Moats, Nikki B <nikki.b.moats@wv.gov>

Ceredo Title V Renewal

David Keatley <david_keatley@tcenergy.com> Wed, Jan 19, 2022 at 11:56 AM
To: "nikki.b.moats@wv.gov" <nikki.b.moats@wv.gov>
Cc: Trevor Galley <trevor_galley@tcenergy.com>

Mr. Moats,

Attached are our comments for R30-09900013-2022. Engine G3 has a bhp of 812 and we plan to update this in a R13 application.

David J. Keatley, PE

Environmental Analyst

USNG Environmental Compliance

Email: david_keatley@tcenergy.com

Desk: (304) 357-2443 or extension 2443

Mobile: (304) 993-4427

1700 Maccorkle Ave SE

4th Floor

Charleston, WV

25314

TC Energy

TCEnergy.com

2 attachments

DPPermit R30-09900013-2022-ERM Comments.docx
312K

DPFactSheet R30-09900013-2022_ERM Comments.doc
114K

West Virginia Department of Environmental Protection
Division of Air Quality

Harold D. Ward
Cabinet Secretary

Permit to Operate

Pursuant to
Title V
of the Clean Air Act

Issued to:
Columbia Gas Transmission, LLC
Ceredo Compressor Station
R30-09900013-2022

Laura M. Crowder
Director, Division of Air Quality

Issued: Draft/Proposed • Effective: Draft/Proposed
Expiration: Draft/Proposed • Renewal Application Due: Draft/Proposed

Permit Number: **R30-09900013-2022**
Permittee: **Columbia Gas Transmission, LLC**
Facility Name: **Ceredo Compressor Station**
Permittee Mailing Address: **1700 MacCorkle Avenue, SE, Charleston, WV 25314**

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45CSR30 — Requirements for Operating Permits. The permittee identified at the above-referenced facility is authorized to operate the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Facility Location:	Ceredo, Wayne County, West Virginia
Facility Mailing Address:	1664 Walkers Branch Road, Huntington, WV 25704
Telephone Number:	(304) 453-7502
Type of Business Entity:	LLC
Facility Description:	Natural Gas Compressor Station
SIC Codes:	4922
UTM Coordinates:	366.1 km Easting • 4247.7 km Northing • Zone 17

Permit Writer: Nikki Moats

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§ 22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §22-5-14.

Issuance of this Title V Operating Permit does not supersede or invalidate any existing permits under 45CSR13, 14 or 19, although all applicable requirements from such permits governing the facility's operation and compliance have been incorporated into the Title V Operating Permit.

Table of Contents

1.0 Emission Units and Active R13, R14, and R19 Permits

1.1. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
00501	E01	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWH-8; 2-cycle, lean burn	1954	2,800 HP	N/A
00502	E02	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWH-8; 2-cycle, lean burn	1954	2,800 HP	N/A
00503	E03	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWH-8; 2-cycle, lean burn	1954	2,800 HP	N/A
00504	E04	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWH-8; 2-cycle, lean burn	1957	2,800 HP	N/A
00505	E05	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWH-8; 2-cycle, lean burn	1958	2,800 HP	N/A
00506	E06	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWH-8; 2-cycle, lean burn	1960	2,800 HP	N/A
00507	E07	Reciprocating Engine/Integral Compressor; Cooper-Bessemer 8V-250; 2-cycle, lean burn	1965	2,700 HP	N/A
00510	E10	Solar Titan 250 Combustion Turbine	2018	30,399 HP	SoloNO_x
005G3	G3	Reciprocating Engine/Generator; Waukesha F3521GL; 4-cycle, lean burn; emergency	1996	812 HP	N/A
005G4	G4	Waukesha VGF-P48GL Emergency Generator	2017	1,175 HP	N/A
BLR3	BL3	Hurst S-4-G-150-15 Boiler	2012	6.276 MMBtu/hr	N/A
HTR1	H1	Fuel Gas Heater	1998	0.375 MMBtu/hr	N/A
HTR3	H3	Heater	2017	0.60 MMBtu/hr	NA
n/a	n/a	Oil-Water Storage Tank	2017	900 Gallons	None
n/a	n/a	Waste Water Storage Tank	2017	5,000 Gallons	None
n/a	n/a	Condensate Storage Tank	2017	5,000 Gallons	None

1.2. Active R13, R14, and R19 Permits

The underlying authority for any conditions from R13, R14, and/or R19 permits contained in this operating permit is cited using the original permit number (e.g. R13-1234). The current applicable version of such permit(s) is listed below.

Permit Number	Date of Issuance
R13-1856C	December 18, 2017

2.0 General Conditions

2.1. Definitions

2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.

2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.

2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.1.4. Unless otherwise specified in a permit condition or underlying rule or regulation, all references to a "rolling yearly total" shall mean the sum of the monthly data, values or parameters being measured, monitored, or recorded, at any given time for the previous twelve (12) consecutive calendar months.

2.2. Acronyms

CAAA	Clean Air Act Amendments	**NSPS**	New Source Performance Standards
CBI	Confidential Business Information	**PM**	Particulate Matter
CEM	Continuous Emission Monitor	**PM_{10}**	Particulate Matter less than 10μm in diameter
CES	Certified Emission Statement	**pph**	Pounds per Hour
C.F.R. *or* CFR	Code of Federal Regulations	**ppm**	Parts per Million
CO	Carbon Monoxide	**PSD**	Prevention of Significant Deterioration
C.S.R. *or* CSR	Codes of State Rules	**psi**	Pounds per Square Inch
DAQ	Division of Air Quality	**SIC**	Standard Industrial Classification
DEP	Department of Environmental Protection	**SIP**	State Implementation Plan
FOIA	Freedom of Information Act	**SO_2**	Sulfur Dioxide
HAP	Hazardous Air Pollutant	**TAP**	Toxic Air Pollutant
HON	Hazardous Organic NESHAP	**TPY**	Tons per Year
HP	Horsepower	**TRS**	Total Reduced Sulfur
lbs/hr *or* lb/hr	Pounds per Hour	**TSP**	Total Suspended Particulate
LDAR	Leak Detection and Repair	**USEPA**	United States Environmental Protection Agency
m	Thousand	**UTM**	Universal Transverse Mercator
MACT	Maximum Achievable Control Technology	**VEE**	Visual Emissions Evaluation
mm	Million	**VOC**	Volatile Organic Compounds
mmBtu/hr	Million British Thermal Units per Hour		
$mmft^3$/hr *or* mmcf/hr	Million Cubic Feet Burned per Hour		
NA *or* N/A	Not Applicable		
NAAQS	National Ambient Air Quality Standards		
NESHAPS	National Emissions Standards for Hazardous Air Pollutants		
NO_x	Nitrogen Oxides		

2.3. Permit Expiration and Renewal

2.3.1. Permit duration. This permit is issued for a fixed term of five (5) years and shall expire on the date specified on the cover of this permit, except as provided in 45CSR§30-6.3.b. and 45CSR§30-6.3.c.
[45CSR§30-5.1.b.]

2.3.2. A permit renewal application is timely if it is submitted at least six (6) months prior to the date of permit expiration.
[45CSR§30-4.1.a.3.]

2.3.3. Permit expiration terminates the source's right to operate unless a timely and complete renewal application has been submitted consistent with 45CSR§30-6.2. and 45CSR§30-4.1.a.3.
[45CSR§30-6.3.b.]

2.3.4. If the Secretary fails to take final action to deny or approve a timely and complete permit application before the end of the term of the previous permit, the permit shall not expire until the renewal permit has been issued or denied, and any permit shield granted for the permit shall continue in effect during that time.
[45CSR§30-6.3.c.]

2.4. Permit Actions

2.4.1. This permit may be modified, revoked, reopened and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.
[45CSR§30-5.1.f.3.]

2.5. Reopening for Cause

2.5.1. This permit shall be reopened and revised under any of the following circumstances:

a. Additional applicable requirements under the Clean Air Act or the Secretary's legislative rules become applicable to a major source with a remaining permit term of three (3) or more years. Such a reopening shall be completed not later than eighteen (18) months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions has been extended pursuant to 45CSR§§30-6.6.a.1.A. or B.

b. Additional requirements (including excess emissions requirements) become applicable to an affected source under Title IV of the Clean Air Act (Acid Deposition Control) or other legislative rules of the Secretary. Upon approval by U.S. EPA, excess emissions offset plans shall be incorporated into the permit.

c. The Secretary or U.S. EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.

d. The Secretary or U.S. EPA determines that the permit must be revised or revoked and reissued to assure compliance with the applicable requirements.

[45CSR§30-6.6.a.]

2.6. Administrative Permit Amendments

2.6.1. The permittee may request an administrative permit amendment as defined in and according to the procedures specified in 45CSR§30-6.4.
[45CSR§30-6.4.]

2.7. Minor Permit Modifications

2.7.1. The permittee may request a minor permit modification as defined in and according to the procedures specified in 45CSR§30-6.5.a.
[45CSR§30-6.5.a.]

2.8. Significant Permit Modification

2.8.1. The permittee may request a significant permit modification, in accordance with 45CSR§30-6.5.b., for permit modifications that do not qualify for minor permit modifications or as administrative amendments.
[45CSR§30-6.5.b.]

2.9. Emissions Trading

2.9.1. No permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading, and other similar programs or processes for changes that are provided for in the permit and that are in accordance with all applicable requirements.
[45CSR§30-5.1.h.]

2.10. Off-Permit Changes

2.10.1. Except as provided below, a facility may make any change in its operations or emissions that is not addressed nor prohibited in its permit and which is not considered to be construction nor modification under any rule promulgated by the Secretary without obtaining an amendment or modification of its permit. Such changes shall be subject to the following requirements and restrictions:

a. The change must meet all applicable requirements and may not violate any existing permit term or condition.

b. The permittee must provide a written notice of the change to the Secretary and to U.S. EPA within two (2) business days following the date of the change. Such written notice shall describe each such change, including the date, any change in emissions, pollutants emitted, and any applicable requirement that would apply as a result of the change.

c. The change shall not qualify for the permit shield.

d. The permittee shall keep records describing all changes made at the source that result in emissions of regulated air pollutants, but not otherwise regulated under the permit, and the emissions resulting from those changes.

e. No permittee may make any change subject to any requirement under Title IV of the Clean Air Act (Acid Deposition Control) pursuant to the provisions of 45CSR§30-5.9.

f. No permittee may make any changes which would require preconstruction review under any provision of Title I of the Clean Air Act (including 45CSR14 and 45CSR19) pursuant to the provisions of 45CSR§30-5.9.

[45CSR§30-5.9.]

2.11. Operational Flexibility

2.11.1. The permittee may make changes within the facility as provided by § 502(b)(10) of the Clean Air Act. Such operational flexibility shall be provided in the permit in conformance with the permit application and applicable requirements. No such changes shall be a modification under any rule or any provision of Title I of the Clean Air Act (including 45CSR14 and 45CSR19) promulgated by the Secretary in accordance with Title I of the Clean Air Act and the change shall not result in a level of emissions exceeding the emissions allowable under the permit.
[45CSR§30-5.8]

2.11.2. Before making a change under 45CSR§30-5.8., the permittee shall provide advance written notice to the Secretary and to U.S. EPA, describing the change to be made, the date on which the change will occur, any changes in emissions, and any permit terms and conditions that are affected. The permittee shall thereafter maintain a copy of the notice with the permit, and the Secretary shall place a copy with the permit in the public file. The written notice shall be provided to the Secretary and U.S. EPA at least seven (7) days prior to the date that the change is to be made, except that this period may be shortened or eliminated as necessary for a change that must be implemented more quickly to address unanticipated conditions posing a significant health, safety, or environmental hazard. If less than seven (7) days notice is provided because of a need to respond more quickly to such unanticipated conditions, the permittee shall provide notice to the Secretary and U.S. EPA as soon as possible after learning of the need to make the change.
[45CSR§30-5.8.a.]

2.11.3. The permit shield shall not apply to changes made under 45CSR§30-5.8., except those provided for in 45CSR§30-5.8.d. However, the protection of the permit shield will continue to apply to operations and emissions that are not affected by the change, provided that the permittee complies with the terms and conditions of the permit applicable to such operations and emissions. The permit shield may be reinstated for emissions and operations affected by the change:

a. If subsequent changes cause the facility's operations and emissions to revert to those authorized in the permit and the permittee resumes compliance with the terms and conditions of the permit, or

b. If the permittee obtains final approval of a significant modification to the permit to incorporate the change in the permit.

[45CSR§30-5.8.c.]

2.11.4. "Section 502(b)(10) changes" are changes that contravene an express permit term. Such changes do not include changes that would violate applicable requirements or contravene enforceable permit terms and conditions that are monitoring (including test methods), recordkeeping, reporting, or compliance certification requirements.
[45CSR§30-2.39]

2.12. Reasonably Anticipated Operating Scenarios

2.12.1. The following are terms and conditions for reasonably anticipated operating scenarios identified in this permit.

a. Contemporaneously with making a change from one operating scenario to another, the permittee shall record in a log at the permitted facility a record of the scenario under which it is operating and to document the change in reports submitted pursuant to the terms of this permit and 45CSR30.

b. The permit shield shall extend to all terms and conditions under each such operating scenario; and

c. The terms and conditions of each such alternative scenario shall meet all applicable requirements and the requirements of 45CSR30.

[45CSR§30-5.1.i.]

2.13. Duty to Comply

2.13.1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
[45CSR§30-5.1.f.1.]

2.14. Inspection and Entry

2.14.1. The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

[45CSR§30-5.3.b.]

2.15. Schedule of Compliance

2.15.1. For sources subject to a compliance schedule, certified progress reports shall be submitted consistent with the applicable schedule of compliance set forth in this permit and 45CSR§30-4.3.h., but at least every six (6) months, and no greater than once a month, and shall include the following:

a. Dates for achieving the activities, milestones, or compliance required in the schedule of compliance, and dates when such activities, milestones or compliance were achieved; and

b. An explanation of why any dates in the schedule of compliance were not or will not be met, and any preventative or corrective measure adopted.

[45CSR§30-5.3.d.]

2.16. Need to Halt or Reduce Activity not a Defense

2.16.1. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

[45CSR§30-5.1.f.2.]

2.17. Emergency

2.17.1. An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

[45CSR§30-5.7.a.]

2.17.2. Effect of any emergency. An emergency constitutes an affirmative defense to an action brought for noncompliance with such technology-based emission limitations if the conditions of 45CSR§30-5.7.c. are met.

[45CSR§30-5.7.b.]

2.17.3. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An emergency occurred and that the permittee can identify the cause(s) of the emergency;

b. The permitted facility was at the time being properly operated;

c. During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and

d. Subject to the requirements of 45CSR§30-5.1.c.3.C.1, the permittee submitted notice of the emergency to the Secretary within one (1) working day of the time when emission limitations were exceeded due to

the emergency and made a request for variance, and as applicable rules provide. This notice, report, and variance request fulfills the requirement of 45CSR§30-5.1.c.3.B. This notice must contain a detailed description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

[45CSR§30-5.7.c.]

2.17.4. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency has the burden of proof.
[45CSR§30-5.7.d.]

2.17.5. This provision is in addition to any emergency or upset provision contained in any applicable requirement.
[45CSR§30-5.7.e.]

2.18. Federally-Enforceable Requirements

2.18.1. All terms and conditions in this permit, including any provisions designed to limit a source's potential to emit and excepting those provisions that are specifically designated in the permit as "State-enforceable only", are enforceable by the Secretary, USEPA, and citizens under the Clean Air Act.
[45CSR§30-5.2.a.]

2.18.2. Those provisions specifically designated in the permit as “State-enforceable only” shall become “Federally-enforceable” requirements upon SIP approval by the USEPA.

2.19. Duty to Provide Information

2.19.1. The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records required to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.
[45CSR§30-5.1.f.5.]

2.20. Duty to Supplement and Correct Information

2.20.1. Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.
[45CSR§30-4.2.]

2.21. Permit Shield

2.21.1. Compliance with the conditions of this permit shall be deemed compliance with any applicable requirements as of the date of permit issuance provided that such applicable requirements are included and are specifically identified in this permit or the Secretary has determined that other requirements specifically identified are not applicable to the source and this permit includes such a determination or a concise summary thereof.
[45CSR§30-5.6.a.]

2.21.2. Nothing in this permit shall alter or affect the following:

a. The liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance; or

b. The applicable requirements of the Code of West Virginia and Title IV of the Clean Air Act (Acid Deposition Control), consistent with § 408 (a) of the Clean Air Act.

c. The authority of the Administrator of U.S. EPA to require information under § 114 of the Clean Air Act or to issue emergency orders under § 303 of the Clean Air Act.

[45CSR§30-5.6.c.]

2.22. Credible Evidence

2.22.1. Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defenses otherwise available to the permittee including but not limited to any challenge to the credible evidence rule in the context of any future proceeding.
[45CSR§30-5.3.e.3.B. and 45CSR38]

2.23. Severability

2.23.1. The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid by a court of competent jurisdiction, the remaining permit terms and conditions or their application to other circumstances shall remain in full force and effect.
[45CSR§30-5.1.e.]

2.24. Property Rights

2.24.1. This permit does not convey any property rights of any sort or any exclusive privilege.
[45CSR§30-5.1.f.4]

2.25. Acid Deposition Control

2.25.1. Emissions shall not exceed any allowances that the source lawfully holds under Title IV of the Clean Air Act (Acid Deposition Control) or rules of the Secretary promulgated thereunder.

a. No permit revision shall be required for increases in emissions that are authorized by allowances acquired pursuant to the acid deposition control program, provided that such increases do not require a permit revision under any other applicable requirement.

b. No limit shall be placed on the number of allowances held by the source. The source may not, however, use allowances as a defense to noncompliance with any other applicable requirement.

c. Any such allowance shall be accounted for according to the procedures established in rules promulgated under Title IV of the Clean Air Act.

[45CSR§30-5.1.d.]

2.25.2. Where applicable requirements of the Clean Air Act are more stringent than any applicable requirement of regulations promulgated under Title IV of the Clean Air Act (Acid Deposition Control), both provisions shall be incorporated into the permit and shall be enforceable by the Secretary and U. S. EPA. **[45CSR§30-5.1.a.2.]**

3.0 Facility-Wide Requirements

3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person is prohibited except as noted in 45CSR§6-3.1. **[45CSR§6-3.1.]**

3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause or allow any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]

3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40 C.F.R. §61.145(b) and 45CSR34]

3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1 State-Enforceable only.]

3.1.5. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2]

3.1.6. **Emission inventory.** The permittee is responsible for submitting, on an annual basis, an emission inventory in accordance with the submittal requirements of the Division of Air Quality.
[W.Va. Code § 22-5-4(a)(14)]

3.1.7. **Ozone-depleting substances.** For those facilities performing maintenance, service, repair or disposal of appliances, the permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 C.F.R. Part 82, Subpart F, except as provided for Motor Vehicle Air Conditioners (MVACs) in Subpart B:

a. Persons opening appliances for maintenance, service, repair, or disposal must comply with the prohibitions and required practices pursuant to 40 C.F.R. §§ 82.154 and 82.156.

b. Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to 40 C.F.R. § 82.158.

c. Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 C.F.R. § 82.161.

[40 C.F.R. 82, Subpart F]

3.1.8. **Risk Management Plan.** Should this stationary source, as defined in 40 C.F.R. § 68.3, become subject to Part 68, then the owner or operator shall submit a risk management plan (RMP) by the date specified in 40 C.F.R. § 68.10 and shall certify compliance with the requirements of Part 68 as part of the annual compliance certification as required by 40 C.F.R. Part 70 or 71.
[40 C.F.R. 68]

3.1.9. Only those emission units/sources as identified in Table 1.1, with the exception of any *de minimis* sources as identified under Table 45-13B of 45CSR13, are authorized at the permitted facility by this permit. In accordance with the information filed in Permit application-R13-1856A, the emission units/sources identified under Table 1.1 of this permit shall be installed, maintained, and operated so as to minimize any fugitive escape of pollutants, shall not exceed the listed maximum design capacities, shall use the specified control devices, and comply with any other information provided under Table 1.1.
[45CSR13, R13-1856, Condition 4.1.1]

3.1.10. Facilities using Mercaptan Tanks shall use proper odor control methods to comply with 45CSR4. **[45CSR§30-12.7 State-Enforceable only.]**

3.1.11. Emergency Operating Condition/Unit Replacement:

For emergency situations which interrupt the critical supply of natural gas to the public, and which pose a life threatening circumstance to the customer, the permittee is allowed to temporarily replace failed engine(s) as long as all of the following conditions are met:

a. The replacement engine(s) is only allowed to operate until repair of the failed engine(s) is complete, but under no circumstance may the replacement engine(s) operate in excess of sixty (60) days;

b. Both the replacement engine(s) and the repaired failed engine(s) shall not operate at the same time with the exception of any necessary testing of the repaired engine(s) and this testing may not exceed five (5) hours;

c. Potential hourly emissions from the replacement engine(s) are less than or equal to the potential hourly emissions from the engine(s) being replaced;

d. Credible performance emission test data verifying the emission rates associated with the operation of the substitute engine shall be submitted to the Director within five (5) business days;

e. The permittee must provide written notification to the Director within five (5) business days of the replacement. This notification must contain:

i. Information to support the claim of life threatening circumstances to justify applicability of this emergency provision;

ii. Identification of the engine(s) being temporarily replaced;

iii. The design parameters of the replacement engine(s) including, but not limited to, the design horsepower and emission factors;

iv. Projected duration of the replacement engine(s); and

v. The appropriate certification by a responsible official.

[45CSR§30-12.7]

3.1.12. **40 C.F.R. 60, Subpart OOOOa**

For each affected facility under §60.5365a(j), you must reduce VOC emissions by complying with the requirements of paragraphs (a) through (j) of §60.5397a. The requirements in this section are independent of the closed vent system and cover requirements in §60.5411a.

a. You must monitor all fugitive emission components, as defined in §60.5430a, in accordance with 40 C.F.R. §§60.5397a(b) through (g). You must repair all sources of fugitive emissions in accordance with 40 C.F.R. §60.5397a(h). You must keep records in accordance with 40 C.F.R. §60.5397a(i) and report in accordance with 40 C.F.R. §60.5397a(j). For purposes of this section, fugitive emissions are defined as any visible emission from a fugitive emissions component observed using optical gas imaging or an instrument reading of 500 parts per million (ppm) or greater using Method 21 of appendix A-7 of 40 CFR part 60.

b. You must develop an emissions monitoring plan that covers the collection of fugitive emissions components at well sites and compressor stations within each company-defined area in accordance with 40 C.F.R. §§60.5397a(c) and (d).

c. Fugitive emissions monitoring plans must include the elements specified in 40 C.F.R. §§60.5397a(c)(1) through (8), at a minimum.

1. Frequency for conducting surveys. Surveys must be conducted at least as frequently as required by 40 C.F.R. §§60.5397a(f) and (g).

2. Technique for determining fugitive emissions (i.e., Method 21 at 40 CFR part 60, appendix A-7, or optical gas imaging meeting the requirements in 40 CFR §60.5397a paragraphs (c)(7)(i) through (vii)).

3. Manufacturer and model number of fugitive emissions detection equipment to be used.

4. Procedures and timeframes for identifying and repairing fugitive emissions components from which fugitive emissions are detected, including timeframes for fugitive emission components that are unsafe to repair. Your repair schedule must meet the requirements of 40 C.F.R. §60.5397a(h) at a minimum.

5. Procedures and timeframes for verifying fugitive emission component repairs.

6. Records that will be kept and the length of time records will be kept.

7. If you are using optical gas imaging, your plan must also include the elements specified in 40 C.F.R. §§60.5397a(c)(7)(i) through (vii).

i. Verification that your optical gas imaging equipment meets the specifications of 40 C.F.R. §§60.5397a(c)(7)(i)(A) and (B). This verification is an initial verification and may either be performed by the facility, by the manufacturer, or by a third party. For the purposes of complying with the fugitive emissions monitoring program with optical gas imaging, a fugitive emission is defined as any visible emissions observed using optical gas imaging.

A. Your optical gas imaging equipment must be capable of imaging gases in the spectral range for the compound of highest concentration in the potential fugitive emissions.

B. Your optical gas imaging equipment must be capable of imaging a gas that is half methane, half propane at a concentration of 10,000 ppm at a flow rate of ≤60g/hr from a quarter inch diameter orifice.

ii. Procedure for a daily verification check.

iii. Procedure for determining the operator's maximum viewing distance from the equipment and how the operator will ensure that this distance is maintained.

iv. Procedure for determining maximum wind speed during which monitoring can be performed and how the operator will ensure monitoring occurs only at wind speeds below this threshold.

v. Procedures for conducting surveys, including the items specified in 40 C.F.R. §§60.5397a(c)(7)(v)(A) through (C).

A. How the operator will ensure an adequate thermal background is present in order to view potential fugitive emissions.

B. How the operator will deal with adverse monitoring conditions, such as wind.

C. How the operator will deal with interferences (e.g., steam).

vi. Training and experience needed prior to performing surveys.

vii. Procedures for calibration and maintenance. At a minimum, procedures must comply with those recommended by the manufacturer.

