG
Program Manager
Air Quality Program

DATE June 30, 2025

RE Review Memorandum of Natural Minor State-Only Operating Permit Application
ETC Northeast Pipeline, LLC
Revolution Cryogenic Plant
Smith Township
Washington County

APS 1090694 AUTH 1443667 PF 805136

Comment and Response Document:

ETC Northeast Pipeline, LLC (“ETC”) owns and operates the Revolution Cryogenic Plant (“Rev Cryo”) located at 76 Rover Lane, Bulger, PA 15019 in Smith Township, Washington County (40.4140816, -80.3500418). The facility is a natural gas processing plant.

The permittee conducts non-FERC-regulated midstream natural gas gathering and processing business. Activities include constructing and operating non-FERC-regulated, intrastate gathering lines and compression facilities; transporting natural gas from well sites to natural gas processing facilities or interconnections with interstate natural gas transmission pipelines; constructing and operating natural gas processing facilities; transporting natural gas to interconnection points on interstate transmission pipelines; transporting natural gas liquids to interstate liquid pipelines.

The Revolution Cryogenic plant is currently permitted under *General Plan Approval and/or General Operating Permit BAQ-GPA/GP5, Natural Gas Compression Stations, Processing Plants, and Transmission Stations*, permit GP5-63-01001A (also under AG5-63-00004A) and permitted under GP1-63-01001A (*Small Gas and No. 2 Oil-Fired Combustion Units*) for a boiler and a number of heaters, both of which were authorized for use on August 7, 2018. The plant was first authorized for construction, installation, and operation on August 3, 2016, under GP5-63-01001 and had expanded operations authorized in 2018 under GP5-63-01001A.

After a December 25, 2022 fire at the facility that resulted in a replacement amine sweetening unit, the Department requested that the facility be permitted under a state-only operating permit rather than under a general permit when the next general permit renewal application would have been due (August 8, 2023), since the most recent revision of the Department’s GP-5 no longer allows for the operation of amine sweetening units.

On June 9, 2023, the Department received a state-only operating permit application for this facility prepared by Trinity Consultants on behalf of ETC Northeast Pipeline, LLC that is the subject of this review. On November 2, 2024, the Department published a notice of intent to issue an initial state-only operating permit (SOOP) to this facility in the *Pennsylvania Bulletin*. Due to an error in the notice showing conflicting information regarding the location of the facility, a second notice was republished in the *Pennsylvania Bulletin* on November 23, 2024. The public comment period closed on December 23, 2024.

The state-only operating permit review and subsequently proposed state-only operating permit did not establish best available technology standards nor authorize any new equipment at the facility. The purpose of this document is to address comments related to the consolidation of existing permitting requirements from the currently authorized GP-5 and GP-1 into a state-only operating permit.

Various comments were received from non-governmental organizations and citizens throughout the public comment period.

On December 19, 2024, the Department received comments from the company via email. Those comments are addressed in Table I below.

Table I:
Facility Comments

Comment	Section	Source	Page	Condition	Condition Summary	Comment	Department Response
1	Multiple	C204	Multiple	Multiple	Rod Packing Combustor	It appears as if rod packing combustor got confused with the thermal oxidizer that controls the amine unit regenerator vent. Please remove references to the rod packing combustor, as it was not installed. See application submitted in June 2023	The Department acknowledges this error and understands that a rod packing combustor was never installed at this facility. It is the understanding of the Department that rod packing emissions are controlled by a closed vent system that routes emissions to the 1.0 MMBtu/hr thermal oxidizer that also controls the 21,000-gallon condensate storage tanks and truck loadout emissions. References to the rod packing combustor have been removed from the operating permit.
2	Cover Page	General	1	N/A	Owner/Operator Info	The mailing address for the Owner should be 101 Technology Drive, Pittsburgh, PA 15275 (we recently moved to this address since the application was filed). Also, the Operator section has an incorrect address.	The addresses have been updated as requested.
3	A, D, E	201	Multiple	Multiple	Amine Unit	The amine unit description should say 200 GPM rather than MMscfd and needs to be updated throughout the permit and review memo.	The application subject to this review had multiple references to the amine unit being rated at 200 MMscfd. The capacity of the amine unit has been updated to 200 gpm.
4	A	General	4	N/A	Site Inventory List	Please revise Source ID 033 to be worded as " HMO HEATER 3". Also update throughout (e.g., header of page 28).	This was an error and intended to reflect HMO Heater 3. The source name has been updated throughout the operating permit.
5	C	Site Level	16	#008	Facility wide emissions	The emissions limitations listed in this permit should be revised to reflect the original construction authorization levels which were set at GP5 sitewide restrictions as follows: 100 tpy NOx, CO, SOx, PM10, PM2.5; 25 tpy total HAP; 10 tpy HCHO, hexane; 50 tpy VOC. Also please revise condition to note that the limits are a "12-month rolling, by month, basis".	The GP-5 limitations reflect major source thresholds. The facility-wide emission limitations included in the proposed operating permit are based on the facility's potential-to-emit. These limitations are not established as BAT limitations, but rather, reflect the current operating capacity of the facility. These emission limitations may be revised via the currently pending plan approval application, or via another plan approval, or other appropriate permitting pathway, if such an action is authorized by the Department. Consequently, the facility-wide emission limitations will remain in place to reflect current operations of the facility. Language to track facility-wide emission totals on a 12-month rolling basis is common in many operating permits, and it is understood by the Department to mean tracking emission totals on a monthly basis for the most recent 12-month period. However, the Department will accommodate adding "calculated monthly" or similar language for clarity.
6	C	Site Level	19	#014	Operating permit terms and conditions	Please strikethrough "comprehensive and accurate" on first line of this condition. It goes without saying that such records are meant to be maintained.	The Department is not opposed to the requested change in language.
7	C	Site Level	20 & 21	#014	Operating permit terms and conditions, bullet h	Please revise to remove the term "RVP tank" for clarity. Condition can state simply condensate tanks.	The source description in the application included RVP in its naming convention. The Department is amenable to a more generic term for the condensate tanks, as "tanks/vessels" is often used as a source description in permits for the oil and gas industry.
8	C	Site Level	20 & 21	#014	Operating permit terms and conditions, bullet h, bullet l, bullet p(iii)	Please revise these conditions to clarify that the records are to be on a "12-month rolling, by month, basis".	See response to Comment 5 above.
9	C	Site Level	21	#014	Operating permit terms and conditions, bullet t.	Daily throughput to the flare is measured but heat content is not directly measured. We calculate the heat content based on the closed drain gas composition. We request that the wording of this condition be changed.	In relevant part, this condition has been revised to the following: [The Owner/Operator shall maintain the following records:] (t.) Daily gas throughput to the MSS flare and a calculated daily heat content to the MSS flare based on the closed drain gas composition.
10	D	201	29	Heading	Source groups with conditions.	See comment 20 below regarding OOOOa applicability	See response to Comment 20 below.
11	D	204	30	Heading	Source groups with conditions.	Rod packing emissions from the stabilizer overhead compressors are not routed to an enclosed combustion device as noted in other comments.	See response to Comment 1 above.
12	D	701	42	#012	Delay of repair daily emission calculations	ETC requests the removal of this condition. Compliance with applicable federal and state requirements for leak detection, repair and reporting are sufficient.	The Department disagrees. This is a requirement for any facility claiming to use the TCEQ 28VHP LDAR program with reductions found in APDG 6422v2 (revised 07/2022). The 28VHP Program includes boilerplate conditions developed by TCEQ that an operator must follow in order to claim the 28VHP reduction factors. This condition is one of those boilerplate conditions for the 28VHP program. Since this facility uses the 28VHP program to claim a larger reduction of fugitive emissions, this condition will be retained.
13	D	702	43 & 44	#002	Requirement to keep record of liquid loadout volumes.	Please revise these conditions to clarify that the records are to be on a "12-month rolling, by month, basis".	Language was added specifying that the 12-month rolling totals are to be calculated monthly.
14	D	702	44	#003	Operating permit terms and conditions	Tank identifiers are incorrect. See comment 23 below.	See response to Comment 23 below.
15	E	Enclosed Combustion Devices	51	Sources Included	Table of enclosed combustion devices / devices sent there	Please revise the heading and applicability of this section as follows: 1. Sources should not be in this list, only true enclosed combustion devices. As an alternative a condition could be added that notes the sources routed to the device. 2. The flare is not an enclosed combustion device and should be removed. The testing requirements listed do not apply and the work practice requirements for flares are not applicable to the enclosed combustion devices. 3. Rod packing combustor not installed. See other relevant comments throughout.	1.) Due to limitations in the Department's permitting system, sources and control devices need to be included to speciate requirements by type, such as emission limitations, monitoring, recordkeeping, reporting requirements, etc. Consequently, sources may be listed in the heading, though it is understood that these requirements would apply to the control devices. 2.) The Department concurs that the open flare is not an enclosed combustion device and has been removed from this source group. The testing requirements still apply to the enclosed combustion devices, though they would not have to test if it was a manufacturer-tested model or one of the same make and model tested in Pennsylvania in similar service. Both the 1.0 MMBtu/hr truck loadout combustor (C201) and the 1.07 MMBtu/hr Amine unit thermal oxidizer (C702) are manufacturer-tested units. The work practice standards requirements of 40 CFR §60.18 were duplicated under both the enclosed combustor requirements and under the MSS flare section of the draft permit. The requirements of §60.18 have been removed from the enclosed combustion device section since it does not apply. The requirements of §60.18 have been retained for the source-specific requirements of the MSS flare. 3.) The rod packing combustor has been removed from the operating permit.
16	E	HMO Heaters	55	#003	Operating permit terms and conditions	The existing HMO heaters were permitted and constructed prior to the issuance of the most recent version of the GP-1 and the current GP-1 CO limit for heaters from that timeframe is 300 ppm _{dv} @ 3% O ₂ . We don't understand where the 49 ppm _{dv} limit is coming from and request that the limits match the previously permitted GP-1 limits for this source group.	The permittee is correct in noting that this emission limitation should reflect that of the BAT established under the GP-1. It was an error to include the 49 ppm _{dv} value and has been corrected to the 300 ppm _{dv} value for CO at 3% oxygen in accordance with GP-1, Section B, Condition 1(a)(i)(C).
17	E	MSS Plant Flare Requirements	59	Sources Included	Table of items going to MSS Flare	Revise the heading to exclude the table of sources routed to the device. Instead, a condition can be added that lists the sources routed to the control.	The heading has been revised to only include C202, the MSS Flare.
18	E	MSS Plant Flare Requirements	59	#001, #003	Emission limit and recordkeeping requirements for the MSS flare.	Please revise these conditions to clarify that the records are to be on a "12-month rolling, by month, basis".	See response to Comment 5 above.
19	E	MSS Plant Flare Requirements	59	#003	Records kept for the flare	Daily throughput to the flare is measured but heat content is not directly measured. We calculate the heat content based on the closed drain gas composition. We request that the wording of this condition be changed.	The permittee continuously measures the flow rate to the flare with two meters – one measuring the low range and the second the high range. There is no gas chromatograph or calorimeter installed. Based on Response 36(d) of this document, provided that the permittee can demonstrate that the gas composition is constant or that the net heating value is above 300 Btu/scf (or other fixed minimum heating value), the Department has determined that tracking the heat content is not required. The permittee has demonstrated that the fuel gas sent to the flare is consistently above 1,012 Btu/scf based on performance testing and that other streams relieving to the flare have a higher BTU content than the fuel gas. Consequently, the requirement to track the daily heat content was removed. Measuring the daily throughput to the flare will be retained.
20	E	Subpart OOOOa Requirements	62	Table	Table describing units subject	The amine unit does not meet the definition of a sweetening unit as defined in NSPS OOOOa. As such please remove all references to the sweetening unit being subject in the NSPS. See application submitted in June 2023. Accordingly, all conditions related to the amine in this section should be removed as they are not applicable.	The Department agrees. A <i>sweetening unit</i> is defined in 40 CFR §60.5430a as a process device that removes hydrogen sulfide and/or carbon dioxide from the sour natural gas stream. This unit does not remove sulfur compounds, does remove carbon dioxide, but does not process a <i>sour</i> natural gas stream and therefore does not meet the definition. According to EPA's AP-42, Section 5.3 (<i>Petroleum Industry</i>), natural gas is considered "sour" if hydrogen sulfide (H ₂ S) is present in amounts greater than 5.7 milligrams per normal cubic meters (mg/Nm ³) (0.25 grains per 100 standard cubic feet [gr/100 scf]). Per 40 CFR §60.5365a(g), a sweetening unit is an <i>affected facility</i> if (1) it processes natural gas produced from either onshore or offshore wells, (2) processes natural gas followed by a sulfur recovery unit, or (3) facilities that have a design capacity less than 2 long tons per day (LT/D) of hydrogen sulfide (H ₂ S) in the acid gas (expressed as sulfur) are required to comply with recordkeeping and reporting requirements specified in §60.5423a(c). This unit processes natural gas from onshore wells and also has a design capacity of less than 2 long tons per day but is not considered an affected facility since it does not meet the definition of a sweetening unit. Therefore, the limited requirements of §60.5423a(c) that were in the proposed operating permit have been removed.
21	N/A	Review Memo	3	Exempt Sources	Heaters	Only one NGL heater and one regenerator heater are currently installed. An additional heater of each type was permitted in the 2018 permit but not constructed.	Signed review memorandums are final documents and generally should not be changed. The notation of two of these heaters and regenerators were noted in the 2018 plan approval review memorandum. The Department notes that only one (1) 6.22 MMBtu/hr natural gas-fired NGL dehydration regenerator heater and one (1) 8.5 MMBtu/hr natural gas-fired regenerator gas heater is on site, and only one heater and regenerator were included in the potential-to-emit calculations for this review.
22	N/A	Review Memo	3	Exempt Sources	Pigging facility list	The description of the first pig receiver lists the 30" receiver as "Bluestone to Rev Cryo" and this should state "Pike CS to Rev Cryo."	Signed review memorandums are final documents and generally should not be changed. The correct pig receiver is noted.
23	N/A	Review Memo	6	Table III	Emission Sources and Controls List	Tank ID #s for Source 301 are incorrect. Tanks TK-811A/B are the 21,000-gallon condensate tanks. Tanks U-406A/B are the 90,000-gallon pressurized condensate vessels.	Signed review memorandums are final documents and generally should not be changed. The correct tank identifiers are noted.
24	N/A	Review Memo	15	NSPS Applicability	Rod Packing Combustor	ETC never installed the rod packing combustor. Please revise the wording to say that ETC replaces the rod packing of the reciprocating compressors on or before 26,000 hours of operation as defined by the rule.	It is understood that ETC replaces rod packing on or before every 26,000 hours. The regulation allows for multiple methods of compliance at the operator's discretion in accordance with 40 CFR Part 60 Subpart OOOOa. Signed review memorandums are final documents and generally should not be changed, however, as noted in other responses, references to the rod packing combustor have been removed from the operating permit.
25	N/A	Review Memo	22	Sources 201 and 203	Amine Units	The flash gas is not routed to the HMO heaters as fuel. All flash gas is routed to the flare.	The process description in the application appeared to indicate that the flash gas could be routed to the HMO heaters as fuel or be sent to the flare. It is noted that all of the flash gas is routed to the flare.
26	N/A	Review Memo	25	Source 601	Blowdowns and rod packing emissions	Consider revisions to first sentence to state that "Equipment blowdowns release gas to the atmosphere or a control device." Rod packing emissions from the stabilizer overhead compressors are controlled by a VRU and routed back to the process. As noted above there was never a rod packing combustor installed.	Signed review memorandums are final documents and generally should not be changed. It is understood that rod packing emissions are controlled by a VRU and routed back to the process rather than to an enclosed combustor. As noted in other responses, it is the understanding of the Department that the rod packing combustor was never installed.

Eight (8) non-governmental organizations submitted comments to the Department, including the (1) Center for Coalfield Justice, (2) the Environmental Integrity Project (EIP), (3) the Clean Air Council, (4) the Moms Clean Air Force Pennsylvania Chapter, (5) Earthworks, (6) Clean Air Action, (7) Carnegie Mellon University's CREATE Lab, and (8) the Environmental Health Project (EHP). Eleven (11) individuals/signatories submitted comments on behalf of these organizations and/or as residents of the community. Thirty-seven (37) additional residents also submitted comments.

Public comments received will be summarized and addressed below.

Comment 27: Commenters requested (1) an extension of the public comment period, (2) a public hearing, and (3) enhanced public participation as an opt-in permit.

Response 27: On November 5, 2024, the Center for Coalfield Justice requested a 30-day extension of the public comment period due to the facility being located in an environmental justice area and due to the public comment period occurring over the holiday season and the political climate in the United States. Similarly, on November 22, 2024, the Environmental Integrity Project and other non-governmental and local signatories requested (1) an extension of the public comment period, (2) a public hearing, and (3) enhanced public participation as an opt-in permit.

On December 3, 2024, the Department's legal counsel responded to the request with the following:

Request to Extend the Comment Period. The Department respectfully declines to extend the comment period beyond the 30-day period prescribed by regulation, which is December 23, 2024. The original Pennsylvania Bulletin notice was published on November 2, 2024 and included both a correct and incorrect address for the facility. The Department then republished the notice on November 23, which restarted the comment period and set a deadline of December 23. By December 23 the comment period will have effectively been open for 51 days. In addition, the Department will receive and respond to any comments received before it takes action on the application.

Request for Public Hearing. Regarding your request for a public hearing pursuant to the Department's discretion under 25 Pa. Code 127.428, the Department will evaluate comments received on the application and decide whether to schedule a hearing after receiving and reviewing all comments on the operating permit. If a public hearing is scheduled, the Department will notify the public and commenters in accordance with 25 Pa. Code 127.428.

Request for Enhanced Public Participation for SOOP as Opt-In Permit. As Emily Green communicated on November 21, 2024, the Department respectfully declines to treat the proposed State-Only Operating Permit as an Opt-In permit under the Department's Environmental Justice Policy. The proposed SOOP does not authorize any new equipment or increase in emissions; it incorporates the existing requirements that apply under the General Permit (GP)-1 and General Permit (GP)-5 authorizations for the facility.

Also, as you referenced in your letter, ETC has submitted a plan approval application for the same facility to add equipment and emissions that would make the facility a Title V facility. This application is pending with the Department. As an authorization that would make the facility a major source of criteria pollutants, that application is a Trigger Permit under the Department's EJ Policy and will have Enhanced Public Participation.

In summary, (1) due to an error in the location of the facility in the original *Pennsylvania Bulletin* public notice, the notice was republished on November 23, 2024. As noted by Department Counsel, this effectively had an extended comment period from 30 to 51 days. The Department has also responded to all comments received to date in this document. (2) The Department's response regarding a public hearing is addressed in Response to Comment 29 below. (3) The Department declined to include the permit as opt-in status since it does not authorize any new equipment, increase emissions, and combines existing general permit requirements into a single state-only operating permit authorization for this facility.

Comment 28: Thirty-eight (38) comments received requested that the Department deny the initial operating permit for this facility.

Response 28: This proposed action by the Department consolidates existing permitting requirements from GP5-63-01001A and GP1-63-01001 into a state only operating permit. The application to expand the facility under PA-63-01001A is pending review by the Department and is outside the scope of this specific application and review.

Per 25 Pa. Code §127.422, which states the following, the Department will deny an operating permit in accordance with the five (5) criteria:

The Department will deny or refuse to revise or renew an operating permit to a source to which one or more of the following applies:

(1) The Department has determined it is likely to cause air pollution or to violate the act, the Clean Air Act or the regulations thereunder applicable to the source.

(2) In the design of the source, provision is not made for adequate verification of compliance, including source testing or alternative means to verify compliance.

(3) The EPA has notified the Department in writing that the permit is not in compliance with the requirements of the Clean Air Act or the regulations thereunder.

(4) The applicant has constructed, installed, modified or operated an air contamination source or installed air pollution control equipment or devices on the source contrary to the plans and specifications approved by the Department.

(5) The applicant or a related party has a violation or lack of intention or ability to comply that is listed on the compliance docket.

Per each of these criteria under 25 Pa. Code § 127.422:

(1) Enforcement action has occurred for violations of visible emission events. On April 2, 2025, the Department sent a notice of violation (NOV) for subsequent visible emission events that have occurred since September 18, 2023, which was the last date covered by a July 3, 2024, Consent Assessment and Civil Penalty (CACP). Concurrent with the NOV, the Department also sent a letter requesting a control plan from the company on April 2, 2025. The company had previously attempted to mitigate the issue by changing out the flare tip when most visible emission events occurred during high flow, low-Btu streams to the flare in September 2024. Once the flare tip was replaced, intermittent visible emissions continued occurring for low flow, high-Btu streams.

On May 1, 2025, the Department received a control plan from the facility as requested by the Department on April 2, 2025. The company conducted subsequent maintenance and troubleshooting in coordination with the flare manufacturer. According to the company, “[the] troubleshooting included making modifications to the flare tip in November 2024 and again in April 2025, as well as multiple adjustments to the blower system, electric control systems, and purge gas systems... ETC has determined that the new flare tip is not functioning and performing as designed and as represented to ETC...” Consequently, the company has engaged discussions with various flare manufacturers and has intended to move up the planned facility-wide outage from September 2025 to July 2025 to replace the flare tip.

On May 23, 2025, ETC submitted to the Department a Supplemental Response and Facility Flare Control Plan in which it proposed to replace the existing Plant Flare blower system to increase the smokeless capacity of the Plant Flare system, by July 31, 2025.

In addition, ETC has noted implementation of operational measures to minimize flaring events, including minimizing the impact to the flare during planned maintenance activities, installing additional heat trace and insulation on liquid PSVs to minimize potential freezing that can cause relief to open prior to the setpoint,

and implemented a maintenance procedure to inspect and repair the heat trace lines and insulation throughout the facility.

The Department is currently negotiating a Consent Order & Agreement (CO&A) with the permittee to address historical violations. The Department has added the following additional requirements under a compliance schedule in the state-only operating permit:

- In accordance with 25 Pa. Code § 127.445, within 30 days of the Department's written approval or alternative timeline specified in a Consent Order & Agreement, the permittee shall complete the Plant Flare Tip Replacement project proposed in the May 1, 2025, Control Plan (Revised May 23, 2025).
- In accordance with 25 Pa. Code § 127.445, within 30 days of the Department's written approval or alternative timeline specified in a Consent Order & Agreement, the permittee shall complete the Plant Flare Blower System Upgrade project proposed in the May 1, 2025, Control Plan (Revised May 23, 2025).

(2) The facility is designed and operated in such a way that the permit can be crafted to include practically enforceable requirements. The proposed operating permit includes requirements from federal subparts, the Department's current versions of the GP-5 and GP-1, and terms and conditions the Department deems necessary to assure the proper operation of the source under 25 Pa. Code § 127.441.

(3) The EPA has not notified the Department in writing that the permit is not in compliance with the requirements of the Clean Air Act or the regulations thereunder.

(4) The applicant has not constructed, installed, modified or operated an air contamination source or installed air pollution control equipment or devices on the source contrary to the plans and specifications approved by the Department. The facility was constructed and operated in accordance with the requirements of the Department's GP-5 and GP-1.

(5) There is no pending violation on the compliance docket of the Environmental Hearing Board (EHB).

None of the five (5) criteria in 25 Pa. Code § 127.422 above are met and compel the denial of the operating permit.

Comment 29: Forty-two (42) comments requested that the Department hold a public hearing.

Response 29: After evaluating comments received after the close of the public comment period on December 23, 2024, the Department has concluded in its discretion not to hold a public hearing. A hearing is not required under 25 Pa. Code § 127.428.

In accordance with 25 Pa. Code § 127.428:

(a) Prior to issuing an operating permit, the Department may hold a fact-finding conference or hearing at which the petitioner, and a person who has properly filed a protest under § 127.426 (relating to filing protests) may appear and give testimony. The Department is not required to hold a conference or hearing.

(b) The applicant, the protestant and other participants will be notified of the time, place and purpose of a conference or hearing, in writing or by publication in a newspaper or the Pennsylvania Bulletin, unless the Department determines that notification by telephone will be sufficient.

This action does not authorize any new air contamination sources, an increase in emissions, or other physical or operational change to the facility. This authorization is to primarily consolidate existing permitting requirements from the currently authorized general permits. The Department may consider any comments received prior to acting on an authorization. Regardless of how a comment is received, whether in writing or via a public hearing, all are given equal weight and consideration.

Comment 30: Two (2) commenters requested that ETC conducts an Environmental Impact Statement (EIS) for all of the company's operations in Washington County prior to any permit renewal.

Response 30: Environmental Impact Statements (EIS) are required for major federal actions that affect the quality of the environment under the National Environmental Policy Act (NEPA). Because this proposed action is for a state-only operating permit and does not involve a federal agency, the mandate for an EIS under NEPA does not apply. The Pennsylvania Code does not require a State-level environmental impact statement to be conducted.

Air quality operating permits are evaluated on a case-by-case basis to ensure conformance with applicable regulations and that any proposed project does not contribute to a degradation of the National Ambient Air Quality Standards (NAAQS). As noted in other responses, this project consolidates existing permitting requirements and does not authorize any new equipment, modifications, or expansion of the plant.

Comment 31: Mandate a Third-Party Emissions Assessment: A thorough, independent facility-wide emissions review should be conducted, with real-time monitoring data reported publicly. Results should be evaluated by a third party selected by DEP.

Response 31: One (1) commenter and one (1) non-governmental organization requested that the Department mandate a third-party emissions assessment. Responsible officials attest under penalty of law that information in an application to the Department, including information relating to actual or potential emissions, is true and accurate to the best of their knowledge. Knowingly falsifying or misrepresenting information to the Department could have civil or criminal penalties. The Department evaluates applications on a case-by-case basis. Based on information provided by the applicant, historical records, operating data, manufacturer data, and EPA guidance, the Department evaluates each application for conformance with applicable regulations, including determining the potential-to-emit of a facility. In addition, most facilities, including this one, submit annual emission inventory reports of actual emissions in accordance with 25 Pa. Code §135.3 - §135.5 that are reviewed by the Department, and records of actual emissions are required to be maintained on a 12-month rolling basis and are to be made available to the Department at any time upon request.

Comment 32: Some commenters discuss a December 25, 2022, fire at the facility, the Department's response, and ongoing visible emission issues and broader violations from the company writ large in the Commonwealth. One commenter notes that a notice of violation (NOV) was not sent out for the December 25, 2022, incident. The commenter states that: "What is ETC asking for in this application and what is DEP considering permitting? There are no limits in the proposed permit. It is ambiguous and lacks clarity, all the more reason for the DEP to hold a public hearing to explain."

Response 32: The Department acknowledges the commenters' concerns about the December 25, 2022, event and other compliance issues that have occurred with this company in the Commonwealth. The Department is committed to ensuring that facilities comply with the Clean Air Act, the Air Pollution Control Act, State regulations, and permits to protect public health and the environment. We recognize the importance of enforcing air quality standards and act to resolve outstanding air quality issues.

The initial inspection report by the Department after the December 25, 2022, incident notes that C₂+ compounds were emitted to the atmosphere. The inspection report noted that ETC determined that a leaking valve at the water wash area (near the amine system) resulted in a vapor cloud of C₂+ material. The vapor cloud then ignited, and the fire spread to surrounding equipment.

As noted in other responses, this action is limited in scope to consolidating existing general permit requirements into one state-only operating permit, since the current version of the Department's GP-5 no longer includes requirements for amine units. The proposed operating permit includes facility-wide ton per year emission limitations and source-specific ton per year limitations for the MSS flare. The permit includes standard limitations under Chapter 123 of the Pennsylvania Code, applicable requirements from the GP-5 and GP-1, and expands references from Federal subparts that were incorporated by reference in those general permits, such as the design standards under 40 CFR § 60.18 and leak detection and repair (LDAR) requirements under 40 CFR Part 60 Subpart OOOOa, for example. The proposed operating permit has monitoring, reporting, testing, work practice standards, and recordkeeping requirements that make the conditions of the operating permit practically enforceable. Concerns regarding a public hearing are addressed in the Response to Comment 29 above.

Comment 33: One (1) non-governmental organization objected to the issuance of the proposed state-only operating permit under Article I, section 27 of the Pennsylvania Constitution. The commenter noted the compliance history at this facility and commented that ETC has not “publicly demonstrated the implementation of additional mitigation and safety measures to ensure no further explosions and fires threaten the lives of local residents, despite the submission of a corrective action plan nearly two weeks after the explosion, which is still in review status.”

The commenter also requested that an EIS is conducted and that a third party be required to provide a comprehensive facility-wide emissions assessment, as well as prove “proper Reasonably Available Control Technology (RACT) emissions mitigation systems are installed in compliance with the latest operational standards, and are monitoring and reporting emissions in real-time to Smith Township in Washington County, PA.”

Response 33: When appropriate, enforcement action has been taken by the Department for any historical compliance issues at this facility and are catalogued in Department records. More recent resolutions to compliance issues at this facility are described in the Response to Comment 28 above.

The December 25, 2022, incident was reported under permitted malfunction reporting requirements with follow up inspections by the Department. The company has implemented certain work practice standards and conducted a Process Hazard Analysis (PHA) after the event. The company conducted a heat trace evaluation and identified areas that were at a high risk of freezing. To mitigate issues from freezing in the future, temperature transmitters connected to an alarm were installed to alert personnel if equipment temperatures hit low points that could compromise operations. The company noted that a standard operating procedure was implemented if an alarm was activated and implemented an annual winterization check list. The company also noted in a response to the Department for this review that, “A procedure was developed specifically for the location where the failure occurred requiring draining of the small area between the valve and check valve after each use during freezing temperatures. Finally, all valves in the facility that were threaded ball valves like the one that separated were identified and replaced with a different style of valve.”

Considering these monitoring and work practices, the Department has added the following requirement to the operating permit:

The owner/operator shall conduct a winterization procedure at the facility at least once per calendar year. This procedure shall include a log of what procedures were conducted and the date when these procedures occurred. This log shall be maintained for a minimum of five years and shall be made available to the Department upon request.

Additional compliance requirements are outlined in the compliance schedule in the state-only operating permit.

The Responses to Comments 30 and 31 above address EIS and a third-party emissions assessment.

New and modified equipment are required to meet Best Available Technology (BAT) standards which is applicable at the time of issuance of a plan approval or modification. Per the definition under 25 Pa. Code §121.1, *best available technology* is defined as the “equipment, devices, methods or techniques as determined by the Department which will prevent, reduce or control emissions of air contaminants to the maximum degree possible and which are available or may be made available.” Air contamination sources at this facility were required to meet the applicable BAT at the time of issuance of the initial general permit to this facility. BAT is not applied during review of state-only operating permits, as no new equipment or modifications are being authorized.

Reasonably available control technology (RACT) is a program that reviews potential control technologies on existing sources that would impose the lowest emission limit for VOCs or NO_x that a particular source is capable of meeting if determined to be technologically and economically feasible. RACT regulations apply to sources installed prior to certain dates specified in the regulation, whereby BAT would be considered more stringent for sources installed after that date. RACT is a program that only applies to major sources of NO_x or VOC. Because this facility is a minor source, RACT does not apply.

The reviewer notes that the currently pending plan approval application for this facility was revised where the company has proposed to implement additional control technologies. Compressor blowdowns and rod packing, centrifugal dry compressor seal venting, purge gas, closed drain vapors, and miscellaneous blowdowns have been proposed to be controlled by a vapor recovery unit (VRU) and utilize a second proposed flare, Flare-002, as a backup. That application is pending review by the Department.

Commenters also objected to the issuance of the proposed operating permit citing Article I, Section 27 of the Pennsylvania Constitution, otherwise known as the Environmental Rights Amendment. Article I, Section 27 grants the people the right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment, and that Pennsylvania’s public natural resources are the common property of all the people.

The Department takes its duties and obligations under the Environmental Rights Amendment seriously. To that end, the Department has considered the environmental effects of issuing this natural minor operating permit and has determined that operations will not result in the unreasonable degradation, diminution, or depletion of the Commonwealth’s air resources. As noted in prior responses, the Department operates the Commonwealth of Pennsylvania Air Monitoring System (COPAMS) to continuously monitor pollutant levels. The goals of the ambient air monitoring program are to evaluate compliance with national and state ambient air quality standards, provide real-time monitoring of air pollution episodes, develop data for trend analysis, develop and implement air quality regulations, and provide information to the public on daily air quality conditions in their area. In Washington County, the COPAMS program operates ambient air monitors for PM_{2.5}, VOC, O₃, SO₂, and NO_x in Charleroi, Pa.; for PM_{2.5}, VOC, O₃, NO_x, and Carbonyls in Houston, Pa.; and for O₃, PM_{2.5}, and SO₂ in Florence, Pa. COPAMS data, which is available to the public, indicates that Washington county is in attainment with the NAAQS except for being in marginal non-

attainment for 8-hour ozone, since all of the Commonwealth of Pennsylvania is classified as being a part of the ozone transport region.

In addition to the COPAMS ambient air monitoring network, other Bureau of Air Quality functions, such as new source review, facility permitting, continuous emission monitoring, and the division of source testing, among others, are a part of continuing efforts to safeguard the health of Pennsylvanians and their environment. Permitting, among other things, specifies operational practices and emission limits, and reporting and testing to provide information on operations. Furthermore, issuance of this state-only operating permit does not authorize the operation of any new air contamination sources or newly imposed emission limits at the facility outside of the currently applicable general permit requirements.

The Department has evaluated the applicable requirements from the Pennsylvania Code, existing general permit requirements, and Federal regulations. Based on the existing air cleaning devices in combination with monitoring, source testing, record keeping, reporting, and work practice requirements contained in the permit and considering ambient monitoring, the Department expects that future operation under this operating permit will prevent the unreasonable degradation, diminution, or depletion of the Commonwealth's air resources.

Comment 34: DEP Should Deny This Permit Due to ETC Northeast Pipeline, LLC's History of Dangerous Releases, Extensive Chronic Noncompliance with Air Pollution Laws, Unresolved Violations, and Ongoing Opaque Flaring at this Facility.

Response 34: Commenters discuss historical compliance issues at this facility, the December 25, 2022, event, and cite 25 Pa. Code §127.422 to deny the operating permit. See Responses to Comments 28 and 32 above.

Comment 35: DEP Should Deny this SOOP Application Because It Fails to Include All Required Information.

Commenters write:

SOOP applications are required to include compliance review forms that include '[a] list of documented conduct and deviations by the applicant or a related party. The list shall include the date, location, plan approval or operating permit number, nature of the documented conduct or deviation, and the incident status—litigation, existing/continuing, corrected and date of correction. . . .' 25 Pa Code §127.412(c)(6). In particular, the SOOP Application fails to include in its compliance review the December 25, 2022 explosion and fire at the Revolution Cryogenic Plant that caused an uncontrolled release of ethane and other gases for nine and a half hours, according to ETC, and prompted a shelter in place order, and for which no penalty has yet been paid nor NOV issued despite as yet unresolved significant noncompliance event.

Response 35: The December 25, 2022, fire at the facility was likely not included by the applicant in the application because an NOV had not been sent to the company for this event. The Department acknowledges and was aware of the event during its review of the application but does not find that the exclusion of an event in the application for which an NOV was not issued, and of which the Department had knowledge, is grounds for denial of an operating permit. The Department reviews each application received for administrative and technical completeness. A technical deficiency was sent to the company on September 24, 2024, with a response received on October 8, 2024. Once the responses were evaluated by the Department, the application was determined to be administratively and technically complete.

Comment 36: The Draft SOOP Fails to Include Clear Monitoring, Testing, Recordkeeping, and Reporting Requirements That Are Necessary to Assure Compliance with Emissions Limits and Air Pollution Laws.

Response 36: Commenters write, “The Draft SOOP lacks adequate monitoring, testing, recordkeeping, or reporting requirements to verify compliance and, for the few requirements the permit seems to contain, uses language that is so ambiguous or confusing that compliance cannot be verified or enforced. The Draft SOOP also fails to require adequate monitoring, recording, or reporting of the emissions of air contaminants. DEP must add new and clarify the existing monitoring, testing, recordkeeping, and reporting requirements for the emissions of pollutants and sources detailed below to correct these deficiencies.”

The Department disagrees with this characterization. Much of the language in the proposed operating permit cites federal regulations verbatim, uses language directly from the applicable general permits, or expands on certain federal regulations that were incorporated into the general permits by reference.

Commenters expand on the comment above with subcomments that will be discussed in the following paragraphs.

a. Venting/Blowdowns: The Draft SOOP Would Permit “Miscellaneous Blowdowns” That Would Increase the Facility’s PTE of VOCs by More than 10 tpy Without Accounting for or Requiring Monitoring of These Emissions.

The review memorandum for the original authorization of this facility, GP5-63-01001, which approved the same equipment subject to this review, calculated a potential-to-emit of 15.19 TPY VOCs.

The review memorandum for GP5-63-01001A listed the total potential-to-emit of VOCs at the facility as 30.02 TPY, which included newly proposed equipment such as a second amine unit and an additional three (3) HMO heaters (totaling 6), though as noted, the additional equipment authorized under GP5-63-01001A were never installed.

The potential-to-emit of VOCs for all sources in the application subject to this review summed to 28.94 TPY, and for Source 601, Venting/Blowdowns specifically, comprised of 13.70 tons of that value. The majority of the difference between the 15.19 and 28.94-ton values, as commenters point out, is based on the 10.24 tons of VOCs from miscellaneous blowdowns in the application subject to this review.

The Department strives to provide the most accurate emissions profile of facilities. The company confirmed to the Department that the miscellaneous blowdowns included in the application were based on estimated gas volumes from installed equipment, a site-specific gas analysis, and actual emissions from blowdowns from reporting year 2022, with a 20% factor added. That year represented the highest volume of blowdown emissions in the preceding five-year period. Miscellaneous blowdowns may include ESD events and other upset conditions within the facility that are not included in the other blowdown categories in the emission calculations, such as the electric residue compressors or maintenance activities. Emergency shutdowns are, by nature, unpredictable events, and in general, only planned ESDs, such as annual tests of the ESD system, should be included in the potential-to-emit. Table II shows the reported actual emissions from blowdowns between 2019 and 2023.

For the pending application for plan approval PA-63-01001B, received by the Department on April 25, 2025, ETC has proposed using a vapor recovery unit (VRU) to control venting/blowdown emissions from purge gas, compressor residue gas, closed drain vapors, compressor rod packing, and dry centrifugal compressor seal streams with a flare as a backup control. If authorized by the Department, this would reduce potential emissions to 3.37 tons of VOCs per year from blowdowns.

Table II:
Reported Actual Emissions from Source 601 in Tons per Year (TPY)

Year	VOC	HAP	CO ₂ e
2023	2.1460	0.116	176
2022	27.3350	0.367	973
2021	9.4930	1.106	772
2020	2.2730	0.0300	887
2019	13.1120	0.0000	1,441

b. Enclosed Combustion Devices Source Group: The Monitoring, Testing, Recordkeeping, and Reporting Requirements for the Enclosed Combustion Source Group are Insufficient and Miscategorized.

Commenters discuss Section E, Group Enclosed Combustion Devices (*Requirements from the GP-5 (2018) for Enclosed Combustion Devices*). Commenters claim that the monitoring, testing, recordkeeping, and reporting requirements are insufficient to assess compliance, specifically noting that testing is required within 180 days of each reauthorization unless certain exceptions are met. Commenters also note that the monitoring requirements of 40 CFR § 60.18 are “confusingly” listed under the work practice requirements section.

This source group mirrors the exact language and requirements listed in Section J, Condition (1)(a)(iii) of the 2018 version of the Department’s GP-5 which applies to enclosed combustion devices. This general permit was developed through the Department’s Central Office after significant notice and comment from the public and has requirements that apply to this source category. Through development of the GP-5, the Department had determined that using a manufacturer tested model or a test of the same make and model enclosed combustion device used in similar service (among other criteria) was sufficient to exempt an enclosed combustion device from further testing. This general permit is authorized at numerous facilities across the Commonwealth with these same requirements. Using this language reflects the currently applicable requirements to this facility.

These requirements apply to the 5.54 MMBtu/hr amine unit thermal oxidizer 1 (C201) and the 1.0 MMBtu/hr truck loading combustor (C702) since they are enclosed combustion devices, but not to the 906 MMBtu/hr MSS plant flare (C202) since it is an open flare.

The requirements under 40 CFR § 60.18 were included under the work practice standards requirements section since this regulation specifies design and operating practices that could be considered work practice standards (e.g. to be operated with a flame present at all times, to be operated with no visible except for a five-minute period in two hours, to be operated at all times when emissions are vented to them, etc.). As noted in the Response to Comment 15, upon additional review, this regulation was removed from this section, as it only applies to open flares and not to enclosed combustion devices. The requirements of 40 CFR § 60.18 apply to the 906 MMBtu/hr MSS open flare (C202) and are included as an applicable regulation for that air cleaning device.

c. HMO Heaters Source Group: The Draft SOOP Fails to Require Any Monitoring Timeframes Despite Including Testing and Monitoring Requirements.

The requirements under Section E, Group HMO Heaters show the applicable requirements of Section L of the 2018 version of the GP-5. Among other requirements, this section includes the following requirements for the HMO heaters:

- Meet the emission limitations of:

Constructed/Modified After	NOx (ppmvd @ 3% O ₂)	CO (ppmvd @ 3% O ₂)	PM (lbs/MMBtu)	Opacity (No more than 3 minutes in one hour)	Opacity (At any time)
December 2, 1995	30	300	0.4	20%	60%

- Conduct either a performance test within 180 days of reauthorization of the GP-5 [or state-only operating permit in this case] **or** conduct periodic monitoring (i.e. portable analyzer testing).

With regards to a periodic monitoring frequency in Section L of the GP-5, commenters are correct to note the error in the GP-5, which was mirrored in the proposed operating permit. Section L of the 2018 version of the GP-5 does not specify a frequency for periodic monitoring.

Per Section L of the GP-5, the operator may choose to conduct performance testing within 180 days of authorization of this state-only operating permit in lieu of conducting periodic monitoring or may choose to conduct periodic monitoring in lieu of performance testing.

The permittee conducted performance testing within 180 days of authorization of the currently authorized GP-5 (and the 2004 version of the GP-1), and since a renewed GP-5 and GP-1 had not been issued for these sources, a subsequent performance test was not required in accordance with Condition 7 of the July 2004 version of the GP-1 (and Section L(1)(b) of the GP-5). The most recent version of the GP-1 does not require performance testing within 180 days of reauthorization for these sources.

If the measured NOx or CO emissions concentrations from periodic monitoring (portable analyzer) exceed the emissions limit, the owner or operator must conduct a performance test (stack test) within 180 days of the periodic monitoring.

Upon additional review, conditions in the proposed operating permit have been updated to reflect the requirements of the most recent version of the GP-1, which applies to Gas and No. 2 Oil-Fired Small Combustion Units (defined as < 100 MMBtu/hr capacity), issued on January 28, 2023, and effective on April 1, 2023.

The current version of the GP-5 requires performance testing within 180 days of reauthorization or periodic monitoring (with an unspecified frequency) as noted in Section L. Section B(2)(b) of the 2023 version of the GP-1 requires periodic monitoring for NOx and CO on a three-year basis (at the 30 ppm NOx and 300 ppm CO emission limits). The GP-1 does not require performance testing for gas-fired units less than 50.0 MMBtu/hr, and consequently, subsequent performance testing is not required under the GP-1 unless periodic monitoring fails to demonstrate compliance with applicable emission limitations.

However, the Department will add the most stringent requirements of each general permit applicable to these heaters, which means that the permittee will either have to conduct either a performance test within 180 days of authorization of this state-only operating permit **or** conduct periodic monitoring within 180 days of authorization (per the GP-5) **and** conduct subsequent periodic monitoring on a three-year basis (per the GP-1). These requirements, in addition to annual tune ups and recordkeeping requirements have been added to the operating permit. Though it should be noted that performance testing may be used at any time in lieu of periodic monitoring.

The Department has added and/or updated the following conditions to the source group for the HMO heaters:

(1.) *[derived from GP-1, Section B(2)(a)]* For each small combustion unit (< 100 MMBtu/hr) constructed and authorized to operate under this state-only operating permit, the owner or operator shall conduct an annual tune-up/inspection on the small combustion unit. At a minimum the tune-up/inspection shall consist of the following:

- (i) As applicable, inspect the burner, and clean or replace any components of the burner as necessary;
- (ii) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available;
- (iii) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly;
- (iv) Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with the NOx requirement to which the small combustion unit is subject.

(2.) *[derived from GP-1, Section B(2)(b)]* For each small combustion unit (< 100 MMBtu/hr) constructed and authorized to operate under this state-only operating permit, the owner or operator shall, within 180 days after authorization of this state-only operating permit, conduct either a performance test or periodic monitoring.

At a minimum frequency of once every three (3) calendar years from the date of the previous performance test or periodic monitoring, the owner or operator shall measure the concentrations in the effluent stream of NOx and CO in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). Measurements may be taken using a portable analyzer as long as it is calibrated and operated according to the manufacturer's recommendations, the procedures specified in ASTM D-6522, and the following requirements:

- (i) The portable analyzer shall undergo factory laboratory calibration and cleaning every three years.
- (ii) The portable analyzer shall have on-site calibration checks using certified calibration gases demonstrating the analyzer accuracy requirements specified in ASTM D-6522.
- (iii) In order to verify emissions, the owner or operator shall conduct three, 20-minute test runs recording emissions data at least once each minute.
- (iv) Depending on concentrations observed, fresh air purges should be performed according to manufacturer's recommendations.
- (v) Re-zeroing of the portable analyzer should be performed according to manufacturer's recommendations or at least before every test run.

A performance test may be used in lieu of periodic monitoring.

(3.) *[derived from Section L(2) of the GP-5 and GP-1, Section B(2)(c)]* For each combustion unit, the owner or operator shall maintain the following records, including information on:

(a) The tune-up/inspection records, which shall at a minimum include:

- (i) The concentrations of NOx and CO in the effluent stream in parts per million by volume, and oxygen in volume percent, measured at high fire or typical operating load, before and after the tune-up of the small combustion unit;
- (ii) A description of any corrective actions taken as part of the tune-up;
- (iii) The date(s) the annual tune-up/inspection was conducted;
- (iv) The factory calibration certification sheets for the portable analyzer; and
- (v) The type and amount of fuel used over the 12 months prior to the tune-up; and

(b) The emissions calculations for the combustion unit in accordance with 25 Pa. Code §135.5.

(4.) (a) When conducting periodic monitoring on a combustion unit, the owner or operator may follow the procedures below. If the owner or operator decides to deviate from those procedures, they must submit a request to use an alternate procedure, in writing, at least 60 days prior to performing the periodic monitoring. In the alternate procedure request, the owner or operator

must demonstrate the alternate procedure's equivalence to the standard procedure to the satisfaction of the Division of Source Testing and Monitoring.

(b) Standardized Periodic Monitoring Procedure.

- (i) Conduct three test runs of at least 20-minutes duration within 10% of 100% peak (or the highest achievable) load.
- (ii) Determine NO_x and CO emissions and O₂ concentrations in the exhaust with either an electro-chemical cell portable gas analyzer used and maintained in accordance with the manufacturer's specifications and following the procedures specified in the current version of ASTM D6522 or by following the procedures in this section.
- (iii) If the measured NO_x or CO emissions concentrations are in exceedance of the emissions limit, the owner or operator must perform a stack test within 180 days of the periodic monitoring.
- (iv) Periodic monitoring for each combustion unit shall be conducted within 180 days of authorization of this state-only operating permit and at a minimum frequency of once every three (3) calendar years thereafter. A performance test may be used in lieu of periodic monitoring.

In summary, the permittee is required to conduct either a performance test or periodic monitoring within 180 days of authorization or state-only operating permit renewal. Subsequent periodic monitoring is required at a minimum of once every three years. A performance test would be required within 180 days if periodic monitoring does not indicate compliance with permitted emission limits. A performance test may be used in lieu of periodic monitoring at any time. An annual tune-up is also required.

d.(i) MSS Flare Group: The MSS Flare Fails to Require Sufficient Monitoring and Reporting to Verify Compliance.

Commenters state that "The Permit Lacks Sufficient Monitoring and Reporting Requirements of Visible Emissions from the Flare," and discuss the applicability of 40 CFR § 60.18, which includes a requirement that, "Flares shall be designed for and operated with no visible emissions as determined by the methods specified in paragraph (f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours..." Commenters write, "Paragraph (f), in turn, requires the use of Method 22 to determine compliance of flares with the visible emission provisions, stating that "the observation period is 2 hours and shall be used according to Method 22."

To address these concerns, the Department has added the following monitoring requirements to the operating permit for the MSS flare:

The owner or operator shall conduct visible emissions observations using either the methods in paragraph (1) of this section or, alternatively, the methods in paragraph (2) of this section. The owner or operator must record and report any instances where visible emissions are observed for more than 5 minutes during any 2 consecutive hours as specified in §60.18(c)(1).

(1) At least once per day for each day a process is routed to the flare, conduct visible emissions observations using an observation period of 5 minutes using Method 22 at 40 CFR part 60, appendix A-7. If at any time the owner or operator sees visible emissions while a process is routed to the flare, even if the minimum required daily visible emission monitoring has already been performed, the owner or operator shall immediately begin an observation period of 5 minutes using Method 22 at 40 CFR part 60, appendix A-7. If visible emissions are observed for more than one continuous minute during any 5-minute observation period, the observation period using Method 22 at 40 CFR part 60, appendix A-7 must be extended to 2 hours or until 5-minutes of visible emissions are observed. Daily 5-minute Method 22 observations are not required to be conducted for days the flare does not receive any volumetric flow from any process.

(2) Use a video surveillance camera to continuously record (at least one frame every 15 seconds with time and date stamps) images of the flare flame and a reasonable distance above the flare flame at an angle suitable for visual

emissions observations. The owner or operator must provide real-time video surveillance camera output to the control room or other continuously manned location where the camera images may be viewed at any time.

The owner or operator must record and report any instances where visible emissions are observed for more than 5 minutes during any 2 consecutive hours as specified in §60.18(c)(1).

Although 40 CFR Part 63 Subpart CC is not applicable to this facility, the condition above uses similar language from 40 CFR §63.670(h) and §63.655(i)(9), whereby “for each flare subject to §63.670...[the owner or operator shall]... Retain records of daily visible emissions observations or video surveillance images required in §63.670(h)...”

The facility uses a video surveillance camera system to demonstrate compliance with this requirement. This requirement also reiterates that the permittee maintain and report any instance in which visible emissions are observed contrary to 40 CFR §60.18(c)(1), such as those events included in the April 2, 2025, notice of violation (NOV).

d.(ii) The MSS Flare Source Group Fails to Require Continuous Monitoring of the Heat Content of the Gases Being Vented to the Flare, Which Is Necessary to Determine That the Flare Is Being Operated as Designed.

Commenters write:

One of the key components of the monitoring is determining the heat content of the gases being vented to the fuel, which is necessary to determine proper operation of the flare. However, DEP has not specified the method for this monitoring nor required continuous monitoring... The permit should require a continuous flow monitor and composition analyzer or calorimeter that provide a record of the vent stream flow and composition, ensuring that the flare is being operated as designed at all times.

The MSS flare is required to meet the applicable requirements of 40 CFR § 60.18. The language in the Department’s system citing 40 CFR § 60.18 was outdated and has since been updated to the most recent revision of this regulation. Paragraphs (c)(3) and (f)(3) of 40 CFR § 60.18 specifies calculation methodologies of the heat content. The operator may either choose to send gas to the flare with a net heating value of at least 300 Btu/scf for air-assisted flares, or they may choose to comply by calculating the flare exit velocity per 40 CFR § 60.18(c)(3)(A)(i). This facility sends gas to the flare with a net heating above that consistently exceeds 300 Btu/scf.

The Department has added the following requirements to the operating permit to track the volumetric flow rate under paragraph (a) below and the heat content under paragraph (b) below in accordance with 25 Pa. Code § 127.441:

The owner or operator shall operate each flare with a pilot flame present on an individual burner or stage of burners at all times when a process is routed to the flare. Each 15-minute block during which there is at least one minute where no pilot flame on an individual burner or stage of burners is present when a process is routed to the flare is a deviation of the standard. Deviations in different 15-minute blocks from the same event are considered separate deviations. The owner or operator shall monitor for the presence of a pilot flame on an individual burner or stage of burners using a device (including, but not limited to, a thermocouple, ultraviolet beam sensor, or infrared sensor) capable of detecting that the pilot flame(s) is present.

(a) The owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate in the flare header or headers that feed the flare as well as any flare supplemental gas used. Different flow monitoring methods may be used to measure different gaseous streams that make up the flare vent gas provided that the flow rates of all gas streams that contribute to the flare vent gas are determined. If assist air or assist steam is used, the owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of continuously

measuring, calculating, and recording the volumetric flow rate of assist air and/or assist steam used with the flare. If pre-mix assist air and perimeter assist are both used, the owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of separately measuring, calculating, and recording the volumetric flow rate of premix assist air and perimeter assist air used with the flare. Flow monitoring system requirements and acceptable alternatives are provided in paragraphs (1) through (6) of this section.

(1) The flow rate monitoring systems must be able to correct for the temperature and pressure of the system and output parameters in standard conditions (i.e., a temperature of 20°C (68°F) and a pressure of 1 atmosphere).

(2) Mass flow monitors may be used for determining volumetric flow rate of flare vent gas provided the molecular weight of the flare vent gas is determined using compositional analysis so that the mass flow rate can be converted to volumetric flow at standard conditions using the following equation.

$$Q_{vol} = [(Q_{mass})(385.3)]/MW_t$$

Where:

Q_{vol} = Volumetric flow rate, standard cubic feet per second.

Q_{mass} = Mass flow rate, pounds per second.

385.3 = Conversion factor, standard cubic feet per pound-mole.