8. If you are using Method 21 of appendix A-7 of this part, your plan must also include the elements specified in 40 C.F.R. §§60.5397a(c)(8)(i) through (iii). For the purposes of complying with the fugitive emissions monitoring program using Method 21 of appendix A-7 of 40 CFR part 60 a fugitive emission is defined as an instrument reading of 500 ppm or greater.

i. Verification that your monitoring equipment meets the requirements specified in Section 6.0 of Method 21 at 40 CFR part 60, appendix A-7. For purposes of instrument capability, the fugitive emissions definition shall be 500 ppm or greater methane using a FID-based instrument. If you wish to use an analyzer other than a FID-based instrument, you must develop a site-specific fugitive emission definition that would be equivalent to 500 ppm methane using a FID-based instrument (e.g., 10.6 eV PID with a specified isobutylene concentration as the fugitive emission definition would provide equivalent response to your compound of interest).

ii. Procedures for conducting surveys. At a minimum, the procedures shall ensure that the surveys comply with the relevant sections of Method 21 at 40 CFR part 60, appendix A-7, including Section 8.3.1.

iii. Procedures for calibration. The instrument must be calibrated before use each day of its use by the procedures specified in Method 21 of appendix A-7 of this part. At a minimum, you must also conduct precision tests at the interval specified in Method 21 of appendix A-7 of this part, Section 8.1.2, and a calibration drift assessment at the end of each monitoring day. The calibration drift assessment must be conducted as specified in paragraph (c)(8)(iii)(A) of 40 C.F.R. §60.5397a. Corrective action for drift assessments is specified in paragraphs (c)(8)(iii)(B) and (C) of 40 C.F.R. §60.5397.

a. Check the instrument using the same calibration gas that was used to calibrate the instrument before use. Follow the procedures specified in Method 21 of appendix A-7 of 40 CFR part 60, Section 10.1, except do not adjust the meter readout to correspond to the calibration gas value. If multiple scales are used, record the instrument reading for each scale used. Divide the arithmetic difference of the initial and post-test calibration response by the corresponding calibration gas value for each scale and multiply by 100 to express the calibration drift as a percentage.

b. If a calibration drift assessment shows a negative drift of more than 10 percent, then all equipment with instrument readings between the fugitive emission definition multiplied by (100 minus the percent of negative drift/divided by 100) and the fugitive emission definition that was monitored since the last calibration must be re-monitored.

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

d. Each fugitive emissions monitoring plan must include the elements specified in 40 C.F.R. §§60.5397a(d)(1) through (3), at a minimum, as applicable.

1. If you are using optical gas imaging, your plan must include procedures to ensure that all fugitive emissions components are monitored during each survey. Example procedures include, but are not limited to, a sitemap with an observation path, a written narrative of where the fugitive emissions components are located and how they will be monitored, or an inventory of fugitive emissions components.

2. If you are using Method 21 of appendix A-7 of 40 CFR part 60, your plan must include a list of fugitive emissions components to be monitored and method for determining the location of fugitive emissions components to be monitored in the field (e.g., tagging, identification on a process and instrumentation diagram, etc.).

3. Your fugitive emissions monitoring plan must include the written plan developed for all of the fugitive emissions components designated as difficult-to-monitor in accordance with 40 C.F.R. §60.5397a(g)(3), and the written plan for fugitive emissions components designated as unsafe-to-monitor in accordance with 40 C.F.R. §60.5397a(g).

e. Each monitoring survey shall observe each fugitive emissions component, as defined in §60.5430a, for fugitive emissions.

f. 1. You must conduct an initial monitoring survey within 90 days of the startup of production, as defined in §60.5430a, for each collection of fugitive emissions components at a new well site or by June 3, 2017, whichever is later. For a modified collection of fugitive emissions components at a well site, the initial monitoring survey must be conducted within 90 days of the startup of production for each collection of fugitive emission components after the modification or by June 3, 2017, whichever is latest.

2. You must conduct an initial monitoring survey within 90 days of the startup of a new compressor station for each collection of fugitive emissions components at the new compressor station or by June 3, 2017, whichever is later. For a modified collection of fugitive emissions components at a compressor station, the initial monitoring survey must be conducted within 90 days of the modification or by June 3, 2017, whichever is later.

g. A monitoring survey of each collection of fugitive emissions components at a well site or at a compressor station must be performed at the frequencies specified in 40 C.F.R. §§60.5397a(g)(1) and (2), with the exceptions noted in 40 C.F.R. §§60.5397a(g)(3) through (5).

1. A monitoring survey of each collection of fugitive emissions components at a well site within a company-defined area must be conducted at least semiannually after the initial survey. Consecutive semiannual monitoring surveys must be conducted at least 4 months apart and no more than 7 months apart.

2. A monitoring survey of the collection of fugitive emissions components at a compressor station must be conducted at least semiannually after the initial survey. Consecutive semiannual monitoring surveys must be conducted at least 4 months apart and no more than 7 months apart.

3. Fugitive emissions components that cannot be monitored without elevating the monitoring personnel more than 2 meters above the surface may be designated as difficult-to-monitor. Fugitive emissions components that are designated difficult-to-monitor must meet the specifications of 40 C.F.R. §§60.5397a(g)(3)(i) through (iv).

i. A written plan must be developed for all of the fugitive emissions components designated difficult-to-monitor. This written plan must be incorporated into the fugitive emissions monitoring plan required by 40 C.F.R. §§60.5397a(b), (c), and (d).

ii. The plan must include the identification and location of each fugitive emissions component designated as difficult-to-monitor.

iii. The plan must include an explanation of why each fugitive emissions component designated as difficult-to-monitor is difficult-to-monitor.

iv. The plan must include a schedule for monitoring the difficult-to-monitor fugitive emissions components at least once per calendar year.

4. Fugitive emissions components that cannot be monitored because monitoring personnel would be exposed to immediate danger while conducting a monitoring survey may be designated as unsafe-

to-monitor. Fugitive emissions components that are designated unsafe-to-monitor must meet the specifications of 40 C.F.R. §§60.5397a(g)(4)(i) through (iv).

i. A written plan must be developed for all of the fugitive emissions components designated unsafe-to-monitor. This written plan must be incorporated into the fugitive emissions monitoring plan required by 40 C.F.R. §§60.5397a(b), (c), and (d).

ii. The plan must include the identification and location of each fugitive emissions component designated as unsafe-to-monitor.

iii. The plan must include an explanation of why each fugitive emissions component designated as unsafe-to-monitor is unsafe-to-monitor.

iv. The plan must include a schedule for monitoring the fugitive emissions components designated as unsafe-to-monitor.

5. You are no longer required to comply with the requirements of 40 C.F.R. §60.5397a(g)(1) when the owner or operator removes all major production and processing equipment, as defined in § 60.5430a, such that the well site becomes a wellhead only well site. If any major production and processing equipment is subsequently added to the well site, then the owner or operator must comply with the requirements in paragraphs (f)(1) and (g)(1) of 40 C.F.R. §60.5397a.

h. Each identified source of fugitive emissions shall be repaired, as defined in 40 C.F.R. §60.5430a, in accordance with 40 C.F.R. §§60.5397a(h)(1) and (2).

1. A first attempt at repair shall be made no later than 30 calendar days after the detection of the fugitive emissions.

2. Repair shall be completed as soon as practicable, but no later than 30 calendar days after the first attempt at repair as required in 40 C.F.R. §60.5397a(h)(1).

3. If the repair is technically infeasible, would require a vent blowdown, a compressor station shutdown, a well shutdown or well shut-in, or would be unsafe to repair during operation of the unit, the repair must be completed during the next compressor station shut down for maintenance, scheduled well shutdown, scheduled well shut-in, after a scheduled vent blowdown or within 2 years, whichever is earliest. For purposes of this condition, a vent blowdown is the opening of one or more blowdown valves to depressurize major production and processing equipment, other than a storage vessel.

4. Each identified source of fugitive emissions must be resurveyed to complete repair according to 40 C.F.R. §60.5397a(h)(i) through (iv) to ensure that there are no fugitive emissions.

i. The operator may resurvey the fugitive emissions components to verify repair using either Method 21 of appendix A-7 of 40 CFR part 60 or optical gas imaging.

ii. For each repair that cannot be made during the monitoring survey when the fugitive emissions are initially found, a digital photograph must be taken of that component or the component must be tagged during the monitoring survey when the fugitives were initially found for identification purposes and subsequent repair. The digital photograph must include the date that the photograph was taken and must clearly identify the component by location within the site (e.g.,

the latitude and longitude of the component or by other descriptive landmarks visible in the picture).

iii. Operators that use Method 21 of appendix A-7 of 40 CFR part 60 to resurvey the repaired fugitive emissions components are subject to the resurvey provisions specified in 40 C.F.R. §§60.5397a(h)(4)(iii)(A) and (B).

A. A fugitive emissions component is repaired when the Method 21 instrument indicates a concentration of less than 500 ppm above background or when no soap bubbles are observed when the alternative screening procedures specified in section 8.3.3 of Method 21 of appendix A-7 of 40 CFR part 60 are used.

B. Operators must use the Method 21 monitoring requirements specified in 40 C.F.R. §60.5397a(c)(8)(ii) or the alternative screening procedures specified in section 8.3.3 of Method 21 of appendix A-7 of 40 CFR part 60.

iv. Operators that use optical gas imaging to resurvey the repaired fugitive emissions components, are subject to the resurvey provisions specified in 40 C.F.R. §§60.5397a(h)(4)(iv)(A) and (B).

A. A fugitive emissions component is repaired when the optical gas imaging instrument shows no indication of visible emissions.

B. Operators must use the optical gas imaging monitoring requirements specified in 40 C.F.R. §60.5397a(c)(7).

i. Records for each monitoring survey shall be maintained as specified §60.5420a(c)(15).

j. Annual reports shall be submitted for each collection of fugitive emissions components at a well site and each collection of fugitive emissions components at a compressor station that include the information specified in §60.5420a(b)(7). Multiple collection of fugitive emissions components at a well site or at a compressor station may be included in a single annual report.

[45CSR13, R13-1856, Condition 4.1.5; 45CSR16; 40 C.F.R. §60.5397a]

3.1.13. No person shall cause, suffer, allow or permit fugitive particulate matter to be discharged beyond the boundary lines of the property on which the discharge originates or at any public or residential location, which causes or contributes to statutory air pollution.

When a person is found in violation of this rule, the Director may require the person to utilize a system to minimize fugitive particulate matter. This system to minimize fugitive particulate matter may include, but is not limited to, the following:

a. Use, where practicable, of water or chemicals for control of particulate matter in demolition of existing buildings or structures, construction operations, grading of roads or the clearing of land;

b. Application of asphalt, water or suitable chemicals on unpaved roads, material stockpiles and other surfaces which can create airborne particulate matter;

c. Covering of material transport vehicles, or treatment of cargo, to prevent contents from dripping, sifting, leaking or otherwise escaping and becoming airborne, and prompt removal of tracked material from roads or streets; or

d. Installation and use of hoods, fans and fabric filters to enclose and vent the handling of materials, including adequate containment methods during sandblasting, abrasive cleaning or other similar operations.

[45CSR§17-3. State-Enforceable only.]

3.2. Monitoring Requirements

3.2.1. **Emission Limit Averaging Time**. Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months.

[45CSR13, R13-1856, Condition 3.2.1]

3.3. Testing Requirements

3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63, if applicable, in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit.

c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

d. The permittee shall submit a report of the results of the stack test within 60 days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall

include the following: the certification described in paragraph 3.5.1; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

1. The permit or rule evaluated, with the citation number and language.
2. The result of the test for each permit or rule condition.
3. A statement of compliance or non-compliance with each permit or rule condition.

[WV Code §§ 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

3.4.1. **Monitoring information.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit and time of sampling or measurements;

b. The date(s) analyses were performed;

c. The company or entity that performed the analyses;

d. The analytical techniques or methods used;

e. The results of the analyses; and

f. The operating conditions existing at the time of sampling or measurement.

[45CSR13, R13-1856 Condition 4.4.1; 45CSR§30-5.1.c.2.A.]

3.4.2. **Retention of records.** The permittee shall retain records of all required monitoring data and support information for a period of at least five (5) years from the date of monitoring sample, measurement, report, application, or record creation date. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Where appropriate, records may be maintained in computerized form in lieu of the above records.
[45CSR§30-5.1.c.2.B.]

3.4.3. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§30-5.1.c. State-Enforceable only.]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.
[45CSR§§30-4.4. *and* 5.1.c.3.D.]

3.5.2. A permittee may request confidential treatment for the submission of reporting required under 45CSR§30-5.1.c.3. pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31. **[45CSR§30-5.1.c.3.E.]**

3.5.3. Except for the electronic submittal of the annual compliance certification and semi-annual monitoring reports to the DAQ and USEPA as required in 3.5.5 and 3.5.6 below, all notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, mailed first class or by private carrier with postage prepaid to the address(es), or submitted in electronic format by e-mail as set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

DAQ:

Director
WVDEP
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

US EPA:

Section Chief
U.S. Environmental Protection Agency, Region III Enforcement and Compliance Assurance Division Air Section (3ED21)
1650 Arch Street
Philadelphia, PA 19103-2029

DAQ Compliance and Enforcement[1]:
DEPAirQualityReports@wv.gov

[1]For all self-monitoring reports (MACT, GACT, NSPS, etc.), stack tests and protocols, Notice of Compliance Status reports, Initial Notifications, etc.

3.5.4. **Certified emissions statement.** The permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. **[45CSR§30-8.]**

3.5.5. **Compliance certification.** The permittee shall certify compliance with the conditions of this permit on the forms provided by the DAQ. In addition to the annual compliance certification, the permittee may be required to submit certifications more frequently under an applicable requirement of this permit. The annual certification shall be submitted to the DAQ and USEPA on or before March 15 of each year and shall certify compliance for the period ending December 31. The permittee shall maintain a copy of the certification on site for five (5) years from submittal of the certification. The annual certification shall be submitted in electronic format by e-mail to the following addresses:

DAQ:

DEPAirQualityReports@wv.gov

US EPA:

R3_APD_Permits@epa.gov

[45CSR§30-5.3.e.]

3.5.6. **Semi-annual monitoring reports.** The permittee shall submit reports of any required monitoring on or before September 15 for the reporting period January 1 to June 30 and on or before March 15 for the reporting period July 1 to December 31. All instances of deviation from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official consistent with 45CSR§30-4.4. The semi-annual monitoring reports shall be submitted in electronic format by e-mail to the following address:

DAQ:

DEPAirQualityReports@wv.gov

[45CSR§30-5.1.c.3.A.]

3.5.7. **Emergencies.** For reporting emergency situations, refer to Section 2.17 of this permit.

3.5.8. **Deviations.**

a. In addition to monitoring reports required by this permit, the permittee shall promptly submit supplemental reports and notices in accordance with the following:

1. Any deviation resulting from an emergency or upset condition, as defined in 45CSR§30-5.7., shall be reported by telephone or telefax within one (1) working day of the date on which the permittee becomes aware of the deviation, if the permittee desires to assert the affirmative defense in accordance with 45CSR§30-5.7. A written report of such deviation, which shall include the probable cause of such deviations, and any corrective actions or preventative measures taken, shall be submitted and certified by a responsible official within ten (10) days of the deviation.

2. Any deviation that poses an imminent and substantial danger to public health, safety, or the environment shall be reported to the Secretary immediately by telephone or telefax. A written report of such deviation, which shall include the probable cause of such deviation, and any corrective actions or preventative measures taken, shall be submitted by the responsible official within ten (10) days of the deviation.

3. Deviations for which more frequent reporting is required under this permit shall be reported on the more frequent basis.

4. All reports of deviations shall identify the probable cause of the deviation and any corrective actions or preventative measures taken.

[45CSR§30-5.1.c.3.C.]

b. The permittee shall, in the reporting of deviations from permit requirements, including those attributable to upset conditions as defined in this permit, report the probable cause of such deviations and any corrective actions or preventive measures taken in accordance with any rules of the Secretary.
[45CSR§30-5.1.c.3.B.]

3.5.9. **New applicable requirements.** If any applicable requirement is promulgated during the term of this permit, the permittee will meet such requirements on a timely basis, or in accordance with a more detailed schedule if required by the applicable requirement.
[45CSR§30-4.3.h.1.B.]

3.5.10. During compliance certification, the facility shall certify that the facility burns natural gas in all stationary equipment regulated under this permit except, when applicable, for emergency equipment (i.e. diesel generators).
[45CSR§30-5.1.c.]

3.6. Compliance Plan

3.6.1. None.

3.7. Permit Shield

3.7.1. The permittee is hereby granted a permit shield in accordance with 45CSR§30-5.6. The permit shield applies provided the permittee operates in accordance with the information contained within this permit.

3.7.2. The following requirements specifically identified are not applicable to the source based on the determinations set forth below. The permit shield shall apply to the following requirements provided the conditions of the determinations are met.

a. According to 45CSR§2-11.1 the boiler and heaters are exempt from the weight emission standards and MRR (monitoring, recordkeeping and reporting) because they are less than 10 mmBtu/hr.

b. 45CSR10; To Prevent and Control Air Pollution from the Emission of Sulfur Oxides: 45CSR10 is not applicable to the facility boiler and heaters because they are less than 10 mmBtu/hr.

c. 45CSR21; To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds: All storage tanks at Ceredo station are below 40,000 gallons in capacity, hence 45CSR§21-28 is not applicable. Ceredo station is not engaged in the extraction or fractionation of natural gas, hence, 45CSR§21-29 is not applicable.

d. 45CSR27; To Prevent and Control the Emissions of Toxic Air Pollutants: Natural gas is included as a petroleum product and contains less than 5% benzene by weight. 45CSR§27-2.4 exempts equipment "used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight."

e. 40 C.F.R. 60 Subpart Dc; Standards of Performance for Steam Generating Units: The boiler and heaters at this facility are less than 10 mmBtu/hr; hence, Subpart Dc is not applicable.

f. 40 C.F.R. 60 Subparts K, Ka; Standards of Performance for Storage Vessels for Petroleum Liquids: All tanks at Ceredo station are below 40,000 gallons in capacity.

g. 40 C.F.R. 60 Subpart Kb; Standards of Performance for Volatile Organic Liquid Storage Vessels: All tanks at Ceredo station are below 75m^3 in capacity.

h. 40 C.F.R. 60 Subpart KKK; Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plant: Ceredo station is not engaged in the extraction or fractionation of natural gas liquids from field gas, the fractionation of mixed natural gas liquids to natural gas products, or both.

i. 40 C.F.R. 60 Subpart IIII; Standards of Performance for Stationary Compression Ignition Internal Combustion Engines: There are no compression ignition engines at this facility.

j. 40 C.F.R 60 Subpart OOOO; Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution: Storage vessel requirements do not apply since all tanks commenced construction prior to August 23, 2011.

k. 40 C.F.R. 63 Subpart HHH; National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities: The facility does not have a glycol dehydration unit and is therefore not subject to the requirements of this subpart.

l. 40 C.F.R. 63 Subpart YYYY; Turbine MACT: The Solar Titan 250 (E10) is subject to 40 C.F.R. 63 Subpart YYYY. Per 40 C.F.R. §63.6095(d), there is a stay of standards for lean premix stationary combustion turbines until EPA takes final action to require compliance with this subpart. The only requirement for the unit is the initial notification requirement of 40 C.F.R. §63.6145, which was satisfied by the preconstruction permit application.

m. 40 C.F.R. 64 – None of the emission units have any add-on controls; therefore, in accordance with 40 C.F.R § 64.2(a), CAM is not applicable to this facility.

4.0 Source Specific Requirements [emission point ID(s): BL3, H1, H3]

4.1. Limitations and Standards

4.1.1. No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average. **[45CSR§2-3.1.]**

4.1.2. Compliance with the visible emission requirements of 45CSR§2-3.1 (Section 4.1.1 of this permit) shall be determined in accordance with 40 C.F.R. Part 60, Appendix A, Method 9 or by using measurements from continuous opacity monitoring systems approved by the Director. The Director may require the installation, calibration, maintenance and operation of continuous opacity monitoring systems and may establish policies for the evaluation of continuous opacity monitoring results and the determination of compliance with the visible emission requirements of 45CSR§2-3.1 (Section 4.1.1 of this permit). Continuous opacity monitors shall not be required on fuel burning units which employ wet scrubbing systems for emission control. **[45CSR§2-3.2.]**

4.1.3. You must meet the work practice standard in 40 C.F.R 63 Subpart DDDDD Table 3 that applies to your boiler or process heater, for each boiler or process heater at your source, except as provided under 40 C.F.R. §63.7522.

If your unit is. . .	You must meet the following. . .
1. A new or existing boiler or process heater with a continuous oxygen trim system that maintains an optimum air to fuel ratio, or a heat input capacity of less than or equal to 5 million Btu per hour in any of the following subcategories: unit designed to burn gas 1; unit designed to burn gas 2 (other); or unit designed to burn light liquid, or a limited use boiler or process heater **(H1, H3)**	Conduct a tune-up of the boiler or process heater every 5 years as specified in §63.7540.
2. A new or existing boiler or process heater without a continuous oxygen trim system and with heat input capacity of less than 10 million Btu per hour in the unit designed to burn heavy liquid or unit designed to burn solid fuel subcategories; or a new or existing boiler or process heater with heat input capacity of less than 10 million Btu per hour, but greater than 5 million Btu per hour, in any of the following subcategories: unit designed to burn gas 1; unit designed to burn gas 2 (other); or unit designed to burn light liquid **(BL3)**	Conduct a tune-up of the boiler or process heater biennially as specified in §63.7540.

If your unit is. . .	You must meet the following. . .
4. An existing boiler or process heater located at a major source facility, not including limited use units. **(H1)**	Must have a one-time energy assessment performed by a qualified energy assessor. An energy assessment completed on or after January 1, 2008, that meets or is amended to meet the energy assessment requirements in this table, satisfies the energy assessment requirement. A facility that operated under an energy management program developed according to the ENERGY STAR guidelines for energy management or compatible with ISO 50001 for at least one year between January 1, 2008 and the compliance date specified in §63.7495 that includes the affected units also satisfies the energy assessment requirement. The energy assessment must include the following with extent of the evaluation for items a. to e. appropriate for the on-site technical hours listed in §63.7575:
	a. A visual inspection of the boiler or process heater system.
	b. An evaluation of operating characteristics of the boiler or process heater systems, specifications of energy using systems, operating and maintenance procedures, and unusual operating constraints.
	c. An inventory of major energy use systems consuming energy from affected boilers and process heaters and which are under the control of the boiler/process heater owner/operator.
	d. A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage.
	e. A review of the facility's energy management program and provide recommendations for improvements consistent with the definition of energy management program, if identified.
	f. A list of cost-effective energy conservation measures that are within the facility's control.
	g. A list of the energy savings potential of the energy conservation measures identified.
	h. A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.

[45CSR34; 40 C.F.R. §63.7500(a)(1), 40 C.F.R. 63 Subpart DDDDD Table 3]

4.1.4. At all times, you must operate and maintain any affected source (as defined in 40 C.F.R. §63.7490), including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.
[45CSR34; 40 C.F.R. §63.7500(a)(3)]

4.1.5. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory with a heat input capacity of less than or equal to 5 million Btu per hour must complete a tune-up every 5 years as specified in 40 C.F.R. §63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory with a heat input capacity greater than 5 million Btu per hour and less than 10 million Btu per hour must complete a tune-up every 2 years as specified in 40 C.F.R. §63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 of 40 C.F.R. 63 subpart DDDDD, or the operating limits in Table 4 of 40 C.F.R. 63 subpart DDDDD.
[45CSR34; 40 C.F.R. §63.7500(e)]

4.1.6. For existing affected sources (as defined in 40 C.F.R. §63.7490), you must complete the initial compliance demonstrations, as specified in 40 C.F.R. §63.7510(a) through (d), no later than 180 days after the compliance date that is specified for your source in 40 C.F.R. §63.7495 and according to the applicable provisions in 40 C.F.R. §63.7(a)(2) as cited in 40 C.F.R. 63 Subpart DDDDD Table 10, except as specified in 40 C.F.R. §63.7510(j). You must complete an initial tune-up by following the procedures described in 40 C.F.R. §§63.7540(a)(10)(i) through (vi) no later than the compliance date specified in 40 C.F.R. §63.7495, except as specified in 40 C.F.R. §63.7510(j). You must complete the one-time energy assessment specified in Table 3 to this subpart no later than the compliance date specified in 40 C.F.R. §63.7495.
[45CSR34; 40 C.F.R. §63.7510(e)](H1)

4.1.7. For new or reconstructed affected sources (as defined in 40 C.F.R. §63.7490), you must demonstrate initial compliance with the applicable work practice standards in 40 C.F.R. 63 Subpart DDDDD Table 3 within the applicable annual, biennial, or 5-year schedule as specified in 40 C.F.R. §63.7515(d) following the initial compliance date specified in 40 C.F.R. §63.7495(a). Thereafter, you are required to complete the applicable annual, biennial, or 5-year tune-up as specified in 40 C.F.R. §63.7515(d).
[45CSR34; 40 C.F.R. §63.7510(g)](H3 and BL3)

4.1.8. If you are required to meet an applicable tune-up work practice standard, you must conduct an annual, biennial, or 5-year performance tune-up according to 40 C.F.R. §63.7540(a)(10), (11), or (12), respectively. Each annual tune-up specified in 40 C.F.R. §63.7540(a)(10) must be no more than 13 months after the previous tune-up. Each biennial tune-up specified in 40 C.F.R. §63.7540(a)(11) must be conducted no more than 25 months after the previous tune-up. Each 5-year tune-up specified in 40 C.F.R. §63.7540(a)(12) must be conducted no more than 61 months after the previous tune-up. For a new or reconstructed affected source (as defined in 40 C.F.R. §63.7490), the first annual, biennial, or 5-year tune-up must be no later than 13 months, 25 months, or 61 months, respectively, after April 1, 2013 or the initial startup of the new or reconstructed affected source, whichever is later.
[45CSR34; 40 C.F.R. §63.7515(d)]

4.1.9. If your boiler or process heater has a heat input capacity of less than 10 million Btu per hour (except as specified in 40 C.F.R. §63.7540(a)(12)), you must conduct a biennial tune-up of the boiler or process heater as specified in 40 C.F.R §63.7540(a)(10)(i) through (vi) to demonstrate continuous compliance.
[45CSR34; 40 C.F.R. §63.7540(a)(11)](BL3)

4.1.10. If your boiler or process heater has a continuous oxygen trim system that maintains an optimum air to fuel ratio or a heat input capacity of less than or equal to 5 million Btu per hour and the unit is in the units designed to burn gas 1; you must conduct a tune-up of the boiler or process heater every 5 years as specified in paragraphs 40 C.F.R. §63.7540(a)(10)(i) through (vi) to demonstrate continuous compliance. You may delay the burner inspection specified in paragraph 40 C.F.R. §63.7540(a)(10)(i) until the next scheduled or unscheduled unit shutdown, but you must inspect each burner at least once every 72 months. If an oxygen

trim system is utilized on a unit without emission standards to reduce the tune-up frequency to once every 5 years, set the oxygen level no lower than the oxygen concentration measured during the most recent tune-up. These tune-ups shall consist of the following:

a. As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may perform the burner inspection any time prior to the tune-up or delay the burner inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the burner inspection until the first outage, not to exceed 36 months from the previous inspection. At units where entry into a piece of process equipment or into a storage vessel is required to complete the tune-up inspections, inspections are required only during planned entries into the storage vessel or process equipment;

b. 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;

c. Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly (you may delay the inspection until the next scheduled unit shutdown). Units that produce electricity for sale may delay the inspection until the first outage, not to exceed 36 months from the previous inspection;

d. Optimize total emissions of CO. This optimization should be consistent with the manufacturer's specifications, if available, and with any NO_X requirement to which the unit is subject;

e. Measure the concentrations in the effluent stream of 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 CO analyzer; and

f. Maintain on-site and submit, if requested by the Administrator, a report containing the following information:

   i. The concentrations of 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 boiler or process heater;

   ii. A description of any corrective actions taken as a part of the tune-up; and

   iii. The type and amount of fuel used over the 12 months prior to the tune-up, but only if the unit was physically and legally capable of using more than one type of fuel during that period. Units sharing a fuel meter may estimate the fuel used by each unit.

[45CSR34; 40 C.F.R. §§63.7540(a)(10) & (a)(12)]

4.1.11. The Heater, identified as H3, shall operate according to the following requirements:

a. The MDHI shall not exceed 0.6 mmBtu/hr and the unit shall only be fired by natural gas;

b. As the annual emission limits given in table 4.1.11(c) are based on operating 8,760 hours/year, there is no limit on the annual hours of operation or fuel usage of the Heater.

c. The maximum combustion exhaust emissions from the Heater shall not exceed the limits given in the following table;

Table 4.1.11.c: Heater Emission Limits

Pollutant	PPH	TPY
CO	0.05	0.22
NO_x	0.06	0.26

d. **45CSR2**
No person shall cause, suffer, allow or permit emission of smoke and/or particulate matter into the open air from any fuel burning unit which is greater than ten (10) percent opacity based on a six minute block average.
[45CSR§2-3.1.]

e. **40 C.F.R. 63 Subpart DDDDD**
Boilers and process heaters in the units designed to burn gas 1 fuels subcategory with a heat input capacity of less than or equal to 5 million Btu per hour must complete a tune-up every 5 years as specified in §63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory with a heat input capacity greater than 5 million Btu per hour and less than 10 million Btu per hour must complete a tune-up every 2 years as specified in §63.7540. Boilers and process heaters in the units designed to burn gas 1 fuels subcategory are not subject to the emission limits in Tables 1 and 2 or 11 through 13 to this subpart, or the operating limits in Table 4 to this subpart.
[45CSR34, 40 C.F.R. §63.7500(e)]

[45CSR13, R13-1856, Condition 4.1.4](H3)

4.2. Monitoring Requirements

4.2.1. At such reasonable times as the Secretary may designate, the permittee shall conduct visible emissions observations using Method 22 for the purpose of demonstrating compliance with Section 4.1.1. If visible emissions are observed, the permittee shall conduct a Method 9 reading unless the cause for visible emissions is corrected within 24 hours. Records of observation will be kept for at least 5 years from the date of observation.
[45CSR§30-5.1.c.]

4.3. Testing Requirements

4.3.1. At such reasonable times(s) as the Secretary may designate, in accordance with the provisions of 3.3.1 of this permit, the permittee shall conduct of have conducted test(s) to determine compliance with the emission limitations established in this permit and/or applicable regulations.
[45CSR13, R13-1856, Condition 4.3.1](H3)

4.4. Recordkeeping Requirements

4.4.1. You must keep records of each notification and report that you submitted to comply with 40 C.F.R. 63 Subpart DDDDD, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report that you submitted, according to the requirements in 40 C.F.R. §63.10(b)(2)(xiv).
[45CSR34; 40 C.F.R. §63.7555(a)(1)]

4.4.2. In what form and how long must I keep my records?

a. Your records must be in a form suitable and readily available for expeditious review, according to 40 C.F.R. §63.10(b)(1).

b. As specified in 40 C.F.R.§63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

c. You must keep each record on site, or they must be accessible from on site (for example, through a computer network), for at least 2 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to 40 C.F.R. §63.10(b)(1). You can keep the records off site for the remaining 3 years.

[45CSR34; 40 C.F.R. §63.7560]

4.5. Reporting Requirements

4.5.1. You must include with the Notification of Compliance Status a signed certification that either the energy assessment was completed according to 40 C.F.R. 63 Subpart DDDDD Table 3, and that the assessment is an accurate depiction of your facility at the time of the assessment, or that the maximum number of on-site technical hours specified in the definition of energy assessment applicable to the facility has been expended. **[45CSR34; 40 C.F.R. §63.7530(e)](H1)**

4.5.2. You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in40 C.F.R. §63.7545(e).
[45CSR34; 40 C.F.R. §63.7530(f)]

4.5.3. If you are not required to conduct an initial compliance demonstration as specified in 40 C.F.R. §63.7530(a), the Notification of Compliance Status must only contain the information specified in 40 C.F.R. §§63.7545(e)(1) and (8) and must be submitted within 60 days of the compliance date specified at 40 C.F.R. §63.7495(b).

a. A description of the affected unit(s) including identification of which subcategories the unit is in, the design heat input capacity of the unit, a description of the add-on controls used on the unit to comply with this subpart, description of the fuel(s) burned, including whether the fuel(s) were a secondary material determined by you or the EPA through a petition process to be a non-waste under §241.3 of this chapter, whether the fuel(s) were a secondary material processed from discarded non-hazardous secondary materials within the meaning of §241.3 of this chapter, and justification for the selection of fuel(s) burned during the compliance demonstration.

b. In addition to the information required in 40 C.F.R. §63.9(h)(2), your notification of compliance status must include the following certification(s) of compliance, as applicable, and signed by a responsible official:

i. “This facility completed the required initial tune-up for all of the boilers and process heaters covered by 40 CFR part 63 subpart DDDDD at this site according to the procedures in 40 C.F.R. §63.7540(a)(10)(i) through (vi).”

ii. "This facility has had an energy assessment performed according to §63.7530(e)."

iii. Except for units that burn only natural gas, refinery gas, or other gas 1 fuel, or units that qualify for a statutory exemption as provided in section 129(g)(1) of the Clean Air Act, include the following: "No secondary materials that are solid waste were combusted in any affected unit."

[45CSR34; 40 C.F.R. §63.7545(e)(1) and (8)]

4.5.4. Unless the EPA Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit each report, according to paragraph 40 C.F.R. §63.7550(h), by the date in 40 C.F.R. 63 Subpart DDDDD Table 9 and according to the requirements in 40 C.F.R. §§63.7550(b)(1) through (4). For units that are subject only to a requirement to conduct subsequent annual, biennial, or 5-year tune-up according to §63.7540(a)(10), (11), or (12), respectively, and not subject to emission limits or Table 4 operating limits, you may submit only an annual, biennial, or 5-year compliance report, as applicable, as specified in 40 C.F.R. §§63.7550(b)(1) through (4), instead of a semi-annual compliance report.
[45CSR34; 40 C.F.R. §63.7550(b)]

4.5.5. For each affected source that is subject to permitting regulations pursuant to part 70 or part 71 of this chapter, and if the permitting authority has established dates for submitting semiannual reports pursuant to 70.6(a)(3)(iii)(A) or 71.6(a)(3)(iii)(A), you may submit the first and subsequent compliance reports according to the dates the permitting authority has established in the permit instead of according to the dates in 40 C.F.R. §§63.7550(b)(1) through (4).
[45CSR34; 40 C.F.R. §63.7550(b)(5)]

4.5.6. A compliance report must contain the following information depending on how the facility chooses to comply with the limits set in this rule.

a. Company and Facility name and address.

b. Process unit information, emissions limitations, and operating parameter limitations.

c. Date of report and beginning and ending dates of the reporting period.

d. Include the date of the most recent tune-up for each unit subject to only the requirement to conduct an annual, biennial, or 5-year tune-up according to 40 C.F.R. §63.7540(a)(10), (11), or (12) respectively. Include the date of the most recent burner inspection if it was not done annually, biennially, or on a 5-year period and was delayed until the next scheduled or unscheduled unit shutdown.

e. Statement by a responsible official with that official's name, title, and signature, certifying the truth, accuracy, and completeness of the content of the report.

[45CSR34; 40 C.F.R. §§63.7550(c), (c)(1), (c)(5)(i)-(iii), (c)(5)(xiv), and (c)(5)(xvii)]

4.6. Compliance Plan

4.6.1. None.

5.0 Source Specific Requirements [emission point ID(s): E01, E02, E03, E04, E05, E06, E07, G3, G4]

5.1. Limitations and Standards

5.1.1. The following stationary RICE do not have to meet the requirements of 40 C.F.R. 63 subpart ZZZZ and of subpart A, including initial notification requirements:

a. Existing spark ignition 2 stroke lean burn (2SLB) stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.

[45CSR34, 40 C.F.R. §63.6590(b)(3)(i)](E01, E02, E03, E04, E05, E06, E07)

5.1.2. If you own or operate any of the following stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to 40 C.F.R. 63 subpart ZZZZ or operating limitations in Tables 1b and 2b to 40 C.F.R. 63 subpart ZZZZ: an existing 2SLB stationary RICE; an existing 4SLB stationary RICE; a stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis; an emergency stationary RICE; or a limited use stationary RICE.
[45CSR34, 40 C.F.R. §63.6600(c)](E01, E02, E03, E04, E05, E06, E07, G3, G4)

5.1.3. If you own or operate an emergency stationary RICE, you must operate the emergency stationary RICE according to the requirements in 40 C.F.R. §§63.6640(f)(1) through (3). In order for the engine to be considered an emergency stationary RICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in 40 C.F.R. §§63.6640(f)(1) through (3), is prohibited. If you do not operate the engine according to the requirements in paragraphs 40 C.F.R. §§63.6640(f)(1) through (3), the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

a. There is no time limit on the use of emergency stationary RICE in emergency situations.

b. You may operate your emergency stationary RICE for any combination of the purposes specified in 40 C.F.R. §63.6640(f)(2)(i) for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraphs 40 C.F.R. §63.6640(f)(3) counts as part of the 100 hours per calendar year allowed by this 40 C.F.R. §63.6640(f)(2).

i. Emergency stationary RICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency RICE beyond 100 hours per calendar year.

c. Emergency stationary RICE located at major sources of HAP may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in 40 C.F.R. §63.6640(f)(2). The 50 hours per year for non-emergency situations

cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

[45CSR34; 40 C.F.R. §§63.6640(f)(1) through (3)](G3 and G4)

5.1.4. The Emergency Generators (EGs), Identified as 005G3 and 005G4, shall meet the following requirements:

a. The authorized EGs shall each be the make, model, and size as specified under Table 1.1, shall only be fired by pipeline-quality natural gas, and each shall not operate in excess of 500 hours per year (during periods of non-emergencies);

b. The maximum emissions from the Waukesha F3521GL Emergency Generator, identified as 005G3, shall not exceed the limits given in the following table:

Pollutant	PPH	TPY
CO	4.31	1.08
NO_X	2.44	0.61
VOC	1.63	0.41
Formaldehyde	0.34	0.09

c. The maximum emissions from the Waukesha VGF-P48GL Emergency Generator, identified as 005G4, shall not exceed the limits given in the following table:

Pollutant	PPH	TPY
CO	10.36	2.59
NO_X	5.18	1.30
VOC	2.59	0.65
Formaldehyde	0.49	0.12

d. **40 C.F.R 60, Subpart JJJJ**

The Waukesha VGF-P48GL identified as 005G4 shall meet all applicable requirements under 40 C.F.R. 60, Subpart JJJJ including the following:

(1) Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in 40 C.F.R. 60, Subpart JJJJ Table 1 for their stationary ICE

Engine type and fuel	Maximum Engine Power	Manufacture Date	Emission Standards[(a)]					
			g/HP-hr			ppmvd at 15% O_2		
			NO_x	CO	VOC[(d)]	NO_x	CO	VOC[(d)]
Emergency	HP≥130	1/1/2009	2.0	4.0	1.0	160	540	86

[(a)] Owners and operators of stationary non-certified SI engines may choose to comply with the emission standards in units of either g/HP-hr or ppmvd at 15% O_2.
[(b)] For Purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.

[45CSR16, 40 C.F.R. §60.4233(e), 40 C.F.R. 60 subpart JJJJ Table 1]

(2) The emergency generator shall meet the definition of "Emergency Stationary Internal Combustion Engine" as given under 40 C.F.R. §60.4248.
[45CSR16, 40 C.F.R. §60.4248]

[45CSR13, R13-1856, Condition 4.1.3.]

5.1.5. Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in §60.4233 over the entire life of the engine.
[45CSR16, 40 C.F.R. §60.4234](G4)

5.1.6. Starting on July 1, 2010, if the emergency stationary SI internal combustion engine that is greater than or equal to 500 HP that was built on or after July 1, 2010, does not meet the standards applicable to non-emergency engines, the owner or operator must install a non-resettable hour meter.
[45CSR16, 40 C.F.R. §60.4237(a)](G4)

5.1.7. If you are an owner or operator of a stationary SI internal combustion engine and must comply with the emission standards specified in §60.4233(d) or (e), you must demonstrate compliance according to one of the methods specified in 40 C.F.R. §60.4243(b)(1) and (2).

a. Purchasing a non-certified engine and demonstrating compliance with the emission standards specified in §60.4233(d) or (e) and according to the requirements specified in §60.4244, as applicable, and according to 40 C.F.R. §60.4243(b)(2)(ii).

i. If you are an owner or operator of a stationary SI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test and conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance.

[45CSR16, 40 C.F.R. §§60.4243(b), (b)(2), & (b)(2)(ii)](G4)

5.1.8. If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in 40 C.F.R. §§60.4243(d)(1) through (3). In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in 40 C.F.R. §§60.4243(d)(1) through (3), is prohibited. If you do not operate the engine according to the requirements in 40 C.F.R. §§60.4243(d)(1) through (3), the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

a. There is no time limit on the use of emergency stationary ICE in emergency situations.

b. You may operate your emergency stationary ICE for any combination of the purposes specified in in 40 C.F.R. §60.4243(d)(2)(i) for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by in 40 C.F.R. §60.4243(d)(3) counts as part of the 100 hours per calendar year allowed by this in 40 C.F.R. §60.4243(d)(2).

i. Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor,

the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

c. Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in 40 C.F.R. §60.4243(d)(2). Except as provided in 40 C.F.R. §60.4243(d)(3)(i), the 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

i. The engine is dispatched by the local balancing authority or local transmission and distribution system operator;

ii. The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

iii. The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

iv. The power is provided only to the facility itself or to support the local transmission and distribution system.

v. The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

[45CSR16, 40 C.F.R. §60.4243(d)](G4)

5.2. Monitoring Requirements

5.2.1. For the purposes of demonstrating compliance with the maximum hours of operation limits set forth in 5.1.4.a, the permittee shall maintain monthly and rolling twelve month records of the hours of operation of the emergency generators.
[45CSR13, R13-1856, Condition 4.2.2.]

5.3. Testing Requirements

5.3.1. For the purposes of demonstrating compliance with the emissions standards of 5.1.4.c and 40 C.F.R. §60.4233(e), the permittee shall conduct an initial performance test within one year after initial startup. After the initial test, subsequent testing shall be conducted every 8,760 hours of operation or 3 years, whichever

comes first. If the engine is not operational, the permittee must conduct the performance test immediately upon startup of the engine. These tests must be conducted within 10 percent of the 100 percent peak (or highest achievable) load and according to the requirements of §60.8, under the specific conditions that are specified by Table 2 of Subpart JJJJ of Part 60 – Requirements for Performance test, and in accordance with Condition 3.3.1. of this permit. Records of such testing shall be maintained in accordance with Condition 3.4.1 of this permit.
[45CSR13, R13-1856, Condition 4.3.2.b](G4)

5.3.2. Owners and operators of stationary SI ICE who conduct performance tests must follow the procedures in 40 C.F.R. §§60.4244(a) through (f).

a. Each performance test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and according to the requirements in §60.8 and under the specific conditions that are specified by Table 2 to this subpart.

b. You may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c). If your stationary SI internal combustion engine is non-operational, you do not need to startup the engine solely to conduct a performance test; however, you must conduct the performance test immediately upon startup of the engine.

c. You must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must be conducted within 10 percent of 100 percent peak (or the highest achievable) load and last at least 1 hour.

d. To determine compliance with the NO_X mass per unit output emission limitation, convert the concentration of NO_X in the engine exhaust using Equation 1 of this section:

$$ER = \frac{C_d \times 1.912 \times 10^{-3} \times Q \times T}{HP-hr} \qquad \text{(Eq. 1)}$$

Where:

ER = Emission rate of NO_X in g/HP-hr.
C_d = Measured NO_X concentration in parts per million by volume (ppmv).
1.912×10^{-3} = Conversion constant for ppm NO_X to grams per standard cubic meter at 20 degrees Celsius.
Q = Stack gas volumetric flow rate, in standard cubic meter per hour, dry basis.
T = Time of test run, in hours.
HP-hr = Brake work of the engine, horsepower-hour (HP-hr).

e. To determine compliance with the CO mass per unit output emission limitation, convert the concentration of CO in the engine exhaust using Equation 2 of this section:

$$ER = \frac{C_d \times 1.164 \times 10^{-3} \times Q \times T}{HP-hr} \qquad \text{(Eq. 2)}$$

Where:

ER = Emission rate of CO in g/HP-hr.

C_d = Measured CO concentration in ppmv.
1.164×10^{-3} = Conversion constant for ppm CO to grams per standard cubic meter at 20 degrees Celsius.
Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.
T = Time of test run, in hours.
HP-hr = Brake work of the engine, in HP-hr.

f. For purposes of this subpart, when calculating emissions of VOC, emissions of formaldehyde should not be included. To determine compliance with the VOC mass per unit output emission limitation, convert the concentration of VOC in the engine exhaust using Equation 3 of this section:

$$ER = \frac{C_d \times 1.833 \times 10^{-3} \times Q \times T}{HP-hr} \quad \text{(Eq. 3)}$$

Where:

ER = Emission rate of VOC in g/HP-hr.
C_d = VOC concentration measured as propane in ppmv.
1.833×10^{-3} = Conversion constant for ppm VOC measured as propane, to grams per standard cubic meter at 20 degrees Celsius.
Q = Stack gas volumetric flow rate, in standard cubic meters per hour, dry basis.
T = Time of test run, in hours.
HP-hr = Brake work of the engine, in HP-hr.

g. If the owner/operator chooses to measure VOC emissions using either Method 18 of 40 CFR part 60, appendix A, or Method 320 of 40 CFR part 63, appendix A, then it has the option of correcting the measured VOC emissions to account for the potential differences in measured values between these methods and Method 25A. The results from Method 18 and Method 320 can be corrected for response factor differences using Equations 4 and 5 of this section. The corrected VOC concentration can then be placed on a propane basis using Equation 6 of this section.

$$RF_i = \frac{C_{Mi}}{C_{Ai}} \quad \text{(Eq. 4)}$$

Where:

RF_i = Response factor of compound i when measured with EPA Method 25A.
C_{Mi} = Measured concentration of compound i in ppmv as carbon.
C_{Ai} = True concentration of compound i in ppmv as carbon.

$$C_{icorr} = RF_i \times C_{imeas} \quad \text{(Eq. 5)}$$

Where:
C_{icorr} = Concentration of compound i corrected to the value that would have been measured by EPA Method 25A, ppmv as carbon.
C_{imeas} = Concentration of compound i measured by EPA Method 320, ppmv as carbon.

$$C_{Peq} = 0.6098 \times C_{icorr} \quad \text{(Eq. 6)}$$

Where:
CPeq = Concentration of compound i in mg of propane equivalent per DSCM.

[45CSR16, 40 C.F.R. §60.4244](G4)

5.4. Recordkeeping Requirements

5.4.1. Owners and operators of all stationary SI ICE must keep records of the following information:

a. All notifications submitted to comply with 40 C.F.R. 60 subpart JJJJ and all documentation supporting any notification.

b. Maintenance conducted on the engine.

c. If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90, 1048, 1054, and 1060, as applicable.

d. If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to §60.4243(a)(2), documentation that the engine meets the emission standards.

[45CSR16, 40 C.F.R. §60.4245(a)](G4)

5.4.2. For all stationary SI emergency ICE greater than or equal to 500 HP manufactured on or after July 1, 2010, that do not meet the standards applicable to non-emergency engines, the owner or operator of must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation.
[45CSR16, 40 C.F.R. §60.4245(b)](G4)

5.5. Reporting Requirements

5.5.1. If you are required to submit an Initial Notification but are otherwise not affected by the requirements of this subpart, in accordance with §63.6590(b), your notification should include the information in §63.9(b)(2)(i) through (v), and a statement that your stationary RICE has no additional requirements and explain the basis of the exclusion (for example, that it operates exclusively as an emergency stationary RICE if it has a site rating of more than 500 brake HP located at a major source of HAP emissions).
[45CSR34, 40 C.F.R. §63.6645(f)](G4)

5.5.2. If you own or operate an emergency stationary RICE with a site rating of more than 100 brake HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in § 63.6640(f)(2)(ii) and (iii) or that operates for the purpose specified in § 63.6640(f)(4)(ii), you must submit an annual report according to the requirements in paragraphs (1) through (3) of this section.

1. The report must contain the following information:

a. Company name and address where the engine is located.

b. Date of report and beginning and ending dates of the reporting period.

c. Engine site rating and model year.

d. Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.

e. Hours operated for the purposes specified in § 63.6640(f)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in § 63.6640(f)(2)(ii) and (iii).

f. Number of hours the engine is contractually obligated to be available for the purposes specified in § 63.6640(f)(2)(ii) and (iii).

g. Hours spent for operation for the purpose specified in § 63.6640(f)(4)(ii), including the date, start time, and end time for engine operation for the purposes specified in § 63.6640(f)(4)(ii). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.

h. If there were no deviations from the fuel requirements in § 63.6604 that apply to the engine (if any), a statement that there were no deviations from the fuel requirements during the reporting period.

i. If there were deviations from the fuel requirements in § 63.6604 that apply to the engine (if any), information on the number, duration, and cause of deviations, and the corrective action taken.

2. The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.

3. The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in § 63.13.

[45CSR34; 40 C.F.R. §63.6650 (h)] (G3 and G4)

5.5.3. Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in §60.4244 within 60 days after the test has been completed. Performance test reports using EPA Method 18, EPA Method 320, or ASTM D6348-03 (incorporated by reference - see 40 CFR 60.17) to measure VOC require reporting of all QA/QC data. For Method 18, report results from sections 8.4 and 11.1.1.4; for Method 320, report results from sections 8.6.2, 9.0, and 13.0; and for ASTM D6348-03 report results of all QA/QC procedures in Annexes 1-7.

[45CSR16; 40 C.F.R. §60.4245(d)] (G4)

5.5.4. If you own or operate an emergency stationary SI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in § 60.4243(d)(2)(ii) and (iii) or that operates for the purposes specified in § 60.4243(d)(3)(i), you must submit an annual report according to the requirements in conditions (1) through (3) of this section.

1. The report must contain the following information:

a. Company name and address where the engine is located.

b. Date of the report and beginning and ending dates of the reporting period.

c. Engine site rating and model year.

d. Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.

e. Hours operated for the purposes specified in § 60.4243(d)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in § 60.4243(d)(2)(ii) and (iii).

f. Number of hours the engine is contractually obligated to be available for the purposes specified in § 60.4243(d)(2)(ii) and (iii).

g. Hours spent for operation for the purposes specified in § 60.4243(d)(3)(i), including the date, start time, and end time for engine operation for the purposes specified in § 60.4243(d)(3)(i). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.