MW_t = Molecular weight of the gas at the flow monitoring location, pounds per pound-mole.

(3) Mass flow monitors may be used for determining volumetric flow rate of assist air or assist steam. Use equation in paragraph (2) of this section to convert mass flow rates to volumetric flow rates. Use a molecular weight of 18 pounds per pound-mole for assist steam and use a molecular weight of 29 pounds per pound-mole for assist air.

(4) Continuous pressure/temperature monitoring system(s) and appropriate engineering calculations may be used in lieu of a continuous volumetric flow monitoring systems provided the molecular weight of the gas is known. For assist steam, use a molecular weight of 18 pounds per pound-mole. For assist air, use a molecular weight of 29 pounds per pound-mole. For flare vent gas, molecular weight must be determined using compositional analysis as specified in paragraph (b) of this section.

(5) Continuously monitoring fan speed or power and using fan curves is an acceptable method for continuously monitoring assist air flow rates.

(6) For perimeter assist air intentionally entrained in lower and/or upper steam, the monitored steam flow rate and the maximum design air-to-steam volumetric flow ratio of the entrainment system may be used to determine the assist air flow rate.

(b) The owner or operator shall determine the concentration of individual components in the flare vent gas using either the methods provided in paragraph (b)(1) or (2) of this section. Alternatively, the owner or operator may elect to directly monitor the net heating value of the flare vent gas following the methods provided in paragraphs (b)(3) of this section and, if desired, may directly measure the hydrogen concentration in the flare vent gas following the methods provided in paragraphs (b)(4) of this section. **The owner or operator may elect to use different monitoring methods for different gaseous streams that make up the flare vent gas using different methods provided the composition or net heating value of all gas streams that contribute to the flare vent gas are determined.**

(1) Except as provided in paragraphs (b)(5) and (6) of this section, the owner or operator shall install, operate, calibrate, and maintain a monitoring system capable of continuously measuring (i.e., at least once every 15-minutes), calculating, and recording the individual component concentrations present in the flare vent gas.

(2) Except as provided in paragraphs (b)(5) and (6) of this section, the owner or operator shall install, operate, and maintain a grab sampling system capable of collecting an evacuated canister sample for subsequent compositional analysis at least once every eight hours while there is flow of a process to the flare. Subsequent compositional analysis of the samples must be performed according to Method 18 of 40 CFR part 60, appendix A-6, ASTM D6420-99 (Reapproved 2010), ASTM D1945-03 (Reapproved 2010), ASTM D1945-14 or ASTM UOP539-12 (all incorporated by reference—see § 63.14).

(3) **Except as provided in paragraphs (b)(5) and (6) of this section, the owner or operator shall install, operate, calibrate, and maintain a calorimeter capable of continuously measuring, calculating, and recording NHV_g at standard conditions.**

(4) If the owner or operator uses a continuous net heating value monitor according to paragraph (b)(3) of this section, the owner or operator may, at their discretion, install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the hydrogen concentration in the flare vent gas.

(5) Direct compositional or net heating value monitoring is not required for purchased (“pipeline quality”) natural gas streams. The net heating value of purchased natural gas streams may be determined using annual or more frequent grab sampling at any one representative location. Alternatively, the net heating value of any purchased natural gas stream can be assumed to be 920 Btu/scf.

(6) Direct compositional or net heating value monitoring is not required for gas streams that have been demonstrated to have consistent composition (or a fixed minimum net heating value).

The company opposes the addition of this language into the operating permit, which are based on 40 CFR 63 Subpart CC (NESHAP from Petroleum Refineries), arguing that they are not applicable requirements to the Revolution Cryogenic facility. The company argued, “Contrary to the applicability criteria outlined in 40 CFR 63.640, the Revolution Cryogenic facility:

- Is an area source with respect to HAP (not major as required by Subpart CC)
- Does not contain the same emissions sources as specified in the rule [40 CFR 63.640(c)(1) – (9)].”

Although this facility is not a refinery and is not subject to this subpart, based on cross references in 40 CFR § 60.18, and since the facility does not have a calorimeter or chromatograph installed at the inlet to the flare, the Department will retain this proposed language. Provided that the permittee can continue to demonstrate that the gas stream sent to the flare has a fixed minimum net heating value, the permittee can demonstrate compliance with these requirements.

e. Fugitive Emissions - Component Leaks (Source 701): DEP Should Provide More Robust Monitoring of Fugitive Emissions and Must Require Method 21 for Quarterly Inspections.

Commenters note that the Department should require more robust monitoring for fugitive emissions by mandating Quarterly Inspections with Method 21, an OGI Camera inspection to be paired with each AVO Inspection, and Method 21-Analysis of all leaks found during any inspection.

Commenters are requesting that more stringent fugitive emission monitoring requirements be placed into the operating permit, by mandating three (3) items: (1) quarterly Method 21 inspections; (2) inspections with an OGI camera during the monthly AVO inspections; and (3) precise data collection with Method 21 for any leak detected by any means. Commenters contend that the requirements in the proposed operating permit could allow for detectable leaks to be missed. Commenters also note that Method 21 must be included in the operating permit as a part of the higher fugitive emission reduction percentages claimed using the 28VHP program.

Commenters assert that adding more monitoring requirements to the existing requirements would allow for different strengths and weaknesses of each method to be compensated for, arguing that it would reduce the time that a potential leak would go unnoticed.

The fugitive emission monitoring requirements outlined in the proposed operating permit align with the established regulatory framework, including the Department’s General Permit 5 (GP-5) for this source category and the federal New Source Performance Standards under 40 CFR Part 60 Subpart OOOOa. These regulations mandate that any detected leak must undergo a first repair attempt within five (5) calendar days and be fully repaired within fifteen (15) days, except in cases where technical infeasibility or safety concerns prevent timely resolution, provided that proper documentation supports such claims.

Commenters also state: “Because Energy Transfer Is Receiving Credit for LDAR Reduction Efficiency Based on Employing the 28VHP Methodology, the Department Must Require Quarterly Inspections of Accessible Fugitive Components Using Method 21.”

As commenters note, a gas analyzer is required to conform with Method 21 described under 40 CFR part 60, Appendix A as a part of the 28VHP program, and ETC has noted that they conform with Method 21 procedures.

In the proposed operating permit, Method 21 is required for closed vent systems at centrifugal compressors, reciprocating compressors, or pneumatic pump affected facilities per 40 CFR §60.5416a. It should be noted that paragraph K of the 28VHP program allows for alternative monitoring frequency schedules of National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H. The Department has altered Section D, Source 701, Condition #001 from the proposed operating permit, originally derived from the GP-5, to state the following: (“For each fugitive emissions component constructed and authorized to operate on or after August 8, 2018...”):

No later than 60 days after initial startup, and quarterly thereafter, the owner or operator shall conduct an LDAR program using either an OGI camera, a gas leak detector that meets the requirements of 40 CFR Part 60, Appendix A-7, Method 21, or other leak detection methods approved by the Division of Source Testing and Monitoring.

To

No later than 60 days after initial startup, and quarterly thereafter, the owner or operator shall conduct an LDAR program using Method 21 in conformance with the 28VHP program.

Similarly, (“For each fugitive emissions component constructed and authorized to operate by the Department on or after February 2, 2013, but prior to August 8, 2018, the following applies...”):

Within 180 days after the initial startup of a source, the owner or operator of the facility shall at a minimum, on a quarterly basis, use forward looking infrared (FLIR) cameras or other leak detection monitoring devices approved by the Department for the detection of fugitive leaks. The Department may grant an extension for use of FLIR camera upon receipt of a written request from the owner or operator of the facility documenting the justification for the requested extension.

To

The owner or operator of the facility shall at a minimum, on a quarterly basis, conduct an LDAR program using Method 21 in conformance with the 28VHP program. Forward looking infrared (FLIR) cameras or other leak detection monitoring devices approved by the Department may also be used in conjunction with Method 21 for the detection of fugitive leaks. The Department may grant an extension for use of FLIR camera upon receipt of a written request from the owner or operator of the facility documenting the justification for the requested extension.

Consequently, this conforms with the 28VHP program requiring Method 21.

f. HMO Heaters: The Permit Lacks Sufficient Monitoring and Reporting Requirements for PM, NO_x, and CO Emissions from the HMO Heaters.

Commenters claim that “the Draft SOOP fails to include any monitoring requirements for PM, NO_x, or CO from the HMO heaters, which are necessary to verify that emissions match the PTE provided in the SOOP Application.” Commenters also discuss the necessity to establish a periodic monitoring frequency for the HMO heaters.

The requirements in the proposed operating permit, and as described in the Response to “c” above, periodic monitoring is required on a three-year basis per the current version of the GP-1. The requirements in the operating permit reflect the applicable requirements of the GP-1. Based on the use of natural gas and the manufacturer guarantee, emissions from these units are predictable and are not a variable process. Actual emissions would only vary from the PTE based on the hours of operation. Monitoring of NO_x, CO, and O₂ can be indicators of efficient combustion. Based on the GP-1 requirements and the manufacturer’s guarantee, the Department does not find it necessary to include additional monitoring, reporting, and recordkeeping requirements for PM, NO_x, and CO for sources fueled by commercially available natural gas. An annual tune up with associated records are still required.

g. The Draft SOOP Must Require ETC to Calculate Emissions According with 25 Pa. Code §135.5 For Each Combustion Unit and Report Such Calculations (Not Only to Keep Records of The Calculations).

Commenters claim that “the Draft Permit establishes a recordkeeping requirement to calculate emissions in accordance with 25 Pa. Code § 135.5 for each combustion unit but lacks a requirement to perform the calculations. This recordkeeping requirement only has meaning when coupled with a permit requirement that the permittee perform emissions calculations. In addition, these emissions calculations should also be required to be reported. See Draft SOOP, at 21, Section IV #014(s)(v).”

The Department disagrees with commenter’s assertion that the operating permit fails to require a calculation for actual emissions from the combustion units. Section C, Condition #019 requires tracking and reporting of actual emissions from all air contamination sources and air cleaning devices at the facility, including any information necessary to perform such calculations such as operating hours, fuel usage, throughput, etc. in accordance with 25 Pa. Code §135.3. Section C, Condition #015 lists 25 Pa. Code §135.5.

h. The Draft SOOP Should Require Monitoring of the Composition of the Inlet Gas On At Least a Quarterly Basis to Assure Accurate VOC and HAPs Emissions Calculations.

Commenters write:

Although the composition of the inlet gas is a value that is necessary to estimate VOC and HAP emissions from various sources, the Draft SOOP fails to require monitoring of this value. The SOOP Application relies on an undated inlet gas value in its “site-specific gas analysis” that has not been updated since the 2018 GP-5 application (and may have been from prior to 2018)... DEP needs to require inlet gas monitoring in order to assure accurate VOC and HAP estimates for a given time period.

The company noted that they use:

[a] ProMax model to determine the potential to emit for the facility that is the basis of the permit application emissions. The model has not changed because the facility conditions remain the same. Actual emissions for the facility are calculated using an annual inlet gas extended analysis. The most recent inlet gas analysis for the facility was collected in November 2024 and was used for the reporting year 2024 emissions that were submitted to the Department.

The facility is required to report accurate actual emissions to the Department on an annual basis and to maintain records of actual emissions on a 12-month rolling basis. It is common in the industry to conduct annual extended inlet gas analyses for actual emission reporting of fugitive emission sources. The instructions for a GP-5 application require that an inlet gas analysis be provided with the application for technical completeness. There is no requirement in the current version of the GP-5 to sample, use chromatography, or other methods to determine gas composition. Consequently, the proposed operating permit reflects the currently applicable requirements to this facility.

However, in alignment with requirements at similar gas processing facilities in similar operation, the Department will impose quarterly inlet gas sampling for consistency.

i. There are No Forms of Intermittent or Continuous Monitoring in the Permit Except for LDAR Requirements.

Commenters write:

The Draft SOOP fails to include intermittent or continuous monitoring of any pollutants that ETC admitted it will be emitting in the SOOP Application aside from the Draft SOOP's LDAR requirements. For example, there are no discernable continuous or even intermittent monitoring requirements for any pollutant for which ETC has PTE from the HMO heaters, amine vent, rod packing/road packing combustor [sic], condensate tanks, miscellaneous tanks, heaters, pneumatic devices, venting/blowdowns, truck loadout, truck loadout combustor, pigging operations, MSS flare, or thermal oxidizer. The Draft SOOP also fails to set testing requirements for any other sources or source groups. The Draft SOOP should require monitoring to measure emissions of all pollutants from each source at Rev Cryo for which ETC listed a PTE in the SOOP Application, and the associated monitoring frequencies should be specified in the permit itself. Testing should also be required for all sources with frequencies established in the permit itself. In addition, all monitoring, testing, and recordkeeping data should be required to be reported to DEP at least monthly in order for the emissions and operational data to be available and for the requirements of the permit to be sufficient to verify compliance.

In summary, commenters claim that the permit fails to include any intermittent or continuous monitoring of any pollutant for all sources and fails to include any testing requirements and requests monitoring of all pollutants from all sources at this facility and requests that the permittee submit monthly reports of monitoring data to the Department.

Monitoring of emissions from all sources “for which ETC listed a PTE in the SOOP application” is either not technically feasible, not economically feasible, or will result in operating permit conditions that are overly burdensome with no additional environmental benefit or reduction in the pollutants emitted from the monitored sources. Continuous emission monitoring systems (CEMS) are most commonly implemented for a variable process source at some Title V facilities. CEMS can only be used on sources with stacks to the outdoor atmosphere and cannot be used on fugitive sources. For certain fugitive emission sources, leak detection and repair (LDAR) programs are often established as discussed under Comment 36(e) above.

For sources that either have predictable process flows or use the same fuel, using AP-42 emission factors, tracking hours of operation, using heat content of fuels, and manufacturer guarantees, emission profiles for those sources can be reliably established with that information. The HMO heaters use the same fuel with a known heat content and manufacturer rating; therefore, emissions would only vary based on operating hours. Sources with manufacturer guarantees are, by definition, are guaranteed not-to-exceed emission rates when operated in accordance with the manufacturer's specifications, maintenance procedures, and good operating practices. Consequently, it is not expected that a source would exceed the manufacturer guaranteed emission rate unless it was not properly maintained or operated, for example. For sources where the potential-to-emit was based on such manufacturer guarantees, performance testing is not necessary.

The permittee is required to track actual emissions of all pollutants from all sources on a 12-month rolling basis and that information is to be made available to the Department at any time upon request as well as submitted via annual AES emission inventory reports. That may include tracking fuel usage, operating hours, the heat content of the gas sent to the flare, gas analyses, knowing the volume of pigging chambers, and manufacturer guarantees, among others.

Comment 37: The Draft SOOP Fails to Include Permit Limits for Pollutants That ETC Admits To Releasing from Various Sources.

Commenters claim that DEP's Draft SOOP fails to include emissions limitations for pollutants of concern that ETC admitted to releasing in its SOOP Application in high quantities. Commenters write:

Under DEP's regulations for operating permits, "[a] permit may contain terms and conditions the Department deems necessary to assure the proper operation of the source," and "[a]t a minimum, each permit shall incorporate by reference the emission and performance standards and other requirements of the act, the Clean Air Act or the regulations thereunder." 25 Pa. Code § 127.441. If the Draft SOOP is to be issued, there are several sources for which limitations should be added and there are several sources for which limitations are so ambiguously worded or unclear in the Draft SOOP as to be unintelligible and unenforceable. These deficiencies must be corrected before DEP issues any final permit.

Response 37: Similar to Comment 36 above, this comment had a number of subcomments that will be addressed below.

Permitting decisions are based, in part, on PTE for regulatory applicability, which represents a worst-case operating scenario. This facility is a natural minor source and includes facility-wide emission limitations for criteria pollutants, VOCs, and HAPs that are not to be exceeded on a 12-month rolling basis.

a. The Draft SOOP Lacks Clear and Enforceable Emissions Limits on PM, NO_x, and CO Emissions from the HMO Heaters (Sources 031, 032, and 033).

Commenters write, "The Draft SOOP lacks any numeric limitations on emissions of pollutants ETC admits will be emitted from the HMO heaters, including PM, NO_x, and CO, and emissions restrictions should be added to Section E.I in order to limit emissions of these pollutants from these sources."

i. PM

The Draft SOOP fails to include any restrictions (or monitoring, discussed in the previous section) on PM from the HMO heaters despite the fact that ETC stated in the SOOP Application that the Potential to Emit ("PTE") for each of these 3 heaters is 0.57 lbs/hour and 2.51 tons per year ("tpy") of PM₁₀ and 0.57 lbs/hr and 2.51 tpy of PM_{2.5}, with all three HMO heaters together having a PTE of 1.72 lb/hr and 7.53 tpy PM₁₀ and 1.72 lb/hr and 7.53 tpy of PM_{2.5}. SOOP Application, at Attachment D, tbl. 12 (pdf page 108). These PTE values are based on an emission factor of 0.014 lb/MMBtu that is in turn based on a Manufacturer's Guarantee. Id. However, the Draft SOOP has no emission restrictions on the quantities or concentrations of PM that the facility may emit. See, e.g., Draft SOOP, at 55 (Section E). Without any lbs/hour or tpy emissions restrictions required in the permit and associated monitoring sufficient to verify compliance with those restrictions, there is no way to determine if the PM emissions will not exceed the PTE expressed in the permit application. The lb/hr and tpy PM limits in the PTE table in the SOOP Application should be adopted as emissions restrictions in the permit and monitoring requirements that are frequent enough to verify compliance with such limits should also be added.

A source to which the potential-to-emit was based on a manufacturer's guarantee may not require additional restrictions. For PM, using a consistent fuel and a manufacturer's guarantee is sufficient to determine actual and potential emissions from the source, as the only variable factor would be the number of hours that the source has operated since the heat content of the fuel and the manufacturer's guarantee would not change. The permittee is required to track the hours of operation of the source and maintain records of actual emissions on a 12-month rolling basis. However, in accordance with the GP-1, Condition 9(d)(ii), there should be a source-specific limit of 0.4 lbs PM/MMBtu per 25 Pa. Code § 123.11 which has been added to the source group HMO Heaters in the operating permit.

ii. NO_x and CO

The Draft SOOP fails to establish clear emissions limitations on NO_x or CO from the HMO heaters, although it appears to Commenters that the Department may have intended to set such limits and that they are necessary for this source. The Draft SOOP includes no numeric emission restrictions in the “Emissions Restriction(s)” section, #001. Draft SOOP, at 55. However, the “Testing Requirements” Section, #003, states, “The permittee shall construct the combustion units capable of reducing nitrogen oxides (NO_x) and carbon monoxide (CO) emissions to or below: i. 30 ppmdv NO_x at 3% O₂; ii. 49 ppmdv CO at 3% O₂.” Draft SOOP, at 55. However, the wording and placement does not create a semantically understandable or legally enforceable emissions restriction. The language is in the “Testing Requirements” section, and it is a manufacturer’s specification for how the units shall be constructed. But requiring that a unit be “capable of” reducing emissions by a certain amount is different from creating a requirement or restriction confirming that the units operate in accordance with those NO_x and CO reduction levels.

The SOOP Application states that the HMO Heaters have a PTE for NO_x of 4.91 lbs/hr and 21.51 tpy as well as a PTE for CO of 4.91 lbs/hr and 21.51 tpy. SOOP Application, at 108. DEP should incorporate these values as explicit emissions restrictions to limit NO_x and CO in the final permit in units of lbs/hour and tpy to require compliance with the levels estimated in the SOOP Application. The permit also needs associated monitoring to be included to assure compliance with these limits, which is discussed in the monitoring section of these comments.

Commenters are correct to note that the intended emission restrictions were inadvertently included in the *testing requirements* section rather than the *emissions restrictions* section, though such limits would still be enforceable regardless of the section to which they are placed. The emission limitations have been moved to the correct section. To note, in the response to Comment 16 above, the emission limitation for CO was revised to reflect the current GP-1.

The language relating to having the units be “capable of” achieving those limitations are based on the manufacturer’s guarantee as well as mirror the exact language in the 2023 version of the GP-1, Section B(1). The permittee is required to conduct periodic monitoring and annual tune ups of the units.

b. The Draft SOOP Fails to Include Emissions Restrictions for Any Pollutant Other than PM for the Regenerator Heaters and Catalytic Heaters (Source 401).

Commenters write:

The Draft SOOP fails to impose emissions restrictions for any pollutant other than particulate matter for the Heaters Source Level, Source ID 401. Draft SOOP, at 34. The SOOP Application shows that the regenerator heaters (HTR-001 and HTR-002) and 15 catalytic heaters have a combined PTE of emit 0.37 tpy VOC, 6.54 tpy NO_x, 5.52 tpy CO, 0.12 tpy HAPs, 0.49 tpy PM₁₀, 0.49 tpy PM_{2.5}, 0.04 tpy SO_x, and 7,582 tpy GHG (CO₂e). SOOP Application, at Attachment D. Yet the permit only establishes emissions limits for PM. The permit should include limits and associated monitoring requirements necessary to assure compliance for each of the other pollutants that the facility will be emitting to assure the facility does not exceed the emissions in lb/hr and tpy that ETC claimed in their PTE calculations.

The Department disagrees that the regenerator heaters and catalytic heaters require additional emission limitations. The heaters are required to meet the standard requirements of 25 Pa. Code § 123.11 and § 123.22. As with all sources at this facility, they are to be operated and maintained in accordance with the manufacturer’s specifications, and actual emissions are to be tracked on a 12-month rolling basis, which can be determined by tracking hours of operation and using AP-42 emission factors. Potential emissions from these units were calculated based on AP-42 emission factors, the manufacturer’s rated heat input, and 8,760 hours of operation per year. Actual emissions from these units are to be included in the facility-wide emission limitations of Section C, Condition #008.

c. For Truck Loading Emissions (Source 702), the Draft Permit Should Require That the Combustor Shall Ensure VOC Emissions Are Controlled by a Minimum of 99%, Which Is the Control Efficiency Stated in the SOOP Application.

For the truck loading emissions (Source 702), the permit specifies that the combustor shall “ensure that VOC emissions from truck loadout are controlled by a minimum of 95%.” Draft SOOP, at 43, Section D, Restriction #001. However, ETC has represented in its application that the truck loading combustor will operate at a 99% control efficiency... DEP failed to provide any explanation for requiring only a 95% control efficiency on VOC emissions when the SOOP Application states that truck loading emissions will be operating at a 99% control efficiency (and, therefore, the emissions levels in the SOOP Application were based on 99%). DEP should require a 99% control efficiency on VOC emissions for truck loading emissions.

The Department agrees that the permit should state a 99% control from the truck loading combustor. It was the intention of the Department to impose the 99% control but had inadvertently included the GP-5 control efficiency of 95%. The minimum control efficiency has been updated. As an alternative to meeting the 99% control efficiency, the permittee may elect to conduct an annual leak test in accordance with the same requirements specified in Section F of the 2018 version of the GP-5.

d. The Draft SOOP Fails to Limit Emissions from Nearly All Sources of Emissions that Will Be Emitting Pollutants and Must Incorporate Additional Limits to Ensure the Safety of the Community.

Commenters write:

Aside from the few incomplete or insufficient limits discussed above (the minimum control efficiencies for the remaining enclosed combustors as well as the Plant Flare), virtually no other source specific or source group specific emission limits are included in the permit. There are no numeric restrictions in the restrictions section of the Draft SOOP (or elsewhere) regarding the quantity of any pollutant may be emitted from the HMO heaters, the amine vent, rod packing/rod packing combustor, tanks, pneumatic devices, venting/blowdowns, fugitive emissions, truck loadout, tank loading combustor, pigging operations, or the thermal oxidizer/rod packing combustor sources. This is despite the fact that each of these sources have the potential to emit pollutants according to ETC’s own PTE calculations. DEP should impose numeric limits to restrict the emissions of all pollutants from all sources with a PTE to ensure that actual emissions do not exceed stated PTE values.

This facility is a natural minor source. The requirements in the operating permit reflect the currently applicable requirements for each source category under the GP-5 and GP-1 under which the facility was constructed and operated. Emissions from the sources above are to be included in facility-wide emission limitations as specified in Section C, Condition #008. Actual emissions are to be tracked on a 12-month rolling basis by way of tracking operating hours, fuel usage, control efficiencies, gas composition, and manufacturer guarantees, among other requirements. Additional monitoring, LDAR, testing, reporting, and recordkeeping requirements ensure practical enforceability of facility-wide emission limitations.

Comment 38: The Permit Replete with Errors and Puts Conditions in Seemingly Incorrect Subsections or Without Regard to Permit Header Categories.

The Draft SOOP contains many errors, misplacements, and ambiguities that frustrate or prevent the ability of the permit to have restrictions or monitoring requirements that are able to be understood by the permittee or the public or enforced by DEP. The examples below are not an exhaustive list.

a. Several Sources Are Listed with Requirements in Both Section D (Source-Specific) and Section E (Source Group Categories) of the Draft SOOP, Which Makes Determining Applicable Requirements for Each Source Challenging

Several sources are listed with differing requirements in both Sections D and E of the permit, which makes identifying applicable requirements unnecessarily confusing. These requirements should be streamlined for each source or should clearly refer to the other parts of the permit that contain requirements for the same units.

It is not uncommon for sources to have site-level (Section C), source-level (Section D), and group-level (Section E) requirements. Oftentimes, specific requirements may apply to an individual source, such as a specific emission limitation, testing requirement, or monitoring requirement, but an applicable federal regulation, such as 40 CFR Part 60 Subpart OOOOa, or others, may be listed as a group-level in Section E to keep all of the requirements under a specific federal regulation in one place that applies to multiple sources at a facility. Other times, for ease of inspecting a facility, it can be helpful to place recordkeeping requirements in Section C of the operating permit and duplicate those requirements as source-specific conditions as well.

b. The Draft SOOP Appears to Erroneously Include Monitoring Requirements in the Recordkeeping Requirements Section for the Fugitives (Source 701) Source Level Requirements.

The definition of leak is erroneously included in the “Recordkeeping Requirements” section rather than the monitoring requirements section. See Draft Permit at 39. “Leak” should be defined in the monitoring requirements section, which has the requirements for when a “leak” is detected. See id. at 38–39.

This condition mirrors Section G(1) and G(2)(b)(viii)(B) of the 2018 GP-5. The first half of this condition specifies recordkeeping requirements, including requiring the permittee to document when an instrument reading meets the definition of a *leak*. The latter half of this condition defines what a leak is. Although it is not necessary to move the definition to a different section, the definition of a leak has been placed under the *additional requirements* section of Section D, Source 701.

c. The Draft SOOP Is Missing Calculations and Hyperlinks in Four Locations, Making the Permit Terms Incomplete and Incorrect.

Commenters write:

There are 4 instances in which the Draft SOOP includes text that is apparently a copy-paste error where it states: “To view Figure, TAB to this link, then press ENTER. There will be a pause while the figure-viewing software loads” but no link is provided. See Draft SOOP, at 53, 60. In these instances, this information is preceded by the phrase: “The net heating value of the gas being combusted in a flare shall be calculated using the following equation.” Id. at 53, 60. This equation cannot be calculated with the equation information and link omitted, and the missing information must be included in permit.

The instances noted here are based on limitations in the Department’s permitting system. Just as certain federal regulations, equations, or tables may be incorporated by reference in an operating permit due to brevity or due to formatting issues within the system, it is also acceptable to incorporate equations in a regulation by reference. However, the formulas were updated for clarity.

Comment 39: A Public Hearing Is Necessary for this Permit Action Because the Public Has a Significant Interest in This Plant Due to Its History of Explosions, Pollution Events, and Noncompliance with Air Pollution Laws.

Response 39: Please refer to the Response to Comment 29 above.

IV.) Conclusion:

I recommend the issuance of an initial natural minor state-only operating permit for this facility with the changes described in this document. The operating permit will have an effective date of two weeks after the official date of issuance so that the permittee has time to acclimate to any changes from the previously authorized GP-5 and GP-1 to the terms and conditions of this state-only operating permit. The operating permit will be effective for a five-year term from the official date of issuance.

List of Commenters:

Date Received	Commenter(s)	Affiliation	Comment No.
12/19/2024	ETC Northeast Pipeline, LLC	ETC Northeast Pipeline, LLC	1-26
11/05/2024	Ethan Story	Center for Coalfield Justice	27-29
11/22/2024	Lisa Hallowell	Environmental Integrity Project	29, 31-39
	Lisa Graves-Marcucci	EIP/Resident	
	Cathy Lodge	Resident	
	Lawrence Hafetz	Clean Air Council	
	Rachel Meyer	Moms Clean Air Force Pennsylvania Chapter	
	Ethan Story	Center for Coalfield Justice	
	Anaïs Peterson	Earthworks	
	Liz Green Schultz	Clean Air Action	
	Ana Hoffman	Carnegie Mellon University, CREATE Lab	
11/26/2024	Samantha Figuly	Resident	28-29
11/25/2024	Barbara White	Resident	28-29
11/25/2024	George Erceg	Resident	28-29
11/25/2024	Anthony R Telles Sr	Resident	28-29
11/25/2024	Melissa K	Resident	28-29
11/25/2024	R.A. Dayton	Resident	28-29
11/25/2024	Paul Brown	Resident	28-29
11/25/2024	John Schaefers	Resident	28-29
11/25/2024	Dawn Peden	Resident	28-29
11/26/2024	George Sarapa	Resident	28-29
11/27/2024	Ryan Joyce	Resident	28-29
11/27/2024	Bill Schill	Resident	28-29
12/08/2024	Christopher East	Resident	28-29
12/14/2024	Richard & Irene Barrie	Residents	28-29
12/16/2024	Jo Ann McNaughton-Kade	Resident	28-29
12/16/2024	Brenda and Nolan Vance	Residents	28-29
12/17/2024	AC Rowland	Resident	28-29
12/19/2024	Nancy Bergey	Resident	28-29
12/19/2024	Steven Patterson	Resident	28-29
12/19/2024	Christopher Lankenau	Resident	28-29
12/19/2024	Jim Gergat	Resident	28-29
12/19/2024	Donald Imler	Resident	28-29
12/19/2024	Michael and Joann Cliggett	Residents	28-29
12/19/2024	Hilary Flint	Resident	28-30
12/19/2024	Suzanne Lamborn	Resident	28-29
12/19/2024	Lynda Ewald	Resident	28-29
12/19/2024	Edward Ketyer	Resident/ AAP Council on Environmental Health & Climate Change for Environmental Health Project and President of Physicians for Social Responsibility Pennsylvania	28-29

12/19/2024	Katie Muth	Resident	28-29
12/19/2024	Thomas Nelson	Resident	28-29
12/20/2024	Anne Jackson	Resident	28-29
12/20/2024	Allan Rubin	Resident	28-29
12/20/2024	Robbie Cross	Resident	28-29
12/20/2024	Talor Musil	Environmental Health Project	28-29
12/22/2024	Cathy Lodge	Resident + Environmental Integrity Project	28-29
12/23/2024	Lisa Hallowell	Environmental Integrity Project	29-39
	Cathy Lodge	Resident	29, 31-39
	Lawrence Hafetz	Clean Air Council	29, 31-39
	Rachel Meyer	Moms Clean Air Force Pennsylvania Chapter	29, 31-39
	Ethan Story	Center for Coalfield Justice	29, 31-39
	Anaïs Peterson	Earthworks	29, 31-39
	Liz Green Schultz	Clean Air Action	29, 31-39
	Ana Hoffman	Carnegie Mellon University, CREATE Lab	29, 31-39
12/24/2024	Katherine Peterson	Resident	28-29
12/24/2024	Anaïs Peterson	Petrochemicals Campaigner on behalf of Earthworks	28-29
12/24/2024	Trina Tokarski	Resident/Ohio River Valley Field Organizer	28-29
12/24/2024	Rachel Meyer	Resident/Moms Clean Air Force Pennsylvania Chapter	28-29
12/24/2024	Sean G. Hoffmann	Legislative Director/ Clean Air Action Fund	28-30
12/24/2024	Nina Victoria, J.D.	Community Advocate	28-29
12/24/2024	Manvika Kohli	Resident	28-29
05/22/2025	Tina Rousselle	Canadian Resident	28



ENERGY TRANSFER

RECEIVED

06/09/2023

AIR QUALITY
DEP, Southwest Regional Office

June 9, 2023

UPS Tracking Number: 1ZT5Z1V31320017414

Mr. Mark Gorog
PADEP – Bureau of Air Quality
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

Mr. Gorog:

ETC Northeast Pipeline, LLC (ETP) is submitting this permit application for a state only operating permit (SOOP) for the continued operation of emissions sources at its existing natural gas processing plant (Revolution Cryo Plant) located in Smith Township, Washington County, Pennsylvania. Per discussions with PADEP, it was determined that ETP should submit a SOOP application instead of a GP5 renewal. The Revolution Cryo Plant is currently operating under General Permit GP5-63-01001A and GP1-63-01001A, both issued on August 8th, 2018.

Per the request of PADEP, ETP is submitting this SOOP application for the continued operation of the following sources:

- One (1) 200 MMSCFD amine sweetening unit with a vent controlled by a thermal oxidizer;
- One (1) 906 MMBtu/hr MSS plant flare;
- One (1) 1.00 Combustor for Truck liquid loading;
- Five (5) heaters of various sizes;
- Fifteen (15) catalytic heaters rated at 0.05 MMBtu/hr;
- Two (2) 90,000-gallon condensate tanks;
- Two (2) 21,000 gallon 2# RVP condensate tanks;
- Miscellaneous storage tanks of various sizes; and
- Associated piping and components.

The enclosed application contains the required application forms and supporting materials including the application fee of \$2,100. The attachments to this letter are organized as outlined below:

- Attachment A: General Information Form (GIF)
- Attachment B: Compliance Review Form
- Attachment C: State Only Operating Permit (SOOP) Form
- Attachment D: Detailed Emission Calculations
- Attachment E: Manufacturer's Data Sheets
- Attachment F: Process Flow Diagram
- Attachment G: Municipal and County Notifications
- Attachment H: Application Fee

Local municipal and county notifications describing the sources are also included in the attached application package. Proof of delivery of these notifications will be submitted to PADEP upon receipt of the delivery receipts.

If you have any further questions regarding this matter, please do not hesitate to contact me at 412-522-2846 or via email at Alyssa.Laird@energytransfer.com.

Sincerely,

Energy Transfer Partners, L.P.

Alyssa Laird
Sr. Specialist - Environmental

SOOP APPLICATION
ETC Northeast Pipeline, LLC



**ENERGY
TRANSFER**

Revolution Cryogenic Plant

Prepared By:

TRINITY CONSULTANTS

4500 Brooktree Road
Suite 310
Wexford, PA 15090



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ATTACHMENT A – GENERAL INFORMATION FORM	A
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ATTACHMENT A – GENERAL INFORMATION FORM



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This form is used by the Department of Environmental Protection (DEP) to inform our programs regarding what other DEP permits or authorizations may be needed for the proposed project or activity. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the DEP.

Related ID#s (If Known) Client ID# 321427 APS ID# Site ID# Auth ID# 1221468 Facility ID# 805136		DEP USE ONLY Date Received & General Notes

CLIENT INFORMATION

DEP Client ID# 321427	Client Type / Code LLC	Dun & Bradstreet ID#	
Legal Organization Name or Registered Fictitious Name ETC Northeast Pipeline, LLC		Employer ID# (EIN) 26-2863376-3	Is the EIN a SSN? ☒ Yes ☐ NO
State of Incorporation or Registration of Fictitious Name		☐ Corporation ☒ LLC ☐ Partnership ☐ LLP ☐ LP ☐ Sole Proprietorship ☐ Association/Organization ☐ Estate/Trust ☐ Other	
Individual Last Name	First Name	MI	Suffix
Additional Individual Last Name	First Name	MI	Suffix
Mailing Address Line 1 6051 Wallace Rd Ext.		Mailing Address Line 2 Suite 300	
Address Last Line – City Wexford	State PA	ZIP+4 15090	Country US
Client Contact Last Name Frisco	First Name Doug	MI	Suffix
Client Contact Title Manager - Environmental Compliance		Phone (570) 505-3730	Ext
Email Address Doug.Frisco@energytransfer.com		FAX	

SITE INFORMATION

DEP Site ID#	Site Name Revolution Cryo Plant		
EPA ID#	Estimated Number of Employees to be Present at Site		
Description of Site Natural Gas Processing Facility			
Tax Parcel ID(s):			
County Name(s) Washington	Municipality(ies) Smith	City	Boro
		☐	☐
		☐	☐
		☐	☐
		☐	☐
Site Location Line 1 Point Pleasant Road	Site Location Line 2		
Site Location Last Line – City Bulger	State PA	ZIP+4 15019	

Detailed Written Directions to Site

From PADEP SWRO, take PA-28 S to get to I-279 S and then I-376 W. Take exit 60A for US-22 W/US-30 W. Take the exit toward Bavington, then a quick right onto Maple Grove Road and a quick left onto Steubenville Pike. Turn left onto Creek Road/T500 and continue straight onto Point Pleasant Road. The facility road will be on your left.

Site Contact Last Name Laird	First Name Alyssa	MI	Suffix
Site Contact Title Senior Environmental Specialist		Site Contact Firm	
Mailing Address Line 1 6051 Wallace Rd Ext		Mailing Address Line 2 Suite 300	
Mailing Address Last Line – City Wexford		State PA	ZIP+4 15090
Phone (412) 522-2846	Ext	FAX	Email Address Alyssa.Najewicz@energytransfer.com
NAICS Codes (Two- & Three-Digit Codes – List All That Apply) 21 & 23		6-Digit Code (Optional) 211112 & 237120	
Client to Site Relationship Owner/Operator			

FACILITY INFORMATION

Modification of Existing Facility	Yes	No
1. Will this project modify an existing facility, system, or activity?	☐	☒
2. Will this project involve an addition to an existing facility, system, or activity?	☒	☐
If "Yes", check all relevant facility types and provide DEP facility identification numbers below.		

Facility Type	DEP Fac ID#	Facility Type	DEP Fac ID#
☒ Air Emission Plant	805136	☐ Industrial Minerals Mining Operation	
☐ Beneficial Use (water)		☐ Laboratory Location	
☐ Blasting Operation		☐ Land Recycling Cleanup Location	
☐ Captive Hazardous Waste Operation		☐ Mine Drainage Treatment / Land Recycling Project Location	
☐ Coal Ash Beneficial Use Operation		☐ Municipal Waste Operation	
☐ Coal Mining Operation		☐ Oil & Gas Encroachment Location	
☐ Coal Pillar Location		☐ Oil & Gas Location	
☐ Commercial Hazardous Waste Operation		☐ Oil & Gas Water Poll Control Facility	
☐ Dam Location		☐ Public Water Supply System	
☐ Deep Mine Safety Operation -Anthracite		☐ Radiation Facility	
☐ Deep Mine Safety Operation -Bituminous		☐ Residual Waste Operation	
☐ Deep Mine Safety Operation -Ind Minerals		☐ Storage Tank Location	
☐ Encroachment Location (water, wetland)		☐ Water Pollution Control Facility	
☐ Erosion & Sediment Control Facility		☐ Water Resource	
☐ Explosive Storage Location		☒ Other: Natural Gas Compressor Station	

Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	40	24	43	-80	20	57
Horizontal Accuracy Measure	Feet			--or-- Meters		
Horizontal Reference Datum Code	☐ North American Datum of 1927 ☒ North American Datum of 1983 ☐ World Geodetic System of 1984					
Horizontal Collection Method Code						
Reference Point Code						
Altitude	Feet 1,140			--or-- Meters		
Altitude Datum Name	☐ The National Geodetic Vertical Datum of 1929 ☐ The North American Vertical Datum of 1988 (NAVD88)					
Altitude (Vertical) Location Datum Collection Method Code						
Geometric Type Code						
Data Collection Date						
Source Map Scale Number	Inch(es)			=	Feet	
	--or-- Centimeter(s)			=	Meters	

PROJECT INFORMATION

Project Name

Revolution Cryo Plant

Project Description

State Only Operating Permit (SOOP) for continued operation of the existing facility.

Project Consultant Last Name

Donaldson

First Name

Ian

MI

Suffix

Project Consultant Title

Managing Consultant

Consulting Firm

Trinity Consultants Inc.

Mailing Address Line 1

4500 Brooktree Road

Mailing Address Line 2

Suite 310

Address Last Line – City

Wexford

State

PA

ZIP+4

15090

Phone

(724) 442-6808

Ext

FAX

Email Address

idonaldson@trinityconsultants.com

Time Schedules

N/A

Project Milestone (Optional)

1. Is the project located in or within a 0.5-mile radius of an Environmental Justice community as defined by DEP?

☐ Yes ☒ No

To determine if the project is located in or within a 0.5-mile radius of an environmental justice community, please use the online [Environmental Justice Areas Viewer](#).

2. Have you informed the surrounding community prior to submitting the application to the Department?

☒ Yes ☐ No

Method of notification: Mail

3. Have you addressed community concerns that were identified?

☐ Yes ☐ No ☒ N/A

If no, please briefly describe the community concerns that have been expressed and not addressed.

4. Is your project funded by state or federal grants?

☐ Yes ☒ No

Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.

Aspect of Project Related to Grant

Grant Source: _____

Grant Contact Person: _____

Grant Expiration Date: _____

5. Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)

☐ Yes ☒ No

Note: If "No" to Question 5, the application is not subject to the Land Use Policy.

If "Yes" to Question 5, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION – *Not Applicable*

Note: Applicants should submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1.	Is there an adopted county or multi-county comprehensive plan?	☐	Yes	☐	No
2.	Is there a county stormwater management plan?	☐	Yes	☐	No
3.	Is there an adopted municipal or multi-municipal comprehensive plan?	☐	Yes	☐	No
4.	Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?	☐	Yes	☐	No
Note: If the Applicant answers "No" to either Questions 1, 3 or 4, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 5 and 6 below. If the Applicant answers "Yes" to questions 1, 3 and 4, the Applicant should respond to questions 5 and 6 below.					
5.	Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval? If zoning approval has been received, attach documentation.	☐	Yes	☐	No
6.	Have you attached Municipal and County Land Use Letters for the project?	☐	Yes	☐	No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 utilizing the [Project Review Form](#).

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	Is this a coal mining project? If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	☐	Yes	☒	No
1.1	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?	☐	Yes	☐	No
1.2	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?	☐	Yes	☐	No
1.3	Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?	☐	Yes	☐	No
1.4	For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?	☐	Yes	☐	No
1.5	Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?	☐	Yes	☐	No
1.6	Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?	☐	Yes	☐	No
2.0	Is this a non-coal (industrial minerals) mining project? If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	☐	Yes	☒	No
2.1	Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?	☐	Yes	☐	No
2.2	Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?	☐	Yes	☐	No

2.3	Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?	☐	Yes	☐	No
2.4	For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?	☐	Yes	☐	No
2.5	Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?	☐	Yes	☐	No
3.0	Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well? If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	☒	Yes	☐	No
3.1	Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?	☐	Yes	☒	No
3.2	Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system? If "Yes", discuss in <i>Project Description</i> .	☐	Yes	☒	No
3.3	Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?	☐	Yes	☒	No
4.0	Will the project involve a construction activity that results in earth disturbance? If "Yes", specify the total disturbed acreage.	☐	Yes	☒	No
4.0.1	Total Disturbed Acreage				
4.0.2	Will the project discharge or drain to a special protection water (EV or HQ) or an EV wetland?	☐	Yes	☐	No
4.0.3	Will the project involve a construction activity that results in earth disturbance in the area of the earth disturbance that are contaminated at levels exceeding residential or non-residential medium-specific concentrations (MSCs) in 25 Pa. Code Chapter 250 at residential or non-residential construction sites, respectively?	☐	Yes	☐	No
5.0	Does the project involve any of the following: water obstruction and/or encroachment, wetland impacts, or floodplain project by the Commonwealth/political subdivision or public utility? If "Yes", respond to 5.1-5.7. If "No", skip to Question 6.0.	☐	Yes	☒	No
5.1	Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?	☐	Yes	☐	No
5.2	Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?	☐	Yes	☐	No
5.3	Floodplain Projects by the Commonwealth, a Political Subdivision of the Commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?	☐	Yes	☐	No
5.4	Is your project an interstate transmission natural gas pipeline?	☐	Yes	☐	No

5.5	Does your project consist of linear construction activities which result in earth disturbance in two or more DEP regions AND three or more counties?	☐	Yes	☐	No
5.6	Does your project utilize Floodplain Restoration as a best management practice for Post Construction Stormwater Management?	☐	Yes	☐	No
5.7	Does your project utilize Class V Gravity / Injection Wells as a best management practice for Post Construction Stormwater Management?	☐	Yes	☐	No
6.0	Will the project involve discharge of construction related stormwater to a dry swale, surface water, ground water or separate storm water system?	☐	Yes	☒	No
6.1	Will the project involve discharge of industrial waste stormwater or wastewater from an industrial activity or sewage to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?	☐	Yes	☐	No
7.0	Will the project involve the construction and operation of industrial waste treatment facilities?	☐	Yes	☒	No
8.0	Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations? If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the <i>Project Description</i> , where applicable.	☐	Yes	☒	No
8.0.1 Estimated Proposed Flow (gal/day)					
9.0	Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?	☐	Yes	☒	No
9.0.1	Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.	☐	Yes	☐	No
10.0	Is this project for the beneficial use of biosolids for land application within Pennsylvania? If "Yes" indicate how much (i.e. gallons or dry tons per year).	☐	Yes	☒	No
10.0.1	Gallons Per Year (residential septage)				
10.0.2	Dry Tons Per Year (biosolids)				
11.0	Does the project involve construction, modification or removal of a dam? If "Yes", identify the dam.	☐	Yes	☒	No
11.0.1	Dam Name				
12.0	Will the project interfere with the flow from, or otherwise impact, a dam? If "Yes", identify the dam.	☐	Yes	☒	No
12.0.1	Dam Name				
13.0	Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?	☒	Yes	☐	No
13.0.1	If "Yes", is the operation subject to the agricultural exemption in 35 P.S. § 4004.1?	☐	Yes	☒	No
13.0.2	If the answer to 13.0.1 is "No", identify each type of emission followed by the estimated amount of that emission.				
Enter all types & amounts of emissions; separate each set with semicolons. See attached emission calculations					

14.0	Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year? If "Yes", check all proposed sub-facilities.	☐	Yes	☒	No
14.0.1	Number of Persons Served				
14.0.2	Number of Employee/Guests				
14.0.3	Number of Connections				
14.0.4	Sub-Fac: Distribution System	☐	Yes	☐	No
14.0.5	Sub-Fac: Water Treatment Plant	☐	Yes	☐	No
14.0.6	Sub-Fac: Source	☐	Yes	☐	No
14.0.7	Sub-Fac: Pump Station	☐	Yes	☐	No
14.0.8	Sub Fac: Transmission Main	☐	Yes	☐	No
14.0.9	Sub-Fac: Storage Facility	☐	Yes	☐	No
15.0	Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?	☐	Yes	☒	No
16.0	Is your project to be served by an existing public water supply? If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project.	☐	Yes	☒	No
16.0.1	Supplier's Name				
16.0.2	Letter of Approval from Supplier is Attached	☐	Yes	☐	No
17.0	Will this project be served by on-lot drinking water wells?	☐	Yes	☒	No
18.0	Will this project involve a new or increased drinking water withdrawal from a river, stream, spring, lake, well or other water bod(ies)? If "Yes", reference Safe Drinking Water Program.	☐	Yes	☒	No
18.0.1	Source Name				
19.0	Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste? If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed.	☐	Yes	☒	No
19.0.1	Type & Amount				
20.0	Will your project involve the removal of coal, minerals, contaminated media, or solid waste as part of any earth disturbance activities?	☐	Yes	☒	No
21.0	Does your project involve installation of a field constructed underground storage tank? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
21.0.1	Enter all substances & capacity of each; separate each set with semicolons.				
22.0	Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
22.0.1	Enter all substances & capacity of each; separate each set with semicolons.				
23.0	Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
23.0.1	Enter all substances & capacity of each; separate each set with semicolons.				

24.0	Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
24.0.1	Enter all substances & capacity of each; separate each set with semicolons.				
NOTE: If the project includes the installation of a regulated storage tank system, including diesel emergency generator systems, the project may require the use of a Department Certified Tank Handler. For a full list of regulated storage tanks and substances, please go to www.dep.pa.gov search term storage tanks					
25.0	Will the intended activity involve the use of a radiation source?	☐	Yes	☒	No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

For applicants supplying an EIN number: I am applying for a permit or authorization from the Pennsylvania Department of Environmental Protection (DEP). As part of this application, I will provide DEP with an accurate EIN number for the applicant entity. By filing this application with DEP, I hereby authorize DEP to confirm the accuracy of the EIN number provided with the Pennsylvania Department of Revenue. As applicant, I further consent to the Department of Revenue discussing the same with DEP prior to issuance of the Commonwealth permit or authorization.

Type or Print Name Stephen D. Schuman

Stephen Schuman
Signature

VP Operations - East Division
Title

6/6/2023
Date

ATTACHMENT B – COMPLIANCE REVIEW FORM



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Compliance Review Form Submittal (check all that apply)

- ☐ Original Filing
☒ Amended Filing

Date of Last Compliance Review Form Filing:

May 2022

Type of Submittal

☐ New Plan Approval	☐ New Operating Permit	☒ Renewal of Operating Permit
☐ Extension of Plan Approval	☐ Change of Ownership	☐ Periodic Submission (@ 6 mos)
☐ Other: _____		

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant") (non-corporations-attach documentation of legal name)

ETC Northeast Pipeline, LLC

Address 6051 Wallace Road Extension, Suite 300

Wexford, PA 15090

Telephone 724-934-0100

Taxpayer ID# 26-2863396

Permit, Plan Approval or Application ID# N/A

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual	☐ Syndicate	☐ Government Agency
☐ Municipality	☐ Municipal Authority	☐ Joint Venture
☐ Proprietorship	☐ Fictitious Name	☐ Association
☐ Public Corporation	☐ Partnership	☐ Other Type of Business, specify below:
☒ Private Corporation	☐ Limited Partnership	

Describe below the type(s) of business activities performed.

Applicant conducts non-FERC-regulated midstream natural gas gathering and processing business. Applicant's business activities include constructing and operating non-FERC-regulated, intrastate gathering lines and compression facilities; transporting natural gas from well sites to natural gas processing facilities or interconnections with interstate natural gas transmission pipelines; constructing and operating natural gas processing facilities; transporting natural gas to interconnection points on interstate transmission pipelines; transporting natural gas liquids to interstate liquid pipelines.

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
Energy Transfer, L.P.	TX	DE	30-0108820	Limited Partner of Heritage ETC, L.P. and Ultimate Parent of Applicant
Heritage ETC GP, LLC	TX	DE	26-2124572	General partner of Heritage ETC, L.P.
Heritage ETC, L.P.	TX	DE	20-0660756	Sole Member of LA GP, LLC and Limited Partner of La Grange Acquisition, L.P.
LA GP, LLC	TX	TX	05-0532446	General partner of LaGrange Acquisition, L.P.
LaGrange Acquisition, L.P.	TX	TX	27-0030184	Parent of Applicant
*** ETC Northeast Pipeline, LLC***	PA	DE	26-2863396	***Applicant***
Subsidiaries of Ultimate Parent with Operations in PA	Attachment 1	Attachment 1	Attachment 1	Attachment 1

SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"

Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
Regency Marcellus Gas Gathering, LLC	101 West Third Street, 3 rd Floor Williamsport, PA 17701	City of Williamsport Lycoming County	570-505-3700	Subsidiary of Applicant
ETC Northeast Pipeline, LLC	6051 Wallace Road Extension, Suite 300, Wexford, PA 15090	Allegheny County, Wexford	724-934-0100	Applicant
ETC Northeast Field Services, LLC	6051 Wallace Road Extension, Suite 300, Wexford, PA 15090	Allegheny County, Wexford	724-934-0100	Subsidiary of Applicant
See Attachment 2				

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address
LaGrange Acquisition, L.P.	8111 Westchester Drive Dallas, TX 75225

Heritage ETC GP, LLC		8111 Westchester Drive Dallas, TX 75225		
List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).				
Name		Business Address		
Stephen D. Schuman		6051 Wallace Road Ext, Suite 300, Wexford, PA 15090		
Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.				
Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date
See Attachment 2				

Compliance Background. (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date	Dollar Amount Penalty
5/4/2023	Pike CS	TV-04-00741	Dehy control device downtime	NOV	Corrected	N/A
1/4/2023	Taylor CS	AG5-08-00013A	THC reduction efficiency requirement	NOV	Corrected, entered into CACP 5/8/2023	\$7,500.00
7/28/22	Revolution Cryo	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected	NA
7/7/22	Revolution Cryo	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected	NA
3/9/22	Lone Walnut CS	AG5-41-00012A	HAP emission exceedance	NOV	Corrected, corrective action plan submitted to DEP 3/24/22	NA
3/9/22	Quaker State Road CS	AG5-41-00004B	HAP emission exceedance	NOV	Corrected, corrective action plan submitted to DEP 3/24/22	Pending
2/3/22	Revolution Cryo	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected	NA
1/10/22	Revolution Cryo	AG5-63-01001A	Heater emission test not conducted at adequate operating load	NOV	Corrective action schedule submitted to DEP	NA
11/12/21	Revolution Cryo	AG5-63-01001A	Visible emissions exceedances from flare	CACP	Corrected, CACP for multiple NOV's.	\$15,550.00
10/12/21	Revolution Cryo	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected	NA
3/15/21	Milesky CS	AG5-30-00012A	HCHO testing not conducted within 180 days of permit issuance	NOV/CACP	Corrected, entered into CACP 1/5/22.	\$8,640.00

3/15/21	Revolution Cryo	AG5-63-01001A	Visible emissions and opacity exceedance from flare	NOV	Corrected	NA
3/10/21	Revolution Cryo	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected	NA
1/25/21	Revolution Cryo	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected	NA
1/15/21	Revolution Cryo	AG5-63-01001A	Visible emissions exceedance from flare	NOV	Corrected	NA
11/17/20	Revolution Cryo	AG5-63-01001A	Failure to conduct Method 22 observation	NOV	Corrected	NA
2/4/20	Hirkey CS	66-00010	Late SOOP renewal application	NOV	Corrected	NA
3/18/19	Chapin Dehy	GP5-66-003A	Missed LDAR inspections	NOV/CACP	Corrected, entered into CACP 3/6/2020.	\$2,550.00
5/22/17	Mehoopany CS	GP5-66-004	Periodic monitoring CO exceedance	NOV	Corrected	NA
3/30/16	Galaxy CS	GP5-10-400A	Late operating permit fee	NOV/CACP	Corrected, entered into CACP 4/6/16	\$500.00

List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
None	None	None	None	None

CONTINUING OBLIGATION. Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

VERIFICATION STATEMENT

Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.