2. The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.

3. The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in § 60.4.

[45CSR16; 40 C.F.R. §60.4245(e)] (G4)

5.6. Compliance Plan

5.6.1. None.

6.0 Source Specific Requirements [emission point ID(s): E10]

6.1. Limitations and Standards

6.1.1. The Solar Titan 250 combustion turbine (CT), identified as 00510, shall meet the following requirements:

a. The authorized CT shall be the make, model, and size as specified under Table 1.1 and shall only be fired by pipeline-quality natural gas;

b. With the exception of operation during "low-temperature mode" and low-load mode" as defined under 6.2.1(a), at all times the CT is in operation, the unit shall utilize SoLoNO$_x$ dry low-NO$_x$ combustor technology;

c. The CT shall be fired using good combustion practices;

d. The maximum emissions from the CT shall not exceed the limits (during specific operational scenarios) as given in the following table:

Pollutant	PPH		TPY
	Normal[(1)]	Low-Load	
CO	12.06	7.25	54.65
NO$_x$	7.93	23.84	35.67
PM$_{2.5}$/PM$_{10}$/PM	1.47	n/a	6.44
SO$_2$	12.71	n/a	0.70
VOC	1.38	0.66	6.03
Formaldehyde	0.16	n/a	0.69

[(1)] Emission limit valid for temperatures ≥ 32°F

e. The CT shall meet all applicable requirements under 40 C.F.R. 60 Subpart KKKK including the following:

(i) You must meet the emission limits for NO$_x$ specified in Table 1 to this subpart.

Table 1 to Subpart KKKK of Part 60—Nitrogen Oxide Emission Limits for New Stationary Combustion Turbines

Combustion turbine type	Combustion turbine heat input at peak load (HHV)	NO$_x$ emission standard
New turbine firing natural gas	>50 MMBtu/h and ≤850 MMBtu/h	25 ppm at 15 percent O$_2$ or 150 ng/J of useful output (1.2 lb/MWh).

[45CSR16, 40 C.F.R. §60.4320(a), 40 C.F.R. 60, Subpart KKKK Table 1]

(ii) If your turbine is located in a continental area, you must comply with either paragraph 40 C.F.R. §§60.4330(a)(1), (a)(2), or (a)(3). **[45CSR16, 40 C.F.R §60.4330(a)]**

(1) You must not cause to be discharged into the atmosphere from the subject stationary combustion turbine any gases which contain SO$_2$ in excess of 110 nanograms per Joule (ng/J)

(0.90 pounds per megawatt-hour (lb/MWh)) gross output; **[45CSR16, 40 C.F.R §60.4330(a)(1)]**

(2) You must not burn in the subject stationary combustion turbine any fuel which contains total potential sulfur emissions in excess of 26 ng SO_2/J (0.060 lb SO_2/MMBtu) heat input. If your turbine simultaneously fires multiple fuels, each fuel must meet this requirement. **[45CSR16, 40 C.F.R §60.4330(a)(2)]**

[45CSR13, R13-1856, Condition 4.1.2]

6.1.2. **Operation and Maintenance or Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all air pollution control equipment listed in Section 1.1 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR13, R13-1856, Condition 4.1.6]

6.1.3. The permittee must operate and maintain the stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.
[45CSR16, 40 C.F.R §60.4333(a); 45CSR13, R13-1856, Condition 4.1.2.f]

6.1.4. If you are not using water or steam injection to control NO_X emissions, you must perform annual performance tests in accordance with 40 C.F.R. §60.4400 to demonstrate continuous compliance. If the NO_X emission result from the performance test is less than or equal to 75 percent of the NO_X emission limit for the turbine, you may reduce the frequency of subsequent performance tests to once every 2 years (no more than 26 calendar months following the previous performance test). If the results of any subsequent performance test exceed 75 percent of the NO_X emission limit for the turbine, you must resume annual performance tests.
[45CSR16, 40 C.F.R §60.4340(a)]

6.2. Monitoring Requirements

6.2.1. The Solar Titan 250 CT shall meet the following Monitoring, Compliance Demonstration, Recording and Reporting Requirements:

a. The permittee shall monitor and record the monthly amount of hours the CT operates in the following modes:

(i) Normal Mode = Load ≥ 40%, Temperature > -20°F: SoLoNO$_x$ operating;

(ii) Low-Temperature Mode = Temperature ≤ -20°F: non-SoLoNO$_x$ mode; and

(iii) Low-Load Mode = Load ≤ 40% (includes startup/shutdown events): non-SoLoNO$_x$ mode.

b. To determine compliance with the CT annual emission limits given in 6.1.1.d, the permittee shall calculate the monthly and twelve month rolling average of actual emissions (in tons) that the CT emitted. The calculation of actual monthly and annual emissions shall be in accordance with the following:

(i) The permittee shall, by the 15th of each calendar month, calculate the actual monthly and rolling twelve month total of emissions of the CT using the data recorded under 6.2.1.a and the best available emission factors in accordance with the following requirements:

(1) Emission factors may be used that were measured during the most recent performance test approved by the Secretary (and that were used to determine compliance with the hourly limits given in 6.1.1.d);

(2) When emission factors as described under 6.2.1.b.(i)(1) are not available, the permittee shall use the emission factors used to calculate the potential-to-emit of the CT as given in Permit Application R13-1856A.

c. **40 C.F.R. 60, Subpart KKKK**

You may elect not to monitor the total sulfur content of the fuel combusted in the turbine, if the fuel is demonstrated not to exceed potential sulfur emissions of 26 ng SO_2/J (0.060 lb/MMBtu) heat input for units located in continental areas and 180 ng SO_2/J (0.42 lb/MMBtu) heat input for units located in noncontinental areas or a continental area that the Administrator determines does not have access to natural gas and that the removal of sulfur compounds would cause more environmental harm than benefit. You must use one of the following sources of information to make the required demonstration:

(i) The fuel quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the fuel, specifying that the maximum total sulfur content for oil use in continental areas is 0.05 weight percent (500 ppmw) or less and 0.04 weight percent (4,000 ppmw) or less for noncontinental areas, the total sulfur content for natural gas use in continental areas is 20 grains of sulfur or less per 100 standard cubic feet and 140 grains of sulfur or less per 100 standard cubic feet for noncontinental areas, has potential sulfur emissions of less than 26 ng SO_2/J (0.060 lb SO_2/MMBtu) heat input for continental areas and has potential sulfur emissions of less than 180 ng SO_2/J (0.42 lb SO_2/MMBtu) heat input for noncontinental areas; or

(ii) Representative fuel sampling data which show that the sulfur content of the fuel does not exceed 26 ng SO_2/J (0.060 lb SO_2/MMBtu) heat input for continental areas or 180 ng SO_2/J (0.42 lb SO_2/MMBtu) heat input for noncontinental areas. At a minimum, the amount of fuel sampling data specified in section 2.3.1.4 or 2.3.2.4 of appendix D to part 75 of this chapter is required.

[45CSR16, 40 CFR §60.4365]

[45CSR13, R13-1856, Condition 4.2.1]

6.2.2. If you elect not to demonstrate sulfur content using options in 40 C.F.R. §60.4365, and the fuel is supplied without intermediate bulk storage, the sulfur content value of the gaseous fuel must be determined and recorded once per unit operating day.
[45CSR16, 40 CFR§ 60.4370(b)]

6.3. Testing Requirements

6.3.1. The permittee shall meet the following testing requirement with respect to the Solar Titan 250 CT:

a. For the purposes of demonstrating compliance with the NO_X emission standard in condition 6.1.1.e and 40 C.F.R. §60.4320(a) the permittee shall conduct an initial performance test within 60 days after achieving maximum output of each turbine, but no later than 180 days after initial startup. After the initial test, subsequent performance testing shall be conducted annually (no more than 14 months following the previous test) unless the previous results demonstrate that the affected units achieved compliance of less than or equal to 75 percent of the NO_X emission limit, then the permittee may reduce

the frequency of subsequent tests to once every two years (no more than 26 calendar months following the previous test) as allowed under 40 C.F.R. §60.4320(a). If the results of any subsequent performance test exceed 75 percent of the NO_X emission limit, then the permittee must resume annual performance tests. Such testing shall be conducted in accordance with Condition 3.3.1. and 40 C.F.R. §60.4400. Records of such testing shall be maintained in accordance with Condition 3.4.2.

[45CSR13, R13-1856, Condition 4.3.2.a]

6.3.2. You must conduct an initial performance test, as required in §60.8. Subsequent NO_X performance tests shall be conducted on an annual basis (no more than 14 calendar months following the previous performance test).

a. There are two general methodologies that you may use to conduct the performance tests. For each test run:

i. Measure the NO_X concentration (in parts per million (ppm)), using EPA Method 7E or EPA Method 20 in appendix A of this part. For units complying with the output based standard, concurrently measure the stack gas flow rate, using EPA Methods 1 and 2 in appendix A of this part, and measure and record the electrical and thermal output from the unit. Then, use the following equation to calculate the NO_X emission rate:

$$E = \frac{(1.194 \times 10^{-7}) \times (NO_X)_C \times Q_{std}}{P}$$

Where:
E = NO_X emission rate, in lb/MWh
1.194×10^{-7} = conversion constant, in lb/dscf-ppm
$(NO_X)_c$ = average NO_X concentration for the run, in ppm
Q_{std} = stack gas volumetric flow rate, in dscf/hr
P = gross electrical and mechanical energy output of the combustion turbine, in MW (for simple-cycle operation), for combined-cycle operation, the sum of all electrical and mechanical output from the combustion and steam turbines, or, for combined heat and power operation, the sum of all electrical and mechanical output from the combustion and steam turbines plus all useful recovered thermal output not used for additional electric or mechanical generation, in MW, calculated according to §60.4350(f)(2); or

ii. Measure the NO_X and diluent gas concentrations, using either EPA Methods 7E and 3A, or EPA Method 20 in appendix A of this part. Concurrently measure the heat input to the unit, using a fuel flowmeter (or flowmeters), and measure the electrical and thermal output of the unit. Use EPA Method 19 in appendix A of this part to calculate the NO_X emission rate in lb/MMBtu. Then, use Equations 1 and, if necessary, 2 and 3 in §60.4350(f) to calculate the NO_X emission rate in lb/MWh.

b. Sampling traverse points for NO_X and (if applicable) diluent gas are to be selected following EPA Method 20 or EPA Method 1 (non-particulate procedures), and sampled for equal time intervals. The sampling must be performed with a traversing single-hole probe, or, if feasible, with a stationary multi-hole probe that samples each of the points sequentially. Alternatively, a multi-hole probe designed and documented to sample equal volumes from each hole may be used to sample simultaneously at the required points.

c. Notwithstanding 40 C.F.R. §60.4400(a)(2), you may test at fewer points than are specified in EPA Method 1 or EPA Method 20 in appendix A of this part if the following conditions are met

i. You may perform a stratification test for NOX and diluent pursuant to the procedures specified in section 6.5.6.1(a) through (e) of appendix A of part 75 of this chapter.

ii. Once the stratification sampling is completed, you may use the following alternative sample point selection criteria for the performance test:

A. If each of the individual traverse point NO_X concentrations is within ±10 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ±5ppm or ±0.5 percent CO_2 (or O_2) from the mean for all traverse points, then you may use three points (located either 16.7, 50.0 and 83.3 percent of the way across the stack or duct, or, for circular stacks or ducts greater than 2.4 meters (7.8 feet) in diameter, at 0.4, 1.2, and 2.0 meters from the wall). The three points must be located along the measurement line that exhibited the highest average NO_X concentration during the stratification test; or

B. For turbines with a NO_X standard greater than 15 ppm @ 15% O_2, you may sample at a single point, located at least 1 meter from the stack wall or at the stack centroid if each of the individual traverse point NO_X concentrations is within ±5 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ±3ppm or ±0.3 percent CO_2 (or O_2) from the mean for all traverse points; or

C. For turbines with a NO_X standard less than or equal to 15 ppm @ 15% O_2, you may sample at a single point, located at least 1 meter from the stack wall or at the stack centroid if each of the individual traverse point NO_X concentrations is within ±2.5 percent of the mean concentration for all traverse points, or the individual traverse point diluent concentrations differs by no more than ±1ppm or ±0.15 percent CO_2 (or O_2) from the mean for all traverse points.

[45CSR16, 40 C.F.R. §60.4400(a)]

6.3.3. The performance test must be done at any load condition within plus or minus 25 percent of 100 percent of peak load. You may perform testing at the highest achievable load point, if at least 75 percent of peak load cannot be achieved in practice. You must conduct three separate test runs for each performance test. The minimum time per run is 20 minutes.

a. If the stationary combustion turbine combusts both oil and gas as primary or backup fuels, separate performance testing is required for each fuel.

b. For a combined cycle and CHP turbine systems with supplemental heat (duct burner), you must measure the total NO_X emissions after the duct burner rather than directly after the turbine. The duct burner must be in operation during the performance test.

c. If water or steam injection is used to control NO_X with no additional post-combustion NO_X control and you choose to monitor the steam or water to fuel ratio in accordance with §60.4335, then that monitoring system must be operated concurrently with each EPA Method 20 or EPA Method 7E run and must be used to determine the fuel consumption and the steam or water to fuel ratio necessary to comply with the applicable §60.4320 NO_X emission limit.

d. Compliance with the applicable emission limit in §60.4320 must be demonstrated at each tested load level. Compliance is achieved if the three-run arithmetic average NO_X emission rate at each tested level meets the applicable emission limit in §60.4320.

e. If you elect to install a CEMS, the performance evaluation of the CEMS may either be conducted separately or (as described in §60.4405) as part of the initial performance test of the affected unit.

f. The ambient temperature must be greater than 0 °F during the performance test.

[45CSR16, 40 C.F.R. §60.4400(b)]

6.4. Recordkeeping Requirements

6.4.1. **Record of Maintenance of Air Pollution Control Equipment.** For all pollution control equipment listed in section 1.1, the permittee shall maintain accurate records of all required pollution control equipment inspection and/or preventative maintenance procedures.
[45CSR13, R13-1856, Condition 4.4.2]

6.4.2. **Record of Malfunctions of Air Pollution Control Equipment.** For all air pollution control equipment listed in section 1.1, the permittee shall maintain records of the occurrence and duration of any malfunction or operational shutdown of the air pollution control equipment during which excess emissions occur. For each such case, the following information shall be recorded:

a. The equipment involved.

b. Steps taken to minimize emissions during the event.

c. The duration of the event.

d. The estimated increase in emissions during the event.

For each such case associated with an equipment malfunction, the additional information shall also be recorded:

e. The cause of the malfunction.

f. Steps taken to correct the malfunction.

g. Any changes or modifications to equipment or procedures that would help prevent future reoccurrences of the malfunction.

[45CSR13, R13-1856, Condition 4.4.3]

6.5. Reporting Requirements

6.5.1. For each affected unit required to continuously monitor parameters or emissions, or to periodically determine the fuel sulfur content under this subpart, you must submit reports of excess emissions and monitor downtime, in accordance with §60.7(c). Excess emissions must be reported for all periods of unit operation, including start-up, shutdown, and malfunction.

[45CSR16, 40 C.F.R §60.4375(a)]

6.5.2. For each affected unit that performs annual performance tests in accordance with §60.4340(a), you must submit a written report of the results of each performance test before the close of business on the 60th day following the completion of the performance test.
[45CSR16, 40 C.F.R §60.4375(b)]

6.6. Compliance Plan

6.6.1. None.

West Virginia Department of Environmental Protection
Division of Air Quality

Fact Sheet

For Draft/Proposed Renewal Permitting Action Under 45CSR30 and Title V of the Clean Air Act

Permit Number: **R30-09900013-2022**
Application Received: **May 26, 2022**
Plant Identification Number: **099-00013**
Permittee: **Columbia Gas Transmission, LLC**
Facility Name: **Ceredo Compressor Station**
Mailing Address: **1700 MacCorkle Avenue, SE, Charleston, WV 25314**

Revised: N/A

Physical Location:	Walkers Branch Road, Wayne County, West Virginia
UTM Coordinates:	366.1 km Easting • 4247.7 km Northing • Zone 17
Directions:	Traveling I-64 West from Charleston, take the Kenova-Ceredo exit. Turn left onto Route 52. Make a left onto Airport Road. Turn right onto Walkers Branch Road at the Pilgrim Glass Plant, travel 2 miles, the station is on the left.

Facility Description

The Ceredo Station is a natural gas transmission facility covered by Standard Industrial Code (SIC) 4922. The station has the potential to operate seven (7) days per week, twenty-four (24) hours per day. The station consists of six (6) 2800-hp and one (1) 2700-hp natural gas fired reciprocating compressor engines, one (1) 30,399-hp compressor turbine, and numerous storage tanks of various sizes. On-site support equipment includes one (1) 812 hp and one (1) 1,175 hp emergency generators, one (1) 6.276 MMBtu/hr boiler, and one (1) 0.375 MMBtu/hr and one (1) 0.60 MMBtu/hr line heaters.

Emissions Summary

Plantwide Emissions Summary [Tons per Year]

Regulated Pollutants	Potential Emissions	2020 Actual Emissions
Carbon Monoxide (CO)	310.41	40.86
Nitrogen Oxides (NO_X)	3,582.71	403.14
Particulate Matter ($PM_{2.5}$)	41.03	5.06
Particulate Matter (PM_{10})	41.03	5.06
Total Particulate Matter (TSP)	41.03	5.06
Sulfur Dioxide (SO_2)	1.23	0.19
Volatile Organic Compounds (VOC)	107.30	15.87

PM_{10} is a component of TSP.

Hazardous Air Pollutants	Potential Emissions	2020 Actual Emissions
Benzene	1.39	NA
Toluene	0.81	NA
Ethylbenzene	0.11	NA
Xylene	0.19	NA
n-Hexane	0.38	NA
Formaldehyde	40.11	4.45
Acetaldehyde	5.58	NA
Other HAPs	9.43	NA
Total HAPs	58.00	NA

Some of the above HAPs may be counted as PM or VOCs.

Title V Program Applicability Basis

This facility has the potential to emit 310.41 tons per year of Carbon Monoxide (CO), 3,582.71 tons per year of Nitrogen Oxides (NO_x), 107.30 tons per year of Volatile Organic Compounds (VOC), 40.11 tons per year of Formaldehyde, and 58.00 tons per year of total HAPs. Due to this facility's potential to emit over 100 tons per year of criteria pollutant, over 10 tons per year of a single HAP, and over 25 tons per year of aggregate HAPs, Columbia Gas Transmission, LLC is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

Legal and Factual Basis for Permit Conditions

The State and Federally-enforceable conditions of the Title V Operating Permits are based upon the requirements of the State of West Virginia Operating Permit Rule 45CSR30 for the purposes of Title V of the Federal Clean Air Act and the underlying applicable requirements in other state and federal rules.

This facility has been found to be subject to the following applicable rules:

Federal and State:	45CSR2	PM limits for Indirect Heat Exchangers
	45CSR6	Open burning prohibited.
	45CSR11	Standby plans for emergency episodes.
	45CSR13	Construction permits
	45CSR16	Standards of Performance for New Stationary Sources.
	WV Code § 22-5-4 (a) (14)	The Secretary can request any pertinent information such as annual emission inventory reporting.
	45CSR30	Operating permit requirement.
	45CSR34	Emission Standards for HAPs
	40 C.F.R. 60, Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines
	40 C.F.R. 60, Subpart KKKK	Standards of Performance for Stationary Combustion Turbines
	40 C.F.R. Part 61	Asbestos inspection and removal
	40 C.F.R. 63, Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
	40 C.F.R. 63, Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters
	40 C.F.R. Part 82, Subpart F	Ozone depleting substances
State Only:	45CSR4	No objectionable odors.
	45CSR17	Prevent And Control Particulate Matter Air Pollution From Materials Handling, Preparation, Storage And Other Sources Of Fugitive Particulate Matter

Each State and Federally-enforceable condition of the Title V Operating Permit references the specific relevant requirements of 45CSR30 or the applicable requirement upon which it is based. Any condition of the Title V permit that is enforceable by the State but is not Federally-enforceable is identified in the Title V permit as such.

The Secretary's authority to require standards under 40 C.F.R. Part 60 (NSPS), 40 C.F.R. Part 61 (NESHAPs), and 40 C.F.R. Part 63 (NESHAPs MACT) is provided in West Virginia Code §§ 22-5-1 *et seq.*, 45CSR16, 45CSR34 and 45CSR30.

Active Permits/Consent Orders

Permit or Consent Order Number	Date of Issuance	Permit Determinations or Amendments That Affect the Permit *(if any)*
R13-1856C	December 18, 2017	

Conditions from this facility's Rule 13 permit(s) governing construction-related specifications and timing requirements will not be included in the Title V Operating Permit but will remain independently enforceable under the applicable Rule 13 permit(s). All other conditions from this facility's Rule 13 permit(s) governing the source's operation and compliance have been incorporated into this Title V permit in accordance with the "General Requirement Comparison Table," which may be downloaded from DAQ's website.

Determinations and Justifications

R30-09900013-2016 (SM01) was issued on August 28, 2017 to incorporate the changes approved under R13-1856B issued on July 13, 2017. On December 18, 2017, Class I administrative update R13-1856C was issued to reduce the maximum design heat input of HTR 3 from 1.0 to 0.6 MMBtu/hr and to add three (3) de minimis storage tanks. Since the permittee did not submit a modification to the Title V permit for the changes approved under R13-1856C, they will be incorporated into this Title V renewal.

The following changes and updates have been made to the Title V permit during this renewal:

Section 1.0

- The Emission Units Table was updated to reflect the changes in R13-1856C. The design capacity of HTR3 was changed from 1.0 to 0.60 MMBtu/hr, the 900 gallon oil-water storage tank was added, the 5,000 gallon waste water storage tank was added, and the 5,000 gallon condensate storage tank was added.
- Table 1.2 was updated since R13-1856C supersedes and replaces R13-1856B.

Section 3.0

- Permit condition 3.1.12 was updated to match the latest version of 40 C.F.R. §60.5397a.
- Permit condition 3.5.3 was updated to match the most recent boilerplate.
- Deleted the last paragraph in condition 3.1.9 since this language is not in R13-1856C.
- Moved condition 3.4.4 to the Limits and Standards section as condition 3.1.13 since it is not a recordkeeping requirement.

Section 4.0

- Permit condition 4.1.11 was updated to reflect the changes in R13-1856C. Specifically, the MDHI in condition 4.1.11.a was changed from 1.00 to 0.60 MMBtu/hr and the emission limits in Table 4.1.1.c were updated to reflect the new limits in R13-1856C.

Section 5.0

- Deleted vacated sections 40 C.F.R. §§63.6640(f)(2)(ii) and (iii) from condition 5.1.3 and deleted vacated sections 40 C.F.R. §§60.4243(d)(2)(ii) and (iii) from condition 5.1.8
- Added reporting requirements for G3 and G4 from 40 CFR §60.6650(h) as condition 5.5.2
- Added reporting requirements for G4 from 40 CFR §§60.4245(d) and (e) as conditions 5.5.3 and 5.5.4

Non-Applicability Determinations

The following requirements have been determined not to be applicable to the subject facility due to the following:

According to 45CSR§2-11.1 the boiler and heaters are exempt from the weight emission standards and MRR (monitoring, recordkeeping and reporting) because they are less than 10 mmBtu/hr.

45CSR10; *To Prevent and Control Air Pollution from The Emission of Sulfur Oxides*: 45CSR10 is not applicable to the facility boiler and heaters because they are less than 10 mmBtu/hr.

45CSR21; *To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds:* All storage tanks at Ceredo station are below 40,000 gallons in capacity, hence 45CSR§21-28 is not applicable. Ceredo station is not engaged in the extraction or fractionation of natural gas, hence, 45CSR§21-29 is not applicable.

45CSR27; *To Prevent and Control the Emissions of Toxic Air Pollutants:* Natural gas is included as a petroleum product and contains less than 5% benzene by weight. 45CSR§27-2.4 exempts equipment "used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight."

40 C.F.R. 60 Subpart Dc; *Standards of Performance for Steam Generating Units:* The boiler and heaters at this facility are less than 10 mmBtu/hr; hence, Subpart Dc is not applicable.

40 C.F.R. 60 Subparts K,Ka; *Standards of Performance for Storage Vessels for Petroleum Liquids:* All tanks at Ceredo station are below 40,000 gallons in capacity.

40 C.F.R. 60 Subpart Kb; *Standards of Performance for Volatile Organic Liquid* S*torage Vessels:* All tanks at Ceredo station are below 75m^3 in capacity.

40 C.F.R. 60 Subpart KKK; *Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plant:* Ceredo station is not engaged in the extraction or fractionation of natural gas liquids from field gas, the fractionation of mixed natural gas liquids to natural gas products, or both.

40 C.F.R. 60 Subpart IIII; *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*: There are no compression ignition engines at this facility.

40 C.F.R 60 Subpart OOOO; Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution: Storage vessel requirements do not apply since all tanks commenced construction prior to August 23, 2011.

40 C.F.R. 63 Subpart HHH; *National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities*: The facility does not have a glycol dehydration unit and is therefore not subject to the requirements of this subpart.

40 C.F.R. 63 Subpart YYYY; Turbine *MACT:* The Solar Titan 250 (E10) is subject to 40 C.F.R. 63 Subpart YYYY. Per 40 C.F.R. §63.6095(d), there is a stay of standards for lean premix stationary combustion turbines until EPA takes final action to require compliance with this subpart. The only requirement for the unit is the initial notification requirement of 40 C.F.R. §63.6145, which was satisfied by the preconstruction permit application.

40 C.F.R. 64 – None of the emission units have any add-on controls; therefore, in accordance with 40 C.F.R § 64.2(a), CAM is not applicable to this facility.