Stephen Schuman

Signature

6/6/2023

Date

Stephen D. Schuman

Name (Print or Type)

VP Operations - East Division

Title

Attachment 1
APCA Compliance Review Form
Subsidiaries with Operations in Pennsylvania of
Ultimate Parent (Energy Transfer Partners, L.P.) of Applicant (ETC Northeast Pipeline, LLC)
June 2023

Entity Name	Entity Main Address	Domestic Jurisdiction	FEIN #	Relationship to Applicant
Regency Marcellus Gas Gathering LLC	101 West Third Street, 3 rd Flr Williamsport, PA 17701	DE	27-2142725	Subsidiary of applicant
ETC Northeast Field Services, LLC	6051 Wallace Road, Suite 300 Wexford, PA 15090	DE	35-2497449	Subsidiary of applicant
ET Rover Pipeline LLC	1300 Main Street Houston, TX 77002	DE	46-5655475	Indirect subsidiary of ultimate parent and Member, Rover Pipeline LLC joint venture
Rover Pipeline LLC	1300 Main Street Houston, TX 77002	DE	47-1958303	Joint Venture of ET Rover Pipeline LLC and a non-affiliated company, AE-MidCo Rover, LLC
Energy Transfer Marketing & Terminals L.P.	8111 Westchester Drive Dallas, TX 75225	TX	23-3102655	Indirect subsidiary of ultimate parent
Sunoco Pipeline L.P.	8111 Westchester Drive Dallas, TX 75225	TX	23-3102656	Indirect subsidiary of ultimate parent
ETC Production LLC	8111 Westchester Drive Dallas, TX 75225	DE	88-1911493	Indirect subsidiary of ultimate parent

Attachment #2: Names, Locations and Permit Information for all ETC Northeast Pipeline, LLC and Subsidiary Entity Facilities in PA.

Facility	Company Name	Location	Permit Number	Permit Issuance Date	Permit Expiration
AUBURN	Regency Marcellus Gas Gathering, LLC	Auburn Twp., Susquehanna Co.	AG5-58-00015A	11/12/2019	11/30/2024
BARTO	Regency NEPA Gas Gathering, LLC	Penn Twp., Lycoming Co.	GP5-41-02G	6/10/2022	6/10/2027
BRADFORD	Regency Marcellus Gas Gathering, LLC	West Burlington, Twp., Bradford Co.	GP5-05-04G	5/16/2023	5/16/2028
BOBST MOUNTAIN	Regency Marcellus Gas Gathering, LLC	Cogan House Twp., Lycoming Co.	GP5-41-651B	7/5/2018	7/5/2023
CANOE RUN	Regency Marcellus Gas Gathering, LLC	Mifflin Twp., Lycoming Co.	AG5-41-00001A	5/22/2023	5/22/2028
CHAPIN	Regency Marcellus Gas Gathering, LLC	Monroe Twp., Wyoming Co.	GP5-66-003A	1/31/2023	1/31/2028
HIRKEY	Regency Marcellus Gas Gathering, LLC	Washington Twp., Wyoming Co.	66-00010	7/8/2020	7/8/2025
LONE WALNUT	Regency Marcellus Gas Gathering, LLC	Cummings Twp. Lycoming Co.	AG5-41-00012A	7/23/2020	7/23/2025
MEHOOPANY	Regency Marcellus Gas Gathering, LLC	Washington Twp. Wyoming Co.	AG5-66-00003A	9/5/2018	9/5/2023
MILESKY	Regency Marcellus Gas Gathering, LLC	Center Twp., Green Co.	GP5-30-00216B	11/20/2019	11/20/2024
OGONTZ EAST	Regency Marcellus Gas Gathering, LLC	Cummings Twp. Lycoming Co.	AG5-41-00016A	8/16/2021	8/16/2026
OGONTZ WEST	Regency Marcellus Gas Gathering, LLC	Cummings Twp. Lycoming Co.	AG5-41-00015A	7/22/2021	7/22/2026
POORMAN	Regency Marcellus Gas Gathering, LLC	Gallagher Twp., Clinton Co.	AG5-18-00001A	9/6/2019	9/6/2024
QUAKER	Regency Marcellus Gas Gathering, LLC	Fairfield Twp., Lycoming Co.	AG5-41-00004A	8/20/2021	8/20/2026
RED BEND	Regency Marcellus Gas Gathering, LLC	Cogan House Twp., Lycoming Co.	GP5-41-700A	6/10/2022	6/10/2027
ROUPP	Regency Marcellus Gas Gathering, LLC	Mifflin Twp., Lycoming Co.	AGP-41-00018A	10/14/2021	10/14/2026
SEVERCOOL	Regency Marcellus Gas Gathering, LLC	Forkston Twp., Wyoming Co.	AG5-66-00001A	7/18/2018	7/18/2023
SUSQUEHANNA EAST	Regency Marcellus Gas Gathering, LLC	Lathrop Twp., Susquehanna Co.	GP5-58-005A	3/31/2023	3/31/2028
TAYLOR	Regency Marcellus Gas Gathering, LLC	Canton Twp., Bradford Co.	GP5-08-391A	1/10/2022	1/10/2027
TEEL	Regency Marcellus Gas Gathering, LLC	Springville Twp., Susquehanna Co.	GP5-58-002A	2/28/2023	2/28/2028
GALAXY	ETC Northeast Pipeline, LLC	Parker Twp., Butler Co.	AG5-10-00005A	12/1/2021	12/1/2026
REVOLUTION CRYO	ETC Northeast Pipeline, LLC	Smith Twp., Washington Co.	GP-1-63-01001A	8/7/2018	8/7/2023
			GP5-63-01001A (AG5-	8/7/2018	8/7/2023
PIKE	ETC Northeast Field Services, LLC	New Sewickley Twp., Beaver Co.	04-00741A	11/5/2021	11/5/2026
FREEDOM	ETC Northeast Field Services, LLC	New Sewickley Twp., Beaver Co.	GP5-04-00744A	2/1/2023	2/1/2028

ATTACHMENT C – STATE ONLY OPERATING PERMIT (SOOP) FORM



OP #: _____
Date: _____

STATE-ONLY OPERATING PERMIT APPLICATION

Section 1 – General Information

1.1 Application Type

Type of permit for which application is made: (Check one)

☐ Initial _____

☒ Renewal Operating Permit No. AG5-63-00004A & GP1-63-01001A

1.2 Facility Information

Firm Name: ETC Northeast Pipeline LLC Federal Tax ID: 26-2863376-3

Facility Name: Revolution Cryo Plant Plant Code: 805136

NAICS Code: 211112 & 237120 SIC Code: 1321

Description of NAICS Code: Natural gas liquid extration & oil and gas pipeline and related structures construction

Description of SIC Code: Natrual gas liquids in mining division

County: Washington Municipality: Smith Township

Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum: North American Datum of 1983 Horizontal Collection Method: _____ Reference Point: _____

1.3 Permit Contact Information

Name: Alyssa Laird Title: Senior Environmental Specialist

Address: 6051 Wallace Rd Ext. Suite 300

City: Wexford State: PA ZIP: 15090

Telephone: (412) 522-2846

Email: Alyssa.Laird@energytransfer.com

1.4 Small Business Question

Are you a small business as defined by the Pennsylvania Air Pollution Control Act? ☐ Yes ☒ No

Are you a small business as defined by the U.S. Small Business Administration? ☐ Yes ☒ No

1.5 Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No

Place confidential information on separate page(s) marked "Confidential".

In order to request confidential treatment for information in any document, you must submit a redacted version of the relevant document with the confidential information blacked out (and thus suitable for public disclosure), along with a letter of request containing a table identifying the page and line number of each redaction, along with a justification for each redacted item as to why it should be deemed confidential under the specific criteria allowed under 25 Pa. Code § 127.12(d) and Section 13.2 of the APCA.

1.6 Certification of Truth, Accuracy and Completeness by a Responsible Official

I certify that, subject to the penalties of Title 18 Pa. C.S.A. Section 4904 and 35 P.S. Section 4009(b)(2), I am the responsible official having primary responsibility for the design and operation of the facilities to which this application applies and that the information provided in this application is true, accurate, and complete to the best of my knowledge, information, and belief formed after reasonable inquiry.

(Signed) Stephen Schuman

Date: 6/6/2023

Name (Typed): Stephen D. Schuman

Title: VP Operations – East Division

Telephone: (878) 332-2240

Email: Dutch.Schuman@energytransfer.com

Section 2 – Site Information

2.1 Potential Emission Estimates for the Site

Provide the estimated potential emission for the site BEFORE and AFTER utilizing the proposed restriction(s) and/or limitation(s).

Pollutant or CAS No.	Potential Emission BEFORE taking Limitations (TPY)	Potential Emission AFTER taking Limitations (TPY)
VOC	17.74	17.74
NOx	30.60	30.60
CO	35.30	35.30
Methanol	0.03	0.03
HCHO	0.05	0.05
Benzene	0.01	0.01
Total HAPs	1.74	1.74
PM10	8.09	8.09
PM2.5	8.09	8.09
SOx	0.38	0.38
GHG (CO ₂ e)	80,172	80,172

* Provide all supporting calculation methods as an attachment.

2.2 Facility Type

Is this facility a Synthetic Minor Facility? ☐ Yes ☒ No

IMPORTANT: Note that all Synthetic Minor Facilities must be able to meet the proposed restriction(s) and/or limitation(s) immediately upon the submission of this application. By signing the Certification of Compliance in Section 13 of this application, the facility for which a Synthetic Minor Status is proposed will be deemed a Synthetic Minor Facility according to the restriction(s) and/or limitation(s) proposed upon receipt of the application by the DEP, unless the DEP determines that the facility is unable to meet the Synthetic Minor requirements at a later date.

2.3 Synthetic Minor Facility Information (to be completed by all facilities seeking Synthetic Minor Status)

Synthetic Minor Status for this facility can be taken at the: Source Level ☐ AND/OR Site Level ☐

If limitation(s) and/or restriction(s) can be taken at the site level (for all sources within this facility), complete the following questions, otherwise please go on to Section 3, "Site Inventory".

Synthetic Minor Status for the Entire Site is achievable through the following restrictions: (Please check all that apply and describe in detail what is/are proposed):

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor

2.4 Compliance Method for the Site

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 2.3.

a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s) listed in Section 2.3:

b. Describe what is to be reported in the compliance report:

c. Reporting start date:

d. Indicate the frequency for submitting compliance report as explained above:

Section 3 – Site Inventory

3.1 Provide a complete list of all air pollution sources, control equipment, emission points, and fuel material locations within this site.

If preprinted information is provided, correct and/or add any new sources as necessary. Note: One (1) of the following sections (5, 6 or 7) of the application must be completed for each new source listed here.

Unit ID	Unit Name	Unit Type
P201	200 MMSCFD Amine Unit 1 (AMINE-001)	Process
P301	Storage Tanks	Process
C202	Flare (FLARE-001)	Process
C702	Combustor for Tank & Loading (COMB-001)	Process
C201	Thermal Oxidizer (THERM-001)	Process
P701	Fugitive Emissions - Component Leaks	Process
P601	Emissions - Blowdowns	Process
P401	NGL Dehy Regen Heater (HTR-001)	Process
P401	Regen Gas Heater (HTR-002)	Process
P031	HMO Heater (HTR-003)	Process
P032	HMO Heater (HTR-004)	Process
P033	HMO Heater (HTR-005)	Process
P401	Catalytic Heaters	Process
P801	Pigging Operations and Gas Venting	Process
P501	Pneumatic Devices	Process

3.2 Provide a narrative description of the facility's operation. The project narrative should include a description of the basic operational activities this facility is engaged in. The narrative should describe how these activities generate air emissions and how they are controlled. Attach the narrative if more space is needed.

See attachment E.

3.3 Attach flow diagram of processes giving all (gaseous, liquid and solid) flow rates. Also, list all raw materials charged to process equipment, and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average charges describing fully expected variations in production rates). Indicate (on diagram) all points where contaminants are controlled (location of water sprays, collection hoods, or other pickup points, etc.) Describe collection hoods location, design, airflow and capture efficiency. Describe any restriction requested and how it will be monitored. Indicate all fugitive emission points and any by-pass stack.

3.4 Provide a listing of all changes in chronological order (additions and subtractions) made at a facility since the last submittal and attach it to this application. For example:

- March 2016 - Added shot blast booth 5, exempted by the attached Request for Determination.
- Dec 2017 - Installed new paint line in accordance with Plan Approval XX-XXXXX
- Etc.

- 2015 Initial Start up
- 2018 Revolution Expansion Project

3.5 For renewals, please review the current operating permit. If you are proposing any changes to the conditions of the existing permit, please provide the condition number, the requested change, and justification for the requested change.

N/A

Section 4 – Source Group (optional) – Not Applicable

4.1 Source Group Definition

Define groups of sources that are subject to one or more applicable requirements that apply to all sources in the group.

Group No.	Source ID (for sources in this group)

4.2 Applicable Requirements for Source Groups

Describe and cite all applicable requirements pertaining to all source groups.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Group No.	Citation No.	Citation Limitation	Limitation Used

Section 5 – Combustion Operational Inventory

(Complete this section for each combustion source in this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new combustion unit listed in Section 3 of this application.

5.1 General Source Information

a. Source ID: 401 (Part of) b. Source Name: Heaters (HTR-001)
c. Plan Approval or Operating Permit Number: AG5-63-00004A
d. Manufacturer: N/A e. Model Number: N/A
f. Source Description: NGL Dehy Regenerator Heater
g. Rated Heat Input/Throughput: 6.22 MMBtu/hr h. Installation Date: N/A
i. Exhaust Temperature: Units: j. Exhaust % Moisture: k. Exhaust Flow Volume: SCFM

5.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
401	Catalytic Heaters	Z401	Fugitive	100

5.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
Natural Gas		54 MMscf/yr	

5.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
Natural Gas	FML01	0	0	1,009

*FML = Fuel Material Location

5.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

5.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 5.5.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

5.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or proposed in Section 5.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

5.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 5 – Combustion Operational Inventory

(Complete this section for each combustion source in this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new combustion unit listed in Section 3 of this application.

5.1 General Source Information

a. Source ID: 401 (Part of) b. Source Name: Heaters (HTR-002)
c. Plan Approval or Operating Permit Number: AG5-63-00004A
d. Manufacturer: N/A e. Model Number: N/A
f. Source Description: Regenerator Gas Heater
g. Rated Heat Input/Throughput: 8.5 MMBtu/hr h. Installation Date: N/A
i. Exhaust Temperature: Units: j. Exhaust % Moisture: k. Exhaust Flow Volume: SCFM

5.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
401	Catalytic Heaters	Z401	Fugitive	100

5.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
Natural Gas		73.8 MMscf/yr	

5.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
Natural Gas	FML01	0	0	1,009

*FML = Fuel Material Location

5.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

5.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 5.5.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

5.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or proposed in Section 5.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

5.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 5 – Combustion Operational Inventory

(Complete this section for each combustion source in this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new combustion unit listed in Section 3 of this application.

5.1 General Source Information

a. Source ID: 031 - 033 b. Source Name: HMO Heaters (HTR-003 – HTR-005)

c. Plan Approval or Operating Permit Number: GP1-63-01001A

d. Manufacturer: Tulsa Heaters, Inc. (Zeeco Burners) e. Model Number: N/A (Vertical Cylindrical GSLF Free-Jet Segmented Ring Burners)

f. Source Description: 40.92 MMBtu/hr HMO Heaters (each)

g. Rated Heat Input/Throughput: 40.92 MMBtu/hr h. Installation Date: N/A

i. Exhaust Temperature: Units: j. Exhaust % Moisture: k. Exhaust Flow Volume: SCFM

5.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
031	HMO Heater 1	Z031	Fugitive	100
032	HMO Heater 2	Z032	Fugitive	100
033	HMO Heater 3	Z033	Fugitive	100

5.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
Natural Gas		355.3 MMscf/yr (Per Unit)	
Natural Gas		1,065.8 MMscf/yr (Total)	

5.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
Natural Gas	FML01	0	0	1,009

*FML = Fuel Material Location

5.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

5.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 5.5.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

5.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or proposed in Section 5.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

5.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 5 – Combustion Operational Inventory

(Complete this section for each combustion source in this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new combustion unit listed in Section 3 of this application.

5.1 General Source Information

a. Source ID: 401 (Part of) b. Source Name: Catalytic Heaters (HTR-006)
c. Plan Approval or Operating Permit Number: _____
d. Manufacturer: N/A e. Model Number: N/A
f. Source Description: 15 catalytic heaters
g. Rated Heat Input/Throughput: 0.85 MMBtu/hr (combined) h. Installation Date: N/A
i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

5.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
401	Catalytic Heaters	Z401	Fugitive	100

5.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
Natural Gas		7.3 MMscf/yr (Total)	

5.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
Natural Gas	FML01	0	0	1,009

*FML = Fuel Material Location

5.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

5.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 5.5.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

5.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or proposed in Section 5.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

5.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 6 – Incinerator Operational Inventory

(Complete this section for each incinerator at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new incinerator listed in Section 3 of this application.

6.1 General Source Information

a. Source ID: N/A b. Source Name: _____

c. Plan Approval or Operating Permit Number: _____

d. Manufacturer: _____ e. Model Number: _____

f. Source Description: _____

g. Rated Heat Input/Throughput: _____ h. Installation Date: _____

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

l. Capacity: _____ Lbs/Hr m. Primary Burner Heat Input: _____ Units: _____

n. Exhaust % CO₂: _____ o. Secondary Burner Heat Input: _____ Units: _____

p. Incinerator Class: _____

q. Waste Type: _____ r. Waste BTU/lb: _____

6.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow

6.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence

6.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)

*FML = Fuel Material Location

6.5 Limitations on Source Operation

Maximum number of hours of source operation per year: _____

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor?

6.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were identified in Section 6.5.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

6.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 6.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY

6.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used

Section 7 – Process Operational Inventory

(Complete this section for each process at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new process listed in Section 3 of this application.

7.1 General Source Information

a. Source ID: 201 b. Source Name: Amine Unit 1 (AMINE-001)
c. Plan Approval or Operating Permit Number: AG5-63-00004A
d. Manufacturer: N/A e. Model Number: N/A
f. Source Description: Amine Sweetening Unit
g. Rated Capacity (for engines use BHP): 200 MMSCFD h. Installation Date: N/A
i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

7.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
201	Amine Unit 1 Regen Vent	C201	Thermal Oxidizer	~73
201	Amine Unit 1 Flash Gas	C202	Flare	~27

7.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
Natural Gas	2310021203	200 MMSCFD	

7.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
Natural Gas	FML01	0	0	1,009

*FML = Fuel Material Location

7.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

7.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 7.6.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

7.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 7.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

7.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 7 – Process Operational Inventory

(Complete this section for each process at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new process listed in Section 3 of this application.

7.1 General Source Information

a. Source ID: 301 (Part of) b. Source Name: Tanks/Vessels
c. Plan Approval or Operating Permit Number: AG5-63-00004A
d. Manufacturer: N/A e. Model Number: N/A
f. Source Description: Condensate Tanks
g. Rated Capacity (for engines use BHP): 90,000 gals (each) h. Installation Date: N/A
i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

7.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
301	Tanks/Vessels	Z301	Tanks/Vessels Stack	100

7.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
N/A			

7.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
N/A				

*FML = Fuel Material Location

7.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor?

7.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 7.6.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

7.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 7.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

7.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 7 – Process Operational Inventory

(Complete this section for each process at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new process listed in Section 3 of this application.

7.1 General Source Information

a. Source ID: 301 (Part of) b. Source Name: Tanks/Vessels
c. Plan Approval or Operating Permit Number: AG5-63-00004A
d. Manufacturer: N/A e. Model Number: N/A
f. Source Description: 2# RVP Condensate Tanks
g. Rated Capacity (for engines use BHP): 21,000 gals (each) h. Installation Date: N/A
i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

7.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
301	Tanks/Vessels	C702	Loading Combustor	100

7.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
N/A			

7.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
N/A				

*FML = Fuel Material Location

7.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

7.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 7.6.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

7.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 7.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

7.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 7 – Process Operational Inventory

(Complete this section for each process at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new process listed in Section 3 of this application.

7.1 General Source Information

a. Source ID: 301 (Part of) b. Source Name: Tanks/Vessels
c. Plan Approval or Operating Permit Number: AG5-63-00004A
d. Manufacturer: N/A e. Model Number: N/A
f. Source Description: Miscellaneous Tanks
g. Rated Capacity (for engines use BHP): 500 – 16,800 gals h. Installation Date: N/A
i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

7.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
301	Tanks/Vessels	Z301	Tanks/Vessels Stack	100

7.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
N/A			

7.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
N/A				

*FML = Fuel Material Location

7.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

7.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 7.6.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

7.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 7.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

7.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 7 – Process Operational Inventory

(Complete this section for each process at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new process listed in Section 3 of this application.

7.1 General Source Information

a. Source ID: 501 b. Source Name: Pneumatics

c. Plan Approval or Operating Permit Number: AG5-63-00004A

d. Manufacturer: N/A e. Model Number: N/A

f. Source Description: Pneumatic Devices

g. Rated Capacity (for engines use BHP): _____ h. Installation Date: N/A

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

7.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
501	Pneumatics	Z501	Fugitive	100

7.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
Natural Gas	2310021203	Varies	

7.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)

*FML = Fuel Material Location

7.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

7.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 7.6.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

7.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 7.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

7.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 7 – Process Operational Inventory

(Complete this section for each process at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new process listed in Section 3 of this application.

7.1 General Source Information

a. Source ID: 601 b. Source Name: Venting/Blowdowns

c. Plan Approval or Operating Permit Number: AG5-63-00004A

d. Manufacturer: N/A e. Model Number: N/A

f. Source Description: Venting/Blowdowns

g. Rated Capacity (for engines use BHP): _____ h. Installation Date: N/A

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

7.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
601	Venting/Blowdowns	C202	Flare	~96
601	Venting/Blowdowns	Z601	Fugitive	~4

7.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
Natural Gas	2310021203	Varies	

7.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
Natural Gas	FML01	0	0	1,009

*FML = Fuel Material Location

7.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

7.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 7.6.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

7.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 7.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

7.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 7 – Process Operational Inventory

(Complete this section for each process at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new process listed in Section 3 of this application.

7.1 General Source Information

a. Source ID: 701 b. Source Name: Fugitives

c. Plan Approval or Operating Permit Number: AG5-63-00004A

d. Manufacturer: N/A e. Model Number: N/A

f. Source Description: Fugitives

g. Rated Capacity (for engines use BHP): _____ h. Installation Date: N/A

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

7.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
701	Fugitives	Z701	Fugitive	100

7.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence

7.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)

*FML = Fuel Material Location

7.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

7.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 7.6.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

7.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 7.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

7.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 7 – Process Operational Inventory

(Complete this section for each process at this site. Duplicate this section as needed).

For renewals, review and correct any pre-printed information and add additional sections for any new process listed in Section 3 of this application.

7.1 General Source Information

a. Source ID: 801 b. Source Name: Pigging Operations

c. Plan Approval or Operating Permit Number: AG5-63-00004A

d. Manufacturer: N/A e. Model Number: N/A

f. Source Description: Pigging

g. Rated Capacity (for engines use BHP): _____ h. Installation Date: N/A

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

7.2 Exhaust System Components

Explain how the exhaust components are configured:

From Unit ID	Unit ID Description	To Unit ID	Unit ID Description	Percent Flow
801	Pigging	C202	Flare	100

7.3 Source Classification Code (SCC) Listing for Standard Operation

Fuel/Material	Associated SCC	Max. Throughput Rate	Firing Sequence
Natural Gas	2310021203	Varies	

7.4 Maximum Fuel Physical Characteristics

If taking limitations on Fuel Physical Characteristics, see instructions.

SCC/Fuel Burned	FML*	% Sulfur	% Ash	BTU Content (Units)
Natural Gas	FML01	0	0	1,009

*FML = Fuel Material Location

7.5 Limitations on Source Operation

Maximum number of hours of source operation per year: 8,760

☐	Hours of Operation:	
☐	Production/Throughput Rate:	
☐	Type of Fuel:	
☐	Fuel Usage:	
☐	Control Devices:	
☐	Emissions Limitations:	
☐	Other:	

Describe how the elected restriction(s) will allow the facility to become a Synthetic Minor? N/A

7.6 Compliance Method for this source

Complete this section only if limitation(s) and/or restriction(s) were proposed in Section 7.6.

- a. Explain how you would demonstrate compliance with the restriction(s) and/or limitation(s):

N/A

- b. Describe what is to be reported in the compliance report:

- c. Reporting start date: _____

- d. Indicate the frequency for submitting compliance report as explained above: _____

7.7 Source Potential to Emit

Give Potential Emission estimate for all air pollutants emitted at this source. Calculations for the Potential Emissions Estimate here should have included the restriction(s) and/or limitation(s) proposed in Section 7.5, if applicable.

Pollutant or CAS Number	Fuel/SCC	Emissions/Activity Allowable per Unit	Calc. Method	Max. Capacity	Total Hours	Emission in TPY
See Attach. C						

7.8 Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.

Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Fuel/SCC	Citation Number	Limitation associated with the citation	Limitation Used
No changes from current permit			

Section 8 – Control Device Information (duplicate this section as needed)

For renewals, review and correct any pre-printed information and add additional sections for any new control device listed in Section 3 of this application.

8.1 General Control Device Information

- a. Unit ID: C202 b. Unit Name: Flare (FLARE-001)
- c. Used by Sources: Process Safety Vents, Flash Tank for Amine Unit, Pigging, Stabilizer Overhead Compressor Blowdowns, Fugitives
- d. Type: Maintenance startup, shutdown (MSS) flare
- e. Pressure Drop (in. H₂O): _____ f. Capture Efficiency: 100%
- g. Flow Rate (specify unit): 0.34 MMBtu/hr (pilot rating), 906 MMBtu/hr (flare rating)
- h. Manufacturer: N/A i. Model Number: N/A
- j. Installation Date: N/A

8.2 Control Device Efficiencies for this Control Device:

Pollutant Name	CAS No.	Control Efficiency	Basis for Efficiency Estimate
VOC		98%	Manufacturer's Specifications
HAP		98%	Manufacturer's Specifications

Section 8 – Control Device Information (duplicate this section as needed)

For renewals, review and correct any pre-printed information and add additional sections for any new control device listed in Section 3 of this application.

8.1 General Control Device Information

a. Unit ID: C204 b. Unit Name: Loading Combustor

c. Used by Sources: Liquids Loading

d. Type: Combustor for Truck Liquid Loading of 2# Condensate

e. Pressure Drop (in. H₂O): _____ f. Capture Efficiency: 100%

g. Flow Rate (specify unit): 0.086 MMBtu/hr (pilot rating), 1.0 MMBtu/hr (flare rating)

h. Manufacturer: N/A i. Model Number: N/A

j. Installation Date: N/A

8.2 Control Device Efficiencies for this Control Device:

Pollutant Name	CAS No.	Control Efficiency	Basis for Efficiency Estimate
VOC		99%	Manufacturer's Specifications
HAP		99%	Manufacturer's Specifications

Section 8 – Control Device Information (duplicate this section as needed)

For renewals, review and correct any pre-printed information and add additional sections for any new control device listed in Section 3 of this application.

8.1 General Control Device Information

- a. Unit ID: C201 b. Unit Name: THERM-001
- c. Used by Sources: Amine Unit Vent (Still Vent Only)
- d. Type: Thermal Oxidizer
- e. Pressure Drop (in. H₂O): _____ f. Capture Efficiency: 100%
- g. Flow Rate (specify unit): 0.27 MMBtu/hr (pilot rating), 1.07 MMBtu/hr (flare rating)
- h. Manufacturer: N/A i. Model Number: N/A
- j. Installation Date: N/A

8.2 Control Device Efficiencies for this Control Device:

Pollutant Name	CAS No.	Control Efficiency	Basis for Efficiency Estimate
VOC		99%	Manufacturer's Specifications
HAP		99%	Manufacturer's Specifications

Section 9 – Stack/Flue Information (duplicate this section as needed)

For renewals, review and correct any pre-printed information and add additional sections for any new stack/flue listed in Section 3 of this application.

9.1 General Stack/Vent Information

a. Unit ID: Z401 b. Unit Name: Heaters

c. Discharge Type: Vertical

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: _____

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum: North American Datum of 1983 Horizontal Collection Method: _____ Reference Point: _____

k. Does the stack have a bypass? ☐ Yes ☐ No

a. Unit ID: Z031 – Z033 b. Unit Name: HMO Heaters

c. Discharge Type: Vertical

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: _____

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum: North American Datum of 1983 Horizontal Collection Method: _____ Reference Point: _____

k. Does the stack have a bypass? ☐ Yes ☐ No

Section 9 – Stack/Flue Information (duplicate this section as needed)

For renewals, review and correct any pre-printed information and add additional sections for any new stack/flue listed in Section 3 of this application.

9.1 General Stack/Vent Information

a. Unit ID: C201 b. Unit Name: THERM-001

c. Discharge Type: _____

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: P201 (Still Vent Only)

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum:	North American Datum of 1983	Horizontal Collection Method:	Reference Point:
_____	_____	_____	_____

k. Does the stack have a bypass? ☐ Yes ☐ No

a. Unit ID: C202 b. Unit Name: Flare (FLARE-001)

c. Discharge Type: _____

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: P201 (flash gas only), P601, and P801

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum:	North American Datum of 1983	Horizontal Collection Method:	Reference Point:
_____	_____	_____	_____

k. Does the stack have a bypass? ☐ Yes ☐ No

Section 9 – Stack/Flue Information (duplicate this section as needed)

For renewals, review and correct any pre-printed information and add additional sections for any new stack/flue listed in Section 3 of this application.

9.1 General Stack/Vent Information

a. Unit ID: C702 b. Unit Name: COMB-001

c. Discharge Type: _____

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: P301 (Part of)

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum:	North American Datum of 1983	Horizontal Collection Method:	Reference Point:
_____	_____	_____	_____

k. Does the stack have a bypass? ☐ Yes ☐ No

a. Unit ID: Z301 b. Unit Name: Tank/Vessels Stack

c. Discharge Type: _____

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: P301 (Part of)

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum:	North American Datum of 1983	Horizontal Collection Method:	Reference Point:
_____	_____	_____	_____

k. Does the stack have a bypass? ☐ Yes ☐ No

Section 9 – Stack/Flue Information (duplicate this section as needed)

For renewals, review and correct any pre-printed information and add additional sections for any new stack/flue listed in Section 3 of this application.

9.1 General Stack/Vent Information

a. Unit ID: Z501 b. Unit Name: Pneumatic Controller Stack

c. Discharge Type: _____

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: P501

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum:	North American Datum of 1983	Horizontal Collection Method:	Reference Point:
_____	_____	_____	_____

k. Does the stack have a bypass? ☐ Yes ☐ No

a. Unit ID: Z601 b. Unit Name: Blowdown Fugitive Stack

c. Discharge Type: _____

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: P601 (Part of)

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum:	North American Datum of 1983	Horizontal Collection Method:	Reference Point:
_____	_____	_____	_____

k. Does the stack have a bypass? ☐ Yes ☐ No

Section 9 – Stack/Flue Information (duplicate this section as needed)

For renewals, review and correct any pre-printed information and add additional sections for any new stack/flue listed in Section 3 of this application.

9.1 General Stack/Vent Information

a. Unit ID: Z701 b. Unit Name: Fugitives

c. Discharge Type: _____

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: P701

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum:	North American Datum of 1983	Horizontal Collection Method:	Reference Point:
_____	_____	_____	_____

k. Does the stack have a bypass? ☐ Yes ☐ No

a. Unit ID: Z801 b. Unit Name: Pigging Fugitives

c. Discharge Type: _____

d. Diameter (ft): _____ Height (ft): _____ Base Elevation (ft): _____

e. Exhaust Temperature: _____ Exhaust % Moisture: _____ Exhaust Velocity: _____

f. Exhaust Volume: _____ ACFM Exhaust Volume: _____ SCFM

g. Distance to Nearest Property Line (ft): _____ h. Weather Cap?: ☐ Yes ☐ No

i. Used by Units: P801 (Part of)

j. Latitude: 40.411944 Longitude: -80.349167

Horizontal Reference Datum:	North American Datum of 1983	Horizontal Collection Method:	Reference Point:
_____	_____	_____	_____

k. Does the stack have a bypass? ☐ Yes ☐ No

Section 10 – Fuel Material Location (FML) Information

For renewals, review and correct any pre-printed information and add additional sections for any new FML listed in Section 3 of this application.

10.1 Fuel Material Location Information

a. FML ID: FML01 b. Name: Natural Gas

c. Capacity: _____ Units: _____ d. Fuel: Natural Gas

e. Maximum Fuel Characteristics: If fuel is coal, what is the moisture content? _____

% Ash: 0 % Sulfur: 0 BTU Content: 1,009 Units: BTU/scf

f. Used by Source: 201, 031-033

a. FML ID: _____ b. Name: _____

c. Capacity: _____ Units: _____ d. Fuel: _____

e. Maximum Fuel Characteristics: If fuel is coal, what is the moisture content? _____

% Ash: _____ % Sulfur: _____ BTU Content: _____ Units: _____

f. Used by Source: _____

a. FML ID: _____ b. Name: _____

c. Capacity: _____ Units: _____ d. Fuel: _____

e. Maximum Fuel Characteristics: If fuel is coal, what is the moisture content? _____

% Ash: _____ % Sulfur: _____ BTU Content: _____ Units: _____

f. Used by Source: _____

Section 11 – Compliance Plan for the Facility

- 11.1 Will your facility be in compliance with all applicable requirements at the time of permit issuance and continue to comply with these requirements during the permit duration? ☒ Yes ☐ No
- 11.2 Will your facility be in compliance with all applicable requirements presently scheduled to take effect during the term of the permit? ☒ Yes ☐ No
- 11.3 Will these requirements be met by the regulatory required dates? ☒ Yes ☐ No

If you checked "No" in Part 11.1, 11.2 or 11.3, answer the following questions:

- 11.4 Identify applicable requirement(s) for which compliance is not or will not be achieved:

Unit ID	Citation No.

- 11.4.1 Briefly describe how compliance with this/these applicable requirement(s) will be achieved:

11.4.2 Provide a detailed schedule of compliance for the noncomplying sources or activities identified in this section of the application. Include an enforceable sequence of corrective actions with milestone and projected compliance dates.

Date	Action/Milestone

11.4.3 Indicate the submittal frequency for the progress report (s): _____

11.4.4 Starting date for the submittal of the progress report(s): _____

Section 12 – Alternative Operating Scenario (optional)

(Duplicate this section for each source participated in this alternative scenario.)

12.1 General Information

- a. Alternative Operating Scenario Name or ID: N/A
- b. Unit ID: _____ c. Unit Name: _____
- d. Unit Type (check one): ☐ Combustion ☐ Incinerator ☐ Process
☐ Control Device ☐ Fuel Material Location
- e. Give a brief description of this alternative scenario stating how it is different from the standard operation:

12.2 Operational Flexibility Request

Check all that apply.

- ☐ Alternative exhaust system component configuration
If this box is checked, complete Sections 12.3 and 12.7
- ☐ Alternative type of fuel usage replacing or in addition to an existing fuel in standard operation.
If this box is checked, complete Sections 12.4 and/or 12.5 and 12.7
- ☐ Alternative process method replacing or in addition to a process SCC existing in standard operation.
If this box is checked, complete Section 12.6 and 12.7
- ☐ Alternative lower limitations. Describe

12.3 Exhaust System Components

Specify the complete exhaust system component configuration for this alternative operating scenario.

From Component Type	From Component Number	To Component Type	To Component Number	Percent Flow	Begin Date	End Date

12.4 Source Classification Code (SCC) Listing for Alternative Operation

Give a complete listing of all fuels burned, products produced by a process or waste incinerated for this alternative operating scenario.

Fuel	Associated SCC	Max. Throughput Rate	Firing Sequence

12.5 Alternative Fuel Physical Characteristics

Give a complete listing of all fuels physical characteristics for this alternative operating scenario.

SCC/Fuel Burned	FML	% Sulfur	% Ash	BTU Content (Units)

12.6 Alternative Process/Product Description

Give a complete listing of all fuels physical characteristics for this alternative operating scenario.

- a. Briefly describe the change(s) in raw materials and/or process methods used in this operating scenario, if applicable:

- b. Provide and briefly describe the process SCC associated with this alternative operating scenario:

Process SCC:

SCC Description:

- c. Alternative Product(s):

12.7 Source Potential to Emit

Give potential emission estimate for all air pollutants emitted at this source for this operating scenario.

[illegible]

Section 13 – Certification of Compliance for Synthetic Minor Facilities

In order for this Synthetic Minor facility to avoid the Title V Operating Permit requirements, the applicant must agree to be bound by the emissions limitation(s) and/or restriction(s) contained in this application. In addition, the applicant must agree that these emission limitation(s) are enforceable by DEP, the Environmental Protection Agency and the citizens.

13.1 Schedule for Compliance Certification Submission

- a. Frequency of submittal: _____
- b. Beginning date: _____

13.2 Certification of Compliance by a Responsible Official

I certify that, subject to the penalties of Title 18 Pa. C.S.A. Section 4904 and 35 P.S. Section 4009(b)(2), the sources covered by this application will comply with the emission limitations and other requirements contained in this application and all previously issued plan approvals and operating permits. I further certify that, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.

(Signed) Stephen Schuman Date 6/6/2023

Name (Typed) Stephen D. Schuman

Title: VP Operations – East Division

ATTACHMENT D – EMISSION CALCULATIONS

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

Atmospheric Emissions from Each Source at the Facility

Source	Pollutants																					
	VOC		NO _x		CO		CH ₃ OH		HCHO		Benzene		Total HAPs		PM ₁₀		PM _{2.5}		SO _x		GHG (CO ₂ e)	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Amine Vent (AMINE-001)	0.55	2.42	---	---	---	---	0.00	0.01	---	---	0.00	0.01	0.03	0.12	---	---	---	---	---	---	343	1,504
Storage Tanks	0.30	2.07	---	---	---	---	0.00	0.01	---	---	---	---	0.01	0.06	---	---	---	---	---	---	0.27	1.20
Flare (FLARE-001)	---	---	61.66	1.65	281.08	7.52	---	---	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.53	0.01	76,305	2,974
Combustor for Tank & Loading (COMB-001)	---	---	0.11	0.33	0.09	0.28	---	---	---	---	---	---	---	---	0.01	0.02	0.01	0.02	0.00	0.00	1,171	2,495
Thermal Oxidizer (THERM-001)	---	---	0.13	0.58	0.11	0.48	---	---	---	---	---	---	---	---	0.01	0.04	0.01	0.04	0.00	0.00	158	692
Fugitive Emissions - Component Leaks	1.58	6.90	---	---	---	---	---	---	---	---	---	---	0.07	0.30	---	---	---	---	---	---	396	1,735
Emissions - Blowdowns	---	13.70	---	---	---	---	---	---	---	---	---	---	---	0.86	---	---	---	---	---	---	---	964
NGL Dehy Regen Heater (HTR-001)	0.03	0.15	0.62	2.70	0.52	2.27	---	---	0.00	0.00	0.00	0.00	0.01	0.05	0.05	0.21	0.05	0.21	0.00	0.02	728	3,191
Regen Gas Heater (HTR-002)	0.05	0.20	0.84	3.69	0.71	3.10	---	---	0.00	0.00	0.00	0.00	0.02	0.07	0.06	0.28	0.06	0.28	0.01	0.02	996	4,360
HMO Heater (HTR-003)	0.22	0.98	1.64	7.17	1.64	7.17	---	---	0.00	0.01	0.00	0.00	0.08	0.34	0.57	2.51	0.57	2.51	0.02	0.11	4,792	20,991
HMO Heater (HTR-004)	0.22	0.98	1.64	7.17	1.64	7.17	---	---	0.00	0.01	0.00	0.00	0.08	0.34	0.57	2.51	0.57	2.51	0.02	0.11	4,792	20,991
HMO Heater (HTR-005)	0.22	0.98	1.64	7.17	1.64	7.17	---	---	0.00	0.01	0.00	0.00	0.08	0.34	0.57	2.51	0.57	2.51	0.02	0.11	4,792	20,991
Catalytic Heaters	0.00	0.02	0.03	0.15	0.03	0.15	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7	31
Pigging Operations and Gas Venting	---	0.62	---	---	---	---	---	---	---	---	---	---	---	0.03	---	---	---	---	---	---	---	72
Pneumatic Devices	0.02	0.07	---	---	---	---	---	---	---	---	---	---	0.00	0.00	---	---	---	---	---	---	1.21	5.30
TOTAL	3.19	29.09	68.30	30.60	287.44	35.30	0.01	0.03	0.01	0.05	0.00	0.01	0.37	2.51	1.85	8.09	1.85	8.09	0.62	0.38	94,484	80,998

- Notes:**
- 1. PM₁₀ and PM_{2.5} emissions are filterable + condensable.
 - 2. Emissions from loading and unloading of condensate are included in Storage Tanks totals
 - 3. Short-term emissions rates from limited duration activities (ex. pigging, compressor blowdowns) are not included in the 'lb/hr' values. All potential emissions are, however, included in the 'tpy' value

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 1. Amine Sweetening Unit Vent Emissions Calculations

Amine Sweetening Unit Information:

Source ID:	AMINE-001
Max. Hours of Operation (hr/yr):	8,760
Control Device for Still Vent:	Thermal Oxidizer
Still Vent - Control Efficiency:	99%
Max Still Vent Flow Rate to Control (lb/hr):	380
Control Device for Flash Gas:	MSS Flare
Flash Gas - Control Efficiency:	98%
Max Flash Flow Rate to Control (lb/hr):	139

Amine Unit Vent Emissions Data (each unit):

Pollutant	Uncontrolled Emissions		Controlled Emissions		Emissions Estimation Method
	lbs/hr	tpy	lbs/hr	tpy	
VOC	31.49	137.91	0.55	2.42	See Note 1 below
HAPs	2.51	11.01	0.03	0.12	See Note 1 below
CH ₃ OH	0.34	1.49	0.00	0.01	See Note 1 below
Benzene	0.26	1.15	0.00	0.01	See Note 1 below
NO _x	N/A	N/A	N/A	N/A	See Thermal Oxidizer/MSS Flare Calculations
SO _x	N/A	N/A	N/A	N/A	See Thermal Oxidizer/MSS Flare Calculations
CO	N/A	N/A	N/A	N/A	See Thermal Oxidizer/MSS Flare Calculations
PM ₁₀	N/A	N/A	N/A	N/A	See Thermal Oxidizer/MSS Flare Calculations
PM _{2.5}	N/A	N/A	N/A	N/A	See Thermal Oxidizer/MSS Flare Calculations
GHG (CO ₂ e)	391.77	1,715.97	343.42	1,504.18	See Note 2 below

Notes:

1. Controlled emissions are calculated by assuming specified control efficiencies for the combustion devices.
2. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298). CO₂ emissions represent the uncombusted CO₂ emissions.
3. Emissions of NO_x, SO_x, CO, PM, and GHG pollutants are the products of combustion of the vent streams in the combustion devices. Based on Promax simulation of facility and process streams.

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 1. Amine Sweetening Unit Vent Emissions Calculations

Promax Emissions Data - Amine Vent (pre-control, each unit):

Pollutant	Scaled Uncontrolled Still Vent	Uncontrolled Still Vent	Scaled Uncontrolled Flash	Uncontrolled Flash Gas
	lbs/hr	lbs/hr	lbs/hr	lbs/hr
CO2	342.4821	311.3474	0.0047	0.0043
Methane	0.2056	0.1869	1.7659	1.6054
Ethane	29.4577	26.7797	113.6133	103.2848
Propane	4.1841	3.8038	18.9327	17.2115
Isobutane	0.2180	0.1982	1.1519	1.0472
n-Butane	0.8134	0.7394	2.8976	2.6342
Isopentane	0.0643	0.0584	0.2964	0.2694
n-Pentane	0.0832	0.0757	0.3175	0.2887
n-Hexane	0.0172	0.0157	0.0702	0.0638
Cyclohexane	0.0000	0.0000	0.0000	0.0000
Heptanes	0.0014	0.0012	0.0095	0.0086
2,2,4-Trimethylpentane	0.0000	0.0000	0.0000	0.0000
Benzene	0.2562	0.2329	0.0075	0.0068
Toluene	1.7743	1.6130	0.0369	0.0336
Ethylbenzene	0.0109	0.0099	0.0002	0.0002
Xylenes	0.0000	0.0000	0.0000	0.0000
CH ₃ OH	0.3394	0.3085	0.0008	0.0007
C8 + Heavier Hydrocarbons	0.0001	0.0001	0.0025	0.0023
Total Emissions	379.9078	345.3707	139.1076	126.4615
Total Hydrocarbon Emissions	37.4257	34.0234	139.1029	126.4572
Total VOC Emissions	7.7625	7.0568	23.7237	21.5670
Total HAP Emissions	2.3980	2.1800	0.1156	0.1051

Notes:

1. Based on Promax simulation of facility and process stream scaled up as an engineering factor: 1.1
2. Methanol (CH₃OH) emissions are based on a site specific sample. ProMax is used to estimate methanol emissions.
3. Amine unit flash tank gas will either be used as fuel in the HMO heaters or be routed to the MSS flare. These calculations assume that all flash tank gas is sent to flare.

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 2. Storage Tank Emissions Calculations

Storage Tank Information:

Source:	Condensate Tanks	2# RVP Condensate Tank	Methanol Tank	Oil Tanks	Slop Tank	R.O. Water Storage Tank	Amine Storage Tank	Amine Drain Tank	Propane Storage Tank	Open Drain Tank
Tank ID:	U-406A/B	TK-811A/B	MISCELLANEOUS TANKS							
Tank Capacity (gallons, each):	90,000	21,000	500	280 to 11,760	Varies	16,800	8,820	4,200	5,000	4,000
Tank Contents:	Pressurized Condensate	2# Condensate	Methyl Alcohol (or similar)	New/Used Compressor Oil/Liquids	Waste Fluids	R.O. Water	Amine/Water	Amine/Water	Propane	Oil/Water (assume 1% condensate)
Tank Type:	Bullet (Pressurized)	Fixed Roof w/Gas Blanket & Controlled by COMB-001	Horizontal	Fixed Roof / Horizontal	Fixed Roof	Fixed Roof	Fixed Roof with Gas Blanket	Fixed Roof	Pressurized	Fixed Roof
Annual Throughput (gallons/year, each):	27,488,880	8,420,112	6,000	274,008	558,240	201,600	105,840	50,400	N/A (pressurized)	24,000
Annual Throughput (bbl/day, each):	1,793	549	0.39	17.87	36.41	---	---	---	---	0.1
Number of Tanks	2	2	1	10	6	2	1	2	1	2
Hours of Operation (hr/yr):	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760	8,760

Emissions Data - Total Emissions (Working + Breathing + Flashing):

Pollutant	Emissions		Emissions		Emissions		Emissions		Emissions		Emissions		Emissions		Emissions		Emissions		Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
VOC	---	0.77	0.21	0.90	0.00	0.01	0.00	0.00	0.04	0.18	---	---	0.00	0.01	---	---	---	---	0.04	0.20
HAPs	---	---	0.01	0.04	0.00	0.01	0.00	0.00	0.00	0.01	---	---	0.00	0.00	---	---	---	---	0.00	0.00
Methane	---	---	0.10	0.45	---	---	---	---	0.16	0.70	---	---	0.01	0.05	---	---	---	---	---	---
CO2	---	---	---	---	---	---	---	---	0.06	0.26	---	---	---	---	---	---	---	---	---	---

1. ProMax was used to estimate methanol, lube oil, and slop tank emissions
2. Misc tanks may include tanks for TEG and MEG. Vapor pressure for these two liquids so low that emissions assumed to be negligible
3. AP-42 Chapter 7 formulas used to calculate emissions from #2 condensate tanks and slop tanks using parameters/compositions as calculated via Promax software
4. Tank emissions are calculated on maximum expected throughput (if known). For smaller tanks, calculations conservatively assume one turnover per month (open drain tank is once every other month)
5. No emissions result from high pressure condensate pressurized tanks under normal operations. Truck unloading calculations are included here; please see unloading calculations tables for detail
6. The following tanks will be equipped with a residue gas blanket for safety: #2 stabilized condensate and amine. See Gas Blanket Calculations table:
7. Stabilized condensate tank emissions will be controlled by the truck loading combustor at 99%. Loading emissions for 2# condensate tank are included here; please see loading calculations tables for detail

Total Tank Emissions Data:

Pollutant	lbs/hr	tpy
VOC	0.30	2.07
HAPs	0.01	0.06
Methane	0.27	1.20
CO2	0.06	0.26

Company Name: ETC Northeast Pipeline, LLC
 Facility Name: Revolution Cryo Plant
 Project Description: Facility PTE

TABLE 3. Liquid Unloading (Truck Hose Disconnect for Condensate) Emissions Calculations

Materials Transferred at Truck Rack:

Source ID	Material Transferred	Loading or Unloading	# Trucks Unloading per Day (truck/day)	Truck Size (bbl)	Avg. Daily Throughput (bbl/day)	Annual Throughput (bbl/yr)	Trucks Per Year (truck/year)
Truck Hose Disconnect	High Pressure Condensate	Unloading	25	180	3,586	1,308,994	7,272

Uncontrolled Crude Truck Unloading Hose Disconnect Fugitive Emissions:

Source ID	Loading Arm Diameter ¹	Soft Hose Length ¹	Loading Arm Pipe Length ¹	Loading Arm Overpressure ¹	Depressurized Volume ²	Vapor Molecular Weight ³	True Vapor Pressure ³	Fugitive VOC Emissions		
	(in)	(ft)	(ft)	(psig)	(ft ³ /truck)	(lb/lb-mole)	(psia)	(lb/truck)	(lb/hr)	(tpy)
Truck Hose Disconnect	4	10	10	1	0.99	83	14.70	0.21	---	0.77

1. Estimated typical parameters from similar loading operations.
2. The hose will be capped as soon as it is disconnected from the truck. It is assumed that all of the vapor from the soft hose is released (worst case emissions) and all of the vapor from the pipe above atmospheric pressure (14.7 psia) or gauge pressure is released. The vapor area released is calculated by taking the volume of the hose and piping multiplied by the pressure fraction released. The entire volume of the hose is assumed to be released, but only the pressure above atmospheric or gauge pressure of the pipe. Depressurized Volume: (Diameter² x Pi ÷ 4) x [Hose length x (psia ÷ 14.7 psi) + Pipe length x (psig ÷ 14.7 psi)]
3. Per HYSIS scenario for facility. Conservatively assumes the liquid molecular weight as the vapor molecular weight and vapor pressure equal to atmospheric.
4. Emissions summed with the condensate tank emissions on the table " Storage Tank Emissions Calculations".

Sample Calculations:

$$\text{Depressurized Volume (ft}^3\text{/truck): } \frac{8.73\text{E-}02 \text{ ft}^2}{\text{truck}} \times \frac{10 \text{ ft}}{385.4 \text{ ft}^3} \times \frac{1 \text{ psig} + 14.7 \text{ psia}}{14.7 \text{ psia}} + \frac{8.73\text{E-}02 \text{ ft}^2}{\text{truck}} \times \frac{10 \text{ ft}}{385.4 \text{ ft}^3} \times \frac{1 \text{ psig}}{14.7 \text{ psia}} = \frac{0.99 \text{ ft}^3}{\text{truck}}$$

$$\text{Truck Unloading Emissions (lb/truck): } \frac{0.99 \text{ ft}^3}{\text{truck}} \times \frac{\text{lb-mol}}{385.4 \text{ ft}^3} \times \frac{83 \text{ lb}}{\text{lb-mol}} \times \frac{14.70 \text{ psia}}{14.7 \text{ psia}} = \frac{2.12\text{E-}01 \text{ lb}}{\text{truck}}$$

$$\text{Annual Emissions (tpy): } \frac{0.21 \text{ lb}}{\text{truck}} \times \frac{7272 \text{ trucks}}{\text{yr}} \times \frac{1 \text{ ton}}{2,000 \text{ lb}} = \frac{0.77 \text{ ton}}{\text{yr}}$$

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 4. Liquid Loading Emissions Calculations

Liquid Loading Information:

Parameter	Value	Description
S	1.45	saturation factor for splash loading (AP-42 Table 5.2-1)
Collection Efficiency		NA
Control Efficiency		NA
P	0.42	true vapor pressure of liquid loaded (psia) - engineering estimate
M	103	molecular weight of vapors (lb/lb-mol) - engineering estimate
T	513.1	temperature of liquids loaded (deg R) - engineering estimate

Description	Loading Losses ¹	Maximum Throughput ²	VOC Uncontrolled Emissions	VOC Controlled Emissions	
	(lb/10 ³ gal)	(gal)	(tpy)	(lb/hr)	(tpy)
Slop Hauling	1.52	3,349,440	2.54	---	2.54

Notes:

- Uncontrolled Loading Losses: $L_L \text{ (lb/10}^3 \text{ gal)} = 12.46 \text{ (SPM)}/T$
- Although slop is expected to be < 10% condensate, the loading slop liquid/vapor properties conservatively assumed equivalent to #2 condensate
- Emissions summed with the slop tank emissions on the table " Storage Tank Emissions Calculations".
- Slop Truck Loading factor (lb/Mgal): 1.52

Company Name:

Facility Name:

Project Description:

ETC Northeast Pipeline, LLC

Revolution Cryo Plant

Facility PTE

TABLE 4. Liquid Loading Emissions Calculations

Liquid Loading Information:

Parameter	Value	Description
S	1.45	saturation factor for splash loading (AP-42 Table 5.2-1)
Collection Efficiency	98.7%	Capture Efficiency for Vapor-Balanced Loading using NSPS-tested trucks (AP-42 Section 5.2)
Control Efficiency	99%	Control Efficiency of Combustor
P	0.42	true vapor pressure of liquid loaded (psia) - from EPA Tanks run
M	103	molecular weight of vapors (lb/lb-mol) - from EPA Tanks run
T	513.1	temperature of liquids loaded (deg R) - from EPA Tanks run

Description	Loading Losses ¹	Maximum Throughput ²	VOC Uncontrolled Emissions	VOC Controlled Emissions	
	(lb/10 ³ gal)	(gal)	(tpy)	(lb/hr)	(tpy)
2# Condensate Hauling	1.52	16,840,224	12.76	---	0.29

Notes:

1. Uncontrolled Loading Losses:

$L_L \text{ (lb/10}^3 \text{ gal)} = 12.46 \text{ (SPM)}/T$
2. Loading of 2# product (condensate) is the only on-loading of condensate into trucks at the facility
3. See - H8. Loading Combustor for combustion related emissions. VOC Routed to Loading Combustor (tpy)

12.47
4. Hourly emissions assumes the following:

0.5

Hrs per Loading Event (estimated)

2,300

Number of Truck Loading Events per Year (estimated)

1,150

Hours of Truck Loading per Year

180

bbls/truck (capacity)
5. Emissions summed with the condensate tank emissions on the table " Storage Tank Emissions Calculations".
6. Controlled Stabilized Truck Loading factor (lb/Mga)

0.035
6. Vapor to combustor (scf/Mgal):

5.498

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 5. Control Device Emissions Calculations - Maintenance Startup, Shutdown (MSS) Facility Flare

Control Device Information:

Source ID:	FLARE-001
Control Efficiency:	98%
Calculated Loading to flare (MMBtu/hr):	906
Calculated Loading to flare (MMBtu/yr):	45,532
Pilot Gas Rate (scf/hr):	337
Pilot Gas Rate (MMBtu/hr):	0.34
Pilot Gas Rate (MMBtu/yr):	2,978
Hours of Operation (hr/yr):	8,760
Pilot Hours of Operation (hr/yr):	8,760

Emissions from Combustion of Gas in Flare:

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO _x	0.068	lb/MMBtu	61.66	1.65	AP-42, Table 13.5-1 (April-2015)
CO	0.310	lb/MMBtu	281.08	7.52	AP-42, Table 13.5-2 (April-2015)
SO _x	0.001	lb/MMBtu	0.53	0.01	AP-42, Table 1.4-2 (Jul-1998)
PM ₁₀	0.000	lb/MMBtu	0.00	0.00	Nonsmoking Flare
PM _{2.5}	0.000	lb/MMBtu	0.00	0.00	Nonsmoking Flare
GHG (CO ₂ e)	See Table Below		76,305.03	2,973.92	40 CFR 98, Tables C-1 & C-2

1. Emissions factors converted by lb/MMscf to lb/MMBtu based on the HHV cited in AP-42 (1020 btu/scf).

Greenhouse Gas (GHG) Emissions - Pilot Gas:

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO ₂	53.06	kg/MMBtu	40.45	177.17	40 CFR 98, Tables C-1 & C-2
CH ₄	0.001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
N ₂ O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO ₂ e)			40.49	177.35	

Notes:

- PM₁₀ and PM_{2.5} are total values (filterable + condensable).
- GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
- Emissions of NO_x, SO_x, CO, PM, and GHG pollutants are the result of combustion of the streams in the flare.

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 5. Control Device Emissions Calculations - Maintenance Startup, Shutdown (MSS) Facility Flare

Greenhouse Gas (GHG) Emissions - Controlled Streams

	Purge Gas	Residue Gas Compressor Blowdowns	Closed Drain Vapors	Pigging Vapors (30" Receiver)	Pigging Vapors (12" C3+ Launcher)	Amine Unit Flash Gas	Stabilizer Rod Packing	Stabilizer Compressor Blowdown, Venting
Composition	mol%	mol%	mol%	mol%	mol%	mol%	mol%	mol%
CO2	0.2983	0.2983	0.4963	0.4983	0.0000	0.0374	0.0088	0.0088
Methane	98.3123	98.3123	76.0056	76.0979	0.0000	3.7781	20.1796	20.1796
Ethane	0.8775	0.8775	14.8929	14.9106	0.6381	83.2000	31.4133	31.4133
Propane	0.0197	0.0197	4.9976	5.0034	54.5881	9.9404	28.7250	28.7250
Isobutane	0.0003	0.0003	0.5575	0.5582	7.2103	0.4359	4.7636	4.7636
n-Butane	0.0004	0.0004	1.3639	1.3655	18.7076	1.1832	11.0496	11.0496
Isopentane	0.0000	0.0000	0.2887	0.2890	4.9288	0.0685	2.0474	2.0474
n-Pentane	0.0000	0.0000	0.3783	0.3787	6.7332	0.0762	1.6800	1.6800
n-Hexane	0.0000	0.0000	0.2589	0.2591	5.2603	0.0084	0.0918	0.0918
Cyclohexane	0.0000	0.0000	0.0129	0.0130	0.2342	0.0014	0.0013	0.0013
Heptanes	0.0000	0.0000	0.0856	0.0857	1.2895	0.0005	0.0145	0.0145
2,2,4-Trimethylpentane	0.0000	0.0000	0.0498	0.0498	0.0000	0.0001	0.0003	0.0003
Benzene	0.0000	0.0000	0.0022	0.0022	0.1455	0.0014	0.0019	0.0019
Toluene	0.0000	0.0000	0.0030	0.0030	0.0250	0.0002	0.0006	0.0006
Ethylbenzene	0.0000	0.0000	0.0002	0.0002	0.0000	0.0000	0.0000	0.0000
Xylenes	0.0000	0.0000	0.0004	0.0004	0.0000	0.0000	0.0001	0.0001
C8 + Heavier Hydrocarbons	0.0000	0.0000	0.0618	0.0123	0.2393	0.0000	0.0014	0.0014
Flow Rate (scfh)	434	330,000	91	120,000	48,135	2,154	0	60,000
Flow (scf/yr)	3,801,840	3,960,000	200,000	1,460,000	32,090	18,866,199	0	1,646,930
Control Efficiency (%)	0.98	0.98	0.98	0.98	0.98	0.98	0	0.98
Annual Hours of Operation	8,760	12	2,190	12.2	0.7	8,760	0	3.0
Density of CO₂ (kg/ft³ at 60F & 14.7 psia)	0.0526	0.0526	0.0526	0.0526	0.0526	0.0526	0	0.0526
Ea,CO₂ (combusted) - scf/hr	426	323,818	120	157,691	171,232	4,374	0	147,959
Ea,CO₂ (combusted) - scf/yr	3,730,617	3,885,814	262,991	1,918,578	114,155	38,319,910	0	4,061,293
Mass, CO₂ (combusted) - lb/hr	49	37,551	14	18,286	19,857	507	0	17,158
Mass, CO₂ (combusted) - tpy	216	225	15	111	7	2,222	0	235

- Purge gas (required for operation of flare) is based on ProMax run at design conditions and facility operations.
- Closed drain vapors based on ProMax run at design conditions and facility operations.
- Pigging based on expected frequencies and compositions from engineering. Flow rate and operating hours are estimated based on a 10 minute event and scaled to hourly.
- For purposes of calculating combusted CO₂, volume of gas to flare from C3+ pigging based on engineering calculations.
- Amine unit flash tank gas is used as fuel for the HMO heaters, and any remnant (excess) goes to the MSS flare. These calculations conservatively assume that all flash tank gas is sent to flare.

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 5. Control Device Emissions Calculations - Maintenance Startup, Shutdown (MSS) Facility Flare

Heating Value - Controlled Streams

	Purge Gas	Residue Gas Compressor Blowdowns	Closed Drain Vapors	Pigging Vapors (30" Receiver)	Pigging Vapors (12" C3+ Launcher)	Amine Unit Flash Gas	Stabilizer Rod Packing	Stabilizer Compressor Blowdown, Venting	Total Vented to Flare	Lower Heating Value ²
Composition	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	MJ/kg
Water	0.00E+00	0.00E+00	9.36E-03	5.36E+00	0.00E+00	1.30E+00	0.00E+00	9.49E-01	7.61E+00	0.000
Carbon Dioxide	1.50E-01	1.14E+02	5.26E-02	6.94E+01	0.00E+00	9.35E-02	0.00E+00	2.21E+00	1.86E+02	0.000
Nitrogen	1.58E-01	1.20E+02	2.55E-02	3.36E+01	0.00E+00	0.00E+00	0.00E+00	8.18E+00	1.62E+02	0.000
Methane	1.81E+01	1.37E+04	2.94E+00	3.86E+03	0.00E+00	3.44E+00	0.00E+00	3.24E+03	2.09E+04	50.009
Ethane	3.02E-01	2.30E+02	1.08E+00	1.42E+03	2.44E+01	1.42E+02	0.00E+00	3.47E+03	5.29E+03	47.794
Propane	9.95E-03	7.57E+00	5.31E-01	6.98E+02	3.06E+03	2.49E+01	0.00E+00	3.08E+03	6.87E+03	46.357
Isobutane	1.92E-04	1.46E-01	7.81E-02	1.03E+02	5.32E+02	1.44E+00	0.00E+00	5.52E+02	1.19E+03	45.613
n-Butane	2.63E-04	2.00E-01	1.91E-01	2.51E+02	1.38E+03	3.91E+00	0.00E+00	1.20E+03	2.83E+03	45.752
Isopentane	5.03E-06	3.83E-03	5.02E-02	6.60E+01	4.52E+02	2.81E-01	0.00E+00	2.38E+02	7.56E+02	45.241
n-Pentane	7.51E-06	5.71E-03	6.58E-02	8.65E+01	6.17E+02	3.12E-01	0.00E+00	2.01E+02	9.05E+02	45.357
n-Hexane	6.92E-07	5.26E-04	5.38E-02	7.07E+01	5.76E+02	4.12E-02	0.00E+00	1.46E+01	6.61E+02	44.752
Cyclohexane	2.92E-08	2.22E-05	2.62E-03	3.45E+00	2.50E+01	6.66E-03	0.00E+00	2.19E-01	2.87E+01	43.450
Heptanes	2.81E-08	2.13E-05	2.07E-02	2.72E+01	1.64E+02	2.63E-03	0.00E+00	3.06E+00	1.94E+02	44.566
2,2,4-Trimethylpentane	4.49E-08	3.42E-05	1.37E-02	1.80E+01	0.00E+00	7.69E-04	0.00E+00	1.40E-04	1.80E+01	44.310
Benzene	1.09E-08	8.25E-06	4.11E-04	5.42E-01	1.96E+01	8.70E-03	0.00E+00	2.86E-01	2.05E+01	40.170
Toluene	2.25E-09	1.71E-06	6.62E-04	8.72E-01	2.93E+00	8.53E-04	0.00E+00	1.21E-01	3.92E+00	40.589
Ethylbenzene	1.10E-11	8.35E-09	5.09E-05	6.70E-02	0.00E+00	8.09E-06	0.00E+00	4.62E-03	7.17E-02	40.938
Xylenes	1.53E-11	1.17E-08	1.02E-04	1.34E-01	0.00E+00	1.42E-05	0.00E+00	2.36E-02	1.58E-01	40.961
C8 + Heavies	3.44E-10	2.61E-07	3.64E-03	4.79E+00	3.47E+01	1.98E-04	0.00E+00	3.64E-01	3.99E+01	44.264
Total	19	14,204	5	6,724	6,886	178	0	12,010	40,025	

Each Stream

Gas Flow Rate (lb/hr)	18.68	14,204.45	5.12	6,723.53	6,885.81	177.91	0.00	12,009.83
Higher Heating Value (Btu/lb)	23,241	23,084	22,638	22,661	21,659	22,316	22,409	22,409
Max Loading to Flare (mmBtu/hr):	0.43	327.89	0.12	152.36	149.14	3.97	0.00	269.13
Hours to Flare	8,760	12	2,190	12	1	8,760	0	3
Max Loading to Flare (mmBtu/yr):	3,803	3,935	254	1,854	99	34,779	0	807

Combined

Gas Flow Rate (lb/hr)	40,025
Higher Heating Value (Btu/lb)	22,645
Max Loading to Flare (mmBtu/hr):	906
Max Loading to Flare (mmBtu/yr):	45,532

1. Published values from https://en.wikipedia.org/wiki/Heat_of_combustion

2. 1 MJ/kg = 429.9 Btu/lb. Converts LHV to HHV with a factor of 1.1.

3. Natural gas density at standard conditions: 0.05 lb/cf at 32F and 14.7 psia

4. Natural gas density: 379 scf/lb-mol

http://www.engineeringtoolbox.com/gas-density-d_158.html

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 6. Control Device Emissions Calculations - Combustor for Truck Liquid Loading of 2# Condensate

Control Device Information:

Source ID:	COMB-001
Control Efficiency:	99%
Calculated Loading to combustor (MMBtu/hr):	1.00
Calculated Loading to combustor (MMBtu/yr):	5,937.65
Pilot Gas Rate (scf/hr):	85
Pilot Gas Rate (MMBtu/hr):	0.086
Pilot Gas Rate (MMBtu/yr):	751
Hours of Operation (hr/yr):	1,150
Pilot Hours of Operation (hr/yr):	8,760

Emissions from Combustion of Pilot Gas and Controlled Vent Stream:

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO _x	0.098	lb/MMBtu	0.11	0.33	AP-42, Table 1.4-1 (Jul-1998)
CO	0.082	lb/MMBtu	0.09	0.28	AP-42, Table 1.4-1 (Jul-1998)
SO _x	0.001	lb/MMBtu	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
PM ₁₀	0.007	lb/MMBtu	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
PM _{2.5}	0.007	lb/MMBtu	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
GHG (CO ₂ e)	See Table Below		1,171.38	2495.09	40 CFR 98, Tables C-1 & C-2

1. Emissions factors converted by lb/MMscf to lb/MMBtu based on the HHV cited in AP-42 (1020 btu/scf).
2. Based on expected throughputs for truck loading.

Greenhouse Gas (GHG) Pilot Gas and HAP Emissions (each unit):

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
HAP:					
HAP	0.002	lb/MMBtu	0.00	0.01	AP-42, Table 1.4-1 (Jul-1998)
GHGs:					
CO ₂	53.06	kg/MMBtu	10.20	44.69	40 CFR 98, Tables C-1 & C-2
CH ₄	0.001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
N ₂ O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO ₂ e)			10.21	44.74	

Notes:

1. PM₁₀ and PM_{2.5} are total values (filterable + condensable).
2. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
3. Emissions of NO_x, SO_x, CO, PM, and GHG pollutants are the result of combustion of the streams in the combustor.

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 6. Control Device Emissions Calculations - Combustor for Truck Liquid Loading of 2# Condensate

Greenhouse Gas (GHG) Emissions - Controlled Vent Stream

Composition	Truck Vapors mol%	Blanket Gas mol%	Tank Vapors mol%
Methane		98.3123	
Ethane		0.8775	
Propane		0.0197	
Butanes		0.0007	
n-Hexane	0.4300	0.0000	0.4300
Heptanes	39.0700	0.0000	39.0700
C8 + Heavier Hydrocarbons	60.5000	0.0000	60.5000
Flow Rate (scfh)	793.8	244.0	504.8
Control Efficiency (%)	0.99	0.99	0.99
Hours of Operation	1,150	8,760	8,760
Density of CO ₂ (kg/ft ³ at 60F & 14.7 psia)	0.0526	0.0526	0.0526
Ea,CO ₂ (combusted) - scf/hr	5,973	242	3,798
Mass, CO ₂ (combusted) - lb/hr	693	28	440
Mass, CO ₂ (combusted) - tpy	398	123	1,929

Heating Value - Controlled Vent Stream

Composition	Truck Vapors lb/hr	Displaced Blanket Gas lb/hr	Displaced Tank Vapors lb/hr	Total Vented to combustor lb/hr	Lower Heating Value MJ/kg	Higher Heating Value btu/lb	Weight Percent Wt Fraction	Higher Heating Value Btu/lb
Methane	0.000	10.321	0.000	10.321	50.009	23,900	0.224	5,358.65
Ethane	0.000	0.173	0.000	0.173	47.794	22,400	0.004	84.04
Propane	0.000	0.006	0.000	0.006	46.357	21,700	0.000	2.68
Butanes	0.000	0.000	0.000	0.000	45.752	20,900	0.000	0.12
n-Hexane	0.461	0.000	0.294	0.755	44.752	21,163	0.016	346.97
Heptanes	14.310	0.000	9.131	23.441	44.566	21,075	0.509	10,732.21
C8 + Heavies	6.920	0.000	4.416	11.336	44.264	20,932	0.246	5,154.89
Total	21.69	10.50	13.84	46.03			1.000	21,680

Total VOC - Displaced Truck Vapor:	12.47	tpy	21.69	lb/hr				
Total VOC - Displaced Tank Vapor:	60.62	tpy	13.84	lb/hr				
VOC Speciation - mass fraction:	0.0212	n-Hexane	0.3189	n-Octane	0.6597	n-Heptane	0.0002	n-Nonane
Gas Flow Rate (lb/hr)	21.69	10.50	13.84					
Higher Heating Value (Btu/lb)	21,680	21,680	21,680					
Max Loading to combustor (mmBtu/hr):	0.47	0.23	0.30					
Hours to combustor	1,150	8,760	8,760					
Max Loading to combustor (mmBtu/yr):	5,163.2			Max Loading to combustor (mmBtu/yr) with Engineering Factor:		5,937.6		

1. Published values from https://en.wikipedia.org/wiki/Heat_of_combustion. Where HHV is not provided in the published values, LHV is converted to HHV as follows: 1 MJ/kg = 429.9 Btu/lb * a factor of 1.1.

2. Natural gas density: 379 scf/lb-mol

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 7. Control Device Emissions Calculations - Thermal Oxidizer Controlling Amine Vent

Control Device Information:

Source ID:	THERM-001
Control Efficiency:	99%
Calculated Loading to oxidizer (MMBtu/hr):	1.07
Calculated Loading to oxidizer (MMBtu/yr):	9,396
Pilot Gas Rate (scf/hr):	266
Pilot Gas Rate (MMBtu/hr):	0.27
Pilot Gas Rate (MMBtu/yr):	2,351
Hours of Operation (hr/yr):	8,760
Pilot Hours of Operation (hr/yr):	8,760

Emissions from Combustion of Gas in Oxidizer (each unit):

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO _x	0.098	lb/MMBtu	0.13	0.58	AP-42, Table 1.4-1 (Jul-1998)
CO	0.082	lb/MMBtu	0.11	0.48	AP-42, Table 1.4-1 (Jul-1998)
SO _x	0.001	lb/MMBtu	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
PM ₁₀	0.007	lb/MMBtu	0.01	0.04	AP-42, Table 1.4-2 (Jul-1998)
PM _{2.5}	0.007	lb/MMBtu	0.01	0.04	AP-42, Table 1.4-2 (Jul-1998)
GHG (CO ₂ e)	See Table Below		158.04	692.20	40 CFR 98, Tables C-1 & C-2

1. Emissions factors converted by lb/MMscf to lb/MMBtu based on the HHV cited in AP-42 (1020 btu/scf).

Greenhouse Gas (GHG) Pilot Gas and HAP Emissions (each unit):

Pollutant	Emission Factor	Units	Post-Control Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
HAP:					
HAP	0.002	lb/MMBtu	0.00	0.01	AP-42, Table 1.4-1 (Jul-1998)
GHGs:					
CO ₂	53.06	kg/MMBtu	31.93	139.86	40 CFR 98, Tables C-1 & C-2
CH ₄	0.001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
N ₂ O	0.0001	kg/MMBtu	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO ₂ e)			31.96	140.00	

Notes:

- PM₁₀ and PM_{2.5} are total values (filterable + condensable).
- GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
- Emissions of NO_x, SO_x, CO, PM, and GHG pollutants are the result of combustion of the streams in the oxidizer.

Company Name:ETC Northeast Pipeline, LLC

Facility Name:Revolution Cryo Plant

Project Description:Facility PTE

TABLE 7. Control Device Emissions Calculations - Thermal Oxidizer Controlling Amine Vent

Greenhouse Gas (GHG) Emissions - Controlled Vent Streams

	Amine Vent Stream
Composition	mol%
CO ₂	85.1748
Methane	0.1378
Ethane	6.8057
Propane	0.6945
Isobutane	0.0262
n-Butane	0.1056
Isopentane	0.0047
n-Pentane	0.0063
n-Hexane	0.0007
Cyclohexane	0.0006
Heptanes	0.0000
2,2,4-Trimethylpentane	0.0000
Benzene	0.0156
Toluene	0.0025
Ethylbenzene	0.0000
Xylenes	0.0001
C8 + Heavier Hydrocarbons	0.0000
Flow Rate (scfh)	6,651
Control Efficiency (%)	0.99
Hours of Operation	8,760
Density of CO ₂ (kg/ft ³ at 60F & 14.7 psia)	0.0526
Ea,CO ₂ (combusted) - scf/hr	1,087
Mass, CO ₂ (combusted) - lb/hr	126
Mass, CO ₂ (combusted) - tpy	552

1. Based on ProMax run at design conditions and facility operations. Uncombusted CO₂ shown on the Amine Vent calculations.

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 7. Control Device Emissions Calculations - Thermal Oxidizer Controlling Amine Vent

Heating Value - Controlled Vent Streams

	Amine Vent Stream	Total Vented to Oxidizer	Lower Heating Value ²	Higher Heating Value ³	Weight Percent	Higher Heating Value
Composition	lb/hr	lb/hr	MJ/kg	btu/lb	Wt %	Btu/lb
Water	2.44E+01	2.44E+01	0.000	0	0.031	0.00
Carbon Dioxide	7.23E+02	7.23E+02	0.000	0	0.909	0.00
Nitrogen	0.00E+00	0.00E+00	0.000	0	0.000	0.00
Methane	7.66E-01	7.66E-01	50.009	23,649	0.001	22.77
Ethane	3.95E+01	3.95E+01	47.794	22,601	0.050	1,121.43
Propane	5.90E+00	5.90E+00	46.357	21,922	0.007	162.78
Isobutane	2.93E-01	2.93E-01	45.613	21,570	0.000	7.96
n-Butane	1.18E+00	1.18E+00	45.752	21,636	0.001	32.19
Isopentane	6.54E-02	6.54E-02	45.241	21,394	0.000	1.76
n-Pentane	8.80E-02	8.80E-02	45.357	21,449	0.000	2.37
n-Hexane	1.10E-02	1.10E-02	44.752	21,163	0.000	0.29
Cyclohexane	9.49E-03	9.49E-03	43.450	20,547	0.000	0.25
Heptanes	4.06E-04	4.06E-04	44.566	21,075	0.000	0.01
2,2,4-Trimethylpentane	9.55E-05	9.55E-05	44.310	20,954	0.000	0.00
Benzene	2.34E-01	2.34E-01	40.170	18,996	0.000	5.60
Toluene	4.41E-02	4.41E-02	40.589	19,194	0.000	1.06
Ethylbenzene	4.95E-04	4.95E-04	40.938	19,359	0.000	0.01
Xylenes	1.36E-03	1.36E-03	40.961	19,370	0.000	0.03
C8 + Heavies	3.20E-05	3.20E-05	44.264	20,932	0.000	0.00
Total	795	795			1.000	1,359

Gas Flow Rate (lb/hr) 795

Higher Heating Value (Btu/lb) 1,349

Max Loading to Oxidizer (mmBtu/hr): 1.07

Hours to Oxidizer 8,760

Max Loading to Oxidizer (mmBtu/yr): 9,396

1. Published values from https://en.wikipedia.org/wiki/Heat_of_combustion

2. 1 MJ/kg = 429.9 Btu/lb. Converts LHV to HHV with a factor of 1.1.

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 8. Fugitive Emissions from Component Leaks

Total Fugitive Emissions:

Pollutant	Atmospheric Emissions		Emissions Estimation Method
	lbs/hr	tpy	
VOC	1.58	6.90	EPA Protocol, Table 2-4 & Site-Specific Gas Analysis
HAPs	0.07	0.30	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
CO ₂	0.14	0.60	40 CFR 98, Table W-1A & Site-Specific Gas Analysis
CH ₄	15.84	69.38	40 CFR 98, Table W-1A & Site-Specific Gas Analysis
GHG (CO ₂ e)	396	1,735	GWP: CO ₂ 1, CH ₄ 25

Fugitive Emissions from Component Leaks:

Component - Service	Stream	Estimated Component Count	Gas Leak Emission Factor	Maximum Gas Leak Rate	LDAR Control Efficiency	Actual Gas Leak Rate	Potential VOC Emissions	Potential HAP Emissions
			(lb/hr/component)	(lb/hr)	%	(tpy)	(tpy)	(tpy)
Valves - Gas/Vapor	Station Inlet	2,313	9.92E-03	22.94	97%	3.01	0.60	0.04
Valves - Gas/Vapor	Residue	1,250	9.92E-03	12.40	97%	1.63	0.00	0.00
Valves - Heavy Oil	---	---	---	---	---	---	---	---
Valves - Gas/Vapor	Refrigerant	550	9.92E-03	5.46	97%	0.72	0.72	0.00
Valves - Light Oil	Condensate	2,750	5.51E-03	15.16	97%	1.99	0.97	0.07
Valves - Water/Oil	---	---	---	---	---	---	---	---
Pump Seals - Gas	Station Inlet	0	5.29E-03	0.00	0%	0.00	0.00	0.00
Pump Seals - Gas	Residue	0	5.29E-03	0.00	0%	0.00	0.00	0.00
Pump Seals - Heavy Oil	---	---	---	---	---	---	---	---
Pump Seals - Gas	Refrigerant	4	5.29E-03	0.02	75%	0.02	0.02	0.00
Pump Seals - Light Oil	Condensate	50	2.87E-02	1.43	75%	1.57	0.76	0.05
Pump Seals - Water/Oil	---	---	---	---	---	---	---	---
Other - Gas/Vapor	Station Inlet	94	1.94E-02	1.82	97%	0.24	0.05	0.00
Other - Gas/Vapor	Residue	50	1.94E-02	0.97	97%	0.13	0.00	0.00
Other - Heavy Oil	---	---	---	---	---	---	---	---
Other - Gas/Vapor	Refrigerant	31	1.94E-02	0.61	75%	0.66	0.66	0.00
Other - Light Oil	Condensate	88	1.65E-02	1.45	75%	1.58	0.77	0.05
Other - Water/Oil	---	---	---	---	---	---	---	---
Connectors - Gas	Station Inlet	1,020	4.41E-04	0.45	97%	0.06	0.01	0.00
Connectors - Gas	Residue	1,020	4.41E-04	0.49	97%	0.07	0.00	0.00
Connectors - Heavy Oil	---	---	---	---	---	---	---	---
Connectors - Light Oil	Refrigerant	---	4.63E-04	---	97%	---	---	---
Connectors - Light Oil	Condensate	---	4.63E-04	---	97%	---	---	---
Connectors - Water/Oil	---	---	---	---	---	---	---	---
Flanges - Gas/Vapor	Station Inlet	8,234	8.60E-04	7.08	97%	0.93	0.18	0.01
Flanges - Gas/Vapor	Residue	4,375	8.60E-04	3.76	97%	0.49	0.00	0.00
Flanges - Heavy Oil	---	---	---	---	---	---	---	---
Flanges - Gas/Vapor	Refrigerant	1,825	8.60E-04	1.57	97%	0.21	0.21	0.00
Flanges - Light Oil	Condensate	10,625	2.43E-04	2.58	97%	0.34	0.16	0.01
Flanges - Water/Oil	---	---	---	---	---	---	---	---
Open-Ended Lines - Gas	Station Inlet	0	4.41E-03	0.00	97%	0.00	0.00	0.00
Open-Ended Lines - Gas	Residue	0	4.41E-03	0.00	97%	0.00	0.00	0.00
Open-Ended Lines - Heavy Oil	---	---	---	---	---	---	---	---
Open-Ended Lines - Light Oil	Refrigerant	---	3.09E-03	---	97%	---	---	---
Open-Ended Lines - Light Oil	Condensate	---	3.09E-03	---	97%	---	---	---
Open-Ended Lines - Water/Oil	---	---	---	---	---	---	---	---
Total (Cryo 1 and Cryo 2)						13.65	5.11	0.25

1. "Other" equipment types include compressor seals, relief valves, diaphragms, drains, meters, etc. 0.02
2. The component count is a preliminary estimate based on the proposed design of the facility.
3. 1995 Protocol for Equipment Leak Emission Estimates (EPA-453/R-95-017) Table 2-4.
4. Control Efficiencies from "TCEQ - Control Efficiencies for TCEQ Leak Detection and Repair Programs" (rev. 07/22). Accounts for NSPS LDAR and GP-5 FLIR/AVO programs.
5. VOC, HAP, CH₄, and CO₂ emissions are based on fractions of these pollutants as follows:

	Wt % VOC	Wt % HAP	Wt. % CO2	Wt % CH4
Inlet Gas	19.79	1.39	1.03	57.48
Residue Gas	0.06	0.00	0.80	96.68
Refrigeration	100.00	0.00	0.00	0.00
Condensate	48.52	3.43	1.37	0.62

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 8. Fugitive Emissions from Component Leaks

Rod Packing Emissions:

Type of Compressors	Number of Compressors	Number of Throws per Compressor	Leak Factor (scf/hr/throw)	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO ₂ Emissions (tpy)	Potential CH ₄ Emissions (tpy)
Residue Compressor (Electric)	3	6	11.5	1,813,320	0.02	0.00	0.31	37.72
Stabilizer Compressor (Electric)	3	2	11.5	30,222	0.98	0.00	0.00	0.13
Centrifugal Dry Compressor Seal	1	1	16.2	141,912	0.78	0.05	0.04	2.28
Total					1.79	0.06	0.36	40.14

1. Emission factors from http://www.epa.gov/gasstar/documents/ll_rodpack.pdf
2. Stabilizer rod-packing VRU control: 95%
3. Centrifugal compressor vendor data for seal rate (scfm): 0.27
4. VOC, HAP, CH₄, and CO₂ emissions are based on fractions of these pollutants as follows:
- | | | | | | |
|---------------------|----------|----------|----------------------|----------------------|-------|
| | Wt % VOC | Wt % HAP | Wt % CO ₂ | Wt % CH ₄ | MW |
| Inlet Gas | 19.76 | 1.34 | 1.03 | 57.48 | 21.21 |
| Residue Gas | 0.06 | 0.00 | 0.80 | 96.68 | 16.31 |
| Stabilizer Overhead | 66.01 | 0.22 | 0.01 | 8.67 | 37.34 |

GHG Fugitive Emissions from Component Leaks:

Component - Service	Estimated Component Count	GHG Emission Factor		Total Volume NG Emitted (scf/yr)	CO ₂ Emissions (tpy)	CH ₄ Emissions (tpy)
		(scf/hr/component)	Factor Source			
Connectors	2,040	0.003	40 CFR 98, Table W-1A	58,972	0.010	1.227
Flanges	12,609	0.003	40 CFR 98, Table W-1A	364,494	0.063	7.584
Open-Ended Lines	0	0.061	40 CFR 98, Table W-1A	0	0.000	0.000
Valves	3,563	0.027	40 CFR 98, Table W-1A	926,863	0.160	19.285
Other	144	0.040	40 CFR 98, Table W-1A	55,407	0.010	1.153
Total					0.24	29.25

1. The component count is a preliminary estimate based on the proposed design of the facility.
2. VOC, HAP, CH₄, and CO₂ emissions are based on fractions of these pollutants as follows:
- | | | | | |
|-------------|-----------|-----------|-----------------------|-----------------------|
| | Vol % VOC | Vol % HAP | Vol % CO ₂ | Vol % CH ₄ |
| Residue Gas | 0.02 | 0.00 | 0.30 | 98.31 |
| Inlet Gas | 8.02 | 0.31 | 0.50 | 76.10 |
3. Emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.
4. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
5. Pneumatic devices at the facility are plant air; as such, no pneumatic device emissions are estimated.
6. Density as follows:
- | | | | | |
|-------------------|----------|---|------|--|
| CO ₂ : | 0.0526 | kg/ft ³ for CO ₂ at 60 °F and 14.7 psia | | |
| CH ₄ : | 0.0192 | kg/ft ³ for CH ₄ at 60 °F and 14.7 psia | | |
| VOC: | 2.40E-05 | lb VOC/ft ³ of total gas (residue gas) | HAP: | 1.73E-09 lb HAP/ft ³ of total gas (residue gas) |
| VOC: | 1.11E-02 | lb VOC/ft ³ of total gas (inlet gas) | HAP: | 7.52E-04 lb HAP/ft ³ of total gas (inlet gas) |

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 9. Emissions from Blowdowns

Total Fugitive and Vented Emissions:

Pollutant	Atmospheric Emissions		Emissions Estimation Method
	lbs/hr	tpy	
VOC	---	13.70	Estimated Gas Volumes & Site-Specific Gas Analysis
HAPs	---	0.86	
CO ₂	---	0.67	
CH ₄	---	38.52	
GHG (CO ₂ e)	---	964	GWP: CO ₂ 1, CH ₄ 25

1. Hours/year (estimated at 10 min per event): 22 hr/yr

Vented Blowdown Emissions:

Blowdown Emissions Sources	Number of Units	Number of Annual Events	Gas Volume per Event (scf)	Controlled by Flare? (Y / N)	Total Potential Emitted Volume NG (scf/yr)	Total Actual Emitted Volume NG (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO ₂ Emissions ¹ (tpy)	Potential CH ₄ Emissions ¹ (tpy)
Residue Compressor (Electric)	3	72	55,000	Y	3,960,000	79,200	0.001	0.00	0.01	1.65
Stabilizer Compressor Downtime (Electric)	--	--	--	Y	1,286,930	25,739	0.84	0.00	0.00	0.11
Moisture Analyzer	--	--	--	N	131,400	131,400	0.73	0.05	0.04	2.11
VRU Compressor Blowdowns	1	24	50	Y	1,200	24	0.00	0.00	0.00	0.00
Facility Maintenance	--	--	--	N	300,000	300,000	1.66	0.11	0.09	4.83
Stabilizer Compressor (Electric)	3	36	10,000	Y	360,000	7,200	0.23	0.00	0.00	0.03
Miscellaneous Blowdowns	--	--	--	Y	92,592,000	1,851,840	10.24	0.70	0.54	29.79
Total							13.70	0.86	0.67	38.52

1. VOC, HAP, CH₄, and CO₂ emissions are based on fractions of these pollutants as follows:
- | | | | | | |
|---------------------|----------|----------|-----------------------|----------------------|-------|
| | Wt % VOC | Wt % HAP | Wt. % CO ₂ | Wt % CH ₄ | MW |
| Residue Gas | 0.06 | 0.00 | 0.80 | 96.68 | 16.31 |
| Stabilizer Overhead | 66.01 | 0.22 | 0.01 | 8.67 | 37.34 |
| Inlet Gas | 19.76 | 1.34 | 1.03 | 57.48 | 21.21 |
2. The gas volumes are estimated based on facility design and standard engineering calculations.
3. Per footnote in Section H10 of GP-5 Application Form and GP-5 Application Instructions (Revised 1/2015), emissions include blowdowns.
4. Where applicable, emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.
5. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
6. Density as follows:
- | | | | | |
|-------------------|----------|---|------|--|
| CO ₂ : | 0.0526 | kg/ft ³ for CO ₂ at 60 °F and 14.7 psia | | |
| CH ₄ : | 0.0192 | kg/ft ³ for CH ₄ at 60 °F and 14.7 psia | | |
| VOC: | 2.40E-05 | lb VOC/ft ³ of total gas (residue gas) | HAP: | 1.73E-09 lb HAP/ft ³ of total gas (residue gas) |
| VOC: | 1.11E-02 | lb VOC/ft ³ of total gas (inlet gas) | HAP: | 7.52E-04 lb HAP/ft ³ of total gas (inlet gas) |
- Value for 'lb VOC/scf' of total gas = Sum of (vol%/100 * MW (lb/lb-mol) / 379 scf/lb-mol) for each VOC constituent

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

Source is exempt from permitting per
#39. Emissions from this source have

TABLE 10. NGL Dehy Regenerator Heater Emissions Calculations

Heater Information:

Source ID:	HTR-001
Number of Units:	1

Heater Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,009
Heat Input (MMBtu/hr)	6.22
Potential Fuel Consumption (MMBtu/yr):	54,487
Max. Fuel Consumption (MMscf/hr):	0.0062
Max. Fuel Consumption (MMscf/yr):	54.0
Max. Annual Hours of Operation (hr/yr):	8,760

Heater Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO _x	100	lb/MMScf	0.62	2.70	AP-42, Table 1.4-1 (Jul-1998)
VOC	5.5	lb/MMScf	0.03	0.15	AP-42, Table 1.4-2 (Jul-1998)
CO	84	lb/MMScf	0.52	2.27	AP-42, Table 1.4-1 (Jul-1998)
SO _x	0.6	lb/MMScf	0.00	0.02	AP-42, Table 1.4-2 (Jul-1998)
PM ₁₀	7.6	lb/MMScf	0.05	0.21	AP-42, Table 1.4-2 (Jul-1998)
PM _{2.5}	7.6	lb/MMScf	0.05	0.21	AP-42, Table 1.4-2 (Jul-1998)
Formaldehyde (HCHO)	0.08	lb/MMScf	0.0005	0.0020	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO ₂ e)	See Table Below		728	3,191	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.01	0.05	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

Notes:

1. PM₁₀ and PM_{2.5} are total values (filterable + condensable).
2. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type.

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

Source is exempt from permitting per
#39. Emissions from this source have

TABLE 10. NGL Dehy Regenerator Heater Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO ₂	53.06	kg/MMBtu	727.72	3,187	40 CFR 98, Tables C-1 & C-2
CH ₄	0.001	kg/MMBtu	0.01	0.06	40 CFR 98, Tables C-1 & C-2
N ₂ O	0.0001	kg/MMBtu	0.00	0.01	40 CFR 98, Tables C-1 & C-2
GHG (CO ₂ e)			728	3,191	
Organic HAPs:					
2-Methylnaphthalene	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	0.01	0.05	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Metal HAPs:					
Arsenic	2.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	4.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Total HAP	1.892		0.012	0.051	

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

Source is exempt from permitting per
#39. Emissions from this source have

TABLE 11. Regenerator Gas Heater Emissions Calculations

Heater Information:

Source ID:	HTR-002
Number of Units:	1

Heater Fuel Information:

Fuel Type:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,009
Heat Input (MMBtu/hr)	8.50
Potential Fuel Consumption (MMBtu/yr):	74,460
Max. Fuel Consumption (MMscf/hr):	0.0084
Max. Fuel Consumption (MMscf/yr):	73.8
Max. Annual Hours of Operation (hr/yr):	8,760

Heater Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
NO _x	100	lb/MMScf	0.84	3.69	AP-42, Table 1.4-1 (Jul-1998)
VOC	5.5	lb/MMScf	0.05	0.20	AP-42, Table 1.4-2 (Jul-1998)
CO	84	lb/MMScf	0.71	3.10	AP-42, Table 1.4-1 (Jul-1998)
SO _x	0.6	lb/MMScf	0.01	0.02	AP-42, Table 1.4-2 (Jul-1998)
PM ₁₀	7.6	lb/MMScf	0.06	0.28	AP-42, Table 1.4-2 (Jul-1998)
PM _{2.5}	7.6	lb/MMScf	0.06	0.28	AP-42, Table 1.4-2 (Jul-1998)
Formaldehyde (HCHO)	0.08	lb/MMScf	0.0006	0.0028	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO ₂ e)	See Table Below		996	4,360	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.02	0.07	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

Notes:

1. PM₁₀ and PM_{2.5} are total values (filterable + condensable).
2. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CC₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

Source is exempt from permitting per
#39. Emissions from this source have

TABLE 11. Regenerator Gas Heater Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	
GHGs:					
CO ₂	53.06	kg/MMBtu	994.48	4,356	40 CFR 98, Tables C-1 & C-2
CH ₄	0.001	kg/MMBtu	0.02	0.08	40 CFR 98, Tables C-1 & C-2
N ₂ O	0.0001	kg/MMBtu	0.00	0.01	40 CFR 98, Tables C-1 & C-2
GHG (CO ₂ e)			996	4,360	
Organic HAPs:					
2-Methylnaphthalene	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	0.02	0.07	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Metal HAPs:					
Arsenic	2.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	4.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Total HAP	1.892		0.016	0.070	

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

These sources are permitted under GP-1 (individual heat inputs are greater than 10 mmBtu/hr and less than 50 mmBtu/hr). Emissions from have been included in site-wide emissions.

TABLE 12. HMO Heaters Emissions Calculations

Heater Information:

Source ID:	HTR-003 to HTR-005
Number of Units:	3

Heater Fuel Information:

	Per Unit	As Combined
Fuel Type:	Natural Gas	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,009	1,009
Heat Input (MMBtu/hr)	40.92	122.76
Potential Fuel Consumption (MMBtu/yr):	358,459	1,075,378
Max. Fuel Consumption (MMscf/hr):	0.0406	0.1217
Max. Fuel Consumption (MMscf/yr):	355.3	1065.8
Max. Annual Hours of Operation (hr/yr):	8,760	8,760

Heater Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Maximum Potential Emissions All Units Combined		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	lbs/hr	tpy	
NO _x	0.040	lb/MMBtu	1.64	7.17	4.91	21.51	Manufacturer Guarantee
VOC	5.5	lb/MMScf	0.22	0.98	0.67	2.93	AP-42, Table 1.4-2 (Jul-1998)
CO	0.040	lb/MMBtu	1.64	7.17	4.91	21.51	Manufacturer Guarantee
SO _x	0.6	lb/MMScf	0.02	0.11	0.07	0.32	AP-42, Table 1.4-2 (Jul-1998)
PM ₁₀	0.014	lb/MMBtu	0.57	2.51	1.72	7.53	Manufacturer Guarantee
PM _{2.5}	0.014	lb/MMBtu	0.57	2.51	1.72	7.53	Manufacturer Guarantee
Formaldehyde (HCHO)	0.08	lb/MMScf	0.0030	0.0133	0.0091	0.0400	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO ₂ e)	See Table Below		4,792	20,991	14,377	62,973	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.08	0.34	0.23	1.01	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

Notes:

1. PM₁₀ and PM_{2.5} are total values (filterable + condensable).
2. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CC₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

These sources are permitted under GP-1 (individual heat inputs are greater than 10 mmBtu/hr and less than 50 mmBtu/hr). Emissions from have been included in site-wide emissions.

TABLE 12. HMO Heaters Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Maximum Potential Emissions All Units Combined		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	lbs/hr	tpy	
GHGs:							
CO ₂	53.06	kg/MMBtu	4787.53	20,969	14362.59	62,908	40 CFR 98, Tables C-1 & C-2
CH ₄	0.001	kg/MMBtu	0.09	0.40	0.27	1.19	40 CFR 98, Tables C-1 & C-2
N ₂ O	0.0001	kg/MMBtu	0.01	0.04	0.03	0.12	40 CFR 98, Tables C-1 & C-2
GHG (CO ₂ e)			4,792	20,991	14,377	62,973	
Organic HAPs:							
2-Methylnaphthalene	2.40E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	0.07	0.32	0.22	0.96	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Metal HAPs:							
Arsenic	2.00E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	4.40E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Total HAP	1.892		0.077	0.336	0.230	1.008	

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

These sources are permitted under GP-1 (individual heat inputs are greater than 10 mmBtu/hr and less than 50 mmBtu/hr). Emissions from have been included in site-wide emissions.

TABLE 12. Catalytic Heaters Emissions Calculations

Heater Information:

Source ID:	HTR-006
Number of Units:	15

Heater Fuel Information:

	Per Unit	As Combined
Fuel Type:	Natural Gas	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,009	1,009
Heat Input (MMBtu/hr)	0.06	0.85
Potential Fuel Consumption (MMBtu/yr):	526	7,411
Max. Fuel Consumption (MMscf/hr):	0.0001	0.0008
Max. Fuel Consumption (MMscf/yr):	0.5	7.3
Max. Annual Hours of Operation (hr/yr):	8,760	8,760

Heater Emissions Data:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Maximum Potential Emissions All Units Combined		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	lbs/hr	tpy	
NO _x	0.040	lb/MMbtu	0.00	0.01	0.03	0.15	Manufacturer Guarantee
VOC	5.5	lb/MMScf	0.00	0.00	0.00	0.02	AP-42, Table 1.4-2 (Jul-1998)
CO	0.040	lb/MMBtu	0.00	0.01	0.03	0.15	Manufacturer Guarantee
SO _x	0.6	lb/MMScf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
PM ₁₀	0.014	lb/MMBtu	0.00	0.00	0.01	0.05	Manufacturer Guarantee
PM _{2.5}	0.014	lb/MMBtu	0.00	0.00	0.01	0.05	Manufacturer Guarantee
Formaldehyde (HCHO)	0.08	lb/MMScf	0.0000	0.0000	0.0001	0.0003	AP-42, Table 1.4-3 (Jul-1998)
GHG (CO ₂ e)	See Table Below		7	31	99	434	40 CFR 98, Tables C-1 & C-2
Other (Total HAP)	See Table Below		0.00	0.00	0.00	0.01	AP-42, Tables 1.4-3 & 1.4-4 (Jul-1998)

Notes:

1. PM₁₀ and PM_{2.5} are total values (filterable + condensable).
2. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CC₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).
3. Total HAP is the summation of all hazardous air pollutants for which there is a published emission factor for this source type

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

These sources are permitted under GP-1 (individual heat inputs are greater than 10 mmBtu/hr and less than 50 mmBtu/hr). Emissions from have been included in site-wide emissions.

TABLE 12. Catalytic Heaters Emissions Calculations

Greenhouse Gas (GHG) & Hazardous Air Pollutant (HAP) Emissions Calculations:

Pollutant	Emission Factor	Units	Maximum Potential Emissions Per Unit		Maximum Potential Emissions All Units Combined		Estimation Basis / Emission Factor Source
			lbs/hr	tpy	lbs/hr	tpy	
GHGs:							
CO ₂	53.06	kg/MMBtu	7.02	31	98.98	434	40 CFR 98, Tables C-1 & C-2
CH ₄	0.001	kg/MMBtu	0.00	0.00	0.00	0.01	40 CFR 98, Tables C-1 & C-2
N ₂ O	0.0001	kg/MMBtu	0.00	0.00	0.00	0.00	40 CFR 98, Tables C-1 & C-2
GHG (CO ₂ e)			7	31	99	434	
Organic HAPs:							
2-Methylnaphthalene	2.40E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
3-Methylchloranthrene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
7,12-Dimethylbenz(a)anthracene	1.60E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzene	2.10E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(a)pyrene	1.20E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(b)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(g,h,i)perylene	1.20E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Benzo(k)fluoranthene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Chrysene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Dibenzo(a,h)anthracene	1.20E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluoranthene	3.00E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Fluorene	2.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
n-Hexane	1.80E+00	lb/MMscf	0.00	0.00	0.00	0.01	AP-42, Table 1.4-3 (Jul-1998)
Indeno(1,2,3-c,d)pyrene	1.80E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Naphthalene	6.10E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Phenanthrene	1.70E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Pyrene	5.00E-06	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Toluene	3.40E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-3 (Jul-1998)
Metal HAPs:							
Arsenic	2.00E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Beryllium	4.40E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cadmium	1.10E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Chromium	1.40E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Cobalt	8.40E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Lead	5.00E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-2 (Jul-1998)
Manganese	3.80E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Mercury	2.60E-04	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Nickel	2.10E-03	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Selenium	2.40E-05	lb/MMscf	0.00	0.00	0.00	0.00	AP-42, Table 1.4-4 (Jul-1998)
Total HAP	1.892		0.000	0.000	0.002	0.007	

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

These sources are exempt from permitting per 25 PA Code 127.14(a)(8) Exemption #31. Emissions have been included in site-wide emissions.

TABLE 14. Pigging Operations and Gas Venting Emissions Calculations

Total Vented Emissions:

Pollutant	Atmospheric Emissions		Emissions Estimation Method
	lbs/hr	tpy	
VOC	---	0.62	Estimated Gas Volumes & Site-Specific Gas Analysis
HAPs	---	0.03	
CO ₂	---	0.05	
CH ₄	---	2.89	
GHG (CO ₂ e)	---	72	GWP: CO ₂ 1, CH ₄ 25

1. Hours/year of pigging (estimated at 10 min per event): 12.8 hr/yr

Vented Emissions:

Blowdown Emissions Sources	Number of Annual Events	Gas Volume per Event (scf)	Total Mass per Event (lbs)	Controlled by Flare? (Y / N)	Total Volume NG (scf/yr)	Total Mass (lbs/yr)	Actual Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO ₂ Emissions ⁷ (tpy)	Potential CH ₄ Emissions ⁷ (tpy)
Flare Purge Gas	---	---	---	Y	3,801,840	---	76,037	0.00	0.00	0.01	1.58
Closed Drain Vapors	---	---	---	Y	200,000	---	4,000	0.00	0.00	0.00	0.08
Pig Receiving 30" Station Receiver	73	20,000	---	Y	1,460,000	---	69,016	0.38	0.03	0.02	1.11
Pig Launching 12" C3+ Launcher	4	---	834	Y	---	3,337	200	0.05	0.00	0.01	0.00
GC Venting (AE-101)	---	---	---	N	928	---	928	0.00	0.00	0.00	0.04
GC Venting (AE-102)	---	---	---	N	928	---	928	0.00	0.00	0.00	0.05
GC Venting (AE-103)	---	---	---	N	928	---	928	0.02	0.00	0.00	0.00
GC Venting (AE-104)	---	---	---	N	464	---	464	0.01	0.00	0.00	0.00
GC Venting (AE-105)	---	---	---	N	928	---	928	0.00	0.00	0.00	0.00
GC Venting (AE-106)	---	---	---	N	464	---	464	0.03	0.00	0.00	0.00
GC Venting (AE-107)	---	---	---	N	928	---	928	0.06	0.00	0.00	0.00
GC Venting (AE-108)	---	---	---	N	928	---	928	0.00	0.00	0.00	0.00
GC Venting (AE-109)	---	---	---	N	---	---	---	---	---	---	---
GC Venting (AE-110)	---	---	---	N	928	---	928	0.06	0.00	0.00	0.00
GC Venting (AE-111)	---	---	---	N	928	---	928	0.01	0.00	0.00	0.02
Total								0.62	0.03	0.05	2.89

1. Uncombusted CH₄ and CO₂ emissions are based on fractions of these pollutants as follows:

	945	Vol % CO ₂	Vol % CH ₄
		Residue Gas 0.298	98.312
		Inlet Gas 0.498	76.098
		C3+ Liquids 0.000	0.000
		C2 Liquids 0.010	1.220

2. The gas volumes are estimated based on facility design and standard engineering calculations (utilizing Equation W-14B from 40 CR 98 Subpart W where appropriate).

3. Per footnote in Section H11 of GP-5 Application Form and GP-5 Application Instructions (Revised 1/2015), emissions include pigging operations and pipeline purging/venting.

4. Total purge gas to flare: 434 scfh

5. Where applicable, emissions are calculated in accordance with Equations W-31, W-35 and W-36 in Subpart W of 40 CFR 98.