Request for Variances or Alternatives

None.

Insignificant Activities

Insignificant emission unit(s) and activities are identified in the Title V application.

Comment Period

Beginning Date:
Ending Date:

Point of Contact

All written comments should be addressed to the following individual and office:

Nikki Moats
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone: 304/926-0499 ext. 41282
Nikki.B.Moats@wv.gov

Procedure for Requesting Public Hearing

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Secretary shall grant such a request for a hearing if he/she concludes that a public hearing is appropriate. Any public hearing shall be held in the general area in which the facility is located.

Response to Comments (Statement of Basis)

Received
May 26, 2021
WV DEP/Div of Air Quality

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : Columbia Gas Transmission, LLC, Ceredo Compressor Station
[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): 099-00013
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): R30-09900013-2016 (SM01) and R13-1856C

- Type of NSR Application (check all that apply):
  - ☐ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Application:
  - ☐ Title V Initial
  - ☑ Title V Renewal
  - ☐ Administrative Amendment**
  - ☐ Minor Modification**
  - ☐ Significant Modification**
  - ☐ Off Permit Change

****If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.**

- Payment Type:
  - ☐ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)
    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☐ Responsible Official/Authorized Representative
    - Name:
    - Email:
    - Phone Number:
  - ☑ Company Contact
    - Name: Trevor Galley
    - Email: trevor_galley@tcenergy.com
    - Phone Number: 304-357-2076
  - ☐ Consultant
    - Name:
    - Email:
    - Phone Number:

Columbia Gas Transmission, LLC

Air Permit Application for Renewal
Ceredo Natural Gas Compressor Station

Ceredo, West Virginia

Prepared By:

ENVIRONMENTAL RESOURCES MANAGEMENT, Inc.
Hurricane, West Virginia

May 2021

Columbia Gas Transmission, LLC
1700 MacCorkle Avenue SE
Charleston, WV 25314

May 26, 2021

Director
WV Department of Environmental Protection (WVDEP)
Division of Air Quality (DAQ)
601 57th Street SE
Charleston, WV 25304

Re: Columbia Gas Transmission, LLC (Columbia)
Ceredo Compressor Station (Facility ID: 099-00013)
Title V Operating Permit Renewal Application

Dear Director,

In accordance WV 45CSR30, please find the attached Title V permit renewal application for Columbia's Ceredo Compressor Station, which is located in Wayne County, West Virginia. Ceredo Compressor Station currently operates under Permit No. R30-09900013-2016 under 45CSR30. The current Title V Permit to Operate expires on December 27, 2021.

This package contains the general application forms along with the required attachments for a Title V renewal permit application. Ceredo Compressor Station's Potential to Emit (PTE) exceeds 100 tons per year for Nitrogen Oxides (NO_x) and Carbon Monoxide (CO) and Volatile Organic Compounds (VOCs). The Ceredo Compressor Station also qualifies as a major source of Hazardous Air Pollutants (HAPs), since the PTE exceeds major source thresholds for formaldehyde and aggregate HAPs. For these reasons, Ceredo in considered a Title V source for permitting purposes.

Should you have any questions regarding the application or if additional information is required, please contact me by email at trevor_galley@tcenergy.com.

Sincerely,

Trevor Galley
Environmental Analyst
TC Energy

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street SE

Charleston, WV 25304

Phone: (304) 926-0475

www.dep.wv.gov/daq

INITIAL/RENEWAL TITLE V PERMIT APPLICATION - GENERAL FORMS

Section 1: General Information

1. **Name of Applicant (As registered with the WV Secretary of State's Office):**
Columbia Gas Transmission, LLC

2. Facility Name or Location:
Ceredo Compressor Station

3. DAQ Plant ID No.:
0 9 9 - 00013

4. Federal Employer ID No. (FEIN):
3 1 0 8 0 2 4 3 5

5. **Permit Application Type:**

☐ Initial Permit — When did operations commence?

☑ Permit Renewal — What is the expiration date of the existing permit?

☐ Update to Initial/Renewal Permit Application

6. Type of Business Entity:

☐ Corporation ☐ Governmental Agency ☑ LLC
☐ Partnership ☐ Limited Partnership

7. Is the Applicant the:

☐ Owner ☐ Operator ☑ Both

If the Applicant is not both the owner and operator, please provide the name and address of the other party.

8. Number of onsite employees:

Less than ten (10) employees

9. Governmental Code:

☑ Privately owned and operated; 0
☐ Federally owned and operated; 1
☐ State government owned and operated; 2
☐ County government owned and operated; 3
☐ Municipality government owned and operated; 4
☐ District government owned and operated; 5

10. Business Confidentiality Claims

Does this application include confidential information (per 45CSR31)? ☐ Yes ☑ No

If yes, identify each segment of information on each page that is submitted as confidential, and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's *"PRECAUTIONARY NOTICE-CLAIMS OF CONFIDENTIALITY"* guidance.

11. Mailing Address		
Street or P.O. Box: 1700 MacCorkle Avenue, SE		
City: Charleston	**State:** WV	**Zip:** 25314
Telephone Number: (304) 357 - 2047	**Fax Number:** (304) 357 - 2770	

12. Facility Location		
Street: 1664 Walkers Branch Road	**City:** Huntington	**County:** Wayne
UTM Easting: 366.115 km	**UTM Northing:** 4247.720 km	**Zone:** ☑ 17 or ☐ 18
Directions: Traveling I-64 West from Charleston, take the Kenova-Ceredo exit. Turn left onto Route 52. Make a left onto Airport Road. Turn right onto Walker's Branch Road at the Pilgrim Glass Plant, and travel 2 miles; the station is on the left.		
Portable Source? ☐ Yes ☑ No		
Is facility located within a nonattainment area? ☐ Yes ☑ No		**If yes, for what air pollutants?**
Is facility located within 50 miles of another state? ☑ Yes ☐ No		**If yes, name the affected state(s).** Kentucky Ohio
Is facility located within 100 km of a Class I Area[1]? ☐ Yes ☑ No **If no, do emissions impact a Class I Area[1]?** ☐ Yes ☑ No		**If yes, name the area(s).**

[1] *Class I areas include Dolly Sods and Otter Creek Wilderness Areas in West Virginia, and Shenandoah National Park and James River Face Wilderness Area in Virginia.*

13. Contact Information		
Responsible Official: Richard Smith		**Title:** Operations Manager
Street or P.O. Box: 1700 MacCorkle Avenue, SE		
City: Charleston	**State:** WV	**Zip:** 25314
Telephone Number: 304-984-4603	**Fax Number:** ( ) -	
E-mail address: richard_smith@tcenergy.com		
Environmental Contact: Trevor Galley		**Title:** Environmental Analyst
Street or P.O. Box: 1700 MacCorkle Avenue, SE		
City: Charleston	**State:** WV	**Zip:** 25314
Telephone Number: (304) 357 - 2076	**Fax Number:** ( ) -	
E-mail address: trevor_galley@tcenergy.com		
Application Preparer: Grant Morgan		**Title:** Principal Consultant
Company: ERM (Environmental Resources Managment)		
Street or P.O. Box: 204 Chase Drive		
City: Hurricane	**State:** wv	**Zip:** 25526
Telephone Number: (304) 590 - 6160	**Fax Number:** ( ) -	
E-mail address: Grant.Morgan@erm.com		

14. Facility Description

List all processes, products, NAICS and SIC codes for normal operation, in order of priority. Also list any process, products, NAICS and SIC codes associated with any alternative operating scenarios if different from those listed for normal operation.

Process	Products	NAICS	SIC
Natural Gas Transmission	Natural Gas	486210	4922

Provide a general description of operations.

The Ceredo Compressor Station is a natural gas transmission facility covered by Standard Industrial Classification (SIC) Code 4922. The station includes seven (7) gas-drive reciprocating compressors, four (4) electric-drive turbines, one (1) gas-drive turbine, two (2) emergency generators, one (1) boiler, two (2) process heaters, and various tanks.

15. Provide an **Area Map** showing plant location as **ATTACHMENT A**.

16. Provide a **Plot Plan(s)**, e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is located as **ATTACHMENT B**.

    For instructions, refer to "Plot Plan - Guidelines."

17. Provide a detailed **Process Flow Diagram(s)** showing each process or emissions unit as **ATTACHMENT C**. Process Flow Diagrams should show all emission units, control equipment, emission points, and their relationships.

Section 2: Applicable Requirements

18. Applicable Requirements Summary	
Instructions: Mark all applicable requirements.	
☑ SIP	☐ FIP
☑ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☑ NESHAP (45CSR34)	☐ Nonattainment NSR (45CSR19)
☐ Section 111 NSPS	☑ Section 112(d) MACT standards
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☑ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ **C**ompliance **A**ssurance **M**onitoring (40CFR64)
☐ CAIR NO_x Annual Trading Program (45CSR39)	☐ CAIR NO_x Ozone Season Trading Program (45CSR40)
☐ CAIR SO_2 Trading Program (45CSR41)	

19. Non Applicability Determinations

List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

45CSR4 – To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors: According to 45CSR§4-7.1, this rule shall not apply to the following sources of objectionable odor until such time as feasible control methods are developed: Internal Combustion Engines

45CSR10 – To Prevent and Control Air Pollution from the Emission of Sulfur Oxides: 45CSR10 is not applicable to the facility's heater because its maximum design heat input (DHI) is less than 10 MMBtu/hr

45CSR21 – To Prevent and Control Air Pollution from the Emission of Volatile Organic Compounds: All storage tanks at the station, which are listed as insignificant sources, are below 40,000 gallons in capacity which exempts the facility from 45CSR§21-28.
The compressor station is not engaged in the extraction or fractionation of natural gas which exempts the facility from 45CSR§21-29 45CSR27 – ToPrevent and Control the Emissions of Toxic Air Pollutants: Natural gas is included as a petroleum product and contains less than 5% benzene by weight. 45CSR§27-2.4 exempts equipment "used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight."

☑ Permit Shield

19. Non Applicability Determinations *(Continued)* - *Attach additional pages as necessary.*

List all requirements which the source has determined not applicable and for which a permit shield is requested. The listing shall also include the rule citation and the reason why the shield applies.

40 CFR 60 Subpart GG – Standards of Performance for Stationary Gas Turbines: The two turbines on site were installed in 1967 and 1971 which predates this NSPS's applicability trigger date of October 3, 1977 as defined in §60.330(b).

40 CFR 60 Subparts K,Ka – Standards of Performance for Storage Vessels for Petroleum Liquids: All tanks at the facility are below 40,000 gallons in capacity as specified in 60.110a(a).

40 CFR 60 Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels: All tanks at the facility are below 75m3 (19,813 gallons) in capacity as specified in 60.110b(a).

40 CFR 60 Subpart KKK – Standards of Performance for Equipment Leaks of VOC From Onshore Natural Gas Processing Plant: This compressor station is not engaged in the extraction or fractionation of natural gas liquids from field gas, the fractionation of mixed natural gas liquids to natural gas products, or both.

40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines: There are no compression ignition engines at this facility.

40 CFR 60 Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines: All engines at the facility were constructed, reconstructed, or modified prior to the June 12, 2006 applicability date listed in 60.4230(a)(4).

40 CFR 60 Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution: The Storage Vessel requirements defined for transmission sources is not applicable to this site because all vessels were constructed, commenced construction, prior to August 23, 2011 as stated in accordance with [40CFR§60.5365(e)].

40 CFR 63 Subpart HHH – National Emission Standards for Hazardous Air Pollutants from Natural gas Transmission and Storage Facilities: This facility does not have a glycol dehydration unit and is therefore not subject to the requirements of this subpart.

40 CFR 64 – Compliance Assurance Monitoring (CAM): There are no add-on controls at this facility; therefore, in accordance with 40CFR§64.2(b)(1), CAM is not applicable to this facility.

☑ Permit Shield

20. Facility-Wide Applicable Requirements

List all facility-wide applicable requirements. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*).

T5 – 3.1.1 – 45 CSR 6-3.1 – Open burning prohibited T5 – 3.1.2 – 45 CSR 6-3.2 – Open burning exemption stipulations
T5 – 3.1.3 – 40 CFR Part 61 and 45 CSR 34 – Asbestos inspection and removal T5 – 3.1.4 – 45 CSR 4 – No objectionable odors
T5 – 3.1.5 – 45 CSR 11-5.2 – Standby plans for emergency episodes T5 – 3.1.6 – WV Code 22-5-4 (a) (14) – Annual emission inventory reporting
T5 – 3.1.7 – 40 CFR Part 82 Subpart F – Ozone depleting substances T5 – 3.1.8 – 40 CFR Part 68 – Risk Management Plan
T5 – 3.1.10 – 45 CSR 30-12.7 – Odor Control for Mercaptan T5 – 3.1.10 – 45 CSR 30-12.7 – Emergency Operating Conditions / unit replacement
T5 - 3.1.12 – 45 CFR Subpart OOOOa – Reduce GHG(in the form of a limitation of Methane) and VOC emissions
T5 – 3.3.1 – 45 CSR 22-5-4(a)(14-15) & 45CSR13 - Stack Testing - Conduct stack testing as required
T5 – 3.4.1 – 45 CSR 30-5.1 - Monitoring information – general monitoring requirements
T5 – 3.4.2 – 45 CSR 30-5.1 - Retention of records - Maintain records for a period of 5 years
T5 – 3.4.3 – 45 CSR 30-5.1 - Odors - Maintain records of odor complaints and corrective actions
T5 – 3.4.4 – 45 CSR 17.3 – Fugitive PM shall not cause statutory Air Pollution
T5 – 3.5.1 – 45 CSR 30-4.4. and 5.1.c.3.D – All documents required by permit shall be certified by a Responsible Official
T5 – 3.5.2 – 45 CSR 30-5.1.c.3.E. - A permittee may request confidential treatment
T5 – 3.5.3 – 45 CSR 30-5 - Communication required or permitted to be made to the DEP and/or USEPA
T5 – 3.5.4 – 45 CSR 30-8 - Certified emissions statement – Operator will Submit a certified emissions statement and pay fees on an annual basis
T5 – 3.5.5 – 45 CSR 30-5.3.e. - Compliance certification. The permittee shall certify compliance with the conditions of this permit on the forms provided by the DAQ T5 – 3.5.6 – 45 SR§30-5.1.c.3.A - Semi-annual monitoring reports. T5 – 3.5.7 – 45 CSR 30-5.7.a through e. - Emergencies
T5 – 3.5.8 – 45 CSR 30-5.1.c.3.B. and C. - Deviations
T5 – 3.5.9 – 45 CSR 30-4.3.h.1.B. New applicable requirements. If any requirement is promulgated, the permittee will meet such requirements on a timely basis
T5 – 3.5.10 – 45 CSR 30-5.1.c.3.C. Natural Gas Use certification during Compliance Certification

☑ Permit Shield

For all facility-wide applicable requirements listed above, provide monitoring/testing / recordkeeping / reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number and/or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

T5 – 3.1.3 – 40 CFR Part 61 and 45 CSR 34 – Prior to demolition/construction buildings will be inspected for asbestos and documented accordingly
T5 – 3.1.4 – 45 CSR 4 – Permittee shall maintain records of all odor complaints received
T5 – 3.1.5 – 45 CSR 11 – Upon request by the Secretary, the permittee shall prepare a standby plan
T5 – 3.1.6 – WV 22-5-4 – The permittee shall submit annual emission inventory reports
T5 – 3.1.7 – 40 CFR Part 82 Subpart F – The permittee will prohibit maintenance, service, or repair of appliances containing ozone depleting substances without persons certified pursuant to 40 CFR 82.161
T5 – 3.1.8 – 40 CFR Part 68 – Should the permittee become subject to 40 CFR Part 68, a RMP shall be submitted
T5 – 3.1.10 – 45CSR§30-12.7 For emergency situations which interrupt the critical supply of natural gas to the public, and which pose a life threatening circumstance to the customer, the permittee is allowed to temporarily replace failed engine(s). Proper notice will be provided to the WVDAQ T5 – 3.3.1 – 45 CSR 22-5-4 Stack Testing – All protocols and reports will be submitted to the WVDAQ
T5 - 3.1.12 – These requirements are independent of the closed vent system and cover requirements in §60.5411a.
T5 – 3.4.1 & 3.4.2 – 45 CSR 30-5.1 Retention of Records - Maintain records of all information required by permit for 5 yrs.
T5 – 3.4.3 – 45 CSR 30-5.1 Odors - Maintain records of all odor complaints and responses.
T5 – 3.5.1 – 45 CSR 30-4.4 and 5.1 Responsible Official - Reports, certifications, etc. shall contain a certification by the responsible official.
T5 – 3.5.4 – 45 CSR 30-8 Certified emissions statement – Operator will Submit a certified emissions statement and pay fees on an annual basis
T5 – 3.5.5 – 45 SR§30-5.3.e Compliance Certification - Prepare and submit an emission inventory as requested
T5 – 3.5.6 – 45 CSR§30-5.1.c.3.A. Semi-annual monitoring reports.
T5 – 3.5.7 – 45 CSR30-5.7.a through e. - For reporting emergency situations, refer to Section 2.17 of this permit
T5 – 3.5.8 – 45 CSR 30-5.1.c.3.B. and C. – Deviations, In addition to required monitoring reports, the permittee shall promptly submit supplemental reports and notices of deviations / include upset conditions, cause of deviation(s) and corrective actions.
T5 – 3.5.9 – 45 CSR 30-4.3.h.1.B. New applicable requirements. If any requirement is promulgated, the permittee will meet such requirements on a timely basis
T5 – 3.5.10 – 45 CSR 30-5.1.c.3.C. During compliance certification, the facility shall certify that the facility burns natural gas in all stationary equipment except, when applicable, for emergency equipment.

Are you in compliance with all facility-wide applicable requirements? ☑ Yes ☐ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

21. Active Permits/Consent Orders		
Permit or Consent Order Number	Date of Issuance MM/DD/YYYY	List any Permit Determinations that Affect the Permit *(if any)*
R30-09900013-2016 (SM01)	12/27/2016	
R13-1856C	12/18/2017	

22. Inactive Permits/Obsolete Permit Conditions		
Permit Number	Date of Issuance	Permit Condition Number

Section 3: Facility-Wide Emissions

23. Facility-Wide Emissions Summary [Tons per Year]	
Criteria Pollutants	Potential Emissions
Carbon Monoxide (CO)	310.41
Nitrogen Oxides (NO_X)	3,582.71
Lead (Pb)	-
Particulate Matter ($PM_{2.5}$)[1]	41.03
Particulate Matter (PM_{10})[1]	41.03
Total Particulate Matter (TSP)	-
Sulfur Dioxide (SO_2)	1.23
Volatile Organic Compounds (VOC)	107.30
Hazardous Air Pollutants[2]	Potential Emissions
Benzene	1.39
Toluene	0.81
Ethylbenzene	0.11
Xylene	0.19
Formaldehyde	40.11
N-hexane	0.38
Acetaldehyde	5.58
Total HAPs	58.00
Regulated Pollutants other than Criteria and HAP	Potential Emissions
CO2e	223,126.75

[1]$PM_{2.5}$ and PM_{10} are components of TSP.
[2]For HAPs that are also considered PM or VOCs, emissions should be included in both the HAPs section and the Criteria Pollutants section.

Section 4: Insignificant Activities

24. Insignificant Activities (Check all that apply)		
☑	1.	Air compressors and pneumatically operated equipment, including hand tools.
☐	2.	Air contaminant detectors or recorders, combustion controllers or shutoffs.
☑	3.	Any consumer product used in the same manner as in normal consumer use, provided the use results in a duration and frequency of exposure which are not greater than those experienced by consumer, and which may include, but not be limited to, personal use items; janitorial cleaning supplies, office supplies and supplies to maintain copying equipment.
☑	4.	Bathroom/toilet vent emissions.
☑	5.	Batteries and battery charging stations, except at battery manufacturing plants.
☑	6.	Bench-scale laboratory equipment used for physical or chemical analysis, but not lab fume hoods or vents. Many lab fume hoods or vents might qualify for treatment as insignificant (depending on the applicable SIP) or be grouped together for purposes of description.
☐	7.	Blacksmith forges.
☐	8.	Boiler water treatment operations, not including cooling towers.
☑	9.	Brazing, soldering or welding equipment used as an auxiliary to the principal equipment at the source.
☐	10.	CO_2 lasers, used only on metals and other materials which do not emit HAP in the process.
☑	11.	Combustion emissions from propulsion of mobile sources, except for vessel emissions from Outer Continental Shelf sources.
☑	12.	Combustion units designed and used exclusively for comfort heating that use liquid petroleum gas or natural gas as fuel.
☑	13.	Comfort air conditioning or ventilation systems not used to remove air contaminants generated by or released from specific units of equipment.
☐	14.	Demineralized water tanks and demineralizer vents.
☐	15.	Drop hammers or hydraulic presses for forging or metalworking.
☐	16.	Electric or steam-heated drying ovens and autoclaves, but not the emissions from the articles or substances being processed in the ovens or autoclaves or the boilers delivering the steam.
☐	17.	Emergency (backup) electrical generators at residential locations.
☐	18.	Emergency road flares.
☑	19.	Emission units which do not have any applicable requirements and which emit criteria pollutants (CO, NO_x, SO_2, VOC and PM) into the atmosphere at a rate of less than 1 pound per hour and less than 10,000 pounds per year aggregate total for each criteria pollutant from all emission units. Please specify all emission units for which this exemption applies along with the quantity of criteria pollutants emitted on an hourly and annual basis: SEE APPENDIX A

24. Insignificant Activities (Check all that apply)		
☑	20.	Emission units which do not have any applicable requirements and which emit hazardous air pollutants into the atmosphere at a rate of less than 0.1 pounds per hour and less than 1,000 pounds per year aggregate total for all HAPs from all emission sources. This limitation cannot be used for any source which emits dioxin/furans nor for toxic air pollutants as per 45CSR27. Please specify all emission units for which this exemption applies along with the quantity of hazardous air pollutants emitted on an hourly and annual basis: SEE APPENDIX A
☐	21.	Environmental chambers not using hazardous air pollutant (HAP) gases.
☐	22.	Equipment on the premises of industrial and manufacturing operations used solely for the purpose of preparing food for human consumption.
☐	23.	Equipment used exclusively to slaughter animals, but not including other equipment at slaughterhouses, such as rendering cookers, boilers, heating plants, incinerators, and electrical power generating equipment.
☑	24.	Equipment used for quality control/assurance or inspection purposes, including sampling equipment used to withdraw materials for analysis.
☐	25.	Equipment used for surface coating, painting, dipping or spray operations, except those that will emit VOC or HAP.
☑	26.	Fire suppression systems.
☑	27.	Firefighting equipment and the equipment used to train firefighters.
☑	28.	Flares used solely to indicate danger to the public.
☑	29.	Fugitive emission related to movement of passenger vehicle provided the emissions are not counted for applicability purposes and any required fugitive dust control plan or its equivalent is submitted.
☐	30.	Hand-held applicator equipment for hot melt adhesives with no VOC in the adhesive formulation.
☑	31.	Hand-held equipment for buffing, polishing, cutting, drilling, sawing, grinding, turning or machining wood, metal or plastic.
☐	32.	Humidity chambers.
☑	33.	Hydraulic and hydrostatic testing equipment.
☑	34.	Indoor or outdoor kerosene heaters.
☑	35.	Internal combustion engines used for landscaping purposes.
☐	36.	Laser trimmers using dust collection to prevent fugitive emissions.
☐	37.	Laundry activities, except for dry-cleaning and steam boilers.
☑	38.	Natural gas pressure regulator vents, excluding venting at oil and gas production facilities.
☐	39.	Oxygen scavenging (de-aeration) of water.
☐	40.	Ozone generators.

24. Insignificant Activities (Check all that apply)		
☑	41.	Plant maintenance and upkeep activities (e.g., grounds-keeping, general repairs, cleaning, painting, welding, plumbing, re-tarring roofs, installing insulation, and paving parking lots) provided these activities are not conducted as part of a manufacturing process, are not related to the source's primary business activity, and not otherwise triggering a permit modification. (Cleaning and painting activities qualify if they are not subject to VOC or HAP control requirements. Asphalt batch plant owners/operators must still get a permit if otherwise requested.)
☑	42.	Portable electrical generators that can be moved by hand from one location to another. "Moved by Hand" means that it can be moved without the assistance of any motorized or non-motorized vehicle, conveyance, or device.
☐	43.	Process water filtration systems and demineralizers.
☑	44.	Repair or maintenance shop activities not related to the source's primary business activity, not including emissions from surface coating or de-greasing (solvent metal cleaning) activities, and not otherwise triggering a permit modification.
☐	45.	Repairs or maintenance where no structural repairs are made and where no new air pollutant emitting facilities are installed or modified.
☐	46.	Routing calibration and maintenance of laboratory equipment or other analytical instruments.
☐	47.	Salt baths using nonvolatile salts that do not result in emissions of any regulated air pollutants. Shock chambers.
☐	48.	Shock chambers.
☐	49.	Solar simulators.
☑	50.	Space heaters operating by direct heat transfer.
☐	51.	Steam cleaning operations.
☐	52.	Steam leaks.
☐	53.	Steam sterilizers.
☑	54.	Steam vents and safety relief valves.
☐	55.	Storage tanks, reservoirs, and pumping and handling equipment of any size containing soaps, vegetable oil, grease, animal fat, and nonvolatile aqueous salt solutions, provided appropriate lids and covers are utilized.
☐	56.	Storage tanks, vessels, and containers holding or storing liquid substances that will not emit any VOC or HAP. Exemptions for storage tanks containing petroleum liquids or other volatile organic liquids should be based on size limits such as storage tank capacity and vapor pressure of liquids stored and are not appropriate for this list.
☐	57.	Such other sources or activities as the Director may determine.
☑	58.	Tobacco smoking rooms and areas.
☑	59.	Vents from continuous emissions monitors and other analyzers.