6. GHG (CO₂e) is carbon dioxide equivalent, which is the summation of CO₂ (GWP = 1) + CH₄ (GWP = 25) + N₂O (GWP = 298).

7. Density as follows: C3+ and C2 liquid lines conservatively assume gas (vapor) composition is identical to liquid composition
Value for 'lb VOC/scf' of total gas = Sum of (vol%/100 * MW (lb/lb-mol) / 379 scf/lb-mol) for each VOC constituent

CO ₂ :	0.0526	kg/ft ³ for CO ₂ at 60 °F and 14.7 psia			
CH ₄ :	0.0192	kg/ft ³ for CH ₄ at 60 °F and 14.7 psia			
VOC:	2.40E-05	lb VOC/ft ³ of total gas (residue gas)	HAP:	1.73E-09	lb HAP/ft ³ of total gas (residue gas)
VOC:	1.11E-02	lb VOC/ft ³ of total gas (inlet gas)	HAP:	7.52E-04	lb HAP/ft ³ of total gas (inlet gas)
VOC:	1.43E-01	lb VOC/ft ³ of total gas (C3+ liquid vapors)	HAP:	1.21E-02	lb HAP/ft ³ of total gas (C3+ liquid vapors)

8. Mol sieve instrumenation vent data: 3 Number of Units 5 SCF/hr, per unit

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: Facility PTE

TABLE 15. Pneumatic Controllers

Total Fugitive Emissions:

Pollutant	Atmospheric Emissions		Emissions Estimation Method
	lbs/hr	tpy	
VOC	0.02	0.07	EPA Protocol, Table 2-4 & Site-Specific Gas Analysis
HAPs	0.00	0.00	EPA Protocol, Table 2-4 and Site-Specific Gas Analysis
CO ₂	0.00	0.00	40 CFR 98, Table W-1A & Site-Specific Gas Analysis
CH ₄	0.05	0.21	40 CFR 98, Table W-1A & Site-Specific Gas Analysis
GHG (CO ₂ e)	1.21	5.30	GWP: CO ₂ 1, CH ₄ 25

Pneumatic Device Emissions:

Type of Compressors	Number of Devices	Volume of Gas Actuation (SCF/each)	Number of Actuators / Yr	Total Volume NG Emitted (scf/yr)	Potential VOC Emissions (tpy)	Potential HAP Emissions (tpy)	Potential CO ₂ Emissions (tpy)	Potential CH ₄ Emissions (tpy)
Intermittent Bleed Controller	2	63	104	13,164	0.07	0.00	0.00	0.21
Total					0.07	0.00	0.00	0.21

1. Pneumatic controller located on the Launchers. Gas loss calculated with manufacturer's controller data as follows (including engineering estimate for tubing):
- | Controller Type | Make/Model | Inboard Stroke (in3) | Outboard Stroke (in3) | Controller Volume (CF) | Pressure (psig) | Volume of Gas (SCF/each) |
|------------------------|--------------|----------------------|-----------------------|------------------------|-----------------|--------------------------|
| Double Acting Actuator | Bettis/G5020 | 4157 | 4383 | 9.88 | 80 | 53.79 |
2. Engineering Assumption for tubing associated with controller:
- | | | | |
|--|------|----|------|
| | 1.75 | 80 | 9.50 |
|--|------|----|------|
3. Hourly emissions are annualized (tpy * 2000 / 8760).
4. VOC, HAP, CH₄, and CO₂ emissions are based on fractions of these pollutants as follows:
- | | Wt % VOC | Wt % HAP | Wt. % CO ₂ | Wt % CH ₄ | MW |
|---------------------|----------|----------|-----------------------|----------------------|-------|
| Inlet Gas | 19.76 | 1.34 | 1.03 | 57.48 | 21.21 |
| Residue Gas | 0.06 | 0.00 | 0.80 | 96.68 | 16.31 |
| Stabilizer Overhead | 66.01 | 0.22 | 0.01 | 8.67 | 37.34 |

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

TABLE 16. Site-Specific Gas Analysis

Location:
HHV (Btu/scf):

Cryo Plant Residue/Fuel Gas
1,009

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.4915	0.8440	28.0100
METHANE	98.3123	96.6776	16.0400
CO2	0.2983	0.8050	44.0100
ETHANE	0.8775	1.6177	30.0700
PROPANE	0.0197	0.0533	44.1000
I-BUTANE	0.0003	0.0010	58.1200
N-BUTANE	0.0004	0.0014	58.1200
I-PENTANE	6.09E-06	0.0000	72.1500
N-PENTANE	9.09E-06	0.0000	72.1500
I-HEXANES	0.00E+00	0.0000	86.1800
N-HEXANE	7.01E-07	0.0000	86.1800
BENZENE	1.21E-08	0.0000	78.1100
CYCLOHEXANE	3.03E-08	0.0000	84.1600
HEPTANES	2.44E-08	0.0000	100.2100
TOLUENE	2.13E-09	0.0000	92.1400
2,2,4 Trimethylpentane	3.44E-08	0.0000	114.2300
N-OCTANE	2.31E-10	0.0000	114.2400
*E-BENZENE	9.03E-12	0.0000	106.1700
*m,o,&p-XYLENE	1.26E-11	0.0000	106.1600
I-NONANES	2.50E-11	0.0000	128.2000
N-NONANE	2.63E-12	0.0000	128.2000
I-DECANES	0.00E+00	0.0000	142.2900
N-DECANE	2.66E-13	0.0000	142.2900
I-UNDECANES +	0.00E+00	0.0000	142.2900
Totals	100.000	100.000	

TOC (Total)	99.210	98.351	
VOC (Total)	0.020	0.056	
HAP (Total)	0.000	0.000	

C8+

0.000

0.000

Molecular Weight

16.311

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

TABLE 17. Site-Specific Gas Analysis

Location:
HHV (Btu/scf):

Cryo Plant Inlet Gas
1,152

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.3787	0.4996	28.01
METHANE	76.0979	57.4840	16.04
CO2	0.4983	1.0327	44.01
ETHANE	14.9106	21.1114	30.07
PROPANE	5.0034	10.3888	44.1
I-BUTANE	0.5582	1.5276	58.12
N-BUTANE	1.3655	3.7371	58.12
I-PENTANE	0.2890	0.9820	72.15
N-PENTANE	0.3787	1.2867	72.15
I-HEXANES			86.18
N-HEXANE	0.2591	1.0515	86.18
BENZENE	0.0022	0.0081	78.11
CYCLOHEXANE	0.0130	0.0513	84.16
HEPTANES	0.0857	0.4044	100.21
TOLUENE	0.0030	0.0130	92.14
2,2,4 Trimethylpentane	0.0498	0.2680	114.23
N-OCTANE	0.0054	0.0289	114.24
*E-BENZENE	0.0002	0.0010	106.17
*m,o,&p-XYLENE			106.16
I-NONANES	0.0007	0.0042	128.2
N-NONANE			128.2
I-DECANES	0.0011	0.0073	142.29
N-DECANE			142.29
I-UNDECANES +			142.29
Totals	99.901	99.888	

	Vol %	Wt%	
TOC (Total)	99.024	98.355	
VOC (Total)	8.015	19.760	
HAP (Total)	0.314	1.342	

C8+

0.007

0.041

Molecular Weight

21.212

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-101 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.3414	0.4653	28.0100
METHANE	77.5766	60.5506	16.0400
CO2	0.0459	0.0983	44.0100
ETHANE	14.9612	21.8919	30.0700
PROPANE	5.0127	10.7571	44.1000
I-BUTANE	0.4739	1.3402	58.1200
N-BUTANE	1.0990	3.1082	58.1200
I-PENTANE	0.1665	0.5847	72.1500
N-PENTANE	0.2100	0.7373	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	0.1112	0.4664	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	99.998	100.000	

TOC (Total)	99.611	99.436	
VOC (Total)	7.073	16.994	
HAP (Total)	0.111	0.466	

Molecular Weight

20.550

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-102 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.4403	0.7508	28.0100
METHANE	97.2527	94.9659	16.0400
CO2	0.0429	0.1150	44.0100
ETHANE	2.2374	4.0957	30.0700
PROPANE	0.0247	0.0664	44.1000
I-BUTANE	0.0006	0.0021	58.1200
N-BUTANE	0.0006	0.0021	58.1200
I-PENTANE	0.0002	0.0008	72.1500
N-PENTANE	0.0002	0.0008	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	0.0001	0.0003	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	100.000	100.000	

TOC (Total)	99.516	99.134	
VOC (Total)	0.026	0.073	
HAP (Total)	0.000	0.000	

Molecular Weight

16.426

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-103 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.0002	0.0002	28.0100
METHANE	0.0394	0.0178	16.0400
CO2	0.1481	0.1840	44.0100
ETHANE	71.6983	60.8644	30.0700
PROPANE	20.3954	25.3917	44.1000
I-BUTANE	1.8431	3.0241	58.1200
N-BUTANE	4.0853	6.7031	58.1200
I-PENTANE	0.6149	1.2525	72.1500
N-PENTANE	0.7741	1.5767	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	0.4050	0.9854	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	100.004	100.000	

TOC (Total)	99.856	99.816	
VOC (Total)	28.118	38.934	
HAP (Total)	0.405	0.985	

Molecular Weight

35.422

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-104 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.0000	0.0000	28.0100
METHANE	0.0588	0.0255	16.0400
CO2	0.0000	0.0000	44.0100
ETHANE	66.0788	53.8272	30.0700
PROPANE	22.4394	26.8075	44.1000
I-BUTANE	2.2738	3.5800	58.1200
N-BUTANE	6.2559	9.8496	58.1200
I-PENTANE	0.6758	1.3209	72.1500
N-PENTANE	1.5307	2.9918	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	0.6843	1.5976	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	99.997	100.000	

TOC (Total)	99.997	100.000	
VOC (Total)	33.860	46.147	
HAP (Total)	0.684	1.598	

Molecular Weight

36.914

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-105 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.0000	0.0000	28.0100
METHANE	0.0834	0.0445	16.0400
CO2	0.0000	0.0000	44.0100
ETHANE	99.9112	99.9472	30.0700
PROPANE	0.0053	0.0078	44.1000
I-BUTANE	0.0000	0.0000	58.1200
N-BUTANE	0.0000	0.0000	58.1200
I-PENTANE	0.0002	0.0005	72.1500
N-PENTANE	0.0000	0.0000	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	0.0000	0.0000	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	100.000	100.000	

TOC (Total)	100.000	100.000	
VOC (Total)	0.006	0.008	
HAP (Total)	0.000	0.000	

Molecular Weight

30.059

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-106 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.0000	0.0000	28.0100
METHANE	0.0000	0.0000	16.0400
CO2	0.0000	0.0000	44.0100
ETHANE	0.0511	0.0310	30.0700
PROPANE	69.2467	61.4573	44.1000
I-BUTANE	7.0174	8.2080	58.1200
N-BUTANE	16.1359	18.8736	58.1200
I-PENTANE	2.6105	3.7904	72.1500
N-PENTANE	3.2673	4.7442	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	1.6695	2.8955	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	99.998	100.000	

TOC (Total)	99.998	100.000	
VOC (Total)	99.947	99.969	
HAP (Total)	1.670	2.896	

Molecular Weight

49.689

Company Name:ETC Northeast Pipeline, LLC

Facility Name:Revolution Cryo Plant

Project Description:Facility PTE

CG Composition

Location:AE-107 Sample

HHV (Btu/scf):1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.0000	0.0000	28.0100
METHANE	0.0000	0.0000	16.0400
CO2	0.0000	0.0000	44.0100
ETHANE	0.1443	0.0871	30.0700
PROPANE	68.1228	60.3134	44.1000
I-BUTANE	7.3167	8.5373	58.1200
N-BUTANE	16.8752	19.6905	58.1200
I-PENTANE	2.6573	3.8491	72.1500
N-PENTANE	3.2840	4.7568	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	1.5986	2.7659	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	99.999	100.000	

TOC (Total)	99.999	100.000	
VOC (Total)	99.855	99.913	
HAP (Total)	1.599	2.766	

Molecular Weight

49.810

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-108 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.0000	0.0000	28.0100
METHANE	0.0752	0.0401	16.0400
CO2	0.0000	0.0000	44.0100
ETHANE	99.9141	99.9513	30.0700
PROPANE	0.0059	0.0086	44.1000
I-BUTANE	0.0000	0.0000	58.1200
N-BUTANE	0.0000	0.0000	58.1200
I-PENTANE	0.0000	0.0000	72.1500
N-PENTANE	0.0000	0.0000	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	0.0000	0.0000	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	99.995	100.000	

TOC (Total)	99.995	100.000	
VOC (Total)	0.006	0.009	
HAP (Total)	0.000	0.000	

Molecular Weight

30.059

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-109 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.0000	0.0000	28.0100
METHANE	1.0000	0.2052	16.0400
CO2	0.0000	0.0000	44.0100
ETHANE	1.0000	0.3847	30.0700
PROPANE	1.0000	0.5641	44.1000
I-BUTANE	1.0000	0.7435	58.1200
N-BUTANE	5.9900	4.4534	58.1200
I-PENTANE	10.9800	10.1340	72.1500
N-PENTANE	20.0500	18.5052	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	58.9700	65.0100	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	99.990	100.000	

TOC (Total)	99.990	100.000	
VOC (Total)	97.990	99.410	
HAP (Total)	58.970	65.010	

Molecular Weight

78.173

Company Name:
Facility Name:
Project Description:

ETC Northeast Pipeline, LLC
Revolution Cryo Plant
Facility PTE

CG Composition

Location:
HHV (Btu/scf):

AE-110 Sample
1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.0000	0.0000	28.0100
METHANE	0.6000	0.1842	16.0400
CO2	0.0200	0.0168	44.0100
ETHANE	14.2000	8.1706	30.0700
PROPANE	28.5800	24.1176	44.1000
I-BUTANE	10.4000	11.5662	58.1200
N-BUTANE	32.5000	36.1444	58.1200
I-PENTANE	4.6000	6.3508	72.1500
N-PENTANE	5.8000	8.0075	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	3.3000	5.4419	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	100.000	100.000	

TOC (Total)	99.980	99.983	
VOC (Total)	85.180	91.628	
HAP (Total)	3.300	5.442	

Molecular Weight

52.260

Company Name:

ETC Northeast Pipeline, LLC

Facility Name:

Revolution Cryo Plant

Project Description:

Facility PTE

CG Composition

Location:

AE-111 Sample

HHV (Btu/scf):

1,020

Constituent	Natural Gas Stream Speciation (Vol. %)	Natural Gas Stream Speciation (Wt. %)	MW g/mol
N2	0.1000	0.0993	28.0100
METHANE	35.5000	20.1870	16.0400
CO2	0.1000	0.1560	44.0100
ETHANE	45.1000	48.0784	30.0700
PROPANE	16.5000	25.7966	44.1000
I-BUTANE	1.0000	2.0605	58.1200
N-BUTANE	1.5000	3.0907	58.1200
I-PENTANE	0.0800	0.2046	72.1500
N-PENTANE	0.0800	0.2046	72.1500
I-HEXANES	0.0000	0.0000	86.1800
N-HEXANE	0.0400	0.1222	86.1800
BENZENE	0.0000	0.0000	78.1100
CYCLOHEXANE	0.0000	0.0000	84.1600
HEPTANES	0.0000	0.0000	100.2100
TOLUENE	0.0000	0.0000	92.1400
2,2,4 Trimethylpentane	0.0000	0.0000	114.2300
N-OCTANE	0.0000	0.0000	114.2400
*E-BENZENE	0.0000	0.0000	106.1700
*m,o,&p-XYLENE	0.0000	0.0000	106.1600
I-NONANES	0.0000	0.0000	128.2000
N-NONANE	0.0000	0.0000	128.2000
I-DECANES	0.0000	0.0000	142.2900
N-DECANE	0.0000	0.0000	142.2900
I-UNDECANES +	0.0000	0.0000	142.2900
Totals	100.000	100.000	

TOC (Total)	99.800	99.745	
VOC (Total)	19.200	31.479	
HAP (Total)	0.040	0.122	

Molecular Weight

28.207



Bryan Research & Engineering, LLC

ProMax[®] 6.0

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Simulation Report

Project: 2023-0331 Amine Unit v0.1.pmx

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Client Name: ETC
Location: Rev Cryo
Job: PTE Calculations

ProMax Filename: C:\Users\Nick.Pezich\Trinity Consultants, Inc\Energy Transfer - ETC NE Pipeline\PA Revolution\00 Projects\233901.00XX Rev Cryo Permit\06 Working\At
ProMax Version: 6.0.22251.0
Simulation Initiated: 3/31/2023 2:41:15 PM

Bryan Research & Engineering, LLC

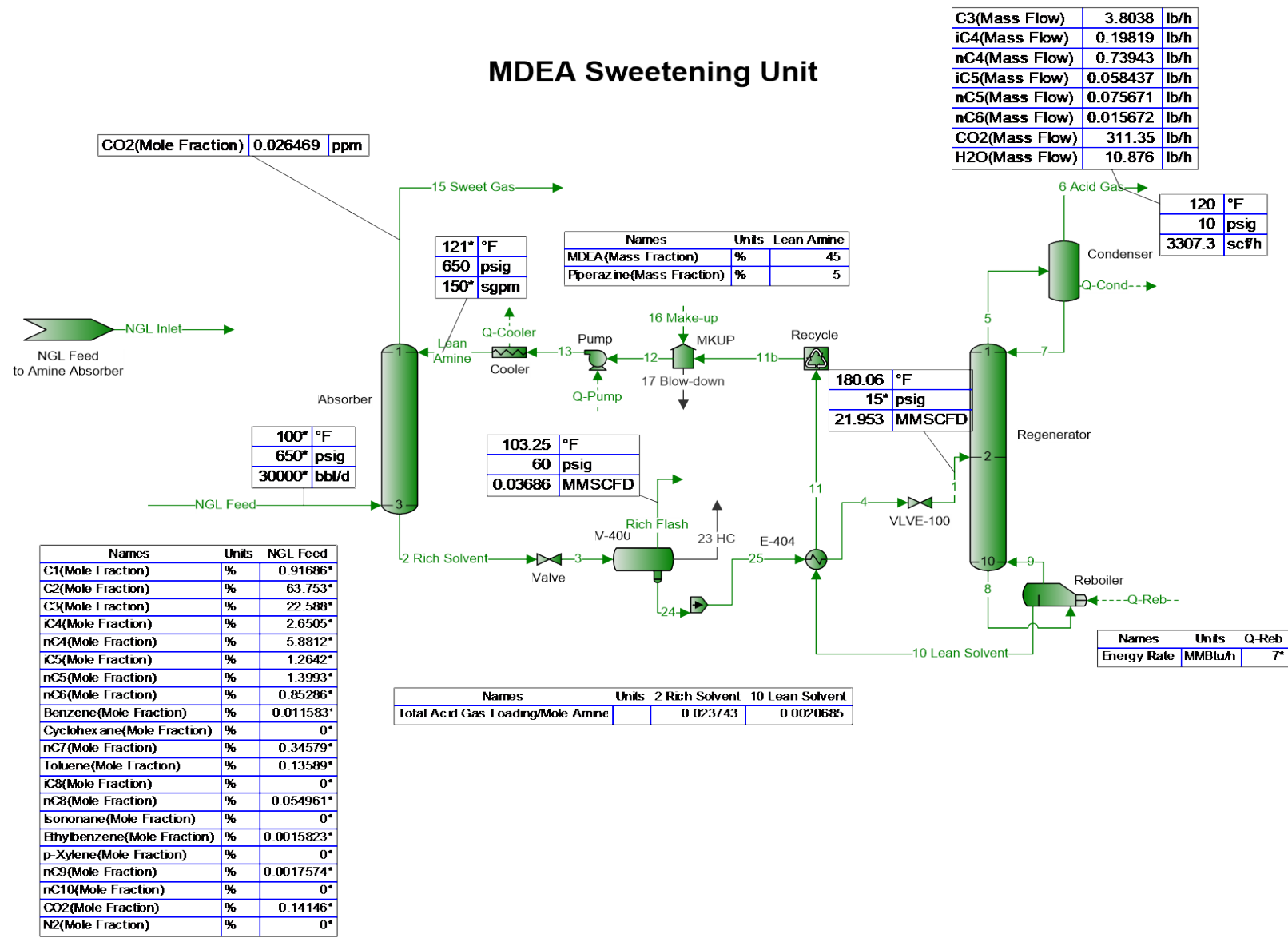
Chemical Engineering Consultants
P.O. Box 4747 Bryan, Texas 77805
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FAX: (979) 776-4818
<mailto:sales@bre.com>
<http://www.bre.com/>

Report Navigator can be activated via the ProMax Navigator Toolbar.

An asterisk (*), throughout the report, denotes a user specified value.

A question mark (?) after a value, throughout the report, denotes an extrapolated or approximate value.

MDEA Sweetening Unit



Class Fraction	%	%	%	%	%	%
C1	1.26061	0.589413	1.26061	0.903279	0.00936881	0.0524627
C2	81.1027	71.5123	81.1027	77.7874	1.34247	7.51717
C3	13.5151	10.4223	13.5151	11.9784	0.190667	1.00773
IC4	0.823314	0.561371	0.823314	0.692633	0.00993341	0.0556304
IC4	2.06843	1.92740	2.06240	0.0370639		0.207560
IC5	0.211581	0.187467	0.211581	0.313215	0.00292879	0.0164035
IC5	0.226684	0.227801	0.226684	0.323121	0.00373264	0.0212410
IC5	0.0501364	0.0458614	0.0501364	0.0622469	0.000785432	0.00439919
	0.00534597	0.0250291	0.00534597	0.0109731	0.0119535	0.0653693
Cyclohexane	0	0	0	0	0	0
IC7	0.00677897	0.00411677	0.00677897	0.00796493	0.17493E-05	0.000345870
Toluene	0.0263718	0.142284	0.0630121	0.0823075		0.452782
IC8	0	0	0	0	0	0
IC8	0.000512178	0.000293026	0.000473902	4.81355E-06		2.89618E-05
Isononane	0	0	0	0	0	0
Ethylbenzene	0.000136532	0.00115237	0.000136532	0.000520374	0.000502924	0.00277590
p-Xylene	3.37938E-06	1.34222E-06	3.11654E-06	9.92649E-08		1.07910E-07
IC10	0	0	0	0	0	0
CO2	0.00337661	0.430354	0.00337661	0.177812	15.7053	87.3965
N2	0	0	0	0	0	0
H2O	0.698097	13.8495	0.698097	5.57904	82.2142	3.05304
TEG	0	0	0	0	0	0
MeOH	0.000543309	0.00800396	0.000543309	0.00332723	0.379726	0.0860553
H2S	0	0	0	0	0	0
MDEA	0.000350260	0.0328252	0.0104456	0.00105852	3.60681E-11	0.448517
Piperazine	0.000930664	0.0324172	0.0137964	0.00792714	4.84304E-10	0.466364
DEA	0	0	0	0	0	0
Mass Flow	lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
C1	1.60539	0.151810	1.60539	0.0537668	0.186956	0.186897
C2	103.285	18.4188	103.285	4.63081	26.7891	26.7797
C3	17.2115	2.65439	17.2115	0.713005	3.80479	3.83076
IC4	1.04722	0.144588	1.04722	0.0412241	0.198223	0.198189
IC4	2.63416	0.498424	2.63416	0.122762	0.739916	0.739426
IC5	0.269450	0.0402544	0.269450	0.0186438	0.0594444	0.0594369
IC5	0.288658	0.0586729	0.288658	0.0192335	0.0756827	0.0756706
IC6	0.0638490	0.0118379	0.0638490	0.00370483	0.0156734	0.0156720
Benzene	0.00808012	0.00644653	0.00808012	0.000653166	0.238533	0.232876
Cyclohexane	0	0	0	0	0	0
IC7	0.00863305	0.00106032	0.00863305	0.000474373	0.00123222	0.00123215
Toluene	0.0335847	0.0366470	0.0335847	0.00375074	1.64246	1.61302
IC8	0	0	0	0	0	0
IC8	0.000652261	7.70203E-05	0.000652261	2.82086E-05	9.60550E-05	9.60507E-05
Isononane	0	0	0	0	0	0
Ethylbenzene	0.000173874	0.000298806	0.000173874	3.09748E-05	0.0100359	0.00988905
p-Xylene	0	0	0	0	0	0
IC9	4.30366E-06	3.45704E-07	4.30366E-06	1.85509E-07	3.84434E-07	3.84427E-07
IC10	0	0	0	0	0	0
CO2	0.00430013	0.113161	0.00430013	0.0102641	313.400	311.347
N2	0	0	0	0	0	23.6655
H2O	0.889031	3.56709	0.889031	0.332087	1640.60	10.8764
TEG	0	0	0	0	0	0
MeOH	0.000691907	0.00206151	0.000691907	0.000198050	7.57748	0.308529
H2S	0	0	0	0	0	3.11330
MDEA	0.000446058	0.00613647	0.000446058	0.000621763	0.0211229	1.28492E-10
Piperazine	0.00118521	0.00834945	0.00118521	0.000821218	0.158187	1.72532E-09
DEA	0	0	0	0	0	34.2895

[illegible][illegible]

Process Streams	Lean Amine	NGL Feed	NGL Inlet	Rich Flash	1	2 Rich Solvent	3	4	5	6 Acid Gas	7	8	9	10 Lean Solvent	11	11b	12	13	15 Sweet Gas	16 Make-up	17 Blow-down	23 HC	24	25	
Properties	Status:	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	Solved	
Phase: Light Liquid	From Block:	Cooler	--	NGL Feed to Amine Absorber	V-400	Solved VLE-100	Solved Absorber	Solved Valve V-400	Solved E-404	Solved Regenerator	Solved Condenser	Solved Condenser	Solved Regenerator	Solved Reboiler	Solved Reboiler	Solved Reboiler	Solved Reboiler	Solved Reboiler	Solved Absorber	Solved MKUP	Solved MKUP	Solved V-400	Solved V-400	Solved	
To Block:	Absorber	Absorber	--	--	Regenerator	Valve	Valve	Regenerator	Condenser	Condenser	Regenerator	Regenerator	Reboiler	E-404	E-404 Recycle	Recycle MKUP	MKUP Pump	Pump Cooler	--	--	--	--	MIX-100	E-404	
Property	Units																								
Temperature	T	121	100	100	180.063	101.701	103.254	180				120.000	252.465			253.650	182.197	182.194	182.045	183.869	108.065	75		103.254	103.254
Pressure	psig	650	650	650	15	650	60	55				10	13			13	8	8	8	655	645	10		60	60
Mole Fraction Vapor	%	0	0	0	0	0	0	0				0	0			0	0	0	0	0	0		0	0	
Mole Fraction Light Liquid	%	100	100	100	100	100	100	100				100	100			100	100	100	100	100	100		100	100	
Mole Fraction Heavy Liquid	%	0	0	0	0	0	0	0				0	0			0	0	0	0	0	0		0	0	
Molecular Weight	lb/lbmol	31.1556	37.5028	37.4901	31.2078	31.2073	31.2069	31.2069				18.0656	29.3016			31.1718	31.1718	31.1717	31.1556	31.1556	37.4984	22.4361		31.2069	31.2069
Mass Density	lb/ft³	64.1446	25.9546	25.9702	63.1202	64.8059	64.8225	63.1127				61.8375	60.4038			60.4008	62.6016	62.6017	62.6049	62.6277	25.07717	63.5784		64.8225	64.8225
Molar Flow	lbmol/h	2406.17	5001.35	5001.84	2409.54	2414.49	2410.44	2410.24				90.7394	2025.94			2401.72	2401.73	2406.17	2406.17	2406.17	4993.03	4.43075		2410.44	2410.44
Mass Flow	lb/h	74965.6	197565	197565	75196.5	75349.6	75222.2	75216.3				1639.27	82218.5			74966.0	74966.0	74966.2	74965.6	74965.6	187181	99.4090		75222.2	75222.2
Vapor Volumetric Flow	ft³/h	1168.70	7226.65	1.42652E+08	1191.32	1162.70	1160.43	1191.78				26.5953	1361.15			1239.49	1195.91	1195.91	1197.44	1197.00	7464.237	1.56357		1160.43	1160.43
Liquid Volumetric Flow	gpm	145.708	900.985	177852	148.529	144.960	144.678	148.585				3.31578	189.702			154.534	149.101	149.101	149.291	149.237	930.6057	0.194938		144.678	144.678
Std Vapor Volumetric Flow	MMSCFD	21.5144	45.5504	9000	21.9452	21.9902	21.9534	21.9516				0.829420	25.5554			21.8740	21.8740	21.8741	21.5144	21.5144	45.4746	0.0403536		21.9534	21.9534
Std Liquid Volumetric Flow	sgpm	150	875	172796	150.632	151.432	150.757	150.727				3.28182	164.533			149.799	149.799	149.799	150	150	873.568	0.201077		150.757	150.757
Compressibility		0.0518092	0.159911	0.159760	0.00213860	0.0531314	0.00585262	0.00502021				0.00116356	0.00175799			0.00186719	0.00164065	0.00164065	0.00164010	0.0482402	0.1818667	0.00151885		0.00595262	0.00595262
Specific Gravity		1.52847	0.416148	0.416398	1.01205	1.03908	1.03934	1.01193				0.886275	0.968494			0.968444	1.00373	1.00373	1.00379	1.00415	0.4020777	1.01639	1.03934		1.03934
API Gravity		3.1530	173.380	173.248	3.17601	3.29746	3.20235	3.19456				10.0626	4.26057			3.92313	3.92400	3.92402	3.92723	3.81444	173.504	6.93263	3.20235		3.20235
Enthalpy	Btu/h	-3.08652E+08	-2.30291E+08	-4.55391E+10	-3.05972E+08	-3.11004E+08	-3.10851E+08	-3.06009E+08				-1.10710E+07	-3.47949E+08			-2.99483E+08	-3.04318E+08	-3.04318E+08	-3.04867E+08	-3.04847E+08	-2.27940E+08	-549270		-3.10851E+08	-3.10851E+08
Mass Enthalpy	Btu/lb	-4117.25	-1227.80	-1229.22	-4006.96	-4127.48	-4132.43	-4066.39				-6753.60	-4232.00			-4000.25	-4064.81	-4064.83	-4066.76	-4063.82	-1217.75	-5525.36		-4132.43	-4132.43
Mass Cp	Btu/(lb*°F)	0.826527	0.853763	0.854342	0.860194	0.808937	0.809421	0.865356				0.965607	0.938401			0.932911	0.874865	0.874863	0.874835	0.873621	0.903950	0.906361		0.809421	0.809421
Ideal Gas Cp/Cv Ratio		1.15187	1.14381	1.14387	1.13773	1.15732	1.15685	1.13775				1.32689	1.13510			1.12304	1.13706	1.13706	1.13718	1.13679	1.14194	1.24254		1.15685	1.15685
Dynamic Viscosity	cP	3.43934	0.0646717	0.0647757	1.53158	4.76790	4.68383	1.53085				0.574999	0.644766			0.727066	1.46437	1.46440	1.45503	1.45408	0.0607886	2.22072		4.68383	4.68383
Kinematic Viscosity	cSt	3.34729	0.155553	0.155710	1.51479	4.59295	4.51062	1.51424				0.982373	0.660373			0.751470	1.46031	1.46034	1.46089	1.44944	0.1513077	2.18054		4.51062	4.51062
Thermal Conductivity	Btu/(hr*°F)	0.200493	0.0527046	0.0527160	0.197876	0.198178	0.199054	0.197761				0.364596	0.207421			0.193894	0.198803	0.198804	0.198908	0.198876	0.0522291	0.268752		0.199054	0.199054
Surface Tension	lb/ft	0.00371786	5.85639E-057	5.83727E-057	0.003387527	0.00379119	0.003387237	0.003387237				0.00463906	0.00304219			0.00295839	0.00338582	0.00338583	0.00338733	0.00337952	4.18701E-057	0.00447983		0.00379119	0.00379119
Net Ideal Gas Heating Value	Btu/ft³	478.683	1983.45	1982.16	477.963	480.282	478.276	478.190				2.01107	411.051			479.261	479.261	479.259	478.683	478.683	1985.18	186.524		478.276	478.276
Net Liquid Heating Value	Btu/lb	5134.56	19914.7	19908.2	5118.93	5148.28	5123.05	5121.96				-1013.76	4596.21			5138.83	5138.83	5138.82	5134.56	5134.56	19939.5	1930.50		5123.05	5123.05
Gross Ideal Gas Heating Value	Btu/ft³	565.133	2160.32	2158.94	564.207	566.680	564.538	564.447				52.4265	492.381			565.756	565.756	565.753	565.133	565.133	2162.24	229.108		564.538	564.538
Gross Liquid Heating Value	Btu/lb	6187.55	21705.6	21698.8	6187.66	6198.63	6172.02	6170.86				45.2638	5649.51			6191.82	6191.82	6191.80	6187.55	6187.55	21732.9	2989.05		6172.02	6172.02

User Specification Summary
For Reported Objects

Client Name:	ETC	Job:	PTE Calculations
Location:	Rev Cryo		
Flowsheet:			

Flowsheet : Amine

PStream : Lean Amine

Project!Flowsheets!Amine!PStreams!Lean Amine!Phases!Total!Properties!Temperature	121	°F
Project!Flowsheets!Amine!PStreams!Lean Amine!Phases!Total!Properties!Std Liquid Volumetric Flow	150	sgpm

PStream : NGL Feed

Project!Flowsheets!Amine!PStreams!NGL Feed!Phases!Total!Properties!Temperature	100	°F	
Project!Flowsheets!Amine!PStreams!NGL Feed!Phases!Total!Properties!Pressure	650	psig	
Project!Flowsheets!Amine!PStreams!NGL Feed!Phases!Total!Properties!Std Liquid Volumetric Flow	875	sgpm	
Project!Flowsheets!Amine!PStreams!NGL Feed!Phases!Total!Composition!Mole Fraction	C1	0.916858725	%
	C2	63.75298085	%
	C3	22.58829322	%
	iC4	2.650519204	%
	nC4	5.881178234	%
	iC5	1.26416962	%
	nC5	1.39927958	%
	nC6	0.852861744	%
	Benzene	1.16E-02	%
	nC7	0.345794896	%
	Toluene	0.135889959	%
	nC8	5.50E-02	%
	Ethylbenzene	1.58E-03	%
	nC9	1.76E-03	%
	CO2	0.141457958	%
	MeOH	8.32E-04	%

PStream : 1

Project!Flowsheets!Amine!PStreams!1!Phases!Total!Properties!Pressure	15	psig

PStream : 3

Project!Flowsheets!Amine!PStreams!3!Phases!Total!Properties!Pressure	60	psig

PStream : 4

Project!Flowsheets!Amine!PStreams!4!Phases!Total!Properties!Temperature	180	°F

PStream : 13

Project!Flowsheets!Amine!PStreams!13!Phases!Total!Properties!Pressure	655	psig

PStream : 16 Make-up

Project!Flowsheets!Amine!PStreams!16 Make-up!Phases!Total!Properties!Temperature	75	°F
Project!Flowsheets!Amine!PStreams!16 Make-up!Phases!Total!Properties!Pressure	10	psig



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Simulation Report

Client Name: ETC

Location: Rev Cryo

Job:

ProMax Filename: 2023-0331 Rev Cryo Misc Tanks v0.1

ProMax Version: 6.0.22251.0

Property Stencil Name: Lube Oil Tank

Property Stencil Flowsheet: Tanks

Emission Summary [Total]					
Component Subset	Tank Losses	Flashing Losses	Working Losses	Standing Losses	Loading Losses
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
VOCs	0.000	0.000	0.000	0.000	-
HAPs	0.000	0.000	0.000	0.000	-
BTEX	0.000	0.000	0.000	0.000	-
H2S	0.000	-	-	-	-
Methane	0.000	0.000	0.000	0.000	-

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Report Navigator can be activated via the ProMax Navigator Toolbar.



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Simulation Report

Client Name: ETC

Location: Rev Cryo

Job:

ProMax Filename: 2023-0331 Rev Cryo Misc Tanks v0.1

ProMax Version: 6.0.22251.0

Property Stencil Name: Methanol Tank

Property Stencil Flowsheet: Tanks

Emission Summary [Total]					
Component Subset	Tank Losses	Flashing Losses	Working Losses	Standing Losses	Loading Losses
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
VOCs	0.015	0.000	0.003	0.012	-
HAPs	0.015	0.000	0.003	0.012	-
BTEX	0.000	0.000	0.000	0.000	-
H2S	0.000	-	-	-	-
Methane	0.000	0.000	0.000	0.000	-

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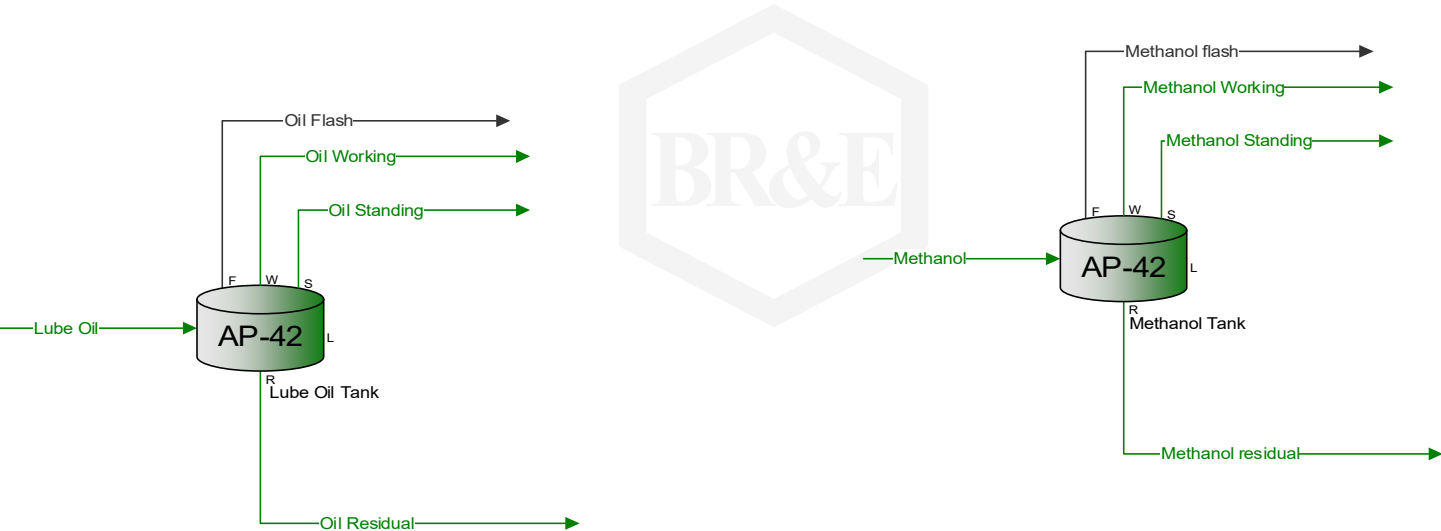
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Tanks



Inlet Stream Summary

Stream Name	Lube Oil	Methanol
Stream Flowsheet	Tanks	Tanks
Temperature °F	60.000	60.000
Pressure psig	0.000	0.000
Standard Vapor Volumetric Flow MSCFD	10.749	1.292
Standard Liquid Volumetric Flow bbl/d	17.874	0.391
Vapor Fraction (%)	0.000	0.000
Component	[Mol%]	[Mol%]
Carbon Dioxide	0.000	0.000
Nitrogen	0.000	0.000
Methane	0.000	0.000
Ethane	0.000	0.000
Propane	0.000	0.000
i-Butane	0.000	0.000
n-Butane	0.000	0.000
i-Pentane	0.000	0.000
n-Pentane	0.000	0.000
i-Hexane	0.000	0.000
Heptane	0.000	0.000
Octane	0.000	0.000
Nonane	0.000	0.000
Benzene	0.000	0.000
Toluene	0.000	0.000
Ethylbenzene	0.000	0.000
m-Xylene	0.000	0.000
n-Hexane	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000
Neopentane	0.000	0.000
Decanes Plus	0.000	0.000
Water	0.000	0.000
Helium	0.000	0.000
Hydrogen	0.000	0.000
Oxygen	0.000	0.000
Lube Oil	100.000	0.000
Propylene Glycol	0.000	0.000
Methanol	0.000	100.000
TEG	0.000	0.000
Ethanol	0.000	0.000
DEG	0.000	0.000
MEG	0.000	0.000
Methyl Mercaptan	0.000	0.000
Diesel	0.000	0.000
Gasoline	0.000	0.000

Flowsheet Information	
Tank Losses Block Name	Lube Oil Tank
Tank Losses Block Inlet Stream	Lube Oil

Tank Characteristics	
Tank Type	Vertical Cylinder
Time Frame	Year
Material Category	Light Organics
Number of Tanks	1
Shell Height [ft]	10.000
Diameter [ft]	5.000
Maximum Liquid Height [%] [ft]	90.000 9.000
Average Liquid Height [%] [ft]	50.000 5.000
Minimum Liquid Height [%] [ft]	10.000 1.000
Sum of Increases in Liquid Level [ft/yr]	1862.746
Tank Volume [gal] [bbl]	1468.797 34.971
Insulation	Uninsulated
Bolted or Riveted Construction	False
Vapor Balanced Tank	False

Paint Characteristics	
Shell Color	Dark Green
Shell Paint Condition	Average
Roof Color	Dark Green
Roof Paint Condition	Average

Roof Characteristics	
Type	Cone
Diameter [ft]	-
Slope [ft/ft]	0.063

Breather Vent Settings	
Breather Vacuum Pressure [psig]	-0.030
Breather Vent Pressure [psig]	0.030

Loading Loss Parameters	
Cargo Carrier	-
Land Based Mode of Operation	-
Marine Based Mode of Operation	-
Control Efficiency [%]	-
Truck Annual Leak Test Passed	-
Overall Reduction Efficiency [%]	-

Meteorological Data	
Location	Pittsburgh, PA
Average Atmospheric Pressure [psia]	14.100
Maximum Average Temperature [°F]	60.400
Minimum Average Temperature [°F]	42.800
Solar Insolation [BTU/ft^2*day]	1170.000
Average Wind Speed [mph]	7.800

Tank Conditions	
Flashing Temperature [°F]	65.077
Maximum Liquid Surface Temperature [°F]	65.077
Average Liquid Surface Temperature [°F]	57.308
Known Liquid Bulk Temperature?	False
Bulk Liquid Temperature [°F]	54.759
Net Throughput [bbl/day] [bbl/yr]	17.849 6514.950
Net Throughput Per Tank [bbl/day] [bbl/yr]	17.849 6514.950
Annual Turnovers Per Tank	232.843
Residual Liquid [bbl/day]	17.874
Residual Liquid Per Tank [bbl/day]	17.874
Raoult's Law Used for Vapor Pressure Calc?	False
Vapor Pressure @ Minimum Liquid Surface Temperature [psia]	0.000
Vapor Pressure @ Maximum Liquid Surface Temperature [psia]	0.000
Vapor Pressure @ Average Daily Liquid Surface Temperature [psia]	0.000

Tank Conditions	
Heated Tank?	-

Flowsheet Information	
Tank Losses Block Name	Methanol Tank
Tank Losses Block Inlet Stream	Methanol

Tank Characteristics	
Tank Type	Vertical Cylinder
Time Frame	Year
Material Category	Light Organics
Number of Tanks	1
Shell Height [ft]	10.000
Diameter [ft]	5.000
Maximum Liquid Height [%] [ft]	90.000 9.000
Average Liquid Height [%] [ft]	50.000 5.000
Minimum Liquid Height [%] [ft]	10.000 1.000
Sum of Increases in Liquid Level [ft/yr]	39.786
Tank Volume [gal] [bbl]	1468.797 34.971
Insulation	Uninsulated
Bolted or Riveted Construction	False
Vapor Balanced Tank	False

Paint Characteristics	
Shell Color	Dark Green
Shell Paint Condition	Average
Roof Color	Dark Green
Roof Paint Condition	Average

Roof Characteristics	
Type	Cone
Diameter [ft]	-
Slope [ft/ft]	0.063

Breather Vent Settings	
Breather Vacuum Pressure [psig]	-0.030
Breather Vent Pressure [psig]	0.030

Loading Loss Parameters	
Cargo Carrier	-
Land Based Mode of Operation	-
Marine Based Mode of Operation	-
Control Efficiency [%]	-
Truck Annual Leak Test Passed	-
Overall Reduction Efficiency [%]	-

Meteorological Data	
Location	Pittsburgh, PA
Average Atmospheric Pressure [psia]	14.100
Maximum Average Temperature [°F]	60.400
Minimum Average Temperature [°F]	42.800
Solar Insolation [BTU/ft^2*day]	1170.000
Average Wind Speed [mph]	7.800

Tank Conditions	
Flashing Temperature [°F]	65.077
Maximum Liquid Surface Temperature [°F]	65.077
Average Liquid Surface Temperature [°F]	57.308
Known Liquid Bulk Temperature?	False
Bulk Liquid Temperature [°F]	54.759
Net Throughput [bbl/day] [bbl/yr]	0.381 139.153
Net Throughput Per Tank [bbl/day] [bbl/yr]	0.381 139.153
Annual Turnovers Per Tank	4.973
Residual Liquid [bbl/day]	0.391
Residual Liquid Per Tank [bbl/day]	0.391
Raoult's Law Used for Vapor Pressure Calc?	False
Vapor Pressure @ Minimum Liquid Surface Temperature [psia]	1.101
Vapor Pressure @ Maximum Liquid Surface Temperature [psia]	1.789
Vapor Pressure @ Average Daily Liquid Surface Temperature [psia]	1.410

Tank Conditions	
Heated Tank?	-

Emission Summary [Total]					
Component Subset	Tank Losses [ton/yr]	Flashing Losses [ton/yr]	Working Losses [ton/yr]	Standing Losses [ton/yr]	Loading Losses [ton/yr]
VOCs	0.000	0.000	0.000	0.000	-
HAPs	0.000	0.000	0.000	0.000	-
BTEX	0.000	0.000	0.000	0.000	-
H2S	0.000	-	-	-	-

Emission Summary [Per Tank]					
Component Subset	Tank Losses [ton/yr]	Flashing Losses [ton/yr]	Working Losses [ton/yr]	Standing Losses [ton/yr]	Loading Losses [ton/yr]
VOCs (C3+)	0.000	0.000	0.000	0.000	-
HAPs	0.000	0.000	0.000	0.000	-
BTEX	0.000	0.000	0.000	0.000	-
H2S	0.000	-	-	-	-

Stream Properties						
	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	188.000	-	188.000	188.000	-
Net Ideal Gas Heating Value	[BTU/scf]	-	-	9169.963	9169.963	-
Standard Vapor Volumetric Flow	[scf/d]	-	0.000	0.000	0.000	-
Specific Gravity		0.851	-	-	-	0.849
Reid Vapor Pressure	[psi]	0.209	-	-	-	0.209
API Gravity		34.804	-	-	-	34.805
Standard Liquid Volumetric Flow	[bbt/d]	17.874	-	-	-	17.874

Stream Mass Flow [Total]							
Component	Tank Inlet [ton/yr]	Flashing Losses [ton/yr]	Working Losses [ton/yr]	Standing Losses [ton/yr]	Loading Losses [ton/yr]	Residual [ton/yr]	Total Emissions [ton/yr]
Carbon Dioxide	0.000	0.000	0.000	0.000	-	0.000	0.000
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
m-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Neopentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decanes Plus	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Helium	0.000	0.000	0.000	0.000	-	0.000	0.000
Hydrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Lube Oil	971.805	0.000	0.000	0.000	-	971.805	0.000
Propylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	0.000	0.000	0.000	0.000	-	0.000	0.000
TEG	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethanol	0.000	0.000	0.000	0.000	-	0.000	0.000
DEG	0.000	0.000	0.000	0.000	-	0.000	0.000
MEG	0.000	0.000	0.000	0.000	-	0.000	0.000
Methyl Mercaptan	0.000	0.000	0.000	0.000	-	0.000	0.000
Diesel	0.000	0.000	0.000	0.000	-	0.000	0.000
Gasoline	0.000	0.000	0.000	0.000	-	0.000	0.000

Stream Composition						
Component	Tank Inlet [Mol%]	Flashing Losses [Mol%]	Working Losses [Mol%]	Standing Losses [Mol%]	Loading Losses [Mol%]	Residual [Mol%]
Carbon Dioxide	0.000	-	0.000	0.000	-	0.000
Nitrogen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
i-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
m-Xylene	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Neopentane	0.000	-	0.000	0.000	-	0.000
Decanes Plus	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Helium	0.000	-	0.000	0.000	-	0.000
Hydrogen	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Lube Oil	100.000	-	100.000	100.000	-	100.000
Propylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
TEG	0.000	-	0.000	0.000	-	0.000
Ethanol	0.000	-	0.000	0.000	-	0.000
DEG	0.000	-	0.000	0.000	-	0.000
MEG	0.000	-	0.000	0.000	-	0.000
Methyl Mercaptan	0.000	-	0.000	0.000	-	0.000
Diesel	0.000	-	0.000	0.000	-	0.000
Gasoline	0.000	-	0.000	0.000	-	0.000
Component	Tank Inlet [Mass%]	Flashing Losses [Mass%]	Working Losses [Mass%]	Standing Losses [Mass%]	Loading Losses [Mass%]	Residual [Mass%]
Carbon Dioxide	0.000	-	0.000	0.000	-	0.000
Nitrogen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
i-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
m-Xylene	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Neopentane	0.000	-	0.000	0.000	-	0.000
Decanes Plus	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Helium	0.000	-	0.000	0.000	-	0.000
Hydrogen	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Lube Oil	100.000	-	100.000	100.000	-	100.000
Propylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	0.000	-	0.000	0.000	-	0.000
TEG	0.000	-	0.000	0.000	-	0.000
Ethanol	0.000	-	0.000	0.000	-	0.000
DEG	0.000	-	0.000	0.000	-	0.000
MEG	0.000	-	0.000	0.000	-	0.000
Methyl Mercaptan	0.000	-	0.000	0.000	-	0.000
Diesel	0.000	-	0.000	0.000	-	0.000
Gasoline	0.000	-	0.000	0.000	-	0.000

Emission Summary [Total]					
Component Subset	Tank Losses [ton/yr]	Flashing Losses [ton/yr]	Working Losses [ton/yr]	Standing Losses [ton/yr]	Loading Losses [ton/yr]
VOCs	0.012	0.000	0.000	0.012	-
HAPs	0.015	0.000	0.003	0.012	-
BTEX	0.000	0.000	0.000	0.000	-
H2S	0.000	-	-	-	-

Emission Summary [Per Tank]					
Component Subset	Tank Losses [ton/yr]	Flashing Losses [ton/yr]	Working Losses [ton/yr]	Standing Losses [ton/yr]	Loading Losses [ton/yr]
VOCs (C3+)	0.012	0.000	0.000	0.012	-
HAPs	0.015	0.000	0.003	0.012	-
BTEX	0.000	0.000	0.000	0.000	-
H2S	0.000	-	-	-	-

Stream Properties						
	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight [lb/lbmol]	32.042	-	32.042	32.042	-	32.042
Net Ideal Gas Heating Value [BTU/scf]	-	-	766.100	766.100	-	-
Standard Vapor Volumetric Flow [scf/d]	-	0.000	0.205	0.757	-	-
Specific Gravity	0.815	-	-	-	-	0.812
Reid Vapor Pressure [psi]	4.884	-	-	-	-	4.884
API Gravity	42.036	-	-	-	-	42.037
Standard Liquid Volumetric Flow [bbbl/d]	0.391	-	-	-	-	0.391

Stream Mass Flow [Total]							
Component	Tank Inlet [ton/yr]	Flashing Losses [ton/yr]	Working Losses [ton/yr]	Standing Losses [ton/yr]	Loading Losses [ton/yr]	Residual [ton/yr]	Total Emissions [ton/yr]
Carbon Dioxide	0.000	0.000	0.000	0.000	-	0.000	0.000
Nitrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
Methane	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethane	0.000	0.000	0.000	0.000	-	0.000	0.000
Propane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Butane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Pentane	0.000	0.000	0.000	0.000	-	0.000	0.000
i-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	-	0.000	0.000
Octane	0.000	0.000	0.000	0.000	-	0.000	0.000
Nonane	0.000	0.000	0.000	0.000	-	0.000	0.000
Benzene	0.000	0.000	0.000	0.000	-	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	-	0.000	0.000
m-Xylene	0.000	0.000	0.000	0.000	-	0.000	0.000
n-Hexane	0.000	0.000	0.000	0.000	-	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Neopentane	0.000	0.000	0.000	0.000	-	0.000	0.000
Decanes Plus	0.000	0.000	0.000	0.000	-	0.000	0.000
Water	0.000	0.000	0.000	0.000	-	0.000	0.000
Helium	0.000	0.000	0.000	0.000	-	0.000	0.000
Hydrogen	0.000	0.000	0.000	0.000	-	0.000	0.000
Oxygen	0.000	0.000	0.000	0.000	-	0.000	0.000
Lube Oil	0.000	0.000	0.000	0.000	-	0.000	0.000
Propylene Glycol	0.000	0.000	0.000	0.000	-	0.000	0.000
Methanol	19.909	0.000	0.003	0.012	-	19.894	0.015
TEG	0.000	0.000	0.000	0.000	-	0.000	0.000
Ethanol	0.000	0.000	0.000	0.000	-	0.000	0.000
DEG	0.000	0.000	0.000	0.000	-	0.000	0.000
MEG	0.000	0.000	0.000	0.000	-	0.000	0.000
Methyl Mercaptan	0.000	0.000	0.000	0.000	-	0.000	0.000
Diesel	0.000	0.000	0.000	0.000	-	0.000	0.000
Gasoline	0.000	0.000	0.000	0.000	-	0.000	0.000

Stream Composition						
Component	Tank Inlet [Mol%]	Flashing Losses [Mol%]	Working Losses [Mol%]	Standing Losses [Mol%]	Loading Losses [Mol%]	Residual [Mol%]
Carbon Dioxide	0.000	-	0.000	0.000	-	0.000
Nitrogen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
i-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
m-Xylene	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Neopentane	0.000	-	0.000	0.000	-	0.000
Decanes Plus	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Helium	0.000	-	0.000	0.000	-	0.000
Hydrogen	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Lube Oil	0.000	-	0.000	0.000	-	0.000
Propylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	100.000	-	100.000	100.000	-	100.000
TEG	0.000	-	0.000	0.000	-	0.000
Ethanol	0.000	-	0.000	0.000	-	0.000
DEG	0.000	-	0.000	0.000	-	0.000
MEG	0.000	-	0.000	0.000	-	0.000
Methyl Mercaptan	0.000	-	0.000	0.000	-	0.000
Diesel	0.000	-	0.000	0.000	-	0.000
Gasoline	0.000	-	0.000	0.000	-	0.000
Component	Tank Inlet [Mass%]	Flashing Losses [Mass%]	Working Losses [Mass%]	Standing Losses [Mass%]	Loading Losses [Mass%]	Residual [Mass%]
Carbon Dioxide	0.000	-	0.000	0.000	-	0.000
Nitrogen	0.000	-	0.000	0.000	-	0.000
Methane	0.000	-	0.000	0.000	-	0.000
Ethane	0.000	-	0.000	0.000	-	0.000
Propane	0.000	-	0.000	0.000	-	0.000
i-Butane	0.000	-	0.000	0.000	-	0.000
n-Butane	0.000	-	0.000	0.000	-	0.000
i-Pentane	0.000	-	0.000	0.000	-	0.000
n-Pentane	0.000	-	0.000	0.000	-	0.000
i-Hexane	0.000	-	0.000	0.000	-	0.000
Heptane	0.000	-	0.000	0.000	-	0.000
Octane	0.000	-	0.000	0.000	-	0.000
Nonane	0.000	-	0.000	0.000	-	0.000
Benzene	0.000	-	0.000	0.000	-	0.000
Toluene	0.000	-	0.000	0.000	-	0.000
Ethylbenzene	0.000	-	0.000	0.000	-	0.000
m-Xylene	0.000	-	0.000	0.000	-	0.000
n-Hexane	0.000	-	0.000	0.000	-	0.000
2,2,4-Trimethylpentane	0.000	-	0.000	0.000	-	0.000
Neopentane	0.000	-	0.000	0.000	-	0.000
Decanes Plus	0.000	-	0.000	0.000	-	0.000
Water	0.000	-	0.000	0.000	-	0.000
Helium	0.000	-	0.000	0.000	-	0.000
Hydrogen	0.000	-	0.000	0.000	-	0.000
Oxygen	0.000	-	0.000	0.000	-	0.000
Lube Oil	0.000	-	0.000	0.000	-	0.000
Propylene Glycol	0.000	-	0.000	0.000	-	0.000
Methanol	100.000	-	100.000	100.000	-	100.000
TEG	0.000	-	0.000	0.000	-	0.000
Ethanol	0.000	-	0.000	0.000	-	0.000
DEG	0.000	-	0.000	0.000	-	0.000
MEG	0.000	-	0.000	0.000	-	0.000
Methyl Mercaptan	0.000	-	0.000	0.000	-	0.000
Diesel	0.000	-	0.000	0.000	-	0.000
Gasoline	0.000	-	0.000	0.000	-	0.000



Bryan Research & Engineering, LLC

ProMax® 6.0

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Simulation Report

Client Name: Energy Transfer

Location: Rev Cryo

Job: GP5 Renewal

ProMax Filename: 2023-0331 Rev Cryo Oily Water v0.1

ProMax Version: 6.0.22251.0

Property Stencil Name: TANK-100

Property Stencil Flowsheet: ETC

Emission Summary [Total]					
Component Subset	Tank Losses	Flashing Losses	Working Losses	Standing Losses	Loading Losses
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
VOCs	0.184	0.168	0.009	0.006	0.056
HAPs	0.011	0.005	0.004	0.002	0.022
BTEX	0.009	0.003	0.004	0.002	0.022
H2S	0.000	-	-	-	-
Methane	0.701	0.665	0.021	0.014	0.129

Bryan Research & Engineering, LLC

Chemical Engineering Consultants

P.O. Box 4747 Bryan, Texas 77805

Office: (979) 776-5220

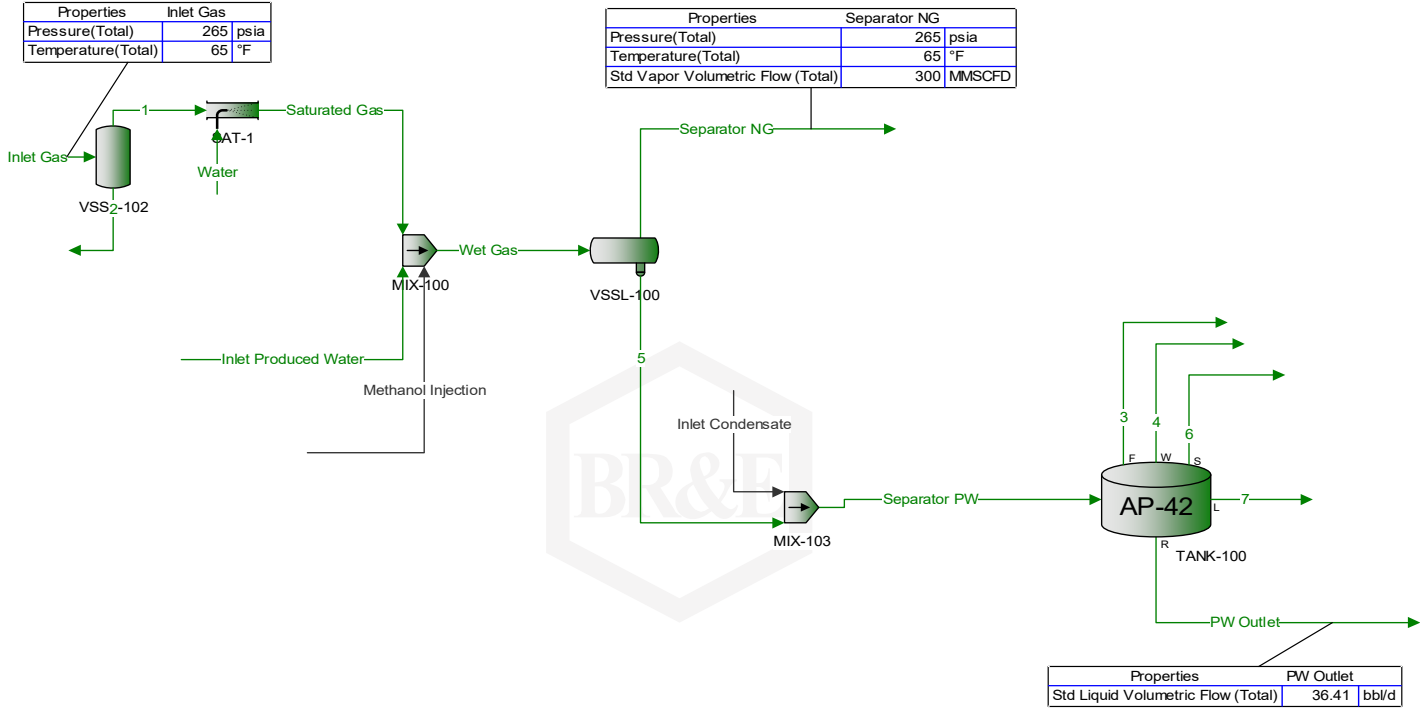
FAX: (979) 776-4818

mailto:sales@bre.com

<http://www.bre.com/>

Report Navigator can be activated via the ProMax Navigator Toolbar.