Section 5: Emission Units, Control Devices, and Emission Points

25. Equipment Table
Fill out the **Title V Equipment Table** and provide it as **ATTACHMENT D**.
26. Emission Units
For each emission unit listed in the **Title V Equipment Table**, fill out and provide an **Emission Unit Form** as **ATTACHMENT E**.
For each emission unit not in compliance with an applicable requirement, fill out a **Schedule of Compliance Form** as **ATTACHMENT F**.
27. Control Devices
For each control device listed in the **Title V Equipment Table**, fill out and provide an **Air Pollution Control Device Form** as **ATTACHMENT G**.
For any control device that is required on an emission unit in order to meet a standard or limitation for which the potential pre-control device emissions of an applicable regulated air pollutant is greater than or equal to the Title V Major Source Threshold Level, refer to the **Compliance Assurance Monitoring (CAM) Form(s)** for CAM applicability. Fill out and provide these forms, if applicable, for each Pollutant Specific Emission Unit (PSEU) as **ATTACHMENT H**.

Section 6: Certification of Information

28. Certification of Truth, Accuracy and Completeness and Certification of Compliance

*Note: This Certification must be signed by a responsible official. The **original**, signed in **blue ink**, must be submitted with the application. Applications without an **original** signed certification will be considered as incomplete.*

a. Certification of Truth, Accuracy and Completeness

I certify that I am a responsible official (as defined at 45CSR§30-2.38) and am accordingly authorized to make this submission on behalf of the owners or operators of the source described in this document and its attachments. I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine and/or imprisonment.

b. Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

Responsible official (type or print)

Name: Richard Smith	Title: Operations Manager

Responsible official's signature:

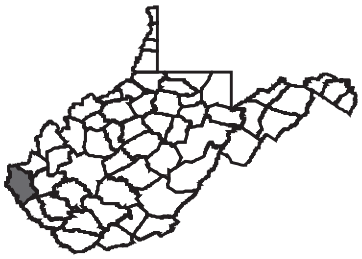
Signature: _____ Signature Date: 5/15/14
(Must be signed and dated in blue ink)

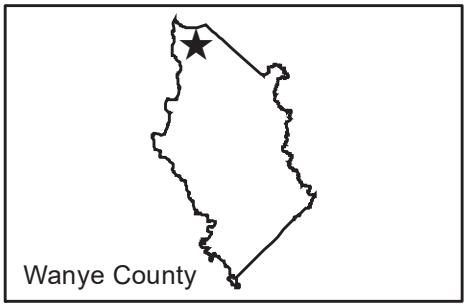
Note: Please check all applicable attachments included with this permit application:

☑	ATTACHMENT A: Area Map
☑	ATTACHMENT B: Plot Plan(s)
☑	ATTACHMENT C: Process Flow Diagram(s)
☑	ATTACHMENT D: Equipment Table
☑	ATTACHMENT E: Emission Unit Form(s)
☐	ATTACHMENT F: Schedule of Compliance Form(s)
☐	ATTACHMENT G: Air Pollution Control Device Form(s)
☐	ATTACHMENT H: Compliance Assurance Monitoring (CAM) Form(s)

All of the required forms and additional information can be found and downloaded from, the DEP website at www.dep.wv.gov/daq, requested by phone (304) 926-0475, and/or obtained through the mail.

Attachment A

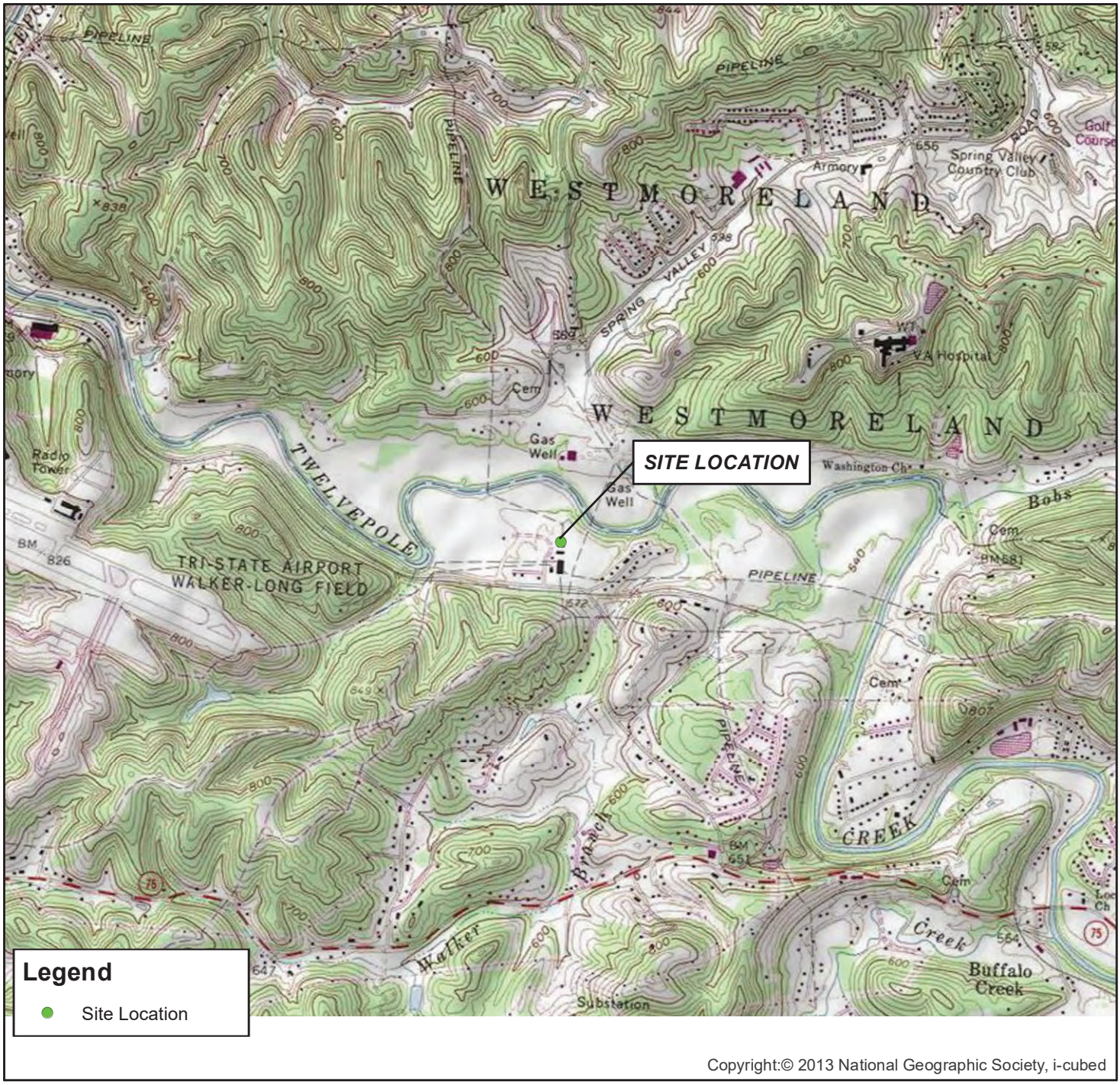




0 1,000 2,000 4,000 Feet

N

LAT. 38.36877 LON. -82.53238
WAYNE COUNTY
WEST VIRGINIA



USGS 1:24K 7.5' Quadrangle:
Burnaugh, WV

SITE LOCATION MAP

Columbia Gas Transmission, LLC

Ceredo Compressor Station
1664 Walkers Branch Road
Huntington, West Virginia

GIS Review: AA
CHK'D: AA
PN: 0570976

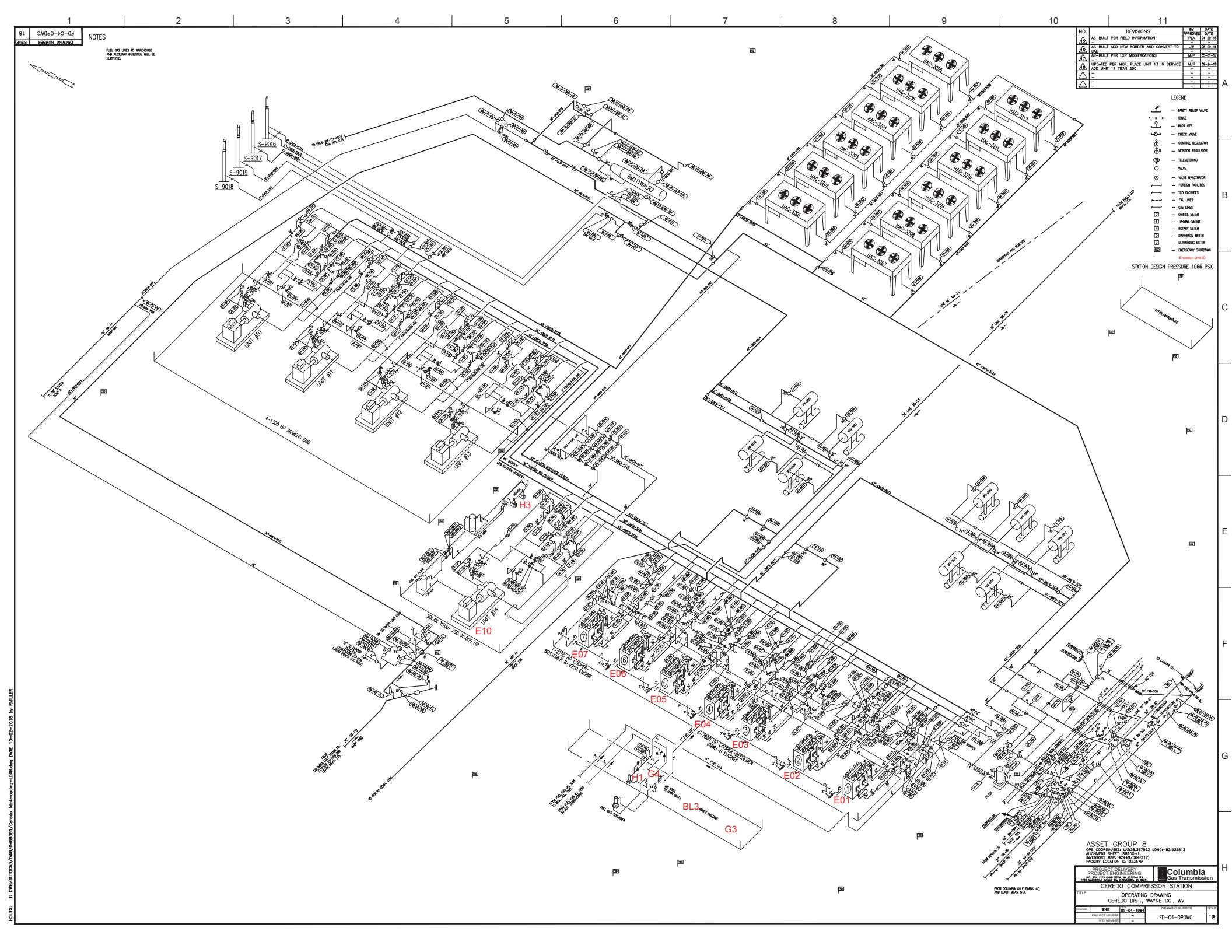
Drawn By:
SRV-4/21/21

Environmental Resources Management

Attachment A

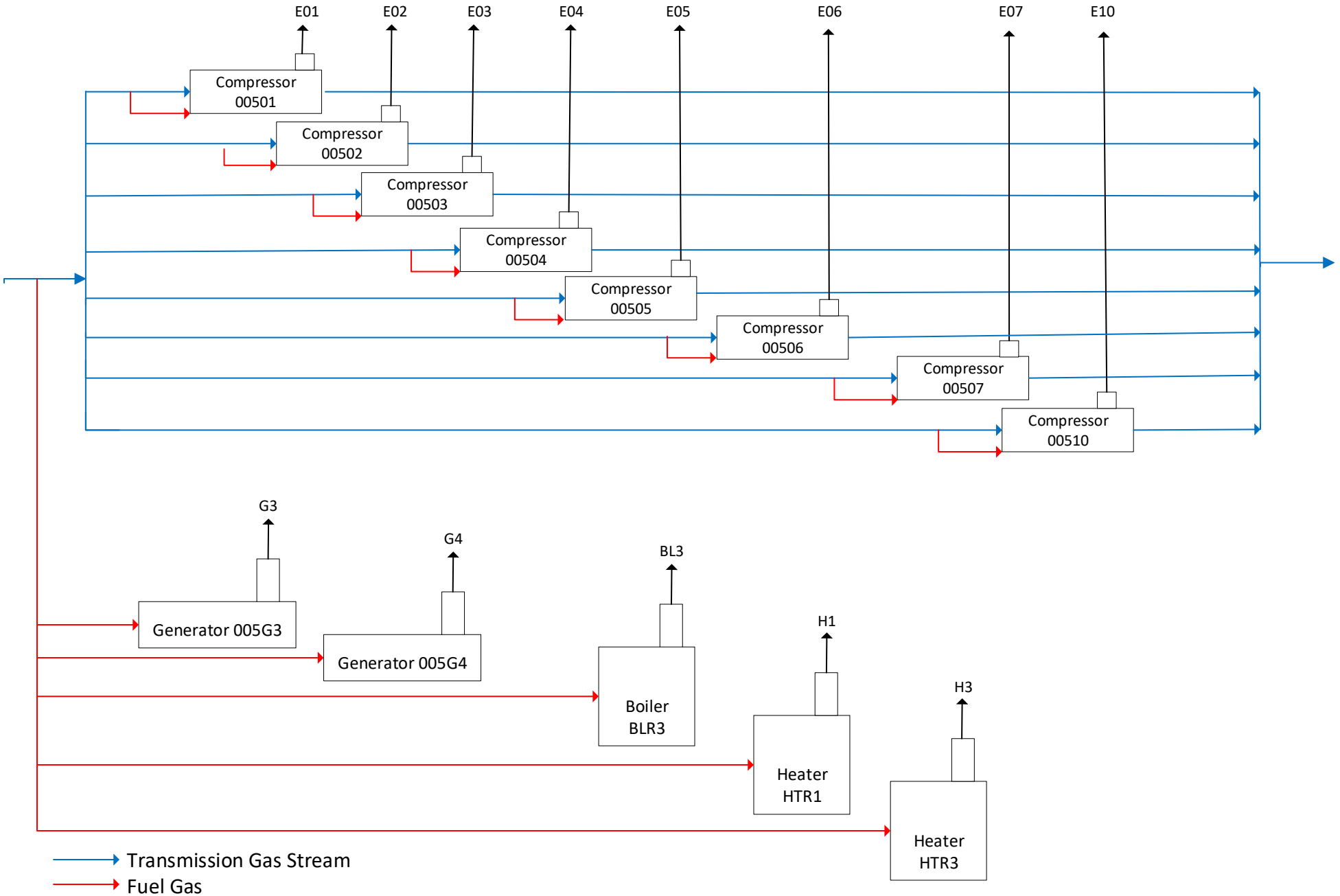
J:\Projects\SiteLocationMaps\Columbia Gas Transmission, LLC_MXD\Figure1-SiteLocationMap_CeredoCompressorStation_20210421.mxd - 4/21/2021\SRV

Attachment B


NOTES
FUEL GAS LINES TO WAREHOUSE AND AUXILIARY BUILDINGS WILL BE SURVEYED.
DRAWING NUMBER FD-C4-OPDWG
ISSUE 18
NO. REVISIONS BY APPROVED DATE
1 AS-BUILT PER FIELD INFORMATION PLA 04-28-15
2 AS-BUILT ADD NEW BORDER AND CONVERT TO CAD JW 05-09-16
3 AS-BUILT PER LXP MODIFICATIONS MJP 05-01-17
4 UPDATED PER MOP, PLACE UNIT 13 IN SERVICE ADD UNIT 14 TITAN 250 MJP 09-24-18
LEGEND
SAFETY RELIEF VALVE
FENCE
BLOW OFF
CHECK VALVE
CONTROL REGULATOR
MONITOR REGULATOR
TELEMETERING
VALVE
VALVE M/ACTUATOR
FOREIGN FACILITIES
TCO FACILITIES
F.G. LINES
GAS LINES
ORIFICE METER
TURBINE METER
ROTARY METER
DIAPHRAGM METER
ULTRASONIC METER
ESD EMERGENCY SHUTDOWN
Emission Unit ID
STATION DESIGN PRESSURE 1066 PSIG
OFFICE/WAREHOUSE
S-9016
S-9017
S-9019
S-9018
EMITTWALR2
HAC-3206
HAC-3205
HAC-3204
HAC-3203
HAC-3202
HAC-3201
HAC-3212
HAC-3211
HAC-3210
HAC-3209
HAC-3208
HAC-3207
UNIT #10
UNIT #11
UNIT #12
UNIT #13
UNIT #14
4-1300 HP SIEMENS EMD
SOLAR TITAN 250 35,000 HP
2-2800 HP COOPER-BESSEMER GMV8-8 ENGINES
2-2700 HP DRESSER-CLARK DPC-H-VGD ENGINE
H1
H3
G3
G4
BL3
E01
E02
E03
E04
E05
E06
E07
E10
ASSET GROUP 8
GPS COORDINATES: LAT:38.367892 LONG:-82.532813
ALIGNMENT SHEET: GM130-367892
INVENTORY UNIT: K244A/3441(17)
FACILITY LOCATION ID: 023579
PROJECT DELIVERY
PROJECT ENGINEERING
Columbia Gas Transmission
CERETO COMPRESSOR STATION
TITLE
OPERATING DRAWING
CERETO DIST., WAYNE CO., WV
DRAWN BY BNR 09-04-1984
PROJECT NUMBER –
W.O. NUMBER –
DRAWING NUMBER FD-C4-OPDWG
ISSUE 18
HOUTX: T:\ DWG\AUTOCAD\DWG\7469351\Cereto fd-c4-opdwg-LDAR.dwg DATE: 10-02-2018 by RMILLER

Attachment C

Attachment C
Ceredo Compressor Station Process Flow Diagram



Attachment D

ATTACHMENT D - Title V Equipment Table

(includes all emission units at the facility except those designated as insignificant activities in Section 4, Item 24 of the General Forms)

Emission Point ID[1]	Control Device[1]	Emission Unit ID[1]	Emission Unit Description	Design Capacity	Year Installed/ Modified
E01	N/A	00501*	Reciprocating Engine/Integral Compressor; Cooper-Bessemer	2,800 hp	1954
E02	N/A	00502*	Reciprocating Engine/Integral Compressor; Cooper-Bessemer	2,800 hp	1954
E03	N/A	00503*	Reciprocating Engine/Integral Compressor; Cooper-Bessemer	2,800 hp	1954
E04	N/A	00504*	Reciprocating Engine/Integral Compressor; Cooper-Bessemer	2,800 hp	1957
E05	N/A	00505*	Reciprocating Engine/Integral Compressor; Cooper-Bessemer	2,800 hp	1958
E06	N/A	00506*	Reciprocating Engine/Integral Compressor; Cooper-Bessemer	2,800 hp	1960
E07	N/A	00507*	Reciprocating Engine/Integral Compressor; Cooper-Bessemer	2,700 hp	1965
E10	N/A	00510*	Solar Titan 250 Turbine	30,399 hp	2018
G3	N/A	005G3*	Reciprocating Engine/Generator; Waukesha 3521GL	812 hp	1996
H1	N/A	HTR1*	Fuel Gas Heater; FLAMECO; Model # FAH14	0.375 MMBtu/hr	1998
BL3	N/A	BLR3*	Heating System Boiler; Hurst;	6.276 MMBtu/hr	2012
G4	N/A	005G4*	Reciprocating Engine/Generator, Waukesha VGF-P48GL	1,175 hp	2018
H3	N/A	HTR3*	PROCESS HEATER	0.6 MMBtu/hr	2018

[1]For 45CSR13 permitted sources, the numbering system used for the emission points, control devices, and emission units should be consistent with the numbering system used in the 45CSR13 permit. For grandfathered sources, the numbering system should be consistent with registrations or emissions inventory previously submitted to DAQ. For emission points, control devices, and emissions units which have not been previously labeled, use the following 45CSR13 numbering system: 1S, 2S, 3S,... or other appropriate description for emission units; 1C, 2C, 3C,... or other appropriate designation for control devices; 1E, 2E, 3E, ... or other appropriate designation for emission points.

Attachment E

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
005G3	Reciprocating Engine/Generator	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
4-cycle, lean burn

Manufacturer:	**Model number:**	**Serial number:**
Waukesha	3521GL	NA
Construction date:	**Installation date:**	**Modification date(s):**
NA	1996	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 812 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? X Yes ___ No	**If yes, is it?** ___ Indirect Fired X Direct Fired
Maximum design heat input and/or maximum horsepower rating: 812 hp	**Type and Btu/hr rating of burners:** 8,000 Btu/hp-hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
6,369 scf/hr / 55,792,440 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

40 C.F.R. § 63.6603(a) and Table 2d (Line 10) – Maintenance Requirements
40 C.F.R. § 63.6605 – Operating Requirements
40 C.F.R. § 63.6625(e)(5), (h), and (j) – Monitoring Requirements
40 C.F.R. § 63.6640(a) and Table 6 (Line 9) – Continuous Compliance Requirements
40 C.F.R. § 63.6660 – Recordkeeping Requirements
40 C.F.R. § 63.6665 – General Requirements/Provisions
40 C.F.R. § 60 Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE)

✓ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 C.F.R. § 63.6603 (a) and Table 2d (Line 10) – Change oil and oil filter, and inspect spark plugs, hoses, and belts every 1,440 hours of operation, or annually, whichever occurs first, and replace as necessary
40 C.F.R. § 63.6605 – Must comply with all emission, operating, and work practice standards at all times.
40 C.F.R. § 63.6625(e)(5), 63.6640 and Table 6 (Line 9) – Work or Management Practices: Operate and Maintain the RICE according to the manufacturer's instructions OR develop and follow your own maintenance plan
40 C.F.R. § 63.6625 (h) – Minimize Idle Time during Startup to not exceed 30 Minutes
40 C.F.R. § 63.6625 (j) – Oil Analysis Program in lieu of Oil change requirement in Table 2d (Line 10)
40 C.F.R. § 63.6655 (d), and (e)(3) – Keep records of maintenance conducted and operating schedule on the RICE
40 C.F.R. § 63.6660 – Records retained for five (5) years and readily available for expeditious review
40 C.F.R. § 60 Subpart JJJJ establishes emission standards for applicable SI ICE. The emergency generator (G3) is subject to the emission limits for emergency engines greater than 130 hp as required under 40CFR60 Table 1.
The emission limits are 2.0 g/hp-hr for NOx, 4.0 g/hp-hr for CO, and 1.0 g/hp-hr. The emergency generator meets these emission limits.
The engine is not certified by the manufacturer to meet the emission standards listed in 40CFR60 Subpart JJJJ. Therefore, CGT will be required to conduct performance testing.

Are you in compliance with all applicable requirements for this emission unit? ✓ Yes ___ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
00501	Reciprocating Engine/Integral Compressor	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer:	**Model number:**	**Serial number:**
Cooper-Bessemer	GMWH-8	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	1954	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,800 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? X Yes ___ No	**If yes, is it?** ___ Indirect Fired X Direct Fired
Maximum design heat input and/or maximum horsepower rating: 2,800 hp	**Type and Btu/hr rating of burners:** 8,400 Btu/hp-hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
23,060 scf/hr / 202,005,600 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

Therefore, there are no specific applicable requirements for this emission unit other than those to submit a certified emission statement in accordance with Title V permit condition 3.5.4 and an annual emission inventory according to Title V permit condition 3.1.6.

X Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
00502	Reciprocating Engine/Integral Compressor	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer:	**Model number:**	**Serial number:**
Cooper-Bessemer	GMWH-8	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	1954	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,800 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? X Yes ___ No	**If yes, is it?** ___ Indirect Fired X Direct Fired
Maximum design heat input and/or maximum horsepower rating: 2,800 hp	**Type and Btu/hr rating of burners:** 8,400 Btu/hp-hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
23,060 scf/hr / 202,005,600 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

Therefore, there are no specific applicable requirements for this emission unit other than those to submit a certified emission statement in accordance with Title V permit condition 3.5.4 and an annual emission inventory according to Title V permit condition 3.1.6.

X Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
00503	Reciprocating Engine/Integral Compressor	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer:	**Model number:**	**Serial number:**
Cooper-Bessemer	GMWH-8	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	1954	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,800 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel?	**If yes, is it?**
X Yes ___ No	___ Indirect Fired X Direct Fired

Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
2,800 hp	8,400 Btu/hp-hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
23,060 scf/hr / 202,005,600 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

Therefore, there are no specific applicable requirements for this emission unit other than those to submit a certified emission statement in accordance with Title V permit condition 3.5.4 and an annual emission inventory according to Title V permit condition 3.1.6.

X Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
00504	Reciprocating Engine/Integral Compressor	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer:	**Model number:**	**Serial number:**
Cooper-Bessemer	GMWH-8	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	1957	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,800 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel?	**If yes, is it?**
X Yes ___ No	___ Indirect Fired X Direct Fired

Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
2,800 hp	8,400 Btu/hp-hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
23,060 scf/hr / 202,005,600 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

Therefore, there are no specific applicable requirements for this emission unit other than those to submit a certified emission statement in accordance with Title V permit condition 3.5.4 and an annual emission inventory according to Title V permit condition 3.1.6.

X Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
00505	Reciprocating Engine/Integral Compressor	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer:	**Model number:**	**Serial number:**
Cooper-Bessemer	GMWH-8	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	1958	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,800 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? X Yes ___ No	**If yes, is it?** ___ Indirect Fired X Direct Fired
Maximum design heat input and/or maximum horsepower rating: 2,800 hp	**Type and Btu/hr rating of burners:** 8,400 Btu/hp-hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
23,060 scf/hr / 202,005,600 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

Therefore, there are no specific applicable requirements for this emission unit other than those to submit a certified emission statement in accordance with Title V permit condition 3.5.4 and an annual emission inventory according to Title V permit condition 3.1.6.

X Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
00506	Reciprocating Engine/Integral Compressor	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer:	**Model number:**	**Serial number:**
Cooper-Bessemer	GMWH-8	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	1960	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,800 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? X Yes ___ No	**If yes, is it?** ___ Indirect Fired X Direct Fired
Maximum design heat input and/or maximum horsepower rating: 2,800 hp	**Type and Btu/hr rating of burners:** 8,400 Btu/hp-hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
23,060 scf/hr / 202,005,600 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

Therefore, there are no specific applicable requirements for this emission unit other than those to submit a certified emission statement in accordance with Title V permit condition 3.5.4 and an annual emission inventory according to Title V permit condition 3.1.6.

X Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
00507	Reciprocating Engine/Integral Compressor	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
2-cycle, lean burn

Manufacturer:	**Model number:**	**Serial number:**
Cooper-Bessemer	8V-250	NA

Construction date:	**Installation date:**	**Modification date(s):**
NA	1965	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 2,700 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? X Yes ___ No	**If yes, is it?** ___ Indirect Fired X Direct Fired
Maximum design heat input and/or maximum horsepower rating: 2,700 hp	**Type and Btu/hr rating of burners:** 7,800 Btu/hp-hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
20,647 scf/hr / 180,867,720 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

According to 40 CFR 63.6590(b)(3)(i) and 40 CFR 63.6600(c), this existing, non-emergency, SI 2SLB engine > 500 hp located at a major source of HAPs does not have any requirements under 40 CFR Part 63 Subpart ZZZZ because it was constructed prior to December 12, 2002.

Therefore, there are no specific applicable requirements for this emission unit other than those to submit a certified emission statement in accordance with Title V permit condition 3.5.4 and an annual emission inventory according to Title V permit condition 3.1.6.

X Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

The emission unit shall track fuel usage and hours of operation in order to quantify annual emissions from this unit.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
00510	Solar Titan 250 Turbine	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):

TURB ENG/CENT COM #00510

Manufacturer:	**Model number:**	**Serial number:**
SOLAR	MARS 100	
Construction date: (MM/DD/YYYY)	**Installation date:** (MM/DD/YYYY)	**Modification date(s):** (MM/DD/YYYY)
/ /	10/1/2018	/ / ; / / / / ; / /

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):

30399 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel?	**If yes, is it?**
✓ Yes ___ No	___ Indirect Fired ✓ Direct Fired
Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
30399 hp	

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural gas

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	See Appendix A
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

40 C.F.R. § 63.6603(a) and Table 2d (Line 10) – Maintenance Requirements
40 C.F.R. § 63.6605 – Operating Requirements
40 C.F.R. § 63.6625(e)(5), (h), and (j) – Monitoring Requirements
40 C.F.R. § 63.6640(a) and Table 6 (Line 9) – Continuous Compliance Requirements
40 C.F.R. § 63.6660 – Recordkeeping Requirements
40 C.F.R. § 63.6665 – General Requirements/Provisions
40 C.F.R § 60 Subpart KKKK Standards of Performance for Stationary Combustion Turbines

✓ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 C.F.R § 60 Subpart KKKK - CT shall meet NOx emission limits of 25 ppm at 15 percent O2 or 150 ng/J of useful output (1.2 lb/MWh). CT must also comply with either paragraph 40 C.F.R.§60.4330(a)(1), (a)(2), or (a)(3). [45CSR16, 40 C.F.R §60.4330(a)]

Are you in compliance with all applicable requirements for this emission unit? ✓ Yes ___ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emi i n Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
BLR3	Heating System Boiler	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):
Heating boiler

Manufacturer:	**Model number:**	**Serial number:**
Hurst	NA	NA
Construction date:	**Installation date:**	**Modification date(s):**
NA	2012	NA

Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 6.276 mmBtu/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8,760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? X Yes ___ No	**If yes, is it?** X Indirect Fired __ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 6.276 mmBtu/hr	**Type and Btu/hr rating of burners:** 6.276 mmBtu/hr

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.
Natural Gas
6,153 scf/hr / 53,900,000 scf/yr

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements
List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included. 45CSR34, 40 C.F.R. 63.7500(a)(1)&(3) and Table 3, Item 1 – Tune Up Requirement Work Practice 40 C.F.R. 63.7510(g) Initial Compliance Demonstration Date for New Sources. 40 C.F.R. 63.7540(a)(10) & (a)(12) Tune up Requirements and Schedule
X Permit Shield
For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.) 40 C.F.R. 63.7515(d) Tune up Test Frequency 40 C.F.R. 63.7555(a)(1) Record of Each Notification & Report 40 C.F.R. 63.7560 Requirement for Maintaining Records 40 C.F.R. 63.7545(e)(1)&(e)(8) Notification of Compliance Status Reporting Requirements. 40 C.F.R. 63.7550(b) & (b)(5) Report Submission – Semi Annual for Title V sources 40 C.F.R. 63.7550(c)(1), (c)(5)(i)-(iii), (c)(xiv), and (c)(xvii) Content of compliance reports.
Are you in compliance with all applicable requirements for this emission unit? X Yes ___No If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description		
Emission unit ID number: HTR1	**Emission unit name:** Fuel Gas Heater	**List any control devices associated with this emission unit:** NA
Provide a description of the emission unit (type, method of operation, design parameters, etc.): Fuel Gas Heater		
Manufacturer: FLAMECO	**Model number:** FAH14	**Serial number:** NA
Construction date: NA	**Installation date:** 1998	**Modification date(s):** NA
Design Capacity (examples: furnaces - tons/hr, tanks - gallons): 0.375 mmBtu/hr		

Maximum Hourly Throughput: NA	**Maximum Annual Throughput:** NA	**Maximum Operating Schedule:** 8,760
Fuel Usage Data **(fill out all applicable fields)**		
Does this emission unit combust fuel? X Yes ___ No		**If yes, is it?** X Indirect Fired ___ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 0.375 mmBtu/hr		**Type and Btu/hr rating of burners:** 0.375 mmBtu/hr
List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each. Natural Gas 343.6 scf/hr / 3,010,000 scf/yr		

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data

Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		

Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
	See Appendix A	

Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

45CSR34, 40 C.F.R. 63.7500(a)(1)&(3) and Table 3, Item 1 – Tune Up Requirement Work Practice
40 C.F.R. 63.7510(e) Initial Compliance Date for Existing Sources
40 C.F.R. 63.7540(a)(10) & (a)(12) Tune up Requirements and Schedule

X Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 C.F.R. 63.7515(d) Tune up Test Frequency
40 C.F.R. 63.7555(a)(1) Record of Each Notification & Report
40 C.F.R. 63.7560 Requirement for Maintaining Records
40 C.F.R 63.7530 (e) & (f) Initial Compliance for Existing Source Energy Assessment Requirements
40 C.F.R. 63.7545(e)(1)&(e)(8) Notification of Compliance Status Reporting Requirements.
40 C.F.R. 63.7550(b) & (b)(5) Report Submission – Semi Annual for Title V sources
40 C.F.R. 63.7550(c)(1), (c)(5)(i)-(iii), (c)(xiv), and (c)(xvii) Content of compliance reports.

Are you in compliance with all applicable requirements for this emission unit? X Yes ___No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
HTR3	PROCESS HEATER	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):

Fuel Gas Heater

Manufacturer:	**Model number:**	**Serial number:**

Construction date: (MM/DD/YYYY)	**Installation date:** (MM/DD/YYYY)	**Modification date(s):** (MM/DD/YYYY)
/ /	1 / 1 / 2018	/ / ; / / / / ; / /

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):

0.6 MMBtu/hr

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel?	**If yes, is it?**
✓ Yes ___ No	___ Indirect Fired ✓ Direct Fired

Maximum design heat input and/or maximum horsepower rating:	**Type and Btu/hr rating of burners:**
0.6 MMBtu/hr	

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural gas

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	See Appendix A
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

45CSR34, 40 C.F.R. 63.7500(a)(1)&(3) and Table 3, Item 1 – Tune Up Requirement Work Practice
40 C.F.R. 63.7510(e) Initial Compliance Date for Existing Sources
40 C.F.R. 63.7540(a)(10) & (a)(12) Tune up Requirements and Schedule

✓ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 C.F.R. 63.7515(d) Tune up Test Frequency
40 C.F.R. 63.7555(a)(1) Record of Each Notification & Report
40 C.F.R. 63.7560 Requirement for Maintaining Records
40 C.F.R 63.7530 (e) & (f) Initial Compliance for Existing Source Energy Assessment Requirements
40 C.F.R. 63.7545(e)(1)&(e)(8) Notification of Compliance Status Reporting Requirements.
40 C.F.R. 63.7550(b) & (b)(5) Report Submission – Semi Annual for Title V sources
40 C.F.R. 63.7550(c)(1), (c)(5)(i)-(iii), (c)(xiv), and (c)(xvii) Content of compliance reports.

Are you in compliance with all applicable requirements for this emission unit? ✓ Yes ___ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

ATTACHMENT E - Emission Unit Form

Emission Unit Description

Emission unit ID number:	**Emission unit name:**	**List any control devices associated with this emission unit:**
005G4	RECIP ENG/GEN #005G4	NA

Provide a description of the emission unit (type, method of operation, design parameters, etc.):

4-cycle, lean burn Emergency Generator

Manufacturer:	**Model number:**	**Serial number:**
WAUKESHA	VGF-P48GL	
Construction date: (MM/DD/YYYY) / /	**Installation date:** (MM/DD/YYYY) 1 / 1 / 2018	**Modification date(s):** (MM/DD/YYYY) / / ; / / / / ; / /

Design Capacity (examples: furnaces - tons/hr, tanks - gallons):

1,175 hp

Maximum Hourly Throughput:	**Maximum Annual Throughput:**	**Maximum Operating Schedule:**
NA	NA	8760

Fuel Usage Data **(fill out all applicable fields)**

Does this emission unit combust fuel? ✓ Yes ___ No	**If yes, is it?** ___ Indirect Fired ✓ Direct Fired
Maximum design heat input and/or maximum horsepower rating: 1,175 hp	**Type and Btu/hr rating of burners:**

List the primary fuel type(s) and if applicable, the secondary fuel type(s). For each fuel type listed, provide the maximum hourly and annual fuel usage for each.

Natural gas

Describe each fuel expected to be used during the term of the permit.

Fuel Type	Max. Sulfur Content	Max. Ash Content	BTU Value
Natural Gas	Pipeline Quality		1,020 Btu/scf

Emissions Data		
Criteria Pollutants	Potential Emissions	
	PPH	TPY
Carbon Monoxide (CO)	See Appendix A	See Appendix A
Nitrogen Oxides (NO_X)		
Lead (Pb)		
Particulate Matter ($PM_{2.5}$)		
Particulate Matter (PM_{10})		
Total Particulate Matter (TSP)		
Sulfur Dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Hazardous Air Pollutants	Potential Emissions	
	PPH	TPY
Regulated Pollutants other than Criteria and HAP	Potential Emissions	
	PPH	TPY

List the method(s) used to calculate the potential emissions (include dates of any stack tests conducted, versions of software used, source and dates of emission factors, etc.).

See Appendix A

Applicable Requirements

List all applicable requirements for this emission unit. For each applicable requirement, include the underlying rule/regulation citation and/or construction permit with the condition number. (*Note: Title V permit condition numbers alone are not the underlying applicable requirements*). If an emission limit is calculated based on the type of source and design capacity or if a standard is based on a design parameter, this information should also be included.

40 C.F.R. § 63.6603(a) and Table 2d (Line 10) – Maintenance Requirements
40 C.F.R. § 63.6605 – Operating Requirements
40 C.F.R. § 63.6625(e)(5), (h), and (j) – Monitoring Requirements
40 C.F.R. § 63.6640(a) and Table 6 (Line 9) – Continuous Compliance Requirements
40 C.F.R. § 63.6660 – Recordkeeping Requirements
40 C.F.R. § 63.6665 – General Requirements/Provisions
40 C.F.R. § 60 Subpart JJJJ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE)

✓ Permit Shield

For all applicable requirements listed above, provide monitoring/testing/recordkeeping/reporting which shall be used to demonstrate compliance. If the method is based on a permit or rule, include the condition number or citation. (Note: Each requirement listed above must have an associated method of demonstrating compliance. If there is not already a required method in place, then a method must be proposed.)

40 C.F.R. § 63.6603 (a) and Table 2d (Line 10) – Change oil and oil filter, and inspect spark plugs, hoses, and belts every 1,440 hours of operation, or annually, whichever occurs first, and replace as necessary
40 C.F.R. § 63.6605 – Must comply with all emission, operating, and work practice standards at all times.
40 C.F.R. § 63.6625(e)(5), 63.6640 and Table 6 (Line 9) – Work or Management Practices: Operate and Maintain the RICE according to the manufacturer's instructions OR develop and follow your own maintenance plan
40 C.F.R. § 63.6625 (h) – Minimize Idle Time during Startup to not exceed 30 Minutes
40 C.F.R. § 63.6625 (j) – Oil Analysis Program in lieu of Oil change requirement in Table 2d (Line 10)
40 C.F.R. § 63.6655 (d), and (e)(3) – Keep records of maintenance conducted and operating schedule on the RICE
40 C.F.R. § 63.6660 – Records retained for five (5) years and readily available for expeditious review
40 C.F.R. § 60 Subpart JJJJ establishes emission standards for applicable SI ICE. The emergency generator (G3) is subject to the emission limits for emergency engines greater than 130 hp as required under 40CFR60 Table 1.
The emission limits are 2.0 g/hp-hr for NOx, 4.0 g/hp-hr for CO, and 1.0 g/hp-hr. The emergency generator meets these emission limits.
The engine is not certified by the manufacturer to meet the emission standards listed in 40CFR60 Subpart JJJJ. Therefore, CGT will be required to conduct performance testing.

Are you in compliance with all applicable requirements for this emission unit? ✓ Yes ___ No

If no, complete the **Schedule of Compliance Form** as **ATTACHMENT F**.

Appendix A

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Facility Total PTE

Source	Capacity	Annual Emissions (tpy)															
		NO_x		CO		CO_2e		$PM_{10}/PM_{2.5}$		VOC		SO_2		CH_2O		Total HAP	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
E01 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	247.02	491.79	17.65	35.08	3,030	12,063	1.25	4.98	3.10	12.36	1.48	0.07	1.43	5.69	2.06	8.19
E02 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	247.02	491.79	17.65	35.08	3,030	12,063	1.25	4.98	3.10	12.36	1.48	0.07	1.43	5.69	2.06	8.19
E03 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	247.02	491.79	17.65	35.08	3,030	12,063	1.25	4.98	3.10	12.36	1.48	0.07	1.43	5.69	2.06	8.19
E04 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	247.02	491.79	17.65	35.08	3,030	12,063	1.25	4.98	3.10	12.36	1.48	0.07	1.43	5.69	2.06	8.19
E05 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	247.02	491.79	17.65	35.08	3,030	12,063	1.25	4.98	3.10	12.36	1.48	0.07	1.43	5.69	2.06	8.19
E06 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	247.02	491.79	17.65	35.08	3,030	12,063	1.25	4.98	3.10	12.36	1.48	0.07	1.43	5.69	2.06	8.19
E07 - Cooper-Bessemer 8V-250 Engine	2,700 hp	297.00	591.30	17.65	39.03	2,713	10,801	1.12	4.46	2.78	11.07	1.48	0.07	1.28	5.09	1.84	7.34
G3 - Waukesha Emergency Generator	812 hp	2.44	0.61	4.31	1.08	761	190	0.06	0.02	1.63	0.41	0.37	1.16E-03	0.34	0.09	0.47	0.12
H1 - Fuel Gas Heater	0.375 MMBtu/hr	0.04	0.16	0.03	0.14	44	192	2.79E-03	0.01	2.02E-03	0.01	0.02	1.17E-03	2.76E-05	1.21E-04	6.94E-04	3.04E-03
BL3 - Heating System Boiler	6.28 MMBtu/hr	0.62	2.69	0.52	2.26	735	3,219	0.05	0.20	0.03	0.15	0.36	0.02	0.000	0.002	0.01	0.05
E10 - Solar Titan 250 Turbine	30,399 hp (32 °F)	23.84	35.67	12.06	54.65	26,074	114,203	1.47	6.44	1.38	6.03	12.71	0.70	0.16	0.69	0.23	1.00
G4 - Waukesha Emergency Generator	1,175 hp	5.18	1.30	10.36	2.59	1,064	266	0.09	0.02	2.59	0.65	0.52	1.62E-03	0.49	0.12	0.67	0.17
H3 - Process Heater	0.60 MMBtu/hr	0.06	0.26	0.05	0.22	70	308	4.47E-03	0.02	3.24E-03	0.01	0.03	1.88E-03	4.41E-05	1.93E-04	1.11E-03	4.87E-03
Equipment Leaks (fugitive emissions)[1,2]						905.86	3,968			0.56	2.46					0.01	0.03
Liquid Storage Tanks						1.38	6.04			0.32	1.42					4.50E-06	1.97E-05
Pneumatic Emissions						69.19	303.05			0.04	0.19					5.74E-04	2.51E-03
Blowdowns						--	21,265.28			--	13.19					--	0.17
Proposed PTE[1]		1,811.26	3,582.71	150.87	310.41	49,708.07	223,132.79	10.30	41.03	27.42	107.30	24.36	1.23	10.84	40.11	15.57	58.00

Notes:
1. Excludes fugitive emissions (compressor stations are not one of the named soure categories that include fugitive emissions).

Columbia Gas Transmission, LLC
Ceredo Compressor Station
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Facility Total HAPs Emissions

Source	Capacity	Total HAPs		Methanol		Formaldehyde		Hexane		Benzene		Toluene		Ethylbenzene		Xylene		2,2,4-Trimethylpentane		Acetaldehyde	
		lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr
E01 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	2.06	8.19	0.26	1.53	1.43	5.69	0.01	0.05	0.05	0.20	0.02	0.10	2.79E-03	0.01	0.01	0.03	0.02	0.09	0.20	0.80
E02 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	2.06	8.19	0.26	1.53	1.43	5.69	0.01	0.05	0.05	0.20	0.02	0.10	2.79E-03	0.01	0.01	0.03	0.02	0.09	0.20	0.80
E03 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	2.06	8.19	0.26	1.53	1.43	5.69	0.01	0.05	0.05	0.20	0.02	0.10	2.79E-03	0.01	0.01	0.03	0.02	0.09	0.20	0.80
E04 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	2.06	8.19	0.26	1.53	1.43	5.69	0.01	0.05	0.05	0.20	0.02	0.10	2.79E-03	0.01	0.01	0.03	0.02	0.09	0.20	0.80
E05 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	2.06	8.19	0.26	1.53	1.43	5.69	0.01	0.05	0.05	0.20	0.02	0.10	2.79E-03	0.01	0.01	0.03	0.02	0.09	0.20	0.80
E06 - Cooper-Bessemer GMWH-8 Engine	2,800 hp	2.06	8.19	0.26	1.53	1.43	5.69	0.01	0.05	0.05	0.20	0.02	0.10	2.79E-03	0.01	0.01	0.03	0.02	0.09	0.20	0.80
E07 - Cooper-Bessemer 8V-250 Engine	2,700 hp	1.84	7.34	0.06	0.23	1.28	5.09	0.01	0.04	0.04	0.18	0.02	0.09	2.50E-03	0.01	0.01	0.02	0.02	0.08	0.18	0.72
G3 - Waukesha Emergency Generator	812 hp	0.47	0.12	0.02	4.06E-03	0.34	0.09	0.01	1.80E-03	2.86E-03	7.15E-04	2.65E-03	6.63E-04	2.58E-04	6.45E-05	1.20E-03	2.99E-04	1.62E-03	4.06E-04	0.05	0.01
H1 - Fuel Gas Heater	0.375 MMBtu/hr	6.94E-04	3.04E-03	--	--	2.76E-05	1.21E-04	6.62E-04	2.90E-03	7.72E-07	3.38E-06	1.25E-06	5.48E-06	--	--	--	--	--	--	--	--
BL3 - Heating System Boiler	6.28 MMBtu/hr	0.01	0.05	--	--	4.61E-04	2.02E-03	0.01	0.05	1.29E-05	5.66E-05	2.09E-05	9.16E-05	--	--	--	--	--	--	--	--
E10 - Solar Titan 250 Turbine	30,399 hp (32 °F)	0.23	1.00	--	--	0.16	0.69	--	--	2.67E-03	0.01	0.03	0.13	0.01	0.03	--	--	--	--	0.01	0.04
G4 - Waukesha Emergency Generator	1,175 hp	0.67	0.17	0.02	0.01	0.49	0.12	0.01	2.52E-03	4.00E-03	9.99E-04	3.71E-03	9.27E-04	3.61E-04	9.02E-05	1.67E-03	4.18E-04	2.27E-03	5.68E-04	0.08	0.02
H3 - Process Heater	0.60 MMBtu/hr	1.11E-03	4.87E-03	--	--	4.41E-05	1.93E-04	1.06E-03	4.64E-03	1.24E-06	5.41E-06	2.00E-06	8.76E-06	--	--	--	--	--	--	--	--
Equipment Leaks (fugitive emissions)[1,2]		0.01	0.03																		
Liquid Storage Tanks		<0.01	<0.01																		
Pneumatic Emissions		5.74E-04	2.51E-03																		
Blowdowns		0.04	0.17																		
Proposed PTE[1]		15.61	58.00	1.63	9.44	10.84	40.11	0.11	0.38	0.36	1.39	0.21	0.81	0.03	0.11	0.05	0.19	0.15	0.60	1.52	5.58

Notes:
1. Excludes fugitive emissions (compressor stations are not one of the named soure categories that include fugitive emissions).