ETC



Inlet Stream Summary			
Stream Name	Inlet Condensate	Inlet Gas	Inlet Produced Water
Stream Flowsheet	ETC	ETC	ETC
Temperature °F	65.000	65.000	65.000
Pressure psig	250.000	250.000	250.000
Standard Vapor Volumetric Flow MSCFD	0.000	299649.893	268.570
Standard Liquid Volumetric Flow bbl/d	0.000	138418.989	36.411
Vapor Fraction (%)	0.000	99.993	0.000
Component	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	0.379	0.000
Oxygen	0.000	0.000	0.000
Carbon Dioxide	0.000	0.499	0.000
Methane	0.000	76.174	0.000
Ethane	0.004	14.925	0.000
Propane	0.849	5.008	0.000
Isobutane	3.212	0.559	0.000
n-Butane	4.880	1.367	0.000
Isopentane	9.785	0.289	0.000
n-Pentane	5.787	0.379	0.000
Cyclopentane	0.000	0.000	0.000
n-Hexane	6.312	0.259	0.000
Cyclohexane	0.000	0.013	0.000
Isohexane	11.832	0.000	0.000
Heptane	15.275	0.086	0.000
Methylcyclohexane	0.000	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.050	0.000
Octane	38.415	0.007	0.000
Benzene	0.488	0.002	0.000
Toluene	1.329	0.003	0.000
Ethylbenzene	0.205	0.000	0.000
o-Xylene	1.626	0.000	0.000
Water	0.000	0.000	100.000
Methanol	0.000	0.000	0.000

Inlet Stream Summary		
Stream Name	Methanol Injection	Water
Stream Flowsheet	ETC	ETC
Temperature °F	55.000	406.130
Pressure psig	250.000	250.000
Standard Vapor Volumetric Flow MSCFD	0.000	371.455
Standard Liquid Volumetric Flow bbl/d	0.000	50.360
Vapor Fraction (%)	-	83.311
Component	[Mol%]	[Mol%]
Nitrogen	0.000	0.000
Oxygen	0.000	0.000
Carbon Dioxide	0.000	0.000
Methane	0.000	0.000
Ethane	0.000	0.000
Propane	0.000	0.000
Isobutane	0.000	0.000
n-Butane	0.000	0.000
Isopentane	0.000	0.000
n-Pentane	0.000	0.000
Cyclopentane	0.000	0.000
n-Hexane	0.000	0.000
Cyclohexane	0.000	0.000
Isohexane	0.000	0.000
Heptane	0.000	0.000
Methylcyclohexane	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.000
Octane	0.000	0.000
Benzene	0.000	0.000
Toluene	0.000	0.000
Ethylbenzene	0.000	0.000
o-Xylene	0.000	0.000
Water	0.000	100.000
Methanol	100.000	0.000

Flowsheet Information	
Tank Losses Block Name	TANK-100
Tank Losses Block Inlet Stream	Separator PW

Tank Characteristics	
Tank Type	Vertical Cylinder
Time Frame	Year
Material Category	Light Organics
Number of Tanks	1
Shell Height [ft]	15.000
Diameter [ft]	12.000
Maximum Liquid Height [%] [ft]	90.000 13.500
Average Liquid Height [%] [ft]	50.000 7.500
Minimum Liquid Height [%] [ft]	10.000 1.500
Sum of Increases in Liquid Level [ft/yr]	659.536
Tank Volume [gal] [bbl]	12690.402 302.152
Insulation	Uninsulated
Bolted or Riveted Construction	False
Vapor Balanced Tank	False

Paint Characteristics	
Shell Color	Dark Green
Shell Paint Condition	Average
Roof Color	Dark Green
Roof Paint Condition	Average

Roof Characteristics	
Type	Cone
Diameter [ft]	-
Slope [ft/ft]	0.063

Breather Vent Settings	
Breather Vacuum Pressure [psig]	-0.030
Breather Vent Pressure [psig]	0.030

Loading Loss Parameters	
Cargo Carrier	Tank Truck or Rail Tank Car
Land Based Mode of Operation	Submerged Loading of a Clean Cargo Tank
Marine Based Mode of Operation	-
Control Efficiency [%]	0.000
Truck Annual Leak Test Passed	None
Overall Reduction Efficiency [%]	0.000

Meteorological Data	
Location	Pittsburgh, PA
Average Atmospheric Pressure [psia]	14.100
Maximum Average Temperature [°F]	60.400
Minimum Average Temperature [°F]	42.800
Solar Insolation [BTU/ft^2*day]	1170.000
Average Wind Speed [mph]	7.800

Tank Conditions	
Flashing Temperature [°F]	65.530
Maximum Liquid Surface Temperature [°F]	65.530
Average Liquid Surface Temperature [°F]	57.669
Known Liquid Bulk Temperature?	False
Bulk Liquid Temperature [°F]	54.759
Net Throughput [bbl/day] [bbl/yr]	36.402 13286.743
Net Throughput Per Tank [bbl/day] [bbl/yr]	36.402 13286.743
Annual Turnovers Per Tank	54.961
Residual Liquid [bbl/day]	36.410
Residual Liquid Per Tank [bbl/day]	36.410
Raoult's Law Used for Vapor Pressure Calc?	False
Vapor Pressure @ Minimum Liquid Surface Temperature [psia]	12.087
Vapor Pressure @ Maximum Liquid Surface Temperature [psia]	14.100
Vapor Pressure @ Average Daily Liquid Surface Temperature [psia]	13.080

Tank Conditions	
Heated Tank?	-

Emission Summary [Total]					
Component Subset	Tank Losses	Flashing Losses	Working Losses	Standing Losses	Loading Losses
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
VOCs	0.184	0.168	0.009	0.006	0.056
HAPs	0.011	0.005	0.004	0.002	0.022
BTEX	0.009	0.003	0.004	0.002	0.022
H2S	0.000	-	-	-	-

Emission Summary [Per Tank]					
Component Subset	Tank Losses	Flashing Losses	Working Losses	Standing Losses	Loading Losses
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
VOCs [C3+]	0.184	0.168	0.009	0.006	0.056
HAPs	0.011	0.005	0.004	0.002	0.022
BTEX	0.009	0.003	0.004	0.002	0.022
H2S	0.000	-	-	-	-

Stream Properties						
	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
Molecular Weight	[lb/lbmol]	18.018	21.846	28.714	28.714	18.015
Net Ideal Gas Heating Value	[BTU/scf]	-	1070.927	467.973	467.973	-
Standard Vapor Volumetric Flow	[scf/d]	-	125.118	11.368	7.631	69.361
Specific Gravity		0.999	-	-	-	0.999
Reid Vapor Pressure	[psi]	1.122	-	-	-	1.034
API Gravity		10.044	-	-	-	9.998
Standard Liquid Volumetric Flow	[bbl/d]	36.474	-	-	-	36.410

Stream Mass Flow [Total]							
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual	Total Emissions
	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]	[ton/yr]
Nitrogen	0.003	0.003	0.000	0.000	0.000	0.000	0.003
Oxygen	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Carbon Dioxide	0.256	0.120	0.081	0.055	0.496	0.000	0.256
Methane	0.701	0.665	0.021	0.014	0.129	0.000	0.701
Ethane	0.361	0.333	0.017	0.011	0.102	0.000	0.361
Propane	0.116	0.109	0.004	0.003	0.024	0.000	0.116
Isobutane	0.012	0.011	0.000	0.000	0.002	0.000	0.012
n-Butane	0.035	0.033	0.001	0.001	0.007	0.000	0.035
Isopentane	0.006	0.006	0.000	0.000	0.001	0.000	0.006
n-Pentane	0.003	0.003	0.000	0.000	0.000	0.000	0.003
Cyclopentane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	0.002	0.001	0.000	0.000	0.000	0.000	0.002
Cyclohexane	0.002	0.001	0.000	0.000	0.001	0.000	0.002
Isohexane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Heptane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Methylcyclohexane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2,2,4-Trimethylpentane	0.001	0.001	0.000	0.000	0.000	0.000	0.001
Octane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Benzene	0.010	0.001	0.001	0.001	0.009	0.007	0.004
Toluene	0.011	0.002	0.002	0.001	0.012	0.006	0.005
Ethylbenzene	0.001	0.000	0.000	0.000	0.001	0.000	0.000
o-Xylene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Water	2326.824	0.024	0.029	0.019	0.174	2326.752	0.072
Methanol	0.000	0.000	0.000	0.000	0.496	0.000	0.000

Stream Composition						
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]	[Mol%]
Nitrogen	0.000	0.182	0.031	0.031	0.031	0.000
Oxygen	0.000	0.000	0.000	0.000	0.000	0.000
Carbon Dioxide	0.005	4.541	33.810	33.810	33.810	0.000
Methane	0.034	68.938	24.178	24.178	24.178	0.000
Ethane	0.009	18.431	10.146	10.146	10.146	0.000
Propane	0.002	4.109	1.612	1.612	1.612	0.000
Isobutane	0.000	0.320	0.094	0.094	0.094	0.000
n-Butane	0.000	0.937	0.336	0.336	0.336	0.000
Isopentane	0.000	0.135	0.036	0.036	0.036	0.000
n-Pentane	0.000	0.066	0.006	0.006	0.006	0.000
Cyclopentane	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	0.000	0.029	0.002	0.002	0.002	0.000
Cyclohexane	0.000	0.026	0.037	0.037	0.037	0.000
Isohexane	0.000	0.000	0.000	0.000	0.000	0.000
Heptane	0.000	0.007	0.000	0.000	0.000	0.000
Methylcyclohexane	0.000	0.000	0.000	0.000	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.008	0.001	0.001	0.001	0.000
Octane	0.000	0.000	0.000	0.000	0.000	0.000
Benzene	0.000	0.024	0.336	0.336	0.336	0.000
Toluene	0.000	0.028	0.401	0.401	0.401	0.000
Ethylbenzene	0.000	0.002	0.022	0.022	0.022	0.000
o-Xylene	0.000	0.000	0.000	0.000	0.000	0.000
Water	99.949	2.219	28.951	28.951	28.951	100.000
Methanol	0.000	0.000	0.000	0.000	0.000	0.000
Component	Tank Inlet	Flashing Losses	Working Losses	Standing Losses	Loading Losses	Residual
	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]	[Mass%]
Nitrogen	0.000	0.233	0.030	0.030	0.030	0.000
Oxygen	0.000	0.000	0.000	0.000	0.000	0.000
Carbon Dioxide	0.011	9.149	51.819	51.819	51.819	0.000
Methane	0.030	50.625	13.508	13.508	13.508	0.000
Ethane	0.016	25.368	10.625	10.625	10.625	0.000
Propane	0.005	8.294	2.476	2.476	2.476	0.000
Isobutane	0.001	0.851	0.189	0.189	0.189	0.000
n-Butane	0.001	2.492	0.680	0.680	0.680	0.000
Isopentane	0.000	0.445	0.090	0.090	0.090	0.000
n-Pentane	0.000	0.217	0.016	0.016	0.016	0.000
Cyclopentane	0.000	0.000	0.000	0.000	0.000	0.000
n-Hexane	0.000	0.113	0.006	0.006	0.006	0.000
Cyclohexane	0.000	0.100	0.110	0.110	0.110	0.000
Isohexane	0.000	0.000	0.000	0.000	0.000	0.000
Heptane	0.000	0.030	0.001	0.001	0.001	0.000
Methylcyclohexane	0.000	0.000	0.000	0.000	0.000	0.000
2,2,4-Trimethylpentane	0.000	0.041	0.003	0.003	0.003	0.000
Octane	0.000	0.001	0.000	0.000	0.000	0.000
Benzene	0.000	0.084	0.914	0.914	0.914	0.000
Toluene	0.000	0.118	1.286	1.286	1.286	0.000
Ethylbenzene	0.000	0.008	0.082	0.082	0.082	0.000
o-Xylene	0.000	0.000	0.000	0.000	0.000	0.000
Water	99.935	1.830	18.164	18.164	18.164	99.999
Methanol	0.000	0.000	0.000	0.000	0.000	0.000

ATTACHMENT E – MANUFACTURER SPECIFICATIONS

UOP Russell, LLC
Tulsa, Oklahoma

JOB NO: TRJ-380FE
CLIENT: Energy Transfer
SUBJECT: 200MMscfd Cryo Plant

DATE: 5/20/15
BY: JRG

FIRED HEATER

Service: HMO Heater				Tag No: H-781, H-782, H-783			
Design Duty, MBTU/Hr 88,384				Type: Vertical Cylindrical			
No. of Coils per Unit One		No. Units: One		Tulsa Heaters			
Fluid		Therminol 55		Burners			
		Inlet	Outlet		Gas	Oil	
Liquids	Lbs/Hr	790,000	790,000	LHV (BTU/cf)	912		
Density	Lbs/CuFt	49.20	44.50	Mol. Wt.	16.2		
Molecular Weight		320	320	Gravity	0.55		
Specific Heat	BTU/Lb °F	0.5605	0.6490	Pressure Avail. (psig)	85		
Thermal Cond.	BTU/Hr-Ft-°F	0.0660	0.0588	Pressure Req'd (psig)			
Viscosity	cP	1.418	0.4920	Steam for Atomizing	N. R.		
Vapor	Lbs/Hr	0	0	Fuel Gas Req'd (MSCFD)	2,759.99	N/A	
Density	Lbs/CuFt			Mfr:	Zeeco GLSF 16		
Molecular Weight				Type:	Natural Draft		
Specific Heat	BTU/Lb °F			Number Req'd:	3		
Thermal Cond.	BTU/Hr-Ft °F			Pilots Req'd:	Yes, elec. Ignition		
Viscosity	cP			Ultra Low NOx Req'd:	Yes, <40 ppmv		
Operating Temp.	°F	290	475	Structural Design			
Operating Pressure	PSIA	110	63.4	Wind Load, MPH, (3)	150 MPH		
Velocity	Ft/Sec			Seismic Zone, (3)	S _s =100%, S _i =40%		
Pressure Drop	PSI	45 Allow.	23.4 Calc.	Ambient, °F	-20 / 100		
Fouling Resistance	SqFt°F/BTU	0.002		Elevation, Ft	1300		
Design Press. / Temp.		150 PSIG	550 °F	Stack Design			
Min. Design Mtl. Temp.		-20 °F @	150 PSIG	Self-supporting	Yes		
Corrosion Allowance		0.125 in.		Minimum Height			
Insulation Thickness		3" - 5" Ceramic Fiber on Interior		Minimum Wall Thickness:	0.125		
Efficiency-Based on LHV (%)		86.8%	(Assume 3% Loss)	Lining Type	No		
Excess Air		15%		Lining Thickness:	No		
Firebox Unit Heat Release		BTU/Hr- Ft^3		Damper:	Yes		
Number of Passes		Four - Process, Two - Fireside					
Coil Design		Radiant	Convection	Convection - Finned			
Gas Temperature	In/Out	/ 1506					
Number Tubes		68	24	48			
Tube O.D.	In	3.5	3.5	3.5			
Tube Length	Eff. Ft	25.67	11.92	11.92			
Bare Surface	Sq Ft	1,646	224	-----			
Finned Surface	Sq Ft	-----	-----	4155			
Avg. Heat Flux	BTU/Hr-Sq Ft	11946					
Tube Materials		SA- 106B	SA- 106B	SA- 106B			
Convection Fins (inch):	Height:	Thickness:	No. / inch:	Material:	CS		
Overall Dimension:							
Code Requirements:	ASME VIII Div I		Stamp: Yes	Nat'l Board:	Yes		
Notes: 1) Add 10% to duty and flow rates for design. 2) See attached Scope of Supply. 3) Wind design per ASCE 7-10, Cat. III, Exposure C. Seismic design per ASCE 7-10, I=1.25, Site D. 4) Electrical power to be 480 v / 3 ph / 60 hz. Control enclosures to be NEMA 4. 5) Add spare ignitor. Design heater to use fuel gas and waste gas. Compositions attached. 6) Please keep design to 4 passes or less. Use more pressure drop as needed. 7) Do not include expansion tanks or pumps in quote. 8) Flanges to be 300# RFWN 9) Three (3) separate units to be provided. Process conditions reflect total for all units combined. 10) Provide separate burner ring for burning waste gas. 11) Provide auto dampers and blower to reduce purge time.							
REVISION	A		B		0		
ENGINEER/DATE	JRG	5/20/15	JEC	8/28/15	JRG	9/17/15	
ISSUED FOR	RFQ		Revised for RFQ		Purchase		

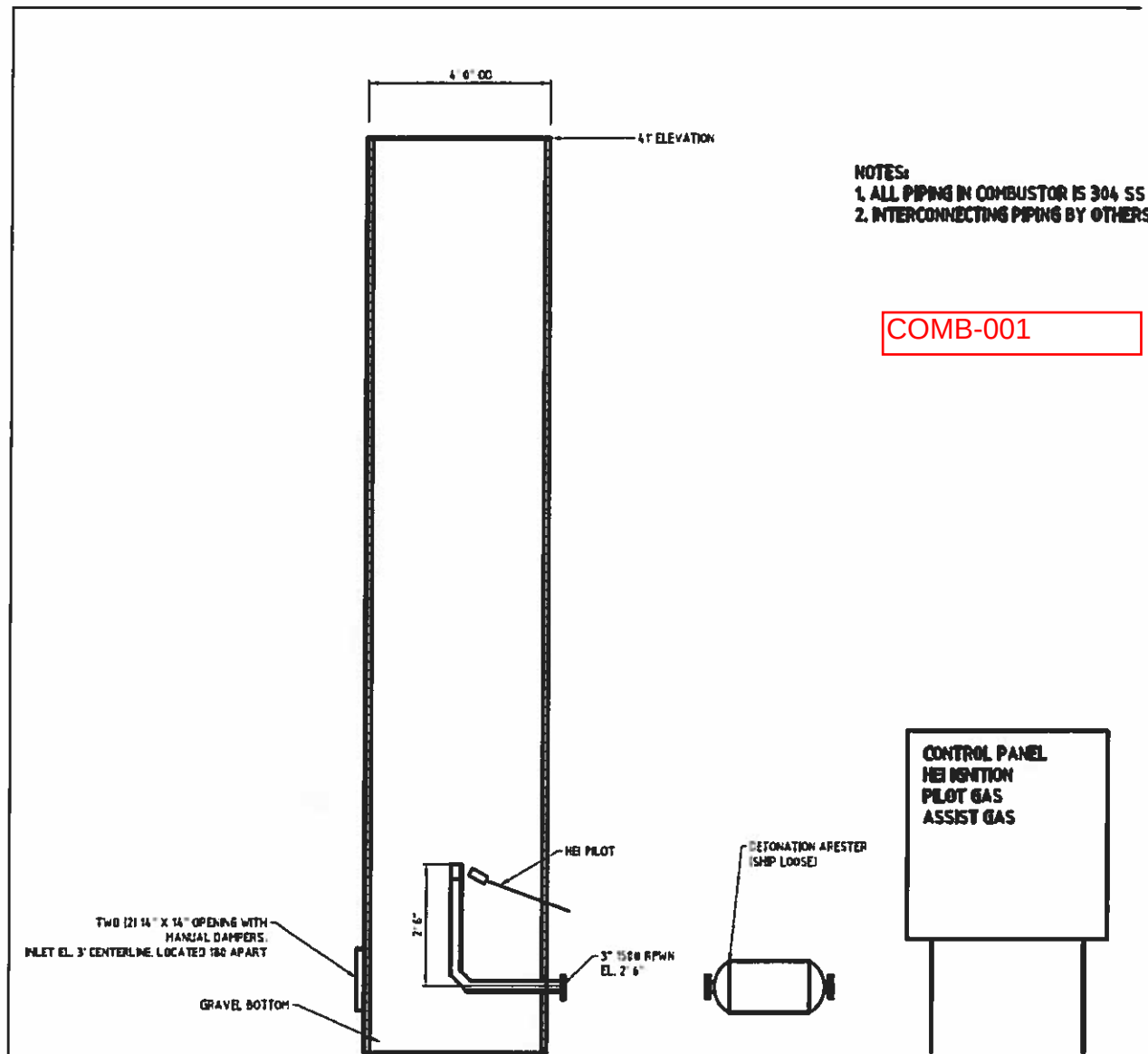
Rev	By	Date
0	Daniel Dunagan	February 5, 2016
1		
2		

COMB-001

PROPOSAL NUMBER: F-XXXXXX				
NOZZLE/OPENING INFORMATION				
	Connection	Size	Quantity	Type
	Waste Gas Inlet	3"	1	TBD
	Air Opening	~ 14" x 14"	2	Dampers
	Pilot Connection	2"	1	TBD
	Thermocouple	1"	1	TBD
CONSTRUCTION MATERIAL				
	Piping in Combustor		304 SS	
	Combustor		A36	
	Rain Protection Cap		304 SS	
	Refractory Anchors		I-601	
DESIGN INFORMATION				
	Overall Height		41'	
	Outer Diameter		4'	
	Combustor Shape		Circular	
	Insulation		Two (2) layers of 1" insulation	
	Pilot Ignition		HEI	
	Dampers		Manual we may be able to remove these from our scope.	
	Header inlet		2' 6"	
	Damper Inlet		3' 0"	
	Damper location		The dampers will be located 180 apart.	
	Floor		Gravel	
	Detonation arrester		3" eccentric type.	
Notes				
	The T/C connection will be at the top of the combustor EL 35'. This will be for a hi hi shutdown at 2100 F.			
	Refer to the marked up PID for clarifications			

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Rev. 1

FLARE-001

Rev	By	Date
0	NA	NA
1	NDS	Jan 21 st
2		

PROPOSAL / PROJECT NUMBER:			
MANUFACTURING SPECIFICATIONS			
1	Welding:	WQS and WPR per ASME Section IX	
2	Paint Specifications:	Carbon Steel: SP-10, Inorganic Zinc Primer, High Heat Aluminum Finish Stainless Steel: no coatings required	
3	Construction	Per AISC	
4			
NOZZLE INFORMATION			
5	Connection	Size	Quantity
6	Air Plenum Inlet (D)	40"	1
7	Waste Gas Inlet (A)	24"	1
8			
CONSTRUCTION MATERIAL			
9	Upper 5' of Plenum and Flare Tip Shell	310 SS	
10	Upper 5' of Internal Tubes	316 SS	
11	Lower 5' of Plenum, Shell, & Tubes	Carbon Steel	
12	Velocity Seal	304 SS	
	Inner Tube Casting	CK-20	
DESIGN INFORMATION			
13	Flare Tip Shell OD (B)	31"	Pilot Quantity
14	Air Plenum Exit OD (C)	35.5"	Tube Quantity
15	Plenum Exit Length (E)	3"	Tube Size
16	Plenum Cone Length (F)	6"	Weight
17	Overall Length (G)	10'-0"	STRUCTURAL
UTILITY CONSUMPTION			
18	Seal Type	Velocity	
19	Natural Gas	434 SCFH	
20	Nitrogen	322 SCFH	
PROCESS CONDITION			
21	Total Flow Rate	570,758 lb/hr	
22	Smokeless Flow Rate	25,000 lb/hr	
23	Gas Temperature	-61/91 °F	
24	Molecular Weight	24.9-43.95	
25	Air Flow Rate	21,500 SCFM	
26	Maximum Gas Velocity	700 ft/s	
NOTES			
1. All flange bolt holes straddle center lines.			
2. All CS is A-36 or equal			
3. Piping must be anchored within 5' of flare			
4. Continuous purge required			
5. Tubes are in two rows. The middle row just has one air tube, the outer row has 6 tubes.			
6.			

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UOP Honeywell Company
Tulsa, OK 74136
USA

PROJECT SPECIFICATION

9XXXXX—220

SHEET

1

THERMAL OXIDIZER

THERM-001

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	02/15/16	ZT	MK				

Energy Transfer, UOPR Project
Thermal Oxidizer

ITEM NO. TO-971

Reference Specifications

UOPC Doc# DT-9xxxxx-201 Thermal oxidizer Ass'y (TBD)

UOPC Doc # 9xxxxxx-958 Thermal oxidizer Burner Data sheet

Item A: Furnish One (1) Oxidizer Furnace in accordance with the following:

A.1. Size and Process Requirements

Provide one 42" OD Top diameter x 40' OAH refractory lined Oxidizer Furnace to perform the following process requirements. Adequate residence time (1.0 seconds as minimum) based upon design temp of 1600~1800°F will be provided in the reduction furnace to allow complete destruction of waste gas:

Parameter	Case -01 Acid Gas	Fuel Gas
Inlet Temperature to Oxidizer, °F	120	69
Pressure required at the Oxidizer, "WC	5	20 psig
Flow Rate, Mol %		
Nitrogen	0.000	0.49
CO2	90.540	0.34
H2S	0.000	0.00
Methane	0.010	98.12
Ethane	0.800	1.03
Propane	0.190	0.02
i-C4	0.000	0.00
n-C4	0.000	0.00
i-C5	0.000	0.00
n-C5	0.000	0.00
C6	0.000	0.00
C7	0.000	0.00
C8	0.000	0.00
C9	0.000	0.00
C10	0.000	0.00
H2O	8.460	0.00

Other specifications
referenced in this
specification:

UOP Standard Specification:

UOP Standard Drawing:

UOP Project Specification:

| EDI Project

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UOP Honeywell Company
Tulsa, OK 74136
USA

PROJECT SPECIFICATION

9XXXXX—220 SHEET 2

THERMAL OXIDIZER

THERM-001

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	02/15/16	ZT	MK				

A.2. Arrangement and Dimensions

The Oxidizer Furnace will be arranged for Vertical up firing.

A.3. Mechanical Requirements

The Thermal Oxidizer assembly will be complete from inlet to outlet connection including:

A.3.1 Thermal Oxidizer with Stack

- a. The design pressure of the combustor will be ambient internal at skin temp between 300°F and 650°F shell temperature.
Corrosion allowance of 0" is to be added to the required thickness. This shell temperature is nominal and is based on an adequate thickness of a suitable refractory lining. Vessel wall thickness will be no less than 1/4".
- b. The vessel will be designed and fabricated in accordance applicable portions of the AISC, welding per AWS.
- c. Seismic Design per ASCE 7-10, Site D. I=1.25. Ss=100%, S1 = 40%.
- d. Wind per ASCE 7-10, Cf = 0.7, V = 150 mph, Cat. III, Exp. C.
- e. All steel plate will be carbon steel in accordance with AISC 9th Edition SA-36 or Equivalent.
- f. Minimum design metal temperature is minus 20 °F.
- g. Oxidizer to be designed for single lift design.

A.3.2 Connections

- a. Burner Conn. One Burner 21 1/2" MTG connection, plate flanged, is required into Thermal Oxidizer.
- b. Thermowells Conn. Three 2" ANSI Class 150 RF flanged openings is required.
- c. EPA Sample Conn. Two 4" ANSI Class 150 RF flanged openings with blind is required.
- d. Sight Ports One 4". ANSI Class 150 RF flanged openings in shell.
Provide welding neck nozzles to project through the refractory lining. Nozzles will be equipped with 1/2" couplings for purge air. Locate couplings on top side of nozzles.

Other specifications
referenced in this
specification:

UOP Standard Specification:
UOP Standard Drawing:
UOP Project Specification:

EDI Project

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PROJECT SPECIFICATION

9XXXXX—220 SHEET 3

THERMAL OXIDIZER

THERM-001

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	02/15/16	ZT	MK				

Sight glass assembly shall have slide gate valve assembly, Callidus STD-1292, material of construction of slide gate valve is SS 304 and same will be replaceable.

The sight port must sight burner and refractory

e. Drain connection One 1 ½" FNPT with plug is required on waste gas plenum.

f. Flame Sensor Port Two 1" MNPT swivel scanner mount is required for installation of flame sensors. These nozzles will be located such that the flame sensor can be positioned to sense failure of the burner and pilot.

Nozzles will be equipped with ½" couplings for purge air. Locate couplings on top side of nozzles.

One port is dedicated to view pilot flame and one ports for sensing of main burner.

Use of swivel joint to adjust the flame sensor orientation is required.

g. Combustion Air connection. One 6" connection plate flange connection blind is required.

h. Waste gas Conn. One 3" ANSI Class 150 RF flanged connection is required.

A.3.3 Lining Materials

Combustion chamber vessel will be lined with 3" 8# 2300deg F ceramic blanket insulation refractory lining.

Alloy 601 Anchors to be installed at shop.

Lining will be installed at shop.

Rain cap is required at the top of refractory lining.

A.3.4 Thermal Shield

Shroud will be provided to maintain metal temperature between 149°C to 343°C and to stay above from flue gas dew point temperature.

Corrugated, 0.8mm thk, 16 DP, 64 CTR/CTR, aluminum sheet to be provided by UOPC, to be installed at site by others.

Other specifications
referenced in this
specification:

UOP Standard Specification:

UOP Standard Drawing:

UOP Project Specification:

EDI Project

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THERMAL OXIDIZER

THERM-001

PROJECT SPECIFICATION

9XXXXX—220 SHEET 4

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	02/15/16	ZT	MK				

A.3.5 Ladders, Platforms, and Stairs

All necessary structural steel will be furnished to properly support the equipment. Necessary platforms, stairways and access ladders for convenient operation and maintenance of the equipment will be provided.

Other specifications referenced in this specification:	UOP Standard Specification:	
	UOP Standard Drawing:	
	UOP Project Specification:	EDI Project



Callidus Technologies LLC
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Tulsa, OK 74136
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PROJECT SPECIFICATION

9XXXXXX—958 SHEET

1

THERMAL OXIDIZER BURNER**THERM-001 Burner Assembly**

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	02/15/16	ZT	MK				

**Energy Transfer, UOPR Project
Thermal Oxidizer Burner****ITEM NO. TO-B1****Reference Specifications**

UOPC Doc# DT-9xxxxx-201 Thermal oxidizer Ass'y

UOPC Doc # 9xxxxx-220 Thermal oxidizer data sheet

Item A: Furnish One (1) Thermal oxidizer Burner in accordance with the following:**A.1. Size and Process Requirements**

Provide one Thermal oxidizer Burner to perform the following process requirements:

Burner will be rated for 120% of maximum heat release. They system will be capable of turndown to 20% of the gas rate listed in operating cases.

Burner will be rated for fuel gas of 5.0 MMBtu for Maximum heat release and 1 MMBTU/Hr of minimum heat release rate.

Combustion air pressure drop through burner must not exceed 2.0" WC for the maximum-firing condition.

The burner will be supplied with a gas fuel, inspiriting type pilot burner having a flame retention head (Callidus STD-1412 or equivalent). Inspirator will be located inside of burner plenum. The pilot and inspirator will be flanged for easy removal and cleaning. Flame retention head will be 25Cr-20Ni metallurgy.

Gas tips and stabilizer cones will be either 25Cr-20Ni or 19Cr-9Ni metallurgy, when it is used.

A.2. Arrangement and Dimensions

The Thermal oxidizer Burner will be arranged for vertical up firing.

Other specifications
referenced in this
specification:

UOP Standard Specification:

UOP Standard Drawing:

UOP Project Specification:

| EDI Project

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PROJECT SPECIFICATION

9XXXXXX—958 SHEET

2

THERMAL OXIDIZER BURNER

THERM-001 Burner Assembly

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	02/15/16	ZT	MK				

A.3. Mechanical Requirements

The burner assembly will be complete from inlet to outlet connection including:

A.3.1 Burner Chamber

- The design pressure of the Thermal Oxidizer Burner will be ambient (internal at skin temp between 300°F and 650°F shell temperature. Corrosion allowance of 0" is to be added to the required thickness. This shell temperature is nominal and is based on an adequate thickness of a suitable refractory lining. Vessel wall thickness will be no less than 1/4".
- The vessel will be designed and fabricated in accordance with applicable portions of the AISC, welding per AWS.
- Seismic Design per ASCE 7-10, Site D. I=1.25. Ss=100%, S1 = 40%.
- Wind per ASCE 7-10, Cf = 0.7, V = 150 mph, Cat. III, Exp. C.
- All steel plate will be carbon steel in accordance with AISC 9th Edition SA-36 or Equivalent.
- Minimum design metal temperature is minus 20 °F.

A.3.2 Connections

- Burner Conn.** One Burner MTG connection, plate flanged, is required into Thermal Oxidizer.
- Blower Conn.** One 6" Plate flange connection is required for combustion air blower.
- Pilot Assembly MTG** One 2" ANSI Class 150 RF flanged Mount.

One manual removable pilot/igniter assemblies required. Each assembly will be equipped with fuel gas connections. Piping to connections shall match pipe class on P&ID. Igniters will be internally and integrally mounted within the pilot pipes.

Pilot air and gas metering orifices will be sized for 100,000 to 150,000 Btu/hr.

Provide one high-energy ignitor systems including explosion proof ignition power packs.

Other specifications
referenced in this
specification:

UOP Standard Specification:

UOP Standard Drawing:

UOP Project Specification:

EDI Project

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PROJECT SPECIFICATION

9XXXXXX—958 SHEET

3

THERMAL OXIDIZER BURNER**THERM-001 Burner Assembly**

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	02/15/16	ZT	MK				

Pilot burner will be provided with time delay relay for ignition time.

Pilot burner will be suitable for intermittent operation.

High-energy ignitor shall be:
Callidus Technologies Scepter Model;

Electrical power supply for ignitors will be 110 volts 50 Hz.

- d. Pilot Gas conn. One ½" ANSI Class 150 RF flanged connection is required.
- e. Pilot Conduit conn. One ¾" FNPT conduit is required for ignitor.
- f. Primary Fuel Conn. One 1" ANSI Class 150 RF flanged openings is required.
- g. Secondary Fuel Conn. One 1 1/2" ANSI Class 150 RF flanged openings is required.
- h. Drain connection One 1 ½" FNPT with plug is required in combustion air plenum.
- i. Sight Ports One 2". ANSI Class 150 RF flanged openings in shell. The sight port must sight main burner.

A.3.3 Burner Tile

Burner blocks (burner tiles), 60% alumina (minimum), shall be pre-fired to 260°C at shop. Burner blocks shall be furnished with a tile alignment to insure proper tile installation.

Other specifications
referenced in this
specification:

UOP Standard Specification:

UOP Standard Drawing:

UOP Project Specification:

EDI Project

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ATTACHMENT F – PROCESS FLOW DIAGRAM

Process Description

The Revolution Cryo Plant is a natural gas processing facility classified under Standard Industrial Classification (SIC) Code 1321. The Revolution Cryo Plant receives natural gas and condensate from the gathering system for processing. The processing will include extracting natural gas liquids from the field gas and partial fractionation of the mixed natural gas liquids (NGLs) to natural gas products. This includes stabilization, cryogenic separation, and fractionation.

The existing facility consists of a single 200 mmscfd cryogenic processing unit, an amine treatment unit controlled by a thermal oxidizer, various heaters, a condensate stabilization unit, condensate storage tanks, condensate truck loading controlled by a combustor, a facility flare as well as miscellaneous storage tanks, piping and components. The maximum throughputs for the existing cryo processing unit and the existing stabilizer will not change as a result of this operating permit application.

Operations are described below and depicted on a process flow diagram which is included in Attachment E.

1.1. PROCESSING – STABILIZATION

The existing stabilizer unit processes natural gas condensates received from the inlet pipeline system as well as condensates received via truck. The existing system consists of two distillation columns that work in series, the first takes the raw condensate and by running through the distillation tower produces a stable condensate that will be used as a feedstock for the second column. The overhead vapors off this first column are compressed and sent to the cryogenic system inlet. The second column takes stable condensate from the first column and will be further distilled to produce a product that is a marketable stabilized condensate with an RVP of approximately 2 psi. The overhead vapor from this column will be a C3+ product that will be condensed and pumped into the C3+ pipeline along with the main plant C3+ product.

1.2. PROCESSING – CRYOGENIC SEPERATION AND FRACTIONATION

The gas stream entering the existing cryogenic unit will include natural gas from the pipeline and flash vapors from the stabilizer unit. The gas will be chilled to cryogenic temperatures first by mechanical refrigeration and then by expansion (where the pressure drop causes further reduction in temperature). Chilling the gas stream causes natural gas liquids (NGL) to condense from the gas stream. The chilled gas/liquid stream will be sent to the deMethanizer tower.

The gas/liquid stream will then be fed to the deMethanizer tower where the NGL will be collected in the bottoms (feed to the deEthanizer unit) and the vapor off the top of the deMethanizer tower is a marketable natural gas stream (residue gas) and will be routed to the compressors for delivery to the residue gas pipeline.

The deEthanizer will produce a marketable ethane product and a separate C3+ product. The bottoms stream from the deMethanizer will enter the deEthanizer tower where it will be separated such that the lighter ethane product leaves the top of the tower, gets condensed, and pumped into the ethane (C2) product pipeline. The heavier components (a propane+ mixture) will collect at the bottom of the deEthanizer tower and get pumped into the C3+ product pipeline.

The deMethanizer and deEthanizer are closed systems that do not have a direct vent to the atmosphere. The HMO Heaters provide heat to the fractionation process; however, the emissions from the heaters are identified as a separate source. The fractionation equipment also contains process safety vents (PSV) and maintenance depressurization vents which are routed to the flare.

The natural gas throughput rating of the cryo unit is 200 mmscfd (station design inlet). Note that on a short-term basis the station may be able to operate up to 220 mmscfd and as such the potential emissions affected by gas throughput capacity reflect this rate as shown in the calculations provided in Attachment C.

The natural gas liquid (NGL) throughput capacity for the cryo unit is as follows:

- 8,420,112 gal/year 2# Condensate produced,
- 18,000 BPD C2 produced (275 MMgal/year) produced,
- 13,500 BPD C3+ produces (207 MMgal/year) produced,

1.3. AMINE UNIT

The Amine Unit will remove CO₂ from the NGLs by putting the NGL stream in contact with a lean amine solution in a contactor tower. The amine solution has a natural affinity for CO₂ by absorption. The rich amine solution leaving the contactor tower (containing the CO₂) will be sent to a flash tank and an amine regeneration system where through heat and distillation the CO₂ will be removed from the amine solution.

The amine regeneration system includes an amine stripper tower and a small reboiler heater. Note that a small amount of hydrocarbons will also be absorbed in the amine solution at the contactor tower and these hydrocarbons will be liberated from the rich amine by the amine regeneration system. The existing amine unit vent is controlled by a thermal oxidizer (THERM-001). For the existing amine units, the flash tank vent is routed to the associated HMO Heaters for use as fuel and any excess flash gas will be controlled by the respective facility flare (FLARE-001).

1.4. COMPRESSORS

Revolution utilizes reciprocating and screw compressors at various points in the process. Existing electric-drive reciprocating compressors are utilized to compress residue gas for transport in the pipeline. Reciprocating compressors are also utilized to compress overhead vapors from the existing stabilizer (routed to the cryogenic unit). The existing stabilizer overhead reciprocating compressors are equipped with a closed vent system to capture rod packing emissions and control them in an enclosed combustor (COMB-001).

1.5. HEATERS

Natural gas-fired indirect heaters provide process heat to the processing units as well as the condensate stabilizers. The heaters will have the ability to operate continuously (i.e. 8,760 hours per year). The heaters are as follows:

- NGL Dehy Regen Heater – 6.22 mmBtu/hr (HTR-001)
This heater is part of the NGL dehydration process where the NGL stream is stripped of all water. The heaters are used in the regeneration of the mole sieve beds where it heats the NGL stream as it circulates through the bed being regenerated. The heated NGL vaporizes the water in the bed where it is then condensed downstream and removed from the stream. Once the bed is free of water, the regeneration system goes into stand-by or switches to the next bed as needed to be regenerated.
- Regen Gas Heater – 8.50 mmBtu/hr (HTR-002)
This heater is part of the inlet gas mole sieve dehydration process where the gas stream is stripped of all water. The heater will be used in the regeneration of the mole sieve beds where it heats the gas stream as it circulates through the bed being regenerated. The heated gas vaporizes the water in the bed which is then condensed downstream and removed from the stream. Once the bed is free of water, the regeneration system goes into stand-by or switches to

the next bed as needed to be regenerated. The mole sieve dehydration process itself will be a closed system that does not vent to the atmosphere.

- HMO Heaters – 40.92 mmBtu/hr each (HTR-003 to 005) These heaters are part of the hot oil system which will provide heat to various users throughout the plant. The users include the inlet gas preheater, condensate stabilization system, deMethanizer trim reboiler, deEthanizer reboiler, and Amine regeneration reboiler.
- Catalytic Heaters – 0.85 mmBtu/hr (combined) (HTR-006) These heaters serve to heat various buildings and processes within the Revolution Cryogenic Plant.

1.6. CONDENSATE TANKS AND LOADING OPERATIONS

Storage of stabilized condensate occurs in two (2) existing storage tanks (TK-811A and TK-811B). Load-out from the storage tanks is controlled by an existing enclosed combustor (COMB-001).

1.7. MISCELLANEOUS STORAGE TANKS

Storage tanks of various sizes will be utilized to store materials such as: engine/compressor oil, amine, produced water, slop, and methanol. In accordance with 25 PA Code 127.14(a)(8) (see Exemption #15 in PADEP's *Air Quality Permit Exemptions* guidance document no. 275-2101-003), storage vessels for volatile organic compounds (which do not contain HAP) which have capacities less than 10,000 gallons are exempt from Plan Approval. Therefore, some of the non-HAP containing storage tanks are exempt. All storage tanks are included in the facility-wide emission in Attachment C.

1.8. GAS VENTING AND PIGGING OPERATIONS

The facility includes sources of emissions at the facility related to general operations and activities at the site. These include gas venting due to normal compressor operation, planned blowdown events, and pigging events. The existing facility includes a 30" station inlet pig receiver and one 12" C3+ pipeline pig launcher.

The attached emissions calculations (Attachment C) detail all miscellaneous vented sources at the facility, along with their corresponding calculations methodology, emissions estimates, and assumptions.

1.9. MISCELLANEOUS PROCESS FUGITIVES

Emissions at the facility will also result from fugitive component leaks (flanges, connectors, valves, etc.). Please see the attached emissions calculations (Attachment C), which detail all component types included, along with emissions estimates and calculations methodology and assumptions.

1.10. FACILITY FLARE, COMBUSTOR, AND THERMAL OXIDIZER

Combustion control devices include the following:

- FLARE-001 – This existing flare controls various streams at the facility related to the existing cryo/stabilizer including existing stabilizer overhead compressor blowdowns, existing amine unit flash tank, and pigging.
- COMB-001 – This existing combustor controls truck loading of stabilized condensate.
- THERM-001 – This existing thermal oxidizer controls emissions from the existing amine vent.

ATTACHMENT G – NOTIFICATIONS

26 May 2023

Tracking Number 9405 5036 9930 0551 6970 93

Smith Township Supervisors
1848 Smith Township State Rd
P.O. Box 94
Slovan, PA 15078

Dear Supervisors:

ETC Northeast Pipeline, LLC is submitting this notification to the board regarding a request to obtain a State Only Operating Permit (SOOP) from the Pennsylvania Department of Environmental Protection's Air Quality Program for the continued operation of emission sources at its existing natural gas processing facility (Revolution Cryo Plant) located in Smith Township, Washington County, Pennsylvania.

Air emissions sources include the following:

- One (1) 200 MMSCFD amine sweetening unit with a vent controlled by a thermal oxidizer;
- One (1) 906 MMBtu/hr MSS plant flare;
- One (1) 1.00 Combustor for Truck liquid loading;
- Five (5) heaters of various sizes;
- Fifteen (15) catalytic heaters rated at 0.05 MMBtu/hr;
- Two (2) 90,000-gallon condensate tanks;
- Two (2) 21,000 gallon 2# RVP condensate tanks;
- Miscellaneous storage tanks of various sizes; and
- Associated piping and components.

Pennsylvania Code Title 25 (Environmental Protection – Air Resources) Section 127.413 requires municipal notifications including a 30-day comment period regarding the permit application, which begins upon receipt of this formal notification. During this comment period, DEP will accept such comments. Comments are to be sent to:

Air Quality Program
PADEP – Southwest Regional Office
400 Waterfront Dr.
Pittsburgh PA 15222
Phone: (412) 442-4436

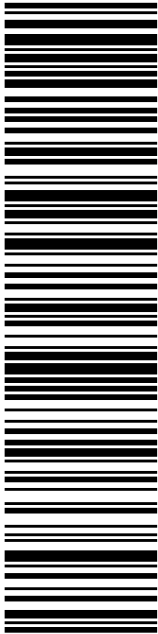
If you have any further questions regarding this matter, please do not hesitate to contact me at 412-522-2846 or via email at Alyssa.Laird@energytransfer.com.

Sincerely,

ETC Northeast Pipeline, LLC



Douglas L. Frisco
Sr. Manager - Environmental

 UNITED STATES POSTAL SERVICE® Click-N-Ship®		P USPS.com 9405 5036 9930 0551 6970 93 0096 5000 0431 5078 US POSTAGE Flat Rate Env U.S. POSTAGE PAID Click-N-Ship® 05/26/2023 Mailed from 17701 98675633101 1492
PRIORITY MAIL® DOUGLAS L FRISCO ENERGY TRANSFER 101 W 3RD ST FL 3 WILLIAMSPORT PA 17701-6413 Expected Delivery Date: 05/30/23 0000		
 SMITH TOWNSHIP SUPERVISORS PO BOX 94 SLOVAN PA 15078-0094 USPS TRACKING #  9405 5036 9930 0551 6970 93		B001
Electronic Rate Approved #038555749 		



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 Expected Delivery Date: 05/30/2023

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 Total: **\$9.65**

From: DOUGLAS L FRISCO
 ENERGY TRANSFER
 101 W 3RD ST FL 3
 WILLIAMSPORT PA 17701-6413

To: SMITH TOWNSHIP SUPERVISORS
 PO BOX 94
 SLOVAN PA 15078-0094

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26 May 2023

Tracking Number: 9405 5036 9930 5551 6971 09

Washington County Board of Commissioners
Courthouse Square
100 West Beau Street
Suite 702
Washington, PA 15301

Dear Commissioners:

ETC Northeast Pipeline, LLC is submitting this notification to the board regarding a request to obtain a State Only Operating Permit (SOOP) from the Pennsylvania Department of Environmental Protection's Air Quality Program for the continued operation of emission sources at its existing natural gas processing facility (Revolution Cryo Plant) located in Smith Township, Washington County, Pennsylvania.

Air emissions sources include the following:

- One (1) 200 MMSCFD amine sweetening unit with a vent controlled by a thermal oxidizer;
- One (1) 906 MMBtu/hr MSS plant flare;
- One (1) 1.00 Combustor for Truck liquid loading;
- Five (5) heaters of various sizes;
- Fifteen (15) catalytic heaters rated at 0.05 MMBtu/hr;
- Two (2) 90,000-gallon condensate tanks;
- Two (2) 21,000 gallon 2# RVP condensate tanks;
- Miscellaneous storage tanks of various sizes; and
- Associated piping and components.

Pennsylvania Code Title 25 (Environmental Protection – Air Resources) Section 127.413 requires municipal notifications including a 30-day comment period regarding the permit application, which begins upon receipt of this formal notification. During this comment period, DEP will accept such comments. Comments are to be sent to:

Air Quality Program
PADEP – Southwest Regional Office
400 Waterfront Dr.
Pittsburgh PA 15222
Phone: (412) 442-4436

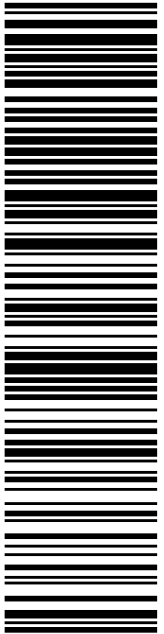
If you have any further questions regarding this matter, please do not hesitate to contact Alyssa Laird at 412-522-2846 or via email at Alyssa.Laird@energytransfer.com.

Sincerely,

ETC Northeast Pipeline, LLC



Douglas L. Frisco
Sr. Manager - Environmental

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05/26/2023		Mailed from 17701 986756331007314	
PRIORITY MAIL®			
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 WASHINGTON COUNTY BOARD OF STE 702 100 W BEAU ST WASHINGTON PA 15301-4443		C023	
USPS TRACKING #			
			
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USPS TRACKING # :
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Trans. #: 589045438
Print Date: 05/26/2023
Ship Date: 05/26/2023
Expected
Delivery Date: 05/30/2023

Priority Mail® Postage: **\$9.65**
Total: **\$9.65**

From: DOUGLAS L FRISCO
ENERGY TRANSFER
101 W 3RD ST FL 3
WILLIAMSPORT PA 17701-6413

To: WASHINGTON COUNTY BOARD OF COMMISSIONERS
STE 702
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WASHINGTON PA 15301-4443

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AIR QUALITY FEES SCHEDULE

There are four different Fees Schedules.

1. Fees Schedule for New Plan Approval
2. Fees Schedule for Pending or Issued Plan Approval
3. Fees Schedule for State-Only Operating Permit
4. Fees Schedule for Title V Operating Permit

If the company is submitting a new plan approval application, the fees schedule for a "New Plan Approval" should be used. In this form, the company should check the appropriate boxes depending on the types of review requested and pay accordingly.

Similarly, if the company is submitting an Operating Permit application, the company should use the respective fees schedule for an Operating Permit, check all the appropriate boxes, and pay the fees required.

Please make the check payable to the "Commonwealth of Pennsylvania Clean Air Fund." Submit this fees schedule and the check with the application package to the appropriate regional office.



**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY**

AIR QUALITY FEES FOR NEW PLAN APPROVAL

Company Information				
Federal Tax ID:		Firm Name:		
Permit # (If any):		Facility Name:		
Municipality:		County:		
Contact Person Name:		Telephone Number:		
E-mail:				
New Plan Approval (The following fees are cumulative.)				
Line #	Check the appropriate boxes below	Type of review requested	Fee 2021 - 2025	Total Fees
1	☐	Base Fee	\$2,500	\$2,500
2	☐	New Source Review, Subchapter E	\$7,500	
3	☐	NSPS/NESHAP /MACT standard A. # of NSPS: _____ B. # of NESHAP/MACT: _____ C. Add lines A and B: _____ D. Maximum applicable standards: <u>3</u> E. Enter smaller of line C or line D: _____ Multiply line E by \$2,500 and enter the amount in the "Total Fees" column.	\$2,500	
4	☐	Case-by-Case MACT	\$9,500	
5	☐	Prevention of Significant Deterioration (PSD) requirements. Subchapter D	\$32,500	
6	☐	Plantwide Applicability Limit (PAL) for NSR regulated pollutants or PAL for PSD regulated pollutants or both	\$7,500	
7	☐	Risk Assessment Analysis – Inhalation only	\$10,000	
8	☐	Risk Assessment Analysis – Multi-pathway	\$25,000	
Add Lines 1 thru 8 of Total Fees column and write it here. 				



AIR QUALITY FEES FOR PENDING* OR ISSUED** PLAN APPROVAL

Company Information				
Federal Tax ID:		Firm Name:		
Permit # (If any):		Facility Name:		
Municipality:		County:		
Contact Person Name:		Telephone Number:		
E-mail:				
Pending or Issued Plan Approval ***				
Line #	Check the appropriate boxes below	Type of Authorization	Fee 2021 - 2025	Total Fees
1	☐	Minor Modification	\$1,500	
2	☐	Extension	\$750	
3	☐	Transfer of Ownership	\$750	
4	☐	Significant Modification, Ambient Impact Analysis	\$9,000	
5	☐	Significant Modification, Reassessment of Control Technology	\$2,500	

* Pending plan approval is such that the Department has completed the technical review and published a notice in the *Pennsylvania Bulletin*. This is applicable only to Lines 4 and 5.

** Issued plan approval is such that the conditions of the plan approval have not been incorporated into an operating permit.

*** Pay maximum amount of fee when one or more authorizations are requested. For example, when a minor modification of a plan approval and a transfer of ownership are needed, please pay only the highest amount of fee (\$1,500).

AIR QUALITY FEES FOR STATE-ONLY OPERATING PERMIT (NON-TITLE V)

Company Information				
Federal Tax ID: 26-2863376-3		Firm Name: ETC Northeast Pipeline LLC		
Permit # (If any): GP5-63-01001A and GP1-63-01001A		Facility Name: Revolution Cryo Plant		
Municipality: Smith		County: Washington		
Contact Person Name: Alyssa Laird		Telephone Number: 412-552-2846		
E-mail: Alyssa.Laird@energytransfer.com				
State-Only Operating Permit				
Line #	Check the appropriate box below	Type of Authorization	Fee 2021 - 2025	Total Fees
1	☐	New Application, Subchapter F	\$2,500	
2	☒	Renewal	\$2,100	2,100
3	☐	Minor Modification	\$1,500	
4	☐	Significant Modification	\$2,000	
5	☐	Administrative Amendment / Change of Ownership	\$1,500	

Pay maximum amount of fee when one or more authorizations are requested. For example, when a renewal application and a change of ownership forms are submitted, please pay only the highest amount of fee (\$2,100).



QUALITY FEES FOR TITLE V OPERATING PERMIT

Company Information				
Federal Tax ID:		Firm Name:		
Permit # (If any):		Facility Name:		
Municipality:		County:		
Contact Person Name:		Telephone Number:		
E-mail:				
Title V Operating Permit				
Line #	Check the appropriate box below	Type of Authorization	Fee 2021 - 2025	Total Fees
1	☐	New Application, Subchapter G	\$5,000	
2	☐	Renewal	\$4,000	
3	☐	Minor Modification	\$1,500	
4	☐	Significant Modification	\$4,000	
5	☐	Administrative Amendment / Change of Ownership	\$1,500	
6	☐	Plantwide Applicability Limit (PAL) for NSR regulated pollutants or PAL for PSD regulated pollutants or both	\$10,000	

Pay maximum amount of fee when one or more authorizations are requested. For example, when a renewal application and a change of ownership forms are submitted, please pay only the highest amount of fee (\$4,000).

Company Name: ETC Northeast Pipeline, LLC
Facility Name: Revolution Cryo Plant
Project Description: SOOP Application

Attachment I - Permit Application Fees

Description	Fee
State Only Operating Permit Fee	\$ 2,100.00
Total	\$ 2,100.00

ETC NORTHEAST PIPELINE LLC
8111 Westchester Dr., Ste 600
Dallas, TX 75225

Page: 1 of 1

Payment Date: 05/26/2023

Vendor: COMMONWEALTH OF PENNSYLVANIA
Vendor ID: 1000003823

Check No.: 210802560
Check Date: 05/26/2023

Invoice Number	Invoice Date	Document Number	Reference	Gross Amount	Discount	Net Amount
ST_54228	05/26/2023	5800014936	REV CRYO SOOP APP FEE	2,100.00	0.00	2,100.00
Check Total.....						\$ 2,100.00

PLEASE DETACH BEFORE DEPOSITING CHECK. For inquiries call:214-840-5422 or email accounts payable@energytransfer.com

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ETC NORTHEAST PIPELINE LLC
8020 Park Lane, Suite 200
Dallas, TX 75231

Vendor ID: 1000003823

Check No.:
210802560

Check Date:
05/26/2023

Payable Through
WELLS FARGO BANK, N.A.

66-156
531

PAY:
***TWO THOUSAND ONE HUNDRED -----

VOID AFTER 90 DAYS

\$2,100.00

To The
Order of:

COMMONWEALTH OF PENNSYLVANIA
RESOURCES
404 WATER FRONT DR
PITTSBURGH, PA 15222-4745



Authorized Signature

SIGNATURE HAS A COLORED BACKGROUND - BORDER CONTAINS MICROPRINTING

Company Name: ETC Northeast Pipeline LLC
Facility Name: Revolution Cryo Plant
Project Description: Draft Permit - 63-01001

Attachment 1. Comments on Proposed State Only Operating Permit

Comment #	Section	Source ID	Page	Condition	Condition Summary	Comment
Example row: 1	B	General	20	#022	This condition outlines the locations to submit reports.	ETC requests that....
1	Multiple	C204	Multiple	Multiple	Rod Packing Combustor	It appears as if rod packing combustor got confused with the thermal oxidizer that controls the amine unit regenerator vent. Please remove references to the rod packing combustor, as it was not installed. See application submitted in June 2023
2	Cover Page	General	1	N/A	Owner/Operator Info	The mailing address for the Owner should be 101 Technology Drive, Pittsburgh, PA 15275 (we recently moved to this address since the application was filed). Also, the Operator section has an incorrect address.
3	A, D, E	201	Multiple	Multiple	Amine Unit	The amine unit description should say 200 GPM rather than MMscfd and needs to be updated throughout the permit and review memo.
4	A	General	4	N/A	Site Inventory List	Please revise Source ID 033 to be worded as " HMO HEATER 3". Also update throughout (e.g., header of page 28).
5	C	Site Level	16	#008	Facility wide emissions	The emissions limitations listed in this permit should be revised to reflect the original construction authorization levels which were set at GP5 sitewide restrictions as follows: 100 tpy NOx, CO, SOx, PM10, PM2.5; 25 tpy total HAP; 10 tpy HCHO, hexane; 50 tpy VOC. Also please revise condition to note that the limits are a "12-month rolling, by month, basis".
6	C	Site Level	19	#014	Operating permit terms and conditions	Please strikethrough "comprehensive and accurate" on first line of this condition. It goes without saying that such records are meant to be maintained.
7	C	Site Level	20 & 21	#014	Operating permit terms and conditions, bullet h	Please revise to remove the term "RVP tank" for clarity. Condition can state simply condensate tanks.
8	C	Site Level	20 & 21	#014	Operating permit terms and conditions, bullet h, bullet i, bullet p(iii)	Please revise these conditions to clarify that the records are to be on a "12-month rolling, by month, basis".
9	C	Site Level	21	#014	Operating permit terms and conditions, bullet t.	Daily throughput to the flare is measured but heat content is not directly measured. We calculate the heat content based on the closed drain gas composition. We request that the wording of this condition be changed.
10	D	201	29	Heading	Source groups with conditions.	See comment 20 below regarding OOOOa applicability
11	D	204	30	Heading	Source groups with conditions.	Rod packing emissions from the stabilizer overhead compressors are not routed to an enclosed combustion device as noted in other comments.
12	D	701	42	#012	Delay of repair daily emission calculations	ETC requests the removal of this condition. Compliance with applicable federal and state requirements for leak detection, repair and reporting are sufficient.
13	D	702	43 & 44	#002	Requirement to keep record of liquid loadout volumes.	Please revise these conditions to clarify that the records are to be on a "12-month rolling, by month, basis".
14	D	702	44	#003	Operating permit terms and conditions	Tank identifiers are incorrect. See comment 23 below.
15	E	ENCLOSED COMBUSTION DEVICES	51	Sources Included	Table of enclosed combustion devices / devices sent there	Please revise the heading and applicability of this section as follows: 1. Sources should not be in this list, only true enclosed combustion devices. As an alternative a condition could be added that notes the sources routed to the device. 2. The flare is not an enclosed combustion device and should be removed. The testing requirements listed do not apply and the work practice requirements for flares are not applicable to the enclosed combustion devices. 3. Rod packing combustor not installed. See other relevant comments throughout.
16	E	HMO HEATERS	55	#003	Operating permit terms and conditions	The existing HMO heaters were permitted and constructed prior to the issuance of the most recent version of the GP-1 and the current GP-1 CO limit for heaters from that timeframe is 300 ppm _{dv} @ 3% O ₂ . We don't understand where the 49 ppm _{dv} limit is coming from and request that the limits match the previously permitted GP-1 limits for this source group.
17	E	MSS Plant Flare Requirements	59	Sources Included	Table of items going to MSS Flare	Revise the heading to exclude the table of sources routed to the device. Instead, a condition can be added that lists the sources routed to the control.

Comment #	Section	Source ID	Page	Condition	Condition Summary	Comment
18	E	MSS Plant Flare Requirements	59	#001, #003	Emission limit and recordkeeping requirements for the MSS flare.	Please revise these conditions to clarify that the records are to be on a "12-month rolling, by month, basis".
19	E	MSS Plant Flare Requirements	59	#003	Records kept for the flare	Daily throughput to the flare is measured but heat content is not directly measured. We calculate the heat content based on the closed drain gas composition. We request that the wording of this condition be changed.
20	E	Subpart OOOOa Requirements	62	Table	Table describing units subject	The amine unit does not meet the definition of a sweetening unit as defined in NSPS OOOOa. As such please remove all references to the sweetening unit being subject in the NSPS. See application submitted in June 2023. Accordingly, all conditions related to the amine in this section should be removed as they are not applicable.
21	N/A	Review Memo	3	Exempt Sources	Heaters	Only one NGL heater and one regenerator heater are currently installed. An additional heater of each type was permitted in the 2018 permit but not constructed.
22	N/A	Review Memo	3	Exempt Sources	Pigging facility list	The description of the first pig receiver lists the 30" receiver as "Bluestone to Rev Cryo" and this should state "Pike CS to Rev Cryo."
23	N/A	Review Memo	6	Table III	Emission Sources and Controls List	Tank ID #s for Source 301 are incorrect. Tanks TK-811A/B are the 21,000 gallon condensate tanks. Tanks U-406A/B are the 90,000 gallon pressurized condensate vessels.
24	N/A	Review Memo	15	NSPS Applicability	Rod Packing Combustor	ETC never installed the rod packing combustor. Please revise the wording to say that ETC replaces the rod packing of the reciprocating compressors on or before 26,000 hours of operation as defined by the rule.
25	N/A	Review Memo	22	Sources 201 and 203	Amine Units	The flash gas is not routed to the HMO heaters as fuel. All flash gas is routed to the flare.
26	N/A	Review Memo	25	Source 601	Blowdowns and rod packing emissions	Consider revisions to first sentence to state that "Equipment blowdowns release gas to the atmosphere or a control device." Rod packing emissions from the stabilizer overhead compressors are controlled by a VRU and routed back to the process. As noted above there was never a rod packing combustor installed.

October 8, 2024

Via Email

Mr. Bradley Spayd
Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

Re: Information Request - Revolution Cryo Plant (GP5-63-01001A/AG5-63-00004A and GP1-63-01001A)

Dear Mr. Spayd:

Please see below the responses to the information request sent on 9/24/2024.

- 1.) Prior Department reviews appear to indicate that the MSS plant flare is rated at 488 MMBtu/hr, however, this application appears to denote the MSS flare as 906 MMBtu/hr. Please verify the rating of the flare. Was an increase in flare capacity authorized? If so, when?

There was not an increase to the capacity of the flare. The updated emission calculations accounted for the streams that are going to the flare accordingly. The calculations used the stream flow rate and heat content to calculate the relative loading to the flare

- 2.) Similarly, prior Department reviews appear to indicate that the thermal oxidizer controlling the amine unit was rated at 5.54 MMBtu/hr, however, the application appears to indicate that the thermal oxidizer is rated at 1.07 MMBtu/hr (pgs 72, 98 of application). Please clarify.

The calculated loading changed, the physical control device did not.

- 3.) Please confirm that there is only one (1) 200 MMscfd amine unit on site and three (3) 40.92 MMBtu/hr HMO heaters on site (003-005), as prior authorizations appear to have allowed for the construction of a second amine unit and up to six HMO heaters.

ETC Confirms that there is only one amine unit and three HMO heaters on site.

- 4.) A source listing table is attached. Please confirm or update the table as needed to verify the sources and control devices on site.

The sources in the document titled "Table of Sources" are correct.

- 5.) Please clarify that both VOC and HAP emissions from the MSS flare, combustor for truck loadout, and the amine thermal oxidizer both from combustion and from the (respective) 1% or 2% of the gas stream that is uncombusted are included in the application. I did not see values for VOCs and HAPs in the overall facility-wide PTE table on page 86 of the application. Please revise any emission estimates if needed.

Amine vent emissions are included with the Amine Line item. Loading VOC's are included in the pressurized condensate VOC emissions with the storage tank emissions. Streams that are controlled by the MSS Flare are reported in the blowdowns tab.

- 6.) Please provide specification sheets and safety data sheets (SDSs) for each product shipped offsite including, but not limited to, condensate, ethane, natural gas liquids (NGLs), and residue gas, among others.

Product SDSs attached.

- 7.) Please confirm that the facility meets the definition of a synthetic organic chemical manufacturing facility as a facility that produces as an intermediate or a final product any one or more of the chemicals listed under §60.489 *List of chemicals produced by affected facilities* for the purposes of 40 CFR Part 60 Subpart VVa.

The facility does not meet this definition as it does not produce any of the listed chemicals as intermediates or final products.

- 8.) Lastly, the application claims a 97% control of valves (and similar reductions for other fugitive emission components) based on the TCEQ - Control Efficiencies for TCEQ Leak Detection and Repair Programs document. Is the 28VHP methodology being used? If so, please provide justification that the 28VHP (or other program) is representative for all component types. In the justification, please include how they meet the 40 CFR Part 60 Subpart OOOOa monitoring and compliance provisions. In addition, because this LDAR reduction efficiency requires certain design criteria to be met, please respond to the attached questionnaire regarding this document and show how ETC is demonstrating compliance with the requirements of this program (e.g. welded or flanged connections instead of screwed connections except for 2" or less diameter piping, etc.). Please provide any supporting documentation as needed.

The questionnaire is attached providing supporting information on how we are demonstrating compliance with the LDAR program document.

Should you have any questions or require additional information, please contact Douglas Frisco at (570) 505-3730.

Sincerely,

Douglas L Frisco

Douglas L. Frisco
Sr. Manager – Environmental

ATTACHMENT

28VHP Boilerplate Special Condition Language		ETC Practices
A	The requirements of paragraphs F and G shall not apply (1) where the Volatile Organic Compound (VOC) has an aggregate partial pressure or vapor pressure of less than 0.044 pounds per square inch, absolute (psia) at 68°F or (2) operating pressure is at least 5 kilopascals (0.725 psi) below ambient pressure. Equipment excluded from this condition shall be identified in a list or by one of the methods described below to be made readily available upon request. The exempted components may be identified by one or more of the following methods: • piping and instrumentation diagram (PIO); • a written or electronic database or electronic file; • color coding; • a form of weatherproof identification; or • designation of exempted process unit boundaries.	Equipment that is not in VOC service is documented in ETC contractors' electronic database where all facility LDAR records are stored.
B	Construction of new and reworked piping, valves, pump systems, and compressor systems shall conform to applicable American National Standards Institute (ANSI), American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), or equivalent codes.	ETC conforms to ANSI, API, and ASME.
C	New and reworked underground process pipelines shall contain no buried valves such that fugitive emission monitoring is rendered impractical. New and reworked buried connectors shall be welded.	ETC does not bury valves and any buried connections are welded.
D	To the extent that good engineering practice will permit, new and reworked valves and piping connections shall be so located to be reasonably accessible for leak checking during plant operation. Difficult-to-monitor and unsafe-to-monitor valves, as defined by Title 30 Texas Administrative Code Chapter 115 (30 TAC Chapter 115), shall be identified in a list to be made readily available upon request. The difficult-to-monitor and unsafe-to-monitor valves may be identified by one or more of the methods described in subparagraph A above. If an unsafe to monitor component is not considered safe to monitor within a calendar year, then it shall be monitored as soon as possible during safe to monitor times. A difficult to monitor component for which quarterly monitoring is specified may instead be monitored annually.	All valves and connections are reasonably accessible.
E	New and reworked piping connections shall be <u>welded or flanged</u>. <u>Screwed</u> connections are permissible only on piping smaller than two-inch diameter. Gas or hydraulic testing of the new and reworked piping connections at no less than operating pressure shall be performed prior to returning the components to service or they shall be monitored for leaks using an approved gas analyzer within	ETC welds or flanges any connection on piping above 2 inches in diameter. Connections are monitored with an approved gas analyzer when placed back into service.

	15 days of the components being returned to service. Adjustments shall be made as necessary to obtain leak-free performance. Connectors shall be inspected by visual, audible, and/or olfactory means at least weekly by operating personnel walk-through. Each open-ended valve or line shall be equipped with an appropriately sized cap, blind flange, plug, or a second valve to seal the line. Except during sampling, both valves shall be closed. If the isolation of equipment for hot work or the removal of a component for repair or replacement results in an open ended line or valve, it is exempt from the requirement to install a cap, blind flange, plug, or second valve for 72 hours. If the repair or replacement is not completed within 72 hours, the permit holder must complete either of the following actions within that time period; (1) a cap, blind flange, plug, or second valve must be installed on the line or valve; or (2) the open-ended valve or line shall be monitored once for leaks above background for a plant or unit turnaround lasting up to 45 days with an approved gas analyzer and the results recorded. For all other situations, the open-ended valve or line shall be monitored once within the 72 hour period following the creation of the open ended line and monthly thereafter with an approved gas analyzer and the results recorded. For turnarounds and all other situations, leaks are indicated by readings of 500 ppmv and must be repaired within 24 hours or a cap, blind flange, plug, or second valve must be installed on the line or valve
F	Accessible valves shall be monitored by leak checking for fugitive emissions at least quarterly using an approved gas analyzer. Sealless/leakless valves (including, but not limited to, welded bonnet bellows and diaphragm valves) and relief valves equipped with a rupture disc upstream or venting to a control device are not required to be monitored. If a relief valve is equipped with rupture disc, a pressure-sensing device shall be installed between the relief valve and rupture disc to monitor disc integrity. A check of the reading of the pressure-sensing device to verify disc integrity shall be performed at least quarterly and recorded in the unit log or equivalent. Pressure sensing devices that are continuously monitored with alarms are exempt from recordkeeping requirements specified in this paragraph. All leaking discs

A daily AVO inspection is completed by Operations.

ETC caps or flanges all open ended lines and valves.

ETC monitors accessible valves quarterly.

ETC does not have any valves equipped with rupture discs.

	shall be replaced at the earliest opportunity but no later than the next process shutdown. The gas analyzer shall conform to requirements listed in Method 21 of 40 CFR part 60, appendix A. The gas analyzer shall be calibrated with methane. In addition, the response factor of the instrument for a specific VOC of interest shall be determined and meet the requirements of Section 8 of Method 21. If a mixture of VOCs is being monitored, the response factor shall be calculated for the average composition of the process fluid. A calculated average is not required when all of the compounds in the mixture have a response factor less than 10 using methane. If a response factor less than 10 cannot be achieved using methane, then the instrument may be calibrated with one of the VOC to be measured or any other VOC so long as the instrument has a response factor of less than 10 for each of the VOC to be measured. Replacements for leaking components shall be re-monitored within 15 days of being placed back into VOC service.	ETC conforms to Method 21 of 40 CFR part 60, appendix A. ETC checks all repairs within 15 days of completion.
G	Except as may be provided for in the special conditions of this permit, all pump, compressor, and agitator seals shall be monitored with an approved gas analyzer at least quarterly or be equipped with a shaft sealing system that prevents or detects emissions of VOC from the seal. Seal systems designed and operated to prevent emissions or seals equipped with an automatic seal failure detection and alarm system need not be monitored. These seal systems may include {but are not limited to} dual pump seals with barrier fluid at higher pressure than process pressure, seals degassing to vent control systems kept in good working order, or seals equipped with an automatic seal failure detection and alarm system. Submerged pumps or sealless pumps (including, but not limited to, diaphragm, canned, or magnetic-driven pumps) may be used to satisfy the requirements of this condition and need not be monitored.	ETC monitors seals quarterly.
H	Damaged or leaking valves or connectors found to be emitting VOC in excess of 500 parts per million by volume (ppmv) or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. Damaged or leaking pump, compressor, and agitator seals found to be emitting VOC in excess of 2,000 ppmv or found by visual inspection to be leaking (e.g., dripping process fluids) shall be tagged and replaced or repaired. A first attempt to repair the leak must be made within 5 days and a record of the attempt shall be maintained.	ETC tags and replaces or repairs all valves and connectors leaking-greater than 500 ppmv of VOC. ETC tags and replaces or repairs all pumps, compressors, and agitator seals leaking greater than 2,000 ppmv VOC. ETC attempts to repair all leaks within 5 days.

I	A leaking component shall be repaired as soon as practicable, but no later than 15 days after the leak is found. If the repair of a component would require a unit shutdown that would create more emissions than the repair would eliminate, the repair may be delayed until the next scheduled shutdown. All leaking components which cannot be repaired until a scheduled shutdown shall be identified for such repair by tagging within 15 days of the detection of the leak. A listing of all components that qualify for delay of repair shall be maintained on a delay of repair list. The cumulative daily emissions from all components on the delay of repair list shall be estimated by multiplying by 24 the mass emission rate for each component calculated in accordance with the instructions in 30 TAC 115.782 {c)(1)(8)(i)(II)}. The calculations of the cumulative daily emissions from all components on the delay of repair list shall be updated within ten days of when the latest leaking component is added to the delay of repair list. When the cumulative daily emission rate of all components on the delay of repair list times the number of days until the next scheduled unit shutdown is equal to or exceeds the total emissions from a unit shutdown as calculated in accordance with 30 TAC 115.782 (c)(1)(B)(i)(I), the TCEQ Regional Manager and any local programs shall be notified and may require early unit shutdown or other appropriate action based on the number and severity of tagged leaks awaiting shutdown. This notification shall be made within 15 days of making this determination.	All leaks are repaired within 15 days or placed on Delay of Repair. ETC utilizes Delay of Repair for any leaks that meets this criteria. ETC identifies Delay of Repair leaks and tracks them. ETC tracks Delay of Repair components to follow compliance standards with the below requirements.
J	Records of repairs shall include date of repairs, repair results, justification for delay of repairs, and corrective actions taken for all components. Records of instrument monitoring shall indicate dates and times, test methods, and instrument readings. The instrument monitoring record shall include the time that monitoring took place for no less than 95% of the instrument readings recorded. Records of physical inspections shall be noted in the operator's log or equivalent.	ETC keeps records of repairs and delays of repair. Corrective actions for each repair are included as well. ETC tracks dates, times, test methods, and instrument readings. Physical Inspections are also recorded.
K	Alternative monitoring frequency schedules of 30 TAC" 115.352 - 115.359 or National Emission Standards for Organic Hazardous Air Pollutants, 40 CFR Part 63, Subpart H, may be used in lieu of Items F through G of this condition.	N/A
L	Compliance with the requirements of this condition does not assure compliance with requirements of 30 TAC Chapter 115, an applicable New Source Performance	N/A

	Standard (NSPS), or an applicable National Emission Standard for Hazardous Air Pollutants (NESHAPS) and does not constitute approval of alternative standards for these regulations.	

Natural Gas - Energy Transfer

Safety Data Sheet

According To Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules And Regulations
Revision Date: 02/25/2016 Date of issue: 10/07/2015

Version: 2.0

SECTION 1: IDENTIFICATION

- 1.1. Product Identifier

Product Form: Mixture

Product Name: Natural Gas - Energy Transfer

Synonyms: Natural Gas, Methane, Fuel Gas, Marsh Gas
- 1.2. Intended Use of the Product

No additional information available
- 1.3. Name, Address, and Telephone of the Responsible Party

Energy Transfer

1300 Main Street

Houston, Texas 77002

713-989-2665
- 1.4. Emergency Telephone Number

Emergency Number : 713-989-2665

SECTION 2: HAZARDS IDENTIFICATION

- 2.1. Classification of the Substance or Mixture

GHS-US classification

Simple Asphy

Flam. Gas 1 H220

Compressed gas H280

Full text of H-phrases: see section 16
- 2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :



GHS02



GHS04

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary Statements (GHS-US) : P210 - Keep away from extremely high or low temperatures, ignition sources, and incompatible materials. - No smoking.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P403 - Store in a well-ventilated place.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.
- 2.3. Other Hazards

Vapour in the headspace of tanks and containers may ignite and explode at temperatures exceeding auto-ignition temperature, where vapour concentrations are within the flammability range. May ignite on surfaces at temperatures above auto-ignition temperature. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Repeated exposure may cause skin dryness or cracking. Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Contact with gas escaping the container can cause frostbite.
- 2.4. Unknown Acute Toxicity (GHS-US)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Product Identifier	%	GHS-US classification
Methane	(CAS No) 74-82-8	> 90	Simple Asphy Flam. Gas 1, H220 Compressed gas, H280

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Ethane	(CAS No) 74-84-0	< 5	Simple Asphy Flam. Gas 1, H220 Compressed gas, H280
Propane	(CAS No) 74-98-6	< 1	Simple Asphy Flam. Gas 1, H220 Compressed gas, H280

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

First-aid Measures After Inhalation: Obtain medical attention if breathing difficulty persists. First, take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate respiratory protective equipment, use the buddy system), then remove the exposed person to fresh air. Keep at rest in a position comfortable for breathing.

First-aid Measures After Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists. Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

First-aid Measures After Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

First-aid Measures After Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: Contact with gas escaping the container can cause frostbite. Asphyxia by lack of oxygen: risk of death.

Symptoms/Injuries After Inhalation: In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.

Symptoms/Injuries After Skin Contact: Contact with gas escaping the container can cause frostbite and freeze burns.

Symptoms/Injuries After Eye Contact: Contact with gas escaping the container can cause frostbite, freeze burns, and permanent eye damage.

Symptoms/Injuries After Ingestion: Not considered a potential route of exposure, but contact with gas escaping the container can cause freeze burns and frostbite.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Do not extinguish burning gas if flow cannot be shut off immediately. Extinguish secondary FIRES with appropriate materials.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Extremely flammable gas.

Explosion Hazard: May form flammable/explosive vapor-air mixture. Container may explode in heat of fire.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information: Use water spray to disperse vapors.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Eliminate every possible source of ignition. Do not get in eyes, on skin, or on clothing. Do not breathe vapors, mist, or spray.

6.1.1. For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

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6.1.2. For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Evacuate unnecessary personnel, isolate, and ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Stop leak, if possible without risk. As an immediate precautionary measure, isolate spill or leak area in all directions.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill. Stop the source of the release, if safe to do so. Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and gas test area before entering.

6.4. Reference to Other Sections

See Heading 8. Exposure controls and personal protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors are flammable. Ruptured cylinders may rocket. Do not pressurize, cut, or weld containers. Asphyxiating gas at high concentrations.

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid prolonged contact with eyes, skin and clothing. Do not breathe gas.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.

Storage Conditions: Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Keep in fireproof place. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling.

Incompatible Products: Strong acids, strong bases, strong oxidizers.

7.3. Specific End Use(s)

No additional information available

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

Propane (74-98-6)		
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1800 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	1000 ppm
USA IDLH	US IDLH (ppm)	2100 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1800 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm

8.2. Exposure Controls

Appropriate Engineering Controls

: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases or vapors may be released. Use explosion-proof equipment. Oxygen detectors should be used when asphyxiating gases may be released.

Personal Protective Equipment

: Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection. Respiratory protection of the dependent type.



Materials for Protective Clothing

: Chemically resistant materials and fabrics. Wear fire/flame resistant/retardant clothing.

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Hand Protection	: Wear protective gloves. If material is cold, wear thermally resistant protective gloves.
Eye Protection	: Chemical safety goggles.
Skin and Body Protection	: Wear suitable protective clothing.
Respiratory Protection	: Use a NIOSH-approved self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.
Thermal Hazard Protection	: Wear thermally resistant protective clothing.
Other Information	: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	: Gas
Appearance	: Colorless gas
Odor	: Odorless, If an odorant has been added by the local utility company, then an unpleasant smell resembling that of a rotten egg or garlic.
Odor Threshold	: No data available
pH	: No data available
Evaporation Rate	: No data available
Melting Point	: No data available
Freezing Point	: No data available
Boiling Point	: 162 °C (323.6 °F)
Flash Point	: 187.8 °C (370.04 °F)
Auto-ignition Temperature	: 540 °C (1004 °F)
Decomposition Temperature	: No data available
Flammability (solid, gas)	: Extremely flammable gas
Vapor Pressure	: No data available
Relative Vapor Density at 20 °C	: 0.6 (Air = 1)
Relative Density	: No data available
Solubility	: Water: Very slightly soluble
Partition Coefficient: N-Octanol/Water	: No data available
Viscosity	: No data available
Explosive Properties	: Contains gas under pressure; may explode if heated.
Lower Flammable Limit	: 5 %
Upper Flammable Limit	: 15 %

9.2. Other Information

Gas Group	: Compressed gas

SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2. Chemical Stability:** Contains gas under pressure; may explode if heated.
- 10.3. Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4. Conditions to Avoid:** Direct sunlight, extremely high or low temperatures, open flames, sources of ignition and incompatible materials.
- 10.5. Incompatible Materials:** Strong acids, strong bases, strong oxidizers.
- 10.6. Hazardous Decomposition Products:** Carbon oxides (CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information On Toxicological Effects

Acute Toxicity: Not classified

Ethane (74-84-0)	
LC50 Inhalation Rat	658 mg/l/4h
Propane (74-98-6)	
LC50 Inhalation Rat	658 mg/l/4h

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

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Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.

Symptoms/Injuries After Skin Contact: Contact with gas escaping the container can cause frostbite and freeze burns.

Symptoms/Injuries After Eye Contact: Contact with gas escaping the container can cause frostbite, freeze burns, and permanent eye damage.

Symptoms/Injuries After Ingestion: Not considered a potential route of exposure, but contact with gas escaping the container can cause freeze burns and frostbite.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General : Not classified.

12.2. Persistence and Degradability

Natural Gas - Energy Transfer	
Persistence and Degradability	Not established.

12.3. Bioaccumulative Potential

Natural Gas - Energy Transfer	
Bioaccumulative Potential	Not established.
Ethane (74-84-0)	
Log Pow	<= 2.8
Propane (74-98-6)	
Log Pow	2.3

12.4. Mobility in Soil No additional information available

12.5. Other Adverse Effects

Other Information : Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, and international regulations.

Additional Information: Container may remain hazardous when empty. Continue to observe all precautions. Handle empty containers with care because residual vapors are flammable. Empty gas cylinders should be returned to the vendor for recycling or refilling. Do not puncture or incinerate container.

Ecology – Waste Materials: Avoid release to the environment.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT

Proper Shipping Name : METHANE, COMPRESSED (with high methane content)
Hazard Class : 2.1
Identification Number : UN1971
Label Codes : 2.1
ERG Number : 115



14.2. In Accordance with IMDG

Proper Shipping Name : METHANE, COMPRESSED
Hazard Class : 2
Division : 2.1
Identification Number : UN1971
Label Codes : 2.1
EmS-No. (Fire) : F-D
EmS-No. (Spillage) : S-U



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14.3. In Accordance with IATA

Proper Shipping Name : METHANE, COMPRESSED
Identification Number : UN1971
Hazard Class : 2
Label Codes : 2.1
Division : 2.1
ERG Code (IATA) : 10L



SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

Natural Gas - Energy Transfer	
SARA Section 311/312 Hazard Classes	Fire hazard Sudden release of pressure hazard Immediate (acute) health hazard
Methane (74-82-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Ethane (74-84-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Propane (74-98-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

15.2 US State Regulations

Methane (74-82-8)	
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List	
Ethane (74-84-0)	
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List	
Propane (74-98-6)	
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List	

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 02/25/2016
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

GHS Full Text Phrases:

Compressed gas	Gases under pressure Compressed gas
Flam. Gas 1	Flammable gases Category 1
Simple Asphy	Simple Asphyxiant
H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated
	May displace oxygen and cause rapid suffocation

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom)

SAFETY DATA SHEET

SDS ID NO.: 0118MAR022
Revision Date: 10/08/2019

1. IDENTIFICATION

Product Name: MarkWest Ethane

Synonym: Ethane
Product Code: 0118MAR022
Chemical Family: Hydrocarbon Gas

Recommended Use: Hydrocarbon.
Restrictions on Use: All others.

Manufacturer, Importer, or Responsible Party Name and Address:

MarkWest Energy Partners, L.P.

a subsidiary of MPLX LP

1515 Arapahoe Street

Tower 1, Suite 1600

Denver, Colorado 80202

SDS information: 1-419-421-3070 (M-F, 8-5 EST)

Emergency Telephone: CHEMTREC: 1-800-424-9300

2. HAZARD IDENTIFICATION

Classification

OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable gases	Category 1
Gases under pressure	Compressed Gas
Simple asphyxiant	-
Specific target organ toxicity (single exposure)	Category 3

Hazards Not Otherwise Classified (HNOC)

Contact with product may cause frostbite.

Label elements

EMERGENCY OVERVIEW

Danger

Extremely flammable gas
Contains gas under pressure; may explode if heated
May displace oxygen and cause rapid suffocation
May cause drowsiness or dizziness
Contact with rapidly expanding gas may cause frostbite

**Appearance** Colorless Compressed Gas**Physical State** Gas**Odor** Odorless**Precautionary Statements - Prevention**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking
 Avoid breathing gas/vapors
 Use only outdoors or in a well-ventilated area

Precautionary Statements - Response

Leaking gas fire: Do not extinguish, unless leak can be stopped safely
 Eliminate all ignition sources if safe to do so
 If inhaled: Remove person to fresh air and keep comfortable for breathing.
 Call a poison center or doctor if you feel unwell

Precautionary Statements - Storage

Store in a well-ventilated place. Keep container tightly closed
 Protect from sunlight
 Store locked up

Precautionary Statements - Disposal

Dispose of contents/container at an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Composition Information:

Name	CAS Number	% Concentration
Ethane	74-84-0	96-100
Propane	74-98-6	0-3
Ethylene	74-85-1	0-2
Propylene	115-07-1	0-1
Methane	74-82-8	0-1

All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

4. FIRST AID MEASURES

First Aid Measures**General Advice:**

In case of accident or if you feel unwell, seek medical advice immediately (show directions for use or safety data sheet if possible).

Inhalation:

Remove to fresh air. If not breathing, utilize bag valve mask or other form of barrier device to institute rescue breathing. If breathing is difficult, ensure airway is clear, give oxygen and continue to monitor. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Get immediate medical attention.

Skin Contact:

If product has caused frostbite, remove contaminated clothing. Thaw frost bitten areas slowly with lukewarm water or by wrapping affected areas with blankets. Do not rub affected areas. Let circulation reestablish itself naturally, exercising area if possible. Get medical attention.

Eye Contact:

Flush with large amounts of tepid water for at least 15 minutes. Gently remove contact

lenses while flushing. Eyelids should be held away from the eyeball to ensure thorough rinsing. If frostbite is suspected (cloudy lens or greyish white tissue around the eye) get immediate medical attention.

Ingestion: Ingestion not likely. If swallowed, immediately call a poison control center or physician.

Most important signs and symptoms, both short-term and delayed with overexposure

Adverse Effects: Asphyxiant gas. High concentrations in the immediate area can displace oxygen causing the feeling of suffocation and can cause headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue from oxygen deprivation. Contact with product may cause frostbite.

Indication of any immediate medical attention and special treatment needed

Notes To Physician: This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided. Treat symptomatically. Administer supplemental oxygen as needed.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

For small fires, Class B fire extinguishing media such as CO₂ or dry chemical can be used. For large fires use water spray or fog. Firefighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

Unsuitable extinguishing media

DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

Specific hazards arising from the chemical

This product has been determined to be an extremely flammable gas per the OSHA Hazard Communication Standard and should be handled accordingly. Sealed containers may rupture when heated. Gas may accumulate along the ground, settle in low lying areas or be moved by ventilation and ignited by many sources such as pilot lights, sparks, electric motors, static discharge, or other ignition sources at locations distant from material handling. Flashback can occur along vapor trail. For additional fire related information see NFPA 30 or the Emergency Response Guidebook 115.

Hazardous combustion products

Smoke, carbon monoxide, and other products of incomplete combustion.

Explosion data

Sensitivity to Mechanical Impact No.

Sensitivity to Static Discharge Yes.

Special protective equipment and precautions for firefighters

Firefighters should wear full protective clothing and positive-pressure self-contained breathing apparatus (SCBA) with a full face-piece, as appropriate. Since this gas could burn with a near invisible flame in daylight, approach with caution. Isolate hazard area. If safe to do so, stop the flow of gas and allow fire to burn out. Extinguishing the flame before shutting off the supply can cause the formation of explosive mixtures. In some cases it may be preferred to allow the flame to continue to burn. Keep surrounding area cool with water spray from a distance and prevent further ignition of combustible material.

Additional firefighting tactics

FIRES INVOLVING TANKS OR CAR/TRAILER LOADS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after the fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

EVACUATION: Consider initial downwind evacuation for at least 1000 feet. If tank, rail car or tank truck is involved in a fire, ISOLATE for 5280 feet (1 mile) in all directions; also, consider initial evacuation of 5280 feet (1 mile) in all directions.

NFPA

Health 1

Flammability 4

Instability 0

Special Hazard -

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions:** Keep people away from and upwind of spill/leak. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources. Use spark-proof tools and explosion-proof equipment. Distant ignition and flashback are possible. Monitor area for flammable or explosive atmosphere. Before entry, especially into confined areas, check atmosphere with an appropriate monitor.
- Protective equipment:** Use personal protection measures as recommended in Section 8.
- Emergency procedures:** Leaking containers should be moved outdoors or to well-ventilated area and contents transferred to a suitable container. Vapors may accumulate in confined spaces without sufficient ventilation. Notify local health and pollution control agencies, if appropriate.
- Environmental precautions:** If leaking, take appropriate steps to disperse gas.
- Methods and materials for containment:** Prevent further leakage or spillage if safe to do so.
- Methods and materials for cleaning up:** Shut off gas supply, if safe to do so. Allow equipment to depressurize. Isolate area until gas has dispersed.

7. HANDLING AND STORAGE

- Safe Handling Precautions:** Avoid breathing fumes, gas, or vapors. Use only outdoors or with adequate ventilation. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Gas may accumulate along the ground, settle in low lying areas or be moved by ventilation and ignited by many sources such as pilot lights, sparks, electric motors, static discharge, or other ignition sources at locations distant from material handling. Flashback may occur along vapor trails. Use only non-sparking tools. Use appropriate grounding and bonding practices. Use personal protection recommended in Section 8. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water. Do not cut, drill, grind or weld on empty containers since explosive residues may remain. Comply with all applicable EPA, OSHA, NFPA and consistent state and local requirements.
- Storage Conditions:** Store in properly closed containers that are appropriately labeled and in a cool, well-ventilated area. Keep product and empty container away from heat and sources of ignition. Do not puncture or incinerate container.
- Incompatible Materials** Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	ACGIH TLV	OSHA PELs:	NIOSH IDLH
Ethane 74-84-0	Simple asphyxiant	-	-
Propane 74-98-6	Simple asphyxiant	TWA: 1000 ppm TWA: 1800 mg/m ³	2100 ppm
Ethylene 74-85-1	200 ppm TWA	-	-
Propylene 115-07-1	500 ppm TWA	-	-
Methane 74-82-8	Simple asphyxiant	-	-

Notes: No further information available.

Engineering measures: Local or general exhaust required in an enclosed area or when there is inadequate

ventilation. Use mechanical ventilation equipment that is explosion-proof. Monitor atmospheric oxygen levels.

Personal protective equipment

Eye protection: Goggles or faceshield may be needed when handling pressurized gases.

Skin and body protection: Wear insulated gloves when handling pressurized gases to prevent skin contact and frostbite or freeze burn. Contact the glove manufacturer for specific advice on glove selection and breakthrough times.

Respiratory protection: Use atmosphere supplying respirators in the event of oxygen deficiency, when material produces gases and/or vapors that exceed permissible limits, or when excessive gases and/or vapors are generated. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 29 CFR 1910.134.

Note: Air purifying respirators are not to be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturers instructions), in oxygen deficient atmospheres, (less than 19.5% oxygen) or under conditions that are immediately dangerous to life and health (IDLH).

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Do not smoke while handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Gas
Appearance	Colorless Compressed Gas
Color	Colorless
Odor	Odorless
Odor Threshold	No data available.

<u>Property</u>	<u>Values (Method)</u>
Melting Point / Freezing Point	-172 °C / -278 °F
Initial Boiling Point / Boiling Range	-89 °C / -128 °F
Flash Point	-135 °C / -211 °F
Evaporation Rate	No data available.
Flammability (solid, gas)	Extremely flammable gas
Flammability Limit in Air (%):	
Upper Flammability Limit:	12.5%
Lower Flammability Limit:	3%
Explosion limits:	No data available.
Vapor Pressure	558 psi @ 21°C (70°F)
Vapor Density	1 (air =1)
Specific Gravity / Relative Density	0.357
Water Solubility	No data available.
Solubility in other solvents	No data available.
Partition Coefficient	No data available.
Decomposition temperature	No data available.
pH:	Not applicable
Autoignition Temperature	472 °C / 882 °F
Kinematic Viscosity	No data available.
Dynamic Viscosity	No data available.
Explosive Properties	No data available.
VOC Content (%)	No data available.
Density	No data available.
Bulk Density	Not applicable

10. STABILITY AND REACTIVITY

<u>Reactivity</u>	The product is non-reactive under normal conditions.
<u>Chemical stability</u>	The material is stable at 70°F (21°C), 760 mmHg pressure.
<u>Possibility of hazardous reactions</u>	None under normal processing.
<u>Hazardous polymerization</u>	Will not occur.
<u>Conditions to avoid</u>	Sources of heat or ignition.
<u>Incompatible Materials</u>	Strong oxidizing agents.
<u>Hazardous decomposition products</u>	None known under normal conditions of use.

11. TOXICOLOGICAL INFORMATION

Potential short-term adverse effects from overexposures

Inhalation	May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination. In high concentration the gas may cause suffocation. Victim may not be aware of asphyxiation.
Eye contact	Gas or vapor is generally non-irritating to eyes. Contact with rapidly expanding gas may cause frostbite.
Skin contact	Gas or vapor is generally non-irritating to skin. Contact with rapidly expanding gas may cause frostbite.
Ingestion	Ingestion not likely.

Acute toxicological data

Name	Oral LD50	Dermal LD50	Inhalation LC50
Ethane 74-84-0	-	-	658 mg/L (Rat) 4 h
Propane 74-98-6	-	-	> 1,464 mg/L (Rat) 15 min
Ethylene 74-85-1	-	-	> 11,473 mg/m ³ (Male rat) 5 h
Propylene 115-07-1	-	-	658 mg/L (Rat) 4 h
Methane 74-82-8	-	-	326 mg/m ³ (Mouse) 2 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

METHANE and ETHANE: Exposure to high levels of these gases produce weak central nervous system (CNS) depressant effects without significant potential for systemic toxicity. At very high levels they act as asphyxiant gases by diluting and displacing oxygen. Symptoms of persons exposed to oxygen deficient atmospheres include headache, dizziness, incoordination, cyanosis and narcosis. Extremely high concentrations can produce unconsciousness followed by death.

PROPANE: Laboratory animal studies indicate exposure to extremely high levels of propane (1 to 10 vol.% in air) may cause cardiac arrhythmias (irregular heartbeats) which may be serious or fatal.

ETHYLENE: At extremely high levels ethylene gas acts as a general anesthetic and central nervous system depressant.

PROPYLENE: At extremely high levels propylene gas acts as a general anesthetic and central nervous system depressant. Studies in laboratory animals indicate evidence of

mild, reversible hydrocarbon nephropathy in male rats exposed to levels of 1000-4,500 ppm propylene for 90-days.

Adverse effects related to the physical, chemical and toxicological characteristics

Signs and Symptoms	Asphyxiant gas. High concentrations in the immediate area can displace oxygen causing the feeling of suffocation and can cause headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue from oxygen deprivation. Contact with product may cause frostbite.
Acute toxicity	None known.
Skin corrosion/irritation	None known.
Serious eye damage/eye irritation	None known.
Sensitization	None known.
Mutagenic effects	None known.
Carcinogenicity	None known.

Cancer designations are listed in the table below

Name	ACGIH (Class)	IARC (Class)	NTP	OSHA
Ethane 74-84-0	Not Listed	Not Listed	Not Listed	Not Listed
Propane 74-98-6	Not Listed	Not Listed	Not Listed	Not Listed
Ethylene 74-85-1	Not Classifiable (A4)	Not Classifiable (3)	Not Listed	Not Listed
Propylene 115-07-1	Not Listed	Not Classifiable (3)	Not Listed	Not Listed
Methane 74-82-8	Not Listed	Not Listed	Not Listed	Not Listed

Reproductive toxicity	None known.
Specific Target Organ Toxicity (STOT) - single exposure	May cause drowsiness or dizziness.
Specific Target Organ Toxicity (STOT) - repeated exposure	None known.
Aspiration hazard	Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Not classified in terms of aquatic toxicity.

Name	Algae/aquatic plants	Fish	Toxicity to Microorganisms	Crustacea
Ethane 74-84-0	-	-	-	-
Propane 74-98-6	-	-	-	-
Ethylene 74-85-1	-	-	-	-
Propylene 115-07-1	-	-	-	-
Methane 74-82-8	-	-	-	-

<u>Persistence and degradability</u>	Expected to be inherently biodegradable.
<u>Bioaccumulation</u>	Not expected to bioaccumulate in aquatic organisms.
<u>Mobility in soil</u>	Expected to rapidly partition to air.
<u>Other adverse effects</u>	No information available.

13. DISPOSAL CONSIDERATIONS

Description of Waste Residues

No information available.

Safe Handling of Wastes

Handle in accordance with applicable local, state, and federal regulations. Use personal protection measures as required. Use appropriate grounding and bonding practices. Use only non-sparking tools. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. No smoking.

Disposal of Wastes / Methods of Disposal

The user is responsible for determining if any discarded material is a hazardous waste (40 CFR 262.11). Dispose of in accordance with federal, state and local regulations.

Methods of Contaminated Packaging Disposal

Empty containers should be completely drained and then discarded or recycled, if possible. Do not cut, drill, grind or weld on empty containers since explosive residues may be present. Dispose of in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT:

UN Proper Shipping Name:	Ethane
UN/Identification No:	UN 1035
Class:	2.1
Packing Group:	Not applicable.

IATA:

UN Proper Shipping Name:	Ethane
UN/Identification No:	UN 1035
Transport Hazard Class(es):	2.1
Packing Group:	Not applicable.

IMDG:

UN Proper Shipping Name:	Ethane
UN/Identification No:	UN 1035
Transport Hazard Class(es):	2.1
Packing Group:	Not applicable.
EmS No:	F-D, S-U
Marine Pollutant:	No

15. REGULATORY INFORMATION

US Federal Regulatory Information:

US TSCA Chemical Inventory Section 8(b):	This product and/or its components are listed on the TSCA Chemical Inventory or are exempt.

EPA Superfund Amendment & Reauthorization Act (SARA):

SARA Section 302: This product does not contain any component(s) included on EPA's Extremely Hazardous Substance (EHS) List.

Name	CERCLA/SARA - Section 302 Extremely Hazardous

	Substances and TPQs
Ethane	NA
Propane	NA
Ethylene	NA
Propylene	NA
Methane	NA

SARA Section 304: This product does not contain any component(s) identified as an EHS or a CERCLA Hazardous substance, which in case of a spill or release may be subject to SARA reporting requirements.

Name	Hazardous Substances RQs
Ethane	NA
Propane	NA
Ethylene	NA
Propylene	NA
Methane	NA

SARA Section 311/312: The following EPA hazard categories apply to this product:

Flammable
 Gas under pressure
 Simple asphyxiant
 Specific target organ toxicity
 Hazard Not Otherwise Classified (HNOC)-Health

SARA Section 313: This product may contain component(s), which if in exceedance of the de minimus threshold, may be subject to the reporting requirements of SARA Title III Section 313 Toxic Release Reporting (Form R).

Name	CERCLA/SARA 313 Emission reporting:
Ethane	None
Propane	None
Ethylene	1.0 % de minimis concentration
Propylene	1.0 % de minimis concentration
Methane	None

State and Community Right-To-Know Regulations:

The following component(s) of this material are identified on the regulatory lists below:

Ethane

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	SN 0834
Pennsylvania Right-To-Know:	Present
Massachusetts Right-To-Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Toxic
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Flammable - fourth degree
New Jersey - Environmental Hazardous Substances List:	SN 0834 TPQ: 500 lb
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Propane

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	SN 1594

Pennsylvania Right-To-Know:	Present
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Flammable - fourth degree
New Jersey - Environmental Hazardous Substances List:	SN 1594 TPQ: 500 lb
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed
Ethylene	
Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	SN 0873
Pennsylvania Right-To-Know:	Environmental hazard
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Flammable - fourth degree; reactive - second degree
New Jersey - Environmental Hazardous Substances List:	SN 0873 TPQ: 500 lb
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed
Propylene	
Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	SN 1609
Pennsylvania Right-To-Know:	Environmental hazard
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Flammable - fourth degree
New Jersey - Environmental Hazardous Substances List:	SN 1609 TPQ: 500 lb
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed
Methane	
Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	SN 1202
Pennsylvania Right-To-Know:	Present
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Toxic
Michigan Critical Materials Register List:	Not Listed

Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Flammable - fourth degree
New Jersey - Environmental Hazardous Substances List:	SN 1202 TPQ: 500 lb
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Canada DSL/NDL Inventory: This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

Notes: Not applicable.

16. OTHER INFORMATION

Prepared By Toxicology & Product Safety

Revision Notes

Revision Date: 10/08/2019

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is intended as guidance for safe handling, use, processing, storage, transportation, accidental release, clean-up and disposal and is not considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

NOTE: Naturally Occurring Radioactive Material (NORM), i.e. gases and particles, are found in trace amounts in crude oil and some derived products. Worker risks from NORM can be minimized by determining where NORM is present and controlling the handling of NORM contaminated wastes and processing, transport or storage equipment (e.g. lines, filters, pumps and reaction units) in compliance with OSHA's Standard on Ionizing Radiation 29CFR 1910.1096. During the processing of crude oil and certain petroleum products, NORM may accumulate in sediments, scales and sludge found in processing equipment (e.g. lines, filters, pumps and reaction units), and consequently may present an inhalation or ingestion hazard. For additional information on managing NORM, please refer to API's Bulletin E2 entitled, "Bulletin on Management of Naturally Occurring Radioactive Material in Oil and Gas Production".

Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200), Health Canada HPR (SOR/2015-17), and Mexico NOM-018-STPS-2015



SECTION 1: Identification

Product Identifier	Natural Gas Liquids
Other means of identification	Natural Gas Liquids, Raw; Natural Gas Liquids, Ethane Free; Plant Condensate; Raw NGL; EPBC Mix; PBC Mix; Y-Grade; Gas Liquids
Code	786340
Issue date	23-May-2019
MARPOL Annex I Category	Naphthas and Condensates
Relevant identified uses	Feedstock
Uses advised against	All others
24 Hour Emergency Phone Number	CHEMTREC: 1-800-424-9300 CHEMTREC Mexico 01-800-681-9531 CHEMTREC Global +1 703 527 3887
Manufacturer/Supplier	SDS Information
Phillips 66 Company	URL: www.phillips66.com/SDS
P.O. Box 421959	Phone: 800-762-0942
Houston, Texas 77242-1959	Email: SDS@P66.com

SECTION 2: Hazard identification

Classified Hazards	Hazards Not Otherwise Classified (HNOC)
H224 -- Flammable liquids -- Category 1 H304 -- Aspiration Hazard -- Category 1 H315 -- Skin corrosion/irritation -- Category 2 H336 -- Specific target organ toxicity (single exposure) -- Category 3 H350 -- Carcinogenicity -- Category 1B H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2	PHNOC: Electrostatic charge may be generated during pumping and other operations HHNOC: May contain or release poisonous hydrogen sulfide gas.

Label elements



DANGER

Extremely flammable liquid and vapor
May be fatal if swallowed and enters airways
Causes skin irritation
May cause drowsiness or dizziness
May cause cancer
May contain or release poisonous hydrogen sulfide gas.
Toxic to aquatic life with long lasting effects



Obtain special instructions before use; Do not handle until all safety precautions have been read and understood; Keep away from heat/sparks/open flames/hot surfaces. - No smoking; Keep container tightly closed; Ground/bond container and receiving equipment; Use explosion-proof electrical (ventilation and lighting) equipment; Use only non-sparking tools; Take precautionary measures against static discharge; Avoid breathing dust/fume/gas/mist/vapours/spray; Wash skin thoroughly after handling; Use only outdoors or in a well-ventilated area; Avoid release to the environment; Wear protective gloves/protective clothing and eye/face protection; IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician; Do NOT induce vomiting; IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower; If skin irritation occurs: Get medical advice/attention; IF INHALED: Remove person to fresh air and keep comfortable for breathing; IF exposed or concerned: Get medical advice/attention; Take off contaminated clothing and wash before reuse; In case of fire: Use CO2, dry chemical, or foam for extinction; Collect spillage; Store in a well-ventilated place. Keep cool; Dispose of contents/container to an approved waste disposal plant

SECTION 3: Composition/information on ingredients

Chemical Name	CASRN	Concentration
Natural gas, petroleum, raw liquid mix	64741-48-6	100

Hazardous Constituent(s) Contained Within Above Complex Substance(s)

Chemical Name	CASRN	Concentration
n-Hexane	110-54-3	5-25
Benzene	71-43-2	0.1-5
Toluene	108-88-3	1-5
Hydrogen sulfide	7783-06-4	<1

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4: First aid measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

Inhalation: If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

Most important symptoms and effects, both acute and delayed: Effects of overexposure can include slight irritation of the respiratory tract, nausea, vomiting, and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Continued exposure to high concentrations can result in vomiting, cardiac irregularities and sudden loss of consciousness. Prolonged or repeated contact may dry skin and cause irritation

Notes to Physician: At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. Amyl nitrite inhalers (found in the cyanide antidote kit) can be used for 30 seconds every minute until an I.V. line is established. For adults the dose is 10 mL of a 3% NaNO₂ solution (0.5 gm NaNO₂ in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias. Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

Other Comments: Before attempting rescue, first responders should be alert to the possible presence of hydrogen sulfide, a poisonous gas with the smell of rotten eggs, and should consider the need for respiratory protection (see Section 8). Remove casualty to fresh air as quickly as possible. Immediately begin artificial respiration if breathing has ceased. Consider whether oxygen administration is needed. Obtain medical advice for further treatment.

SECTION 5: Firefighting measures

NFPA 704: National Fire Protection Association

Health: 1 Flammability: 4 Instability: 0



0 = minimal hazard
1 = slight hazard
2 = moderate hazard
3 = severe hazard
4 = extreme hazard

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Specific hazards arising from the chemical

Unusual Fire & Explosion Hazards: Extremely flammable This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe) Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire. Hazardous combustion/decomposition products, including hydrogen sulfide, may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Hydrogen sulfide and oxides of nitrogen and sulfur may also be formed.

Special protective actions for fire-fighters: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Cool equipment exposed to fire with water, if it can be done safely.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: Extremely flammable Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. May contain or release poisonous hydrogen sulfide gas. If the presence of dangerous amounts of H₂S around the spilled product is suspected, additional or special actions may be warranted, including access restrictions and use of protective equipment. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop and contain spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods and material for containment and cleaning up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with

inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken. See Section 13 for information on appropriate disposal.

SECTION 7: Handling and storage

Precautions for safe handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. May contain or release dangerous levels of hydrogen sulfide. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Extremely Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

Static Accumulation Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding of tanks, transfer piping, and storage tank level floats are necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. Special care should be given to ensure that special slow load procedures for "switch loading" are followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha). For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Check atmosphere for oxygen content, H₂S, and flammability prior to entry. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

SECTION 8: Exposure controls/personal protection

Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

Chemical Name	ACGIH	OSHA	Mexico	Phillips 66
n-Hexane	TWA-8hr: 50 ppm Skin	TWA-8hr: 500 ppm TWA-8hr: 1800 mg/m ³	TWA-8hr: 50 ppm (VLE-PPT) Skin	TWA-8hr: 50 ppm Skin
Benzene	TWA-8hr: 0.5 ppm STEL: 2.5 ppm	TWA-8hr: 10 ppm applies to industry segments exempt	TWA-8hr: 0.5 ppm (VLE-PPT)	TWA-8hr: 0.5 ppm STEL: 2.5 ppm

	Skin	from the benzene standard at 29 CFR 1910.1028 TWA-8hr: 1 ppm STEL: 5 ppm Ceiling: 25 ppm Carcinogen	STEL: 2.5 ppm (PPT-CT) Carcinogen Skin	Skin Carcinogen
Toluene	TWA-8hr: 20 ppm	TWA-8hr: 200 ppm Ceiling: 300 ppm	TWA-8hr: 20 ppm (VLE-PPT) Carcinogen Skin	TWA-8hr: 20 ppm
Hydrogen sulfide	TWA-8hr: 1 ppm STEL: 5 ppm	Ceiling: 20 ppm	TWA-8hr: 1 ppm (VLE-PPT) STEL: 5 ppm (PPT-CT)	TWA-8hr: 5 ppm STEL: 15 ppm

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Biological occupational exposure limits		
Chemical Name	ACGIH	Mexican NOM-047-SSA1-2011
n-Hexane	2,5-Hexanedione without hydrolysis in urine: 0.5 mg/L (end of shift)	2,5-Hexanedione without hydrolysis in urine: 0.4 mg/L (end of shift at end of work week)
Benzene	S-Phenylmercapturic acid in urine: 25 µg/g creatinine (end of shift) t,t-Muconic acid in urine: 500 µg/g creatinine (end of shift)	S-Phenylmercapturic acid in urine: 25 µg/g creatinine (end of work shift) t,t-Muconic acid in urine: 500 µg/g creatinine (end of work shift)
Toluene	Toluene in blood: 0.02 mg/L (prior to last shift of workweek) Toluene in urine: 0.03 mg/L (end of shift) o-Cresol with hydrolysis in urine: 0.3 mg/g creatinine (end of shift)	o-Cresol in urine: 0.5 mg/L (end of work shift) Hippuric acid in urine: 1.6 g/g creatinine (end of work shift) Toluene in blood: 0.05 mg/L (before last shift at end of work week)

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information --- = None

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile rubber

Respiratory Protection: Where there is potential for airborne exposure to hydrogen sulfide (H₂S) above exposure limits, a NIOSH approved, self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used. Under conditions where hydrogen sulfide (H₂S) is NOT detected, a NIOSH certified air purifying respirator equipped with A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use.

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

SECTION 9: Physical and chemical properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance: Colorless
Physical Form: Liquid
Odor: Gasoline; Rotten egg / sulfurous
Odor Threshold: No data
pH: Not applicable
Vapor Density (air=1): >1
Upper Explosive Limits (vol % in air): No data
Lower Explosive Limits (vol % in air): No data
Evaporation Rate (nBuAc=1): No data
Particle Size: Not applicable
Percent Volatile: 100%
Flammability (solid, gas): Not applicable
Solubility in Water: Negligible

Flash Point: < -99 °F / < -73 °C
Test Method: (estimate)
Initial Boiling Point/Range: No data
Vapor Pressure: 150 - 200 psia (Reid VP) @ 100°F / 37.8°C
Partition Coefficient (n-octanol/water) (Kow): No data
Melting/Freezing Point: No data
Auto-ignition Temperature: No data
Decomposition Temperature: No data
Specific Gravity (water=1): (estimated) 0.5 - 0.7 @ 68°F (20°C)
Bulk Density: 4.2-5.8 lbs/gal
Viscosity: No data
Pour Point: No data

SECTION 10: Stability and reactivity

Reactivity: Not chemically reactive.

Chemical stability: Stable under normal ambient and anticipated conditions of use.

Possibility of hazardous reactions: Hazardous reactions not anticipated.

Conditions to avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Incompatible materials: Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous decomposition products: Not anticipated under normal conditions of use.

SECTION 11: Toxicological information

Information on Toxicological Effects

Substance / Mixture			
Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Expected to have a low degree of toxicity by inhalation	May contain or release poisonous hydrogen sulfide gas - see Other Comments.	> 5.2 mg/L (vapor)
Dermal	Unlikely to be harmful		> 2 g/kg
Oral	Unlikely to be harmful		> 5 g/kg

Likely Routes of Exposure: Inhalation, eye contact, skin contact

Aspiration Hazard: May be fatal if swallowed and enters airways

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure. Two year inhalation studies of wholly vaporized unleaded gasoline, and 90 days studies of various petroleum naphthas, did not produce significant target organ toxicity in laboratory animals. Nephropathy in male rats, characterized by the accumulation of

alpha-2-u- globulin in epithelial cells of the proximal tubules was observed, however follow-up studies suggest that these changes are unique to the male rat.

Carcinogenicity: May cause cancer. Based on component information. Two year inhalation studies of vaporized unleaded gasoline produced an increased incidence of kidney tumors in male rats and liver tumors in female mice. Repeated skin application of various petroleum naphthas in mice for two years resulted in an increased incidence of skin tumors but only in the presence of severe skin irritation. Follow-up mechanistic studies suggest that the occurrence of these tumors may be the consequence of promotional processes and not relevant to human risk assessment. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by the International Agency for Research on Cancer.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity. No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to high vapor concentrations of unleaded gasoline and petroleum naphthas via inhalation. A two-generation reproductive toxicity study of vapor recovery gasoline did not adversely affect reproductive function or offspring survival and development.

Other Comments: This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.

Information on Toxicological Effects of Components

n-Hexane

Reproductive Toxicity: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Target Organ(s): Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Benzene

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

Reproductive Toxicity: Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

Target Organ(s): Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Germ Cell Mutagenicity: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.

Toluene

Carcinogenicity: Exposure of rats and mice to toluene at concentrations ranging from 120-1200 ppm for two years did not demonstrate evidence of carcinogenicity. Toluene has not been listed as a carcinogen by IARC.

Reproductive Toxicity: Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. Decreased fetal body weight and increased skeletal variations in both inhalation and oral studies, but only at doses that were maternally toxic. No fetal toxicity was seen at doses that were not maternally toxic. Decreased sperm counts have been observed in male rats in the absence of a reduction in fertility. Toluene has been reported to cause mental or growth retardation in the children of solvent abusers who directly inhale toluene during pregnancy.

Target Organ(s): Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

SECTION 12: Ecological information



GHS Classification:

H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2
Toxic to aquatic life with long lasting effects.

Toxicity: Acute aquatic toxicity studies on samples of gasoline and naphtha streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. These substances should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment.

Persistence and Degradability: The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Persistence per IOPC Fund definition: Non-Persistent

Bioaccumulative Potential: Log Kow values measured for the hydrocarbon components of this material range from 3 to greater than 6 and therefore are regarded as having the potential to bioaccumulate. In practice, metabolic processes or physical properties may prevent this effect or limit bioavailability.

Mobility in Soil: On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 6.5 days for benzene to 0.5 days for n-dodecane.

Other adverse effects: None anticipated.

SECTION 13: Disposal considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations. This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the SDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste. Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Benzene

SECTION 14: Transport information

If vapor pressure is $\leq$ 300 kPa (43.5 psia) at 50° C (122° F) shipping description is:
UN3295, Hydrocarbons, liquid, n.o.s., 3, I or II [I if BP < 95° F (35° C); II if BP > 95° F]

UN Number: UN1965

UN proper shipping name: Hydrocarbon gas mixture, liquefied, n.o.s

Transport hazard class(es): 2.1; ,

Packing Group: None

Environmental Hazards: Marine pollutant - Environmentally Hazardous

Special precautions for user: *If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.*

Container(s) greater than 5 liters (liquids) or 5 kilograms (solids), shipped by water mode and ALL bulk shipments may require the shipping description to contain the "Marine Pollutant" notation [49 CFR 172.203(l)] and the container(s) to display the [Marine Pollutant Mark] [49 CFR 172.322].

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds)

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Chemical Name	TPQ	EPCRA RQ
Hydrogen sulfide	500 lb	100 lb

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CERCLA/SARA - Section 313 and 40 CFR 372

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Chemical Name	Concentration	de minimis
n-Hexane	5-25	1.0%
Benzene	0.1-5	0.1%
Toluene	1-5	1.0%
Cyclohexane	0-3	1.0%
Hydrogen sulfide	<1	1.0%

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

EPA (CERCLA) Reportable Quantity (in pounds)

This material contains the following chemicals subject to the reporting requirements of 40 CFR 302.4:

California Proposition 65

 **WARNING.** This product can expose you to chemicals including Benzene (CASRN 71-43-2) which is known to the State of California to cause cancer, and Benzene (CASRN 71-43-2), n-Hexane (CASRN 110-54-3) and Toluene (CASRN 108-88-3) which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

International Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.
All components are either on the DSL, or are exempt from DSL listing requirements.

SECTION 16: Other information

Issue date	Previous Issue Date:	SDS Number	Status:
23-May-2019	04-Jan-2018	786340	FINAL

Revised Sections or Basis for Revision:
Exposure limits (Section 8)

Mexican NOM-018-STPS-2015:

The information within is considered correct but is not exhaustive and will be used for guidance only, which is based on the current knowledge of the substance or mixture and is applicable to the appropriate safety precautions for the product.

Precautionary Statements:

P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment

P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P264 - Wash skin thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P331 - Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P332 + P313 - If skin irritation occurs: Get medical advice/attention
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P362 - Take off contaminated clothing and wash before reuse
P370 + P378 - In case of fire: Use dry chemical, carbon dioxide, or foam to extinguish
P391 - Collect spillage
P403 + P235 - Store in a well-ventilated place. Keep cool
P501 - Dispose of contents/ container to an approved waste disposal plant

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; HPR = Hazardous Products Regulations; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:

The information presented in this Safety Data Sheet is based on data believed to be accurate as of the date this Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license. Except to the extent required by law, re-publication or retransmission of this document, in whole or part, is not permitted.

SECTION 1: IDENTIFICATION**1.1. Product Identifier****Product Form:** Mixture**Product Name:** Propane Plus**1.2. Intended Use of the Product****Use of the Substance/Mixture:** No use is specified.**1.3. Name, Address, and Telephone of the Responsible Party**

Energy Transfer Partners

100 Green St.

Marcus Hook, PA

214-981-0700

1.4. Emergency Telephone Number**Emergency Number** : CHEMTREC: (800) 424-9300/ (703) 527-3887**SECTION 2: HAZARDS IDENTIFICATION****2.1. Classification of the Substance or Mixture****GHS-US Classification**

Simple Asphy

Flam. Gas 1 H220

Press. Gas (Liq.) H280

STOT SE 3 H336

Aquatic Acute 2 H401

Aquatic Chronic 2 H411

Full text of hazard classes and H-statements : see section 16

2.2. Label Elements**GHS-US Labeling****Hazard Pictograms (GHS-US)** :**Signal Word (GHS-US)** :

: Danger

Hazard Statements (GHS-US) :

: H220 - Extremely flammable gas.

H280 - Contains gas under pressure; may explode if heated.

H336 - May cause drowsiness or dizziness.

H401 - Toxic to aquatic life.

H411 - Toxic to aquatic life with long lasting effects.

May displace oxygen and cause rapid suffocation.

Precautionary Statements (GHS-US) :

: P210 - Keep away from extremely high or low temperatures, ignition sources, and incompatible materials. - No smoking.

P261 - Avoid breathing gas.

P271 - Use only outdoors or in a well-ventilated area.

P273 - Avoid release to the environment.

P304+P340 - If inhaled: Remove person to fresh air and keep at rest in a position comfortable for breathing.

P312 - Call a poison center or doctor if you feel unwell.

P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 - Eliminate all ignition sources if safe to do so.

P391 - Collect spillage.

P403 - Store in a well-ventilated place.

P403+P233 - Store in a well-ventilated place. Keep container tightly closed.

P405 - Store locked up.

P410+P403 - Protect from sunlight. Store in a well-ventilated place.

P501 - Dispose of contents/container in accordance with local, regional, national, and international regulations.

Propane Plus

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

2.3. Other Hazards

Vapor in the headspace of tanks and containers may ignite and explode at temperatures exceeding auto-ignition temperature, where vapor concentrations are within the flammability range. May ignite on surfaces at temperatures above auto-ignition temperature. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Repeated exposure may cause skin dryness or cracking. Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Contact with gas escaping the container can cause frostbite.

2.4. Unknown Acute Toxicity (GHS-US)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Not applicable

3.2. Mixture

Name	Product Identifier	%	GHS-US classification
Propane	(CAS-No.) 74-98-6	35 - 100	Simple Asphy Flam. Gas 1, H220 Press. Gas (Liq.), H280
Isobutane	(CAS-No.) 75-28-5	<= 45	Simple Asphy Flam. Gas 1, H220 Press. Gas (Liq.), H280
Butane	(CAS-No.) 106-97-8	<= 25	Simple Asphy Flam. Gas 1, H220 Press. Gas (Liq.), H280
Isopentane	(CAS-No.) 78-78-4	<= 15	Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411
n-Pentane	(CAS-No.) 109-66-0	<= 10	Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 2, H401 Aquatic Chronic 2, H411

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First-aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

First-aid Measures After Inhalation: First, take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate respiratory protective equipment, use the buddy system), then remove the exposed person to fresh air. Keep at rest in a position comfortable for breathing. Obtain medical attention if breathing difficulty persists.

First-aid Measures After Skin Contact: For brief contact with a small amount: Rewarm with body heat. Get immediate medical advice/attention. For extensive contact or a large amount: Immediately call a poison center/doctor and follow their advice. Specific treatment is urgent, incorrect first-aid practices will aggravate the injury. Protect affected area with a loose cover until proper medical treatment is received.

First-aid Measures After Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists. If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

First-aid Measures After Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

Symptoms/Injuries: May cause frostbite on contact with the liquid. May cause drowsiness and dizziness. Asphyxia by lack of oxygen: risk of death.

Propane Plus

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Symptoms/Injuries After Inhalation: High concentrations may cause central nervous system depression such as dizziness, vomiting, numbness, drowsiness, headache, and similar narcotic symptoms. In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.

Symptoms/Injuries After Skin Contact: Contact with gas/liquid escaping the container can cause frostbite and freeze burns.

Symptoms/Injuries After Eye Contact: Contact with gas/liquid escaping the container can cause frostbite, freeze burns, and permanent eye damage.

Symptoms/Injuries After Ingestion: Not considered a potential route of exposure, but contact with gas/liquid escaping the container can cause freeze burns and frostbite.

Chronic Symptoms: None expected under normal conditions of use.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Do not extinguish burning gas if flow cannot be shut off immediately. Extinguish secondary FIRES with appropriate materials.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Extremely flammable gas.

Explosion Hazard: May form flammable/explosive vapor-air mixture. Container may explode in heat of fire.

Reactivity: Hazardous reactions will not occur under normal conditions.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO₂).

Other Information: Use water spray to disperse vapors. Do not allow run-off from firefighting to enter drains or water courses.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Eliminate every possible source of ignition. Do not get in eyes, on skin, or on clothing. Do not breathe gas.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protective equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Evacuate unnecessary personnel, isolate, and ventilate area. Ventilate area. Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Avoid release to the environment. Collect spillage.

6.3. Methods and Materials for Containment and Cleaning Up

For Containment: Stop leak, if possible without risk. As an immediate precautionary measure, isolate spill or leak area in all directions.

Methods for Cleaning Up: Stop the source of the release, if safe to do so. Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and gas test area before entering. Contact competent authorities after a spill.

6.4. Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors are flammable. Ruptured cylinders may rocket. Do not pressurize, cut, or weld containers. Asphyxiating gas at high concentrations.

Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid prolonged contact with eyes, skin and clothing. Do not breathe gas.

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Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.

Storage Conditions: Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials. Keep in fireproof place. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Store locked up/in a secure area.

Incompatible Materials: Strong acids, strong bases, strong oxidizers. Oxygen.

7.3. Specific End Use(s)

No use is specified.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), or OSHA (PEL).

Propane (74-98-6)		
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1800 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	1000 ppm
USA IDLH	US IDLH (ppm)	2100 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1800 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
Isobutane (75-28-5)		
USA ACGIH	ACGIH STEL (ppm)	1000 ppm (explosion hazard)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1900 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	800 ppm
Butane (106-97-8)		
USA ACGIH	ACGIH STEL (ppm)	1000 ppm (explosion hazard)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1900 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	800 ppm
USA IDLH	US IDLH (ppm)	1600 ppm (>10% LEL)
Isopentane (78-78-4)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
n-Pentane (109-66-0)		
USA ACGIH	ACGIH TWA (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	350 mg/m ³
USA NIOSH	NIOSH REL (TWA) (ppm)	120 ppm
USA NIOSH	NIOSH REL (ceiling) (mg/m ³)	1800 mg/m ³
USA NIOSH	NIOSH REL (ceiling) (ppm)	610 ppm
USA IDLH	US IDLH (ppm)	1500 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	2950 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm

8.2. Exposure Controls

Appropriate Engineering Controls

: Suitable eye/body wash equipment should be available in the vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Use explosion-proof equipment. Proper grounding procedures to avoid static electricity should be followed. Gas detectors should be used when flammable gases or vapors may be released. Oxygen detectors should be used when asphyxiating gases may be released. Ensure all national/local regulations are observed.

Personal Protective Equipment

: Gloves. Protective clothing. Protective goggles. Respiratory protection of the dependent type.



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Materials for Protective Clothing	: Chemically resistant materials and fabrics. Wear fire/flame resistant/retardant clothing.
Hand Protection	: Wear protective gloves. If material is cold, wear thermally resistant protective gloves.
Eye and Face Protection	: Chemical safety goggles.
Skin and Body Protection	: Wear suitable protective clothing.
Respiratory Protection	: Use a NIOSH-approved self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.
Thermal Hazard Protection	: Wear thermally resistant protective clothing.
Other Information	: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	: Gas
Appearance	: Colorless gas
Odor	: Odorless
Odor Threshold	: No data available
pH	: No data available
Evaporation Rate	: No data available
Melting Point	: No data available
Freezing Point	: -279.5 °F (-173.06 °C)
Boiling Point	: -127.5 °F (-88.61 °C)
Flash Point	: -211 °F (-135 °C)
Auto-ignition Temperature	: 882 °F (472.22 °C)
Decomposition Temperature	: No data available
Flammability (solid, gas)	: Extremely flammable gas
Vapor Pressure	: 28856.83 mm Hg
Relative Vapor Density at 20°C	: 1.04
Relative Density	: No data available
Specific Gravity	: 0.45
Solubility	: Water: Negligible
Partition Coefficient: N-Octanol/Water	: No data available
Viscosity	: No data available
Explosive Properties	: Contains gas under pressure; may explode if heated.
Lower Flammable Limit	: -3 %
Upper Flammable Limit	: -12.4 %

9.2. Other Information

Gas Group	: Press. Gas (Liq.)

SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:** Hazardous reactions will not occur under normal conditions.
- 10.2. Chemical Stability:** Contains gas under pressure; may explode if heated.
- 10.3. Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- 10.4. Conditions to Avoid:** Direct sunlight, extremely high or low temperatures, open flames, sources of ignition and incompatible materials.
- 10.5. Incompatible Materials:** Strong acids, strong bases, strong oxidizers. Oxygen.
- 10.6. Hazardous Decomposition Products:** Carbon oxides (CO, CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects

Acute Toxicity: Not classified

Propane (74-98-6)	
LC50 Inhalation Rat	> 800000 ppm (Exposure time: 15 min)
Isobutane (75-28-5)	
LC50 Inhalation Rat	658 mg/l/4h
LC50 Inhalation Rat	11000 ppm

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Butane (106-97-8)	
LC50 Inhalation Rat	30957 mg/m ³ (Exposure time: 4 h)
n-Pentane (109-66-0)	
LD50 Oral Rat	> 2000 mg/kg
LD50 Dermal Rabbit	3000 mg/kg
LC50 Inhalation Rat	364 g/m ³ (Exposure time: 4 h)
LC50 Inhalation Rat	> 20 mg/l/4h

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness or dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: High concentrations may cause central nervous system depression such as dizziness, vomiting, numbness, drowsiness, headache, and similar narcotic symptoms. In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness and death.

Symptoms/Injuries After Skin Contact: Contact with gas/liquid escaping the container can cause frostbite and freeze burns.

Symptoms/Injuries After Eye Contact: Contact with gas/liquid escaping the container can cause frostbite, freeze burns, and permanent eye damage.

Symptoms/Injuries After Ingestion: Not considered a potential route of exposure, but contact with gas/liquid escaping the container can cause freeze burns and frostbite.

Chronic Symptoms: None expected under normal conditions of use.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General : Toxic to aquatic life with long lasting effects.

Isopentane (78-78-4)	
EC50 Daphnia 1	2.3 mg/l (Exposure time: 48 h - Species: Daphnia magna)
n-Pentane (109-66-0)	
LC50 Fish 1	9.87 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	9.74 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 Fish 2	11.59 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
NOEC Chronic Algae	2 mg/l

12.2. Persistence and Degradability

Propane Plus	
Persistence and Degradability	May cause long-term adverse effects in the environment.

12.3. Bioaccumulative Potential

Propane Plus	
Bioaccumulative Potential	Not established.
Propane (74-98-6)	
Log Pow	2.3
Isobutane (75-28-5)	
BCF Fish 1	1.57 - 1.97
Log Pow	2.88 (at 20 °C)
Butane (106-97-8)	
Log Pow	2.89
Isopentane (78-78-4)	
Log Pow	3.2 - 3.3
n-Pentane (109-66-0)	

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Log Pow

3.39

12.4. Mobility in Soil No additional information available

12.5. Other Adverse Effects

Other Information : Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste Treatment Methods

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, and international regulations.

Additional Information: Container may remain hazardous when empty. Continue to observe all precautions. Handle empty containers with care because residual vapors are flammable. Empty gas cylinders should be returned to the vendor for recycling or refilling. Do not puncture or incinerate container. EPA Hazardous Waste Number: D001 (Ignitability).

Ecology - Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

14.1. In Accordance with DOT

Proper Shipping Name : PETROLEUM GASES, LIQUEFIED
Hazard Class : 2.1
Identification Number : UN1075
Label Codes : 2.1
ERG Number : 115



14.2. In Accordance with IMDG

Proper Shipping Name : PETROLEUM GASES, LIQUEFIED
Hazard Class : 2
Division : 2.1
Identification Number : UN1075
Label Codes : 2.1
EmS-No. (Fire) : F-D
EmS-No. (Spillage) : S-U



14.3. In Accordance with IATA

Proper Shipping Name : PETROLEUM GASES, LIQUEFIED
Identification Number : UN1075
Hazard Class : 2
Label Codes : 2.1
Division : 2.1
ERG Code (IATA) : 10L



SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Propane Plus	
SARA Section 311/312 Hazard Classes	Fire hazard Sudden release of pressure hazard Immediate (acute) health hazard
Propane (74-98-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Isobutane (75-28-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Butane (106-97-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Isopentane (78-78-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
n-Pentane (109-66-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	

Propane Plus

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15.2. US State Regulations

Propane (74-98-6)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
Isobutane (75-28-5)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
Butane (106-97-8)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
Isopentane (78-78-4)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List
n-Pentane (109-66-0)
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision	: 01/08/2018
Other Information	: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200

GHS Full Text Phrases:

Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Asp. Tox. 1	Aspiration hazard Category 1
Flam. Gas 1	Flammable gases Category 1
Flam. Liq. 1	Flammable liquids Category 1
Press. Gas (Liq.)	Gases under pressure Liquefied gas
Simple Asphy	Simple Asphyxiant
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H220	Extremely flammable gas
H224	Extremely flammable liquid and vapor
H280	Contains gas under pressure; may explode if heated
H304	May be fatal if swallowed and enters airways
H336	May cause drowsiness or dizziness
H401	Toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom)



May 1, 2025

Via Email

Mr. Stephen J. Wiedemer, AICP
PADEP – Bureau of Air Quality
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

RE: NOV Response and Facility Flare Control Plan
ETC Northeast Pipeline, LLC Revolution Cryo Plant

Mr. Wiedemer,

ETC Northeast Pipeline, LLC (ETC) is submitting this letter in response to the Notice of Violation and Request for Control Plan issued to ETC by the Department on April 2, 2025. For context, in September 2024, as a corrective action to address past visible emission events, and to ultimately improve flare performance, ETC installed a new facility flare tip. This project to replace the flare tip was developed in coordination with the original equipment manufacturer for the flare.

After installation of the new flare tip, ETC observed intermittent visible emissions and promptly engaged in subsequent maintenance and troubleshooting in coordination with the manufacturer to improve performance of the new flare tip and prevent future visible emissions issues. This troubleshooting undertaking included making modifications to the flare tip in November 2024 and again in April 2025, as well as multiple adjustments to the blower system, electric control systems, and purge gas systems. After exhausting all efforts, ETC has determined that the new flare tip is not functioning and performing as designed and as represented to ETC; therefore, we plan to once again replace the flare tip. We are currently evaluating replacement options with various manufacturers. The control plan requested by the Department is outlined below.

Control Plan for Revolution Cryo Plant Flare

Proposed Activity	Timetable
Replacement of Flare Tip	July 2025

In order to take prompt corrective action as outlined above, ETC intends to move up our previously planned annual facility outage from September 2025 to July 2025. This will allow us to replace the flare tip in July 2025, with a flare tip designed to prevent visible flare emissions in compliance with 40 CFR § 60.18(c)(1) and 25 Pa. Code § 122.

Additionally, we have implemented operational measures to minimize flaring events. When developing maintenance plans that require depressurization of equipment to the facility flare options are evaluated on how we can minimize flaring events while performing the planned maintenance. Also, we have installed additional heat trace and insulation on liquid PSVs to minimize potential freezing that can cause relief to open prior to the setpoint and implemented a maintenance procedure to inspect and repair heat trace and insulation throughout the facility.

Should you have any questions or require additional information, please contact me at (570) 505-3730.

Sincerely,

Douglas L. Frisco

Douglas L. Frisco
Sr. Manager – Environmental Compliance



May 23, 2025

Via Email

Mr. Stephen J. Wiedemer, AICP
PADEP – Bureau of Air Quality
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

RE: Supplemental NOV Response and Facility Flare Control Plan
ETC Northeast Pipeline, LLC Revolution Cryo Plant

Mr. Wiedemer,

ETC Northeast Pipeline, LLC (ETC) is submitting this letter to supplement the information provided in our May 1, 2025 response to the Department and communicated during our meeting on May 15, 2025. Our previous submission detailed our plan for replacing the flare tip and to further expand on the information below about the cause of each visible emission event which resulted in an NOV from the Department. In addition, we are planning to replace the existing flare blower system with a dual blower system including a larger capacity main blower and a smaller purge blower. This change will not result in an increase to the total capacity of the flare system; however, it is intended to increase the smokeless capacity of the flare system. The purge blower will operate continuously when lower volume (purge gas) flows are routed to the flare and the main blower will ramp up as needed during higher flow events.

Summary of NOVs and Type of Flaring Events

Since the initial startup of the facility, the Department has issued NOVs to ETC related to thirty visible flare emissions events for the facility. Of those, one was associated with the temporary flare used during the maintenance project in September 2024 and has been excluded from the remaining discussion. The remaining events include eighteen that occurred after the September 2024 flare tip replacement, the majority of which were low-opacity emissions during regular operations. For the purpose of this discussion, we are also excluding those events because the planned replacement of the flare tip is designed to remedy those issues.

That leaves eleven events that occurred before the flare tip replacement project. Six of these events occurred when the blower motor failed, or the power was lost to the facility/blower. Three resulted from PSV events. Two were from compressor/equipment blowdowns that occurred in October 2020 and January 2021 when the facility was initially ramping up operations.

Amended Control Plan for Revolution Cryo Plant Flare

Below we have detailed our amended Control Plan which includes the modifications to the blower system. Based on the summary above, ETC believes that this plan will allow the facility to maintain compliance with 40 CFR § 60.18(c)(1) and 25 Pa. Code § 122. The majority of past events that resulted in exceedances of visible emission requirements resulted from issues with the blower. The new dual-blower system will provide redundancy if the purge blower motor fails as the main blower

can be turned on at its minimum flowrate until the purge blower is back in service. Additionally, the larger main blower will increase the smokeless capacity of the flare. ETC will separately submit documentation to the Department's engineering staff detailing how the proposed changes meet the exemption criteria as physical changes qualifying for exemption under Section 127.14(a)(9)(13).

As noted in our previous submission, ETC has implemented operational measures to minimize flaring events, particularly PSV events that result in higher flows to the flare.

Proposed Activity	Timetable
Replacement of Flare Tip	July 2025
Upgrade of Flare Blower System	July 2025

In order to take prompt corrective action as outlined above, ETC intends to move up our previously planned annual facility outage from September 2025 to July 2025. This will allow us to replace the flare tip in July 2025, with a flare tip designed to prevent visible flare emissions in compliance with 40 CFR § 60.18(c)(1) and 25 Pa. Code § 122.

Should you have any questions or require additional information, please contact me at (570) 505-3730.

Sincerely,

Douglas L. Frisco

Douglas L. Frisco
Sr. Manager – Environmental Compliance

PENNSYLVANIA BULLETIN

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See Part II page 7199
for the Notices

Part I

Agencies in this issue

The Courts
Department of Agriculture
Department of Banking and Securities
Department of Environmental Protection
Department of Health
Department of Human Services
Department of Labor and Industry
Department of Revenue
Department of Transportation
Fish and Boat Commission
Health Care Cost Containment Council
Insurance Department
Municipal Police Officer's Education and
Training Commission
Pennsylvania Public Utility Commission
Philadelphia Parking Authority
Public School Employees' Retirement Board
State Board of Medicine



and work practice standards along with monitoring, recordkeeping and reporting requirements to ensure the facility complies with the applicable air quality regulations. Among other items the conditions include provisions from 25 Pa. Code §§ 123.11, 123.22, 123.13 and 123.21 and 40 CFR Part 60 Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

Contact: Thomas Hanlon, PE, East Permit Section Chief, 717-705-4862.

06-03012, Brenntag Northeast LLC/Snyder Rd, 619 Snyder Road, Reading, PA 19612, Ontelaunee Township, **Berks County**. Application received: August 23, 2024. To issue a State Only Operating Permit for the chemical distribution facility. The potential emissions from the facility are estimated at 17.73 tpy of VOCs and 11.13 tpy of HAPs. The Operating Permit will include emission limits and work practice standards along with monitoring, recordkeeping and reporting requirements to ensure the facility complies with the applicable air quality regulations. Among other items, the conditions include provisions derived from 25 Pa. Code § 129.57 Storage tanks less than or equal to 40,000 gallons capacity containing VOCs.

06-03113, Haines & Kibblehouse, Inc., P.O. Box 196, Skippack, PA 19474, Robeson Township, **Berks County**. Application received: January 30, 2024. For the operation of a limestone crushing plant. This is for renewal of the existing State-Only Permit. The operation is controlled by wet suppression and fabric collectors. The crushing plant includes equipment subject to 40 CFR Part 60 Subpart OOO—Standards of Performance for Nonmetallic Mineral Processing Plants. The facility has the potential to emit an estimated 99.96 tons per year of uncontrolled particulate matter (PM) emissions. This is for renewal of the existing State-Only Permit. The Operating Permit will include emission limits and work practice standards along with monitoring, recordkeeping and reporting requirements to ensure the facility complies with the applicable air quality regulations.

Southeast Region: Air Quality Program, 2 East Main Street, Norristown, PA 19401, 484-250-5900.

Contact: Janine Tulloch-Reid, Facilities Permitting Chief, 484-250-5920.

46-00239, SEI Investments, 100 Cinder Mill Rd, Oaks, PA 19456, Upper Providence Township, **Montgomery County**. Application received: April 8, 2024. For the renewal of a Non-Title V Facility, State-Only, Synthetic Minor Permit. SEI Investments sources of emissions include the following emergency diesel engines: two 1,800 hp, four 960 hp, one 1,120 hp, one 268 hp and two 1,839 hp diesel engines. The facility has a potential to emit 847 tons per year of NO_x based on running all engines 8,760 hours per year. All engines have emission limits and hours of operation limits which brings the NO_x PTE emissions to 13.4 tons per year. Monitoring, recordkeeping and reporting requirements are included in the permit to address applicable limitations. The only change reflected in this renewal permit is the incorporation of GP9-46-0113. The GP was for two (2) 1839 bhp diesel emergency engines, EPA Tier 2 certified.

46-00026, Global Packaging, 209 Brower Ave, Oaks, PA 19460, Upper Providence Township, **Montgomery County**. Application received: April 19, 2024. This action is for renewal of a non-Title V, Synthetic Minor Operating Permit. The facility produces packaging for various consumer products. During this renewal the facility notified

DEP that Source ID 111 is no longer controlled by the catalytic oxidizer (C02), DEP approved a new ink VOC emission calculations formula. The primary pollutants of concern are Volatile Organic Compounds (VOC) and Hazardous Air Pollutants (HAP) and their potential emissions are 24.9 tpy and 24.9/9.99 tpy respectively. The permit includes monitoring, recordkeeping and reporting requirements designed to address all applicable air quality requirements. Anyone wishing to request information regarding this action can do so by contacting the Southeast Regional Office through the previously listed contact person in the header. Comments on the draft permit can be submitted through the Air Quality resource account at RA-EPSEROAQPUBCOM@pa.gov.

Southwest Region: Air Quality Program, 400 Waterfront Drive, Pittsburgh, PA 15222-4745, 412-442-4000.

Contact: Thomas Joseph, P.E., Facilities Permitting Chief, 412-442-4336.

63-01001, ETC Northeast Pipeline, LLC, 76 Rover Lane, Bulger, PA 15019, Salem Township, **Westmoreland County**. Application received: June 9, 2023. In accordance with 25 Pa. Code §§ 127.424 and 127.425, and the Department is providing notice of intent to issue an initial natural minor State-Only Operating Permit for the continued operation of the Revolution Cryogenic Plant located in Smith Township, Washington County. The facility has previously been permitted under a GP-5 and a GP-1. The Revolution Cryogenic Plant is a natural gas processing plant. Air contamination sources and air cleaning devices at this facility include the following: three (3) 40.92 MMBtu/hr HMO heaters, one (1) 200 MMscfd amine sweetening unit controlled by a 5.54 MMBtu/hr thermal oxidizer, two (2) 90,000-gallon 12-lb pressurized condensate tanks, two (2) 21,000-gallon 2-lb RVP condensate tanks, various miscellaneous storage tanks, truck loadout controlled by a 1.0 MMBtu/hr combustor, one (1) 6.22 MMBtu/hr NGL dehydration regenerator heater, one (1) 8.5 MMBtu/hr regenerator gas heater, fifteen (15) catalytic heaters, two (2) air-actuated pneumatic devices, venting/blowdowns, fugitive emission sources (such as valves, flanges, connectors, etc.), rod packing controlled by an 11.3 MMBtu/hr combustor, pigging operations (one launcher and one receiver), and a 906 MMBtu/hr plant-wide flare. The Revolution Cryogenic Plant has potential emissions of 30.6 TYP NO_x, 35.3 TYP CO, 29.0 TYP VOC, 8.1 TYP PM₁₀, 8.1 TYP PM_{2.5}, < 1 TYP SO_x, 2.4 TYP hexane, 2.6 TYP total HAP, and 81,000 TYP CO_{2e}. The permit includes emission limitations and operational, monitoring, testing, recordkeeping, work practice, and reporting requirements for the site. Those who wish to provide the Department with additional written information that they believe should be considered prior to the issuance of the State-Only Operating Permit may submit the information to Thomas Joseph, Environmental Engineering Manager, Department of Environmental Protection, Southwest Regional Office, 400 Waterfront Drive, Pittsburgh, PA 15222. Written comments must contain the name, address and telephone number of the person submitting the comments, identification of the proposed Operating Permit (63-01001) and concise statements regarding the relevancy of the information or objections to issuance of the Operating Permit. A public hearing may be held, if the Department, in its discretion, decides that such a hearing is warranted based on the information received. All persons submitting comments or requesting a hearing will be notified of the decision to hold a hearing by publication in the newspaper or by the *Pennsylvania Bulletin*, or by telephone, where the Department determines such notification by telephone is sufficient. Written

comments or requests for a public hearing should be directed to Thomas Joseph, Environmental Engineering Manager, at the previously listed address or submitted to tjoseph@pa.gov. All comments must be received prior to the close of business 30 days after the date of this publication. The application, DEP's Review Memorandum, and the proposed permit are available for public review during normal business hours at DEP's Southwest Regional Office, 400 Waterfront Drive, Pittsburgh, PA 15222. A file review can be scheduled through the DEP's website at <https://www.dep.pa.gov/Citizens/PublicRecords/Pages/Informal-File-Review.aspx> and by contacting Thomas Joseph, Environmental Engineering Manager, at 412-442-4336 or tjoseph@pa.gov. Persons with a disability who wish to comment and require an auxiliary aid, service or other accommodations to do so should contact Lauren Camarda at 412-442-4203 or the Pennsylvania Hamilton Relay Service at 1-800-654-5984 (TDD) to discuss how the Department may accommodate your needs.

COAL & NONCOAL MINING ACTIVITY APPLICATIONS

Applications under the Surface Mining Conservation and Reclamation Act (52 P.S. §§ 1396.1—1396.31); the Noncoal Surface Mining Conservation and Reclamation Act (52 P.S. §§ 3301—3326); the Clean Streams Law (35 P.S. §§ 691.1—691.1001); the Coal Refuse Disposal Control Act (52 P.S. §§ 30.51—30.66); the Bituminous Mine Subsidence and Land Conservation Act (52 P.S. §§ 1406.1—1406.21).

Mining activity permits issued in response to such applications are also subject to applicable permitting requirements of the following statutes: the Air Pollution Control Act (35 P.S. §§ 4001—4015); the Dam Safety and Encroachments Act (32 P.S. §§ 693.1—693.27); and the Solid Waste Management Act (35 P.S. §§ 6018.101—6018.1003).

The following permit applications to conduct mining activities have been received by the Department of Environmental Protection (DEP). A copy of the application is available for inspection at the District Mining Office indicated above each application. Requests for 401 Water Quality Certifications are included in individual application only if noted.

Written comments or objections, or requests for an informal conference, or a public hearing, as applicable, on a mining permit application may be submitted by any person or any officer or head of any Federal, State or Local Government Agency or Authority to DEP at the address of the District Mining Office indicated above each application within 30-days of this publication, or within 30-days after the last publication of the applicant's newspaper advertisement, as provided by 25 Pa. Code §§ 77.121—77.123 and 86.31—86.34 (relating to public notices of filing of permit applications, opportunity for comment, and informal conferences). Such comments or objections should contain the name, address and phone number of persons submitting comments or objections; application number; and a statement of sufficient detail to inform DEP on the basis of comment or objection and relevant facts upon which it is based.

In addition, requests for an informal conference, or a public hearing, as applicable, on a mining permit application, as provided by 25 Pa. Code § 77.123 (relating to public hearing-informal conferences) or § 86.34 (relating to informal conferences), must also contain a brief summary of the issues to be raised by the requestor at the conference and a statement whether the requestor desires to have the conference conducted in the locality of the proposed mining activities.

Where a National Pollutant Discharge Elimination System (NPDES) number is listed, the mining activity permit application is associated with an application for an NPDES permit. A separate notice will be provided for the draft NPDES permit.

Individuals in need of accommodations should contact DEP through the Pennsylvania Hamilton Relay Service at (800) 654-5984 (TDD users) or (800) 654-5988 (voice users).

Coal Applications

Effluent Limits—The following range of effluent limits (Table 1) will apply to NPDES permits issued in conjunction with the associated coal mining activity permit. Additional effluent limits will be listed as part of the publication of the draft NPDES permit.

Table 1

Parameter	30-Day Average	Daily Maximum	Instantaneous Maximum
Iron (total)	1.5 to 3.0 mg/l	3.0 to 6.0 mg/l	3.5 to 7.0 mg/l
Manganese (total)	1.0 to 2.0 mg/l	2.0 to 4.0 mg/l	2.5 to 5.0 mg/l
Suspended solids	10 to 35 mg/l	20 to 70 mg/l	25 to 90 mg/l
Aluminum (Total)	0.75 to 2.0 mg/l	1.5 to 4.0 mg/l	2.0 to 5.0 mg/l
pH must always be greater than 6.0; less than 9.0.			
Alkalinity must always be greater than acidity.			

California District Mining Office: 25 Technology Drive, Coal Center, PA 15423, 724-769-1100.

Contact: Bonnie Herbert, Clerical Assistant 3.

Mining Permit No. 32743710. NPDES No. PA0214884. Helvetia Coal Company LLC, 275 Technology Drive, Suite 101, Canonsburg, PA 15317, Center Township, **Indiana County**. To renew the permit and related NPDES permit. Application received: September 25, 2024. Accepted: October 10, 2024.

Mining Permit No. 11051301. NPDES No. PA0235652. Rosebud Mining Company, 301 Market Street, Kittanning, PA 16201, Cresson and Munster Townships, **Cambria County**. To revise the permit and related NPDES permit for installation of a mine degas borehole, affecting 1.4 proposed surface acres. Application received: September 9, 2024. Accepted: October 10, 2024.

Mining Permit No. 30841316. NPDES No. PA0213535. Consol Pennsylvania Coal Company LLC, 275 Technology Drive, Suite 101, Canonsburg, PA 15317, Aleppo Township, **Greene County**. To revise the permit and related

From: [Frisco, Doug](#)
To: [Spayd, Bradley](#)
Cc: [Cameron, Caleb](#)
Subject: [External] RE: Rev Cryo Follow Up
Date: Monday, May 5, 2025 9:31:35 AM
Attachments: [image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)
[20210511 ET Revolution Cryo HMO Heater & Flare Test Report.pdf](#)

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Brad,

In response to the comments that you emailed and the previous phone conversations that we have had please see our responses below regarding the draft SOOP for the Revolution Cryo.

Regarding changes that we implemented after the December 2022 fire at the facility our operations and engineering group provided the following: During the Process Hazard Analysis (PHA) after the incident, the team identified critical low points within the facility that were deemed a high risk of freezing. The team completed a heat trace evaluation to ensure adequacy for the service and location. The team also added temperature transmitters that alarm in the control room when the piping gets close to freezing for the identified critical low points. An SOP was developed for response if the alarm was activated. A heat trace testing program was developed for the facility and all circuits are tested to ensure they are properly operating. The team implemented a winterization check list that specifically targets low point areas that are to be checked and cleared of any liquid before cold weather onset. A procedure was developed specifically for the location where the failure occurred requiring draining of the small area between the valve and check valve after each use during freezing temperatures. Finally, all valves in the facility that were threaded ball valves like the one that separated were identified and replaced with a different style of valve.

Regarding the operation of the flare, we are actively working to resolve visible emissions exceedances. The Control Plan submitted to the Department on May 1, 2025 outlines the steps we have taken to improve performance of the flare and our next steps to resolve this matter.

Below are our responses to the comments from your April 22, 2025 email.

1. *Regarding Comment 19 that you submitted related to Condition #003, Page 59 for the MSS flare.....*

We have continuous flow meters that measure the flow to the flare. One meter reads the low range and a second reads the high range. We performed confirmation of the

flare gas BTU content and the flare exit velocity in 2021. That information was submitted to the Department as part of an emission testing report on May 11, 2021 (report is attached for reference and the flare results are on page 4). The average BTU content measure was 1,177 and the minimum was 1,012. Further, the fuel gas used for the flare represents the minimum BTU rating of streams that will be routed to the flare and that gas stream is in excess of 1,000 BTU. All other streams that may relieve to the flare are higher in BTU content than the fuel gas.

2. *Per the attached comments, I will need more information regarding Page 12, IV.(a) as it relates to miscellaneous blowdowns. My understanding is that you will be sending me some information related to that sometime this week.*

The miscellaneous blowdowns included in the application were based on actual blowdowns from reporting year 2022 with a 20% engineering factor added. That year represents the highest blowdown emissions in the preceding 5-year period and that is why we included it in the PTE calculations. Miscellaneous blowdowns may include ESD events and upset conditions within the facility that are not included in the other blowdown categories in the emission calculations.

3. *As an FYI, for the comment on page 14 of the attached (“MSS Flare Group: The MSS Flare Fails to Require Sufficient Monitoring and Reporting to Verify Compliance”), the Department has proposed added the following conditions. My understanding is that you use a video camera for monitoring.*

We do not have any comments on the proposed conditions.

4. *On Page 15 of the attached, regarding heat content monitoring of the flare, as I noted in 1.) above, it is my understanding that there is the option to either ensure that the heat content to the flare is at least 300 Btu/scf if air-assisted or calculate the flare exit velocity in accordance with 40 CFR §60.18(c)(3)(i)(A). It is my understanding that you calculate the exit velocity, but if there is any additional support you would like to provide, please do so.*

Please see response to item 1 above addressing the BTU and velocity. Regarding the proposed conditions based on 40 CFR 63 Subpart CC (NESHAP from Petroleum Refineries) are not applicable requirements to the Revolution Cryogenic facility. Contrary to the applicability criteria outlined in 40 CFR 63.640, the Revolution Cryogenic facility:

- Is an area source with respect to HAP (not major as required by Subpart CC)
- Does not contain the same emissions sources as specified in the rule [40 CFR 63.640(c)(1) – (9)]

Being that the MSS flare controls pressure relief devices, it is only subject to 40 CFR 60.18 as required by 40 CFR 60.482-10a(d). Furthermore, Energy Transfer complies with the leak provisions as outlined in 40 CFR 60.5401a and the covers and closed vent system requirements of 60.5411a. The associated streams that are routed to

the MSS flare have higher heat content than those in refinery applications, with a minimum heat content of 1,000 btu/scf as noted above, and the proposed conditions from 40 CFR 63.670(j)(6) note that net heating value monitoring is not required if it can be demonstrated that the inlet streams have a fixed minimum net heating value.

ETC believes this prior data is sufficient demonstration. However, if the Department is adamant on sampling, then Energy Transfer requests a once per permit term sampling requirement of the gas vented to flare similar to the documentation submitted in 2021 (included here for reference).

5. *Please review comment (h) on Page 19 of the attached regarding monitoring of the composition of the inlet gas on a quarterly basis. How frequently is the inlet gas composition monitored? How are you ensuring that actual emissions of VOCs and HAPs are accurate?*

The comment notes that the site-specific gas analysis used in the application is the same as used in the 2018 GP-5 application. For clarity, we use a ProMax model to determine the potential to emit for the facility that is the basis of the permit application emissions. The model has not changed because the facility conditions remain the same. Actual emissions for the facility are calculated using an annual inlet gas extended analysis. The most recent inlet gas analysis for the facility was collected in November 2024 and was used for the reporting year 2024 emissions that were submitted to the Department.

Please let me know if you need to discuss our response or need any additional information. I am traveling for work through Wednesday of this week and may be intermittently available, but I will get back to you as soon as possible.

Thanks,

Douglas Frisco
Sr. Manager, Environmental Compliance
Energy Transfer
O: 570.505.3730
M: 215.630.5563



From: Spayd, Bradley <bspayd@pa.gov>
Sent: Tuesday, April 22, 2025 12:00 PM
To: Frisco, Doug <Doug.Frisco@energytransfer.com>
Subject: Rev Cryo Follow Up

Hi, Doug,

I'm following up from our discussion yesterday. I have some questions in the attached Word document that I will need information on. I have also attached comments received as a pdf, which have specific ones highlighted and are cross-referenced in the attached Word document. These were not all of the comments received nor reflect all of the changes to the operating permit, but I will need additional information on these issues before the Department makes its final determination on the permit. Let me know if you'd like to discuss.

Thanks!

Bradley Spayd | Air Quality Engineering Specialist
Department of Environmental Protection | Air Quality Program
Southwest Regional Office
400 Waterfront Dr. | Pittsburgh, PA 15222
Phone: 412.442.5227
www.dep.pa.gov

DEP accepts permit and authorization applications, as well as other documents and correspondence, electronically through ePermitting and Public Upload with Electronic Payment. Please use the link below to view the webpage, get instructions, and submit documents:

<https://www.pa.gov/agencies/dep/data-and-tools/electronic-submissions.html>.

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