Columbia Gas Transmission, LLC
Ceredo Compressor Station
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Insignificant Sources Emissions

Ceredo Compressor Station - Insignificant Sources

	VOCs		HAPs	
Emission Sources	**lb/hr**	**lb/year**	**lb/hr**	**lb/year**
Pneumatic Emissions	0.04	376.04	<0.01	5.03
Produced Liquids Tanks A18, A19, and A20	0.32	2841.12	<0.01	<0.01
Wastewater Tank A21	<0.01	#VALUE!	#VALUE!	<0.01
Totals	**0.37**	**#VALUE!**	**#VALUE!**	**5.03**

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
2SLB Reciprocating Compressor Engines (E01 - E06)

Horsepower	2,800	HP
Maximum Horsepower	3,080	HP
Brake Specific Fuel Consumption	8,400	Btu/Bhp-hr
Total Heat Input	23.52	MMBtu/hr
Max Heat Input	25.87	MMBtu/hr
Operating Hours	8,760	hr/yr
Natural Gas Heat Content	1,020	Btu/scf
Fuel Consumption	202.00	MMscf/yr
	25,365	scf/hr
Quantity	6	

Pollutant	Emission Factor		Emission Rate			Emission Factor Reference
	lb/MMBtu	lb/bhp-hr	lb/hr	ton/yr (per engine)	ton/yr (6 engines)	
NO_x (Maximum Hourly)		8.02E-02	247.02			CGT Test
NO_x (Average Annual)		4.01E-02		491.79	2,951	CGT Test
CO (Maximum Hourly)		5.73E-03	17.65			CGT Test
CO (Average Annual)		2.86E-03		35.08	210	CGT Test
CO_2e	117.1		3,030	12,063	72,379	40 CFR 98 Subpart C
PM_{10}	0.048		1.25	4.98	29.86	AP-42 Table 3.2-1 (7/00) - 2SLB
$PM_{2.5}$	0.048		1.25	4.98	29.86	AP-42 Table 3.2-1 (7/00) - 2SLB
VOC	0.120		3.10	12.36	74.17	AP-42 Table 3.2-1 (7/00) - 2SLB
SO_2 (Maximum Hourly)	0.0571		1.48			20 grains S / 100 scf
SO_2 (Average Annual)	0.000714			0.07	0.44	0.25 grains S / 100 scf
Methanol	0.002480		0.06	0.26	1.53	AP-42 Table 3.2-1 (7/00) - 2SLB
Hexane	0.000445		0.01	0.05	0.28	AP-42 Table 3.2-1 (7/00) - 2SLB
Benzene	0.001940		0.05	0.20	1.20	AP-42 Table 3.2-1 (7/00) - 2SLB
Toluene	0.000963		0.02	0.10	0.60	AP-42 Table 3.2-1 (7/00) - 2SLB
Ethylbenzene	0.000108		0.00	0.01	0.07	AP-42 Table 3.2-1 (7/00) - 2SLB
Acetaldehyde	0.007760		0.20	0.80	4.80	AP-42 Table 3.2-1 (7/00) - 2SLB
2,2,4-Trimethylpentane	0.000846		0.02	0.09	0.52	AP-42 Table 3.2-1 (7/00) - 2SLB
Xylene	0.000268		0.01	0.03	0.17	AP-42 Table 3.2-1 (7/00) - 2SLB
Formaldehyde	0.05520		1.43	5.69	34.12	AP-42 Table 3.2-1 (7/00) - 2SLB
Total HAPs	0.07954		2.06	8.19	49.16	AP-42 Table 3.2-1 (7/00) - 2SLB

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
2SLB Reciprocating Compressor Engine (E07)

Horsepower	2,700	HP
Maximum Horsepower	2,970	HP
Brake Specific Fuel Consumption	7,800	Btu/Bhp-hr
Total Heat Input	21.06	MMBtu/hr
Max Heat Input	23.17	MMBtu/hr
Operating Hours	8,760	hr/yr
Natural Gas Heat Content	1,020	Btu/scf
Fuel Consumption	180.87	MMscf/yr
	22,712	scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMBtu	lb/bhp-hr	lb/hr	ton/yr	
NO_x (Maximum Hourly)		1.00E-01	297.00		CGT Test
NO_x (Average Annual)		5.00E-02		591.30	CGT Test
CO (Maximum Hourly)		6.61E-03	19.63		CGT Test
CO (Average Annual)		3.30E-03		39.03	CGT Test
CO_2e	117.1		2,713	10,801	40 CFR 98 Subpart C
PM_{10}	0.048		1.12	4.46	AP-42 Table 3.2-1 (7/00) - 2SLB
$PM_{2.5}$	0.048		1.12	4.46	AP-42 Table 3.2-1 (7/00) - 2SLB
VOC	0.120		2.78	11.07	AP-42 Table 3.2-1 (7/00) - 2SLB
SO_2 (Maximum Hourly)	0.0571		1.32		20 grains S / 100 scf
SO_2 (Average Annual)	0.000714			0.07	0.25 grains S / 100 scf
Methanol	0.002480		0.06	0.23	AP-42 Table 3.2-1 (7/00) - 2SLB
Hexane	0.000445		0.01	0.04	AP-42 Table 3.2-1 (7/00) - 2SLB
Benzene	0.001940		0.04	0.18	AP-42 Table 3.2-1 (7/00) - 2SLB
Toluene	0.000963		0.02	0.09	AP-42 Table 3.2-1 (7/00) - 2SLB
Ethylbenzene	0.000108		0.00	0.01	AP-42 Table 3.2-1 (7/00) - 2SLB
Acetaldehyde	0.007760		0.18	0.72	AP-42 Table 3.2-1 (7/00) - 2SLB
2,2,4-Trimethylpentane	0.000846		0.02	0.08	AP-42 Table 3.2-1 (7/00) - 2SLB
Xylene	0.000268		0.01	0.02	AP-42 Table 3.2-1 (7/00) - 2SLB
Formaldehyde	0.05520		1.28	5.09	AP-42 Table 3.2-1 (7/00) - 2SLB
Total HAPs	0.07954		1.84	7.34	AP-42 Table 3.2-1 (7/00) - 2SLB

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Waukesha 4SLB Emergency Generator (G3)

Horsepower	812	hp
Brake Specific Fuel Consumption	8,000	Btu/Bhp-hr
Total Heat Input	6.50	MMBtu/hr
Operating Hours	500	hr/yr
Natural Gas Heat Content	1,020	Btu/scf
Fuel Consumption	3.18	MMscf/yr
	6,369	scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMBtu	lb/bhp-hr	lb/hr	ton/yr	
NO_x		3.00E-03	2.44	0.61	R13-1856 Permit Limit
CO		5.31E-03	4.31	1.08	R13-1856 Permit Limit
CO_2e	117.1		761	190	40 CFR 98 Subpart C
PM_{10}	0.010		0.06	0.02	AP-42 Table 3.2-2 (7/00) - 4SLB
$PM_{2.5}$	0.010		0.06	0.02	AP-42 Table 3.2-2 (7/00) - 4SLB
VOC		2.01E-03	1.63	0.41	R13-1856 Permit Limit
SO_2 (Maximum Hourly)	0.0571		0.37		20 grains S / 100 scf
SO_2 (Average Annual)	0.000714			1.16E-03	0.25 grains S / 100 scf
Methanol	0.002500		0.02	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Hexane	0.001110		0.01	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Benzene	0.000440		0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Toluene	0.000408		0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Ethylbenzene	0.000040		0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Acetaldehyde	0.008360		0.05	0.01	AP-42 Table 3.2-2 (7/00) - 4SLB
2,2,4-Trimethylpentane	0.000250		0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Xylene	0.000184		0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Formaldehyde	0.05280		0.34	0.09	AP-42 Table 3.2-2 (7/00) - 4SLB
Total HAPs	0.07220		0.47	0.12	AP-42 Table 3.2-2 (7/00) - 4SLB

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Fuel Gas Heater (H1)

Heat Input	0.375	MMBtu/hr
Operating Hours	8760	hr/yr
Natural Gas Heat Content	1020	Btu/scf
Fuel Consumption	3.22	MMscf/yr
	367.6	scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO_x	100	0.098	0.04	0.16	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.03	0.14	AP-42 Table 1.4-1 (7/98)
CO_2e		117.1	44	192	40 CFR 98 Subpart C
PM_{10}	7.6	0.007	2.79E-03	0.01	AP-42 Table 1.4-2 (7/98)
$PM_{2.5}$	7.6	0.007	2.79E-03	0.01	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	2.02E-03	0.01	AP-42 Table 1.4-2 (7/98)
SO_2 (Maximum Hourly)		0.0571	0.02		20 grains S / 100 scf
SO_2 (Average Annual)		0.000714		1.17E-03	0.25 grains S / 100 scf
Hexane	1.800	0.001765	6.62E-04	2.90E-03	AP-42 Table 1.4-3 (7/98)
Benzene	0.002100	0.000002	0.00	3.38E-06	AP-42 Table 1.4-3 (7/98)
Toluene	0.003400	0.000003	0.00	5.48E-06	AP-42 Table 1.4-3 (7/98)
Formaldehyde	0.075	0.00007	2.76E-05	1.21E-04	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	6.94E-04	3.04E-03	AP-42 Table 1.4-3 & 4 (7/98)

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Heating System Boiler (BL3)

Heat Input	6.276	MMBtu/hr
Operating Hours	8760	hr/yr
Natural Gas Heat Content	1020	Btu/scf
Fuel Consumption	53.90	MMscf/yr
	6152.9	scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO_x	100	0.098	0.62	2.69	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.52	2.26	AP-42 Table 1.4-1 (7/98)
CO_2e		117.1	735	3,219	40 CFR 98 Subpart C
PM_{10}	7.6	0.007	0.05	0.20	AP-42 Table 1.4-2 (7/98)
$PM_{2.5}$	7.6	0.007	0.05	0.20	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	0.03	0.15	AP-42 Table 1.4-2 (7/98)
SO_2 (Maximum Hourly)		0.0571	0.36		20 grains S / 100 scf
SO_2 (Average Annual)		0.000714		0.02	0.25 grains S / 100 scf
Hexane	1.8	0.002	0.01	0.05	AP-42 Table 1.4-3 (7/98)
Benzene	0.0021	2.06E-06	0.00	0.00	AP-42 Table 1.4-3 (7/98)
Toluene	0.0034	3.33E-06	0.00	0.00	AP-42 Table 1.4-3 (7/98)
Formaldehyde	0.075	7.35E-05	4.61E-04	2.02E-03	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	0.01	0.05	AP-42 Table 1.4-3 & 4 (7/98)

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Solar Titan 250 Turbine (E10)

Horsepower	30,399	hp (32 °F)
Brake Specific Fuel Consumption	6,599	Btu/bhp-hr (LHV, 32 °F)
Total Heat Input	200.60	MMBtu/hr (LHV, 32 °F)
	222.67	MMBtu/hr (HHV, 32 °F)[3]
Operating Hours	8760	hr/yr
Natural Gas Heat Content	1020	Btu/scf
Fuel Consumption	1,912.31	MMscf/yr
	218,300.0	scf/hr (based on 32 °F)

Pollutant	Emission Factor			Emission Rate		Emission Factor Reference
	ppmvd@15%O2	lb/MMBtu		lb/hr[1]	ton/yr[2]	
NO_x	10.00	0.039	LHV	7.93	35.67	Vendor Data
CO	25.00	0.060	LHV	12.06	54.65	Vendor Data
GHG (CO_2e)		117.1	HHV	26,074	114,203	40 CFR 98 Subpart C
PM_{10}		0.0066	HHV	1.47	6.44	AP-42 Table 3.1-2a (4/00)
$PM_{2.5}$		0.0066	HHV	1.47	6.44	AP-42 Table 3.1-2a (4/00)
VOC	5.00	0.007	LHV	1.38	6.03	Vendor Data (20% of UHC)[4]
SO_2 (Maximum Hourly)		0.0571	HHV	12.71		20 grains S / 100 scf
SO_2 (Average Annual)		0.000714	HHV		0.70	0.25 grains S / 100 scf
Benzene		0.000012	HHV	0.00	0.01	AP-42 Table 3.1-3 (4/00)
Toluene		0.000130	HHV	0.03	0.13	AP-42 Table 3.1-3 (4/00)
Ethylbenzene		0.000032	HHV	0.01	0.03	AP-42 Table 3.1-3 (4/00)
Acetaldehyde		0.000040	HHV	0.01	0.04	AP-42 Table 3.1-3 (4/00)
Formaldehyde		0.00071	HHV	0.16	0.69	AP-42 Table 3.1-3 (4/00)
Total HAPs		0.00102	HHV	0.23	1.00	AP-42 Table 3.1-3 (4/00)

1. Maximum hourly emission rate based on normal operation at 32 °F. Heat input, fuel consumption, and emissions increase as temperature decreases, and for the purpose of this application, hourly emissions are characterized by Solar emissions data for 32 °F.
2. Annual emission rate based on maximum of: (1) normal operation or (2) normal operation plus non-SoLoNOx operation.
3. HHV heat input based on HHV=1.11*LHV
4. VOC based on 20% of vendor data for unburned hydrocarbon.

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Solar Titan 250 (E10) - Normal and Non-SoLoNOx Emission Rates

Normal and Non-SoLoNOx Emission Rates

Operating Mode	Units	NO_x	CO	VOC
Normal Load @ 32 °F[1]	lb/hr	7.93	12.06	1.38
Normal Load @ 32 °F[2]	tpy	34.20	52.02	5.96
Non-SoLoNOx Operation[3]	tpy	1.47	2.63	0.06
Total Emissions per Turbine	tpy	35.67	54.65	6.03

1. Based on data from Solar Titan 250 Compressor Set data sheet and the following concentrations: 11 ppm NO_x; 25 ppm CO; 5 ppm VOC
2. Based on 8760 hr/yr of normal operation.
3. Potential emissions in excess of 8760 hr/yr at normal operation that may occur when turbine operates in non-SoLoNOx mode such as during low ambient temperatures (<0 °F), low load (< 50%), and during startup and shutdown events. This annual total represents the difference between the aggregate total with non-SoLoNOx operation and 8760 hr/yr of normal operation.

Emission Rates During Normal Operation (g/hp-hr)[1]

Emission Point ID / Model	NO_x	CO	VOC[2]	SO_2[3]	PM_{10} / $PM_{2.5}$	CH_2O
E10 / Solar Titan 250	0.12	0.18	0.02	0.19	0.02	0.002

1. Based on vendor performance data; values in italics based on AP-42 emission factors.
2. VOC is based on 20 percent of unburned hydrocarbons per Solar Product Information Letter 168.
3. Conservatively based on 20 grains sulfur per 100 standard cubic feet of natural gas for maximum short-term emissions.

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Waukesha VGF-P48GL Emergency Generator (G4)

Horsepower	1,175	hp
Brake Specific Fuel Consumption	7,733	Btu/Bhp-hr
Total Heat Input	9.09	MMBtu/hr
Operating Hours	500	hr/yr
Natural Gas Heat Content	1,020	Btu/scf
Fuel Consumption	4.45	MMscf/yr
	8,908	scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	g/bhp-hr	lb/MMBtu	lb/hr	ton/yr	
NO_x	2.00		5.18	1.30	NSPS Subpart JJJJ Limitation
CO	4.00		10.36	2.59	NSPS Subpart JJJJ Limitation
CO_2e		117.1	1,064	266	40 CFR 98 Subpart C
PM_{10}		0.010	0.09	0.02	AP-42 Table 3.2-2 (7/00) - 4SLB
$PM_{2.5}$		0.010	0.09	0.02	AP-42 Table 3.2-2 (7/00) - 4SLB
VOC	1.00		2.59	0.65	NSPS Subpart JJJJ Limitation
SO_2 (Maximum Hourly)		0.0571	0.52		20 grains S / 100 scf
SO_2 (Average Annual)		0.000714		1.62E-03	0.25 grains S / 100 scf
Methanol		0.002500	0.02	0.01	AP-42 Table 3.2-2 (7/00) - 4SLB
Hexane		0.001110	0.01	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Benzene		0.000440	0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Toluene		0.000408	0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Ethylbenzene		0.000040	0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Acetaldehyde		0.008360	0.08	0.02	AP-42 Table 3.2-2 (7/00) - 4SLB
2,2,4-Trimethylpentane		0.000250	0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Xylene		0.000184	0.00	0.00	AP-42 Table 3.2-2 (7/00) - 4SLB
Formaldehyde	0.19		0.49	0.12	Vendor Data
Total HAPs		0.07356	0.67	0.17	AP-42 Table 3.2-2 (7/00) - 4SLB

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Fuel Gas Heater (H3)

Heat Input	0.60	MMBtu/hr
Operating Hours	8760	hr/yr
Natural Gas Heat Content	1020	Btu/scf
Fuel Consumption	5.15	MMscf/yr
	588.2	scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO_x	100	0.098	0.06	0.26	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.05	0.22	AP-42 Table 1.4-1 (7/98)
CO_2e		117.1	70	308	40 CFR 98 Subpart C
PM_{10}	7.6	0.007	4.47E-03	0.02	AP-42 Table 1.4-2 (7/98)
$PM_{2.5}$	7.6	0.007	4.47E-03	0.02	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	3.24E-03	0.01	AP-42 Table 1.4-2 (7/98)
SO_2 (Maximum Hourly)		0.0571	0.03		20 grains S / 100 scf
SO_2 (Average Annual)		0.000714		1.88E-03	0.25 grains S / 100 scf
Hexane	1.800	0.001765	1.06E-03	4.64E-03	AP-42 Table 1.4-3 (7/98)
Benzene	0.0021	0.000002	1.24E-06	5.41E-06	AP-42 Table 1.4-3 (7/98)
Toluene	0.0034	0.000003	2.00E-06	8.76E-06	AP-42 Table 1.4-3 (7/98)
Formaldehyde	0.075	0.00007	4.41E-05	1.93E-04	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	1.11E-03	4.87E-03	AP-42 Table 1.4-3 & 4 (7/98)

Ceredo Compressor Station
Title V Permit Application - May 2021
Fugitive Emissions from Leaks

Component	Number of Components[1]	Estimated Number of Leaking Components[2]	Emission Factor[3]	Fugitive Emissions							
				Total	CH_4[4]	CO_2[4]	CH_4[5]	CO_2[5]	CO_2e[6]	VOC[7]	HAPs[8]
			scf/hr / component	scf/yr	scf/yr	scf/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
Compressor Service											
Valve	1027	21	14.84	2,729,966	2,372,341	11,619	50.21	0.67	1255.90	0.78	0.01
Connector	2918	59	5.59	2,889,136	2,510,659	12,296	53.14	0.71	1329.12	0.82	0.01
Open-Ended Line	12	1	17.27	151,285	131,467	644	2.78	0.04	69.60	0.04	0.00
Pressure Relief Valve	13	1	39.66	347,422	301,909	1,479	6.39	0.09	159.83	0.10	0.00
Meter	1	1	19.33	169,331	147,148	721	3.11	0.04	77.90	0.05	0.00
Other	5	1	4.1	35,916	31,211	153	0.00	0.00	0.00	0.00	0.00
Non-Compressor Service											
Valve	704	15	6.42	843,588	733,078	3,590	15.52	0.21	388.09	0.24	0.00
Connector	1437	29	5.71	1,450,568	1,260,544	6,174	26.68	0.36	667.32	0.41	0.01
Open-Ended Line	0	0	11.27	0	0	0	0.00	0.00	0.00	0.00	0.00
Pressure Relief Valve	15	1	2.01	17,608	15,301	75	0.32	0.00	8.10	0.01	0.00
Meter	2	1	2.93	25,667	22,304	109	0.47	0.01	11.81	0.01	0.00
Other	3	1	4.1	35,916	31,211	153	0.00	0.00	0.00	0.00	0.00
						Total:	158.62	2.13	3967.67	2.46	0.03

Notes:
1. Number of fugitive components per Columbia Gas Transmission facility inventory data.
2. Estimated number of leaking components at Ceredo utilizing a 2% component leak rate factor throughout the Columbia pipeline system obtained from fugitive leak survey results at Columbia facilities, and rounded up to the nearest integer.
3. Emission factors from 40 CFR 98 Subpart W Table W-3
4. CH4 and CO2 emission rates based on 86.90 vol% CH4 and 0.43 vol% CO2 in Ceredo natural gas data
5. Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
6. Based on 40 CFR 98 Subpart A Global Warming Potentials
7. Based on a 0.005084 mol ratio of VOC to methane as calculated from Ceredo gas composition data
8. Based on a 0.0000379 ratio of HAPs to methane as calculated from Ceredo gas composition data

Densities per 40 CFR 98.233(v):

CH_4	0.0192 kg/scf
CO_2	0.0526 kg/scf

Weight Conversion Factor

2.20462 lb/kg

Global Warming Potential per 40 CFR 98 Subpart A:

25 lb CO_2e/lb CH_4

Hours/year (leap year) 8760

Ceredo Compressor Station
Title V Permit Application - May 2021
Emissions from Pneumatic Devices

Type of Natural Gas Pneumatic Device	Count	EF scf/hr	Hours	CO2 Concentration	CH4 Concentration	SCF CO2	SCF CH4	CO2 lb/hr	CH4 lb/hr	VOC lb/hr	HAPS lb/hr	CO2e lb/hr	CO2 TPY	CH4 TPY	VOC TPY	HAPS TPY	CO2e TPY
High-Bleed Pneumatic Devices	0	18.2	8760	0.004	0.869	0.00	0.00	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Intermittent Bleed Pneumatic Devices	32	2.35	8760	0.004	0.869	2,803.65	572,455.49	0.04	2.77	0.04	<0.01	69.19	0.16	12.12	0.19	<0.01	303.054
Low-Bleed Pneumatic Devices	0	1.37	8760	0.004	0.869	0.00	0.00	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
					Totals:	2,803.65	572,455.49	0.04	2.77	0.04	<0.01	69.19	0.16	12.12	0.19	<0.01	303.054

Densities per 40 CFR 98.233(v):	
Density of CO_2 at standard conditions in lb/ft^3	0.1160
Density of CH_4 at standard conditions in lb/ft^3	0.0423

- Emission factors from 40 CFR 98 Subpart W Table W-3
- CH4 and CO2 emission rates based on 86.90 vol% CH4 and 0.43 vol% CO2 in Ceredo natural gas data
- Conversion based on densities of GHG as provided in 40 CFR 98.233(v)
- Based on 40 CFR 98 Subpart A Global Warming Potentials
- Based on a 0.005084 mol ratio of VOC to methane as calculated from Ceredo gas composition data
- Based on a 0.0000379 ratio of HAPs to methane as calculated from Ceredo gas composition data

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Blowdown Emissions

Component	Emission Rate (ton/yr)				
	CH_4 [1]	CO_2	CO_2e	VOC [2]	HAPs [3]
Equipment Blowdowns	775.22	10.40	19390.92	12.03	0.16
Station Emergency Shutdown	74.93	1.01	1874.36	1.16	0.01
Blowdown, Total	850.16	11.41	21265.28	13.19	0.17

1. CH_4 emission rates based on 86.90 vol% CH_4 in annualized Ceredo natural gas data
2. Based on a 0.005084 mol ratio of VOC to methane as calculated from Ceredo gas composition data
3. Based on a 0.0000379 ratio of HAPs to methane as calculated from Ceredo gas composition data

Ceredo Facility Wide Emergency Shutdown (ESD) PTE Emission Calculations
Blowdown Emissions per Event (mscf/event): 4,074.3
Blowdown Events per Year: 1

Parameter	Gas Loss from ESD (mscf/yr)	CH_4 Gas Loss (mscf/yr)	CO_2 Gas Loss (mscf/yr)	CH_4 Emissions (ton/yr)	CO_2 Emissions (ton/yr)	CO_2e Emissions (ton/yr)	VOC Emissions (ton/yr)	HAPs Emissions (ton/yr)
ESD Emissions	4,074.3	3,540.59	17.34	74.93	1.01	1,874.36	1.16	0.005

Notes:
- Gas loss volume based on TC Energy Engineering Department calculations using estimated facility piping volume, the average suction pressure, and discharge at MAOP. This volume would also be used when reporting ESD gas loss events at Frametown to PHMSA.

Compressor Startup/Shutdown PTE Emission Calculations

Unit	Blowdown Count	Average Gas Loss per Event for Unit (mscf/event)	Annual Gas Loss from Unit (mscf/yr)	CH_4 Gas Loss (mscf/yr)	CO_2 Gas Loss (mscf/yr)	CH_4 Emissions (ton/yr)	CO_2 Emissions (ton/yr)	CO_2e Emissions (ton/yr)	VOC Emissions (ton/yr)	HAPs Emissions (ton/yr)
E01 - Cooper-Bessemer GMWH-8 Engine	100	27.5	2,748	2,388	11.70	50.55	0.68	1264.33	0.78	0.01
E02 - Cooper-Bessemer GMWH-8 Engine	100	27.6	2,761	2,399	11.75	50.77	0.68	1270.04	0.79	0.01
E03 - Cooper-Bessemer GMWH-8 Engine	100	27.6	2,761	2,399	11.75	50.77	0.68	1270.04	0.79	0.01
E04 - Cooper-Bessemer GMWH-8 Engine	100	27.6	2,761	2,399	11.75	50.77	0.68	1270.04	0.79	0.01
E05 - Cooper-Bessemer GMWH-8 Engine	100	30.6	3,063	2,661	13.03	56.32	0.76	1408.88	0.87	0.01
E06 - Cooper-Bessemer GMWH-8 Engine	100	30.6	3,063	2,661	13.03	56.32	0.76	1408.88	0.87	0.01
E07 - Cooper-Bessemer 8V-250 Engine	100	30.6	3,063	2,661	13.03	56.32	0.76	1408.88	0.87	0.01
Electric Unit 10 - Siemens SH712	100	27.6	2,761	2,399	11.75	50.77	0.68	1270.04	0.79	0.01
Electric Unit 11 - Siemens SH712	100	28.2	2,819	2,449	12.00	51.84	0.70	1296.68	0.80	0.01
Electric Unit 12 - Siemens SH712	100	28.2	2,819	2,449	12.00	51.84	0.70	1296.68	0.80	0.01
Electric Unit 13 - Siemens SH712	100	30.6	3,063	2,661	13.03	56.32	0.76	1408.88	0.87	0.01
E10 - Solar Titan 250 Turbine (Unit 14)	100	104.7	10,472	9,100	44.57	192.60	2.58	4817.56	2.99	0.04
Total	--	--	42,150	36,629	179.39	775.22	10.40	19,390.92	12.03	0.16

Notes:

Densities per 40 CFR 98.233(v):
CH_4 0.0192 kg/scf
CO_2 0.0526 kg/scf

Weight Conversion Factor
2.20462 lb/kg

Global Warming Potential per 40 CFR 98 Subpart A:
25 lb CO_2e/lb CH_4

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Produced Liquids Tanks A18, A19, and A20
Insignificant Source

Air Contaminant	Emission Rates	
	Hourly (lb/hr)	Annual (tpy)
VOCs	0.32	1.42
Total HAPs	<0.01	<0.01
Benzene	<0.01	<0.01
Toluene	<0.01	<0.01
Ethylbenzene	<0.01	<0.01
m-Xylene	<0.01	<0.01
n-Hexane	<0.01	<0.01
2,2,4-Trimethylpentane	<0.01	<0.01
CH_4	0.06	0.24
CO_2	<0.01	<0.01
CO_2e	1.38	6.04

Notes:

- Tank emission rates were calculated using Promax software. Promax output emissions are attached.

- Emission profiles shown above are for one (1) of the three (3) 6,000 gallon Produced Liquids Tanks. The total emissions from all 3 tanks are displayed in the emission summary tab.

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Title V Permit Application - May 2021
Wastewater Tank A21
Insignificant Source

Air Contaminant	Emission Rates	
	Hourly (lb/hr)	Annual (tpy)
VOCs	<0.01	<0.01

Notes:
- Tank emission rates were calculated using Promax software. Promax output emissions are attached.

Columbia Gas Transmission, LLC
Ceredo Compressor Station
Natural Gas Composition

Representative Composition of Natural Gas

Natural Gas Composition	Molar Fraction[1] (mole %)	Molecular Weight (lb/lb-mole)	Weighted Sum (lb/lb-mole)	Weight Fraction (weight %)
Nitrogen	0.51	28.01	0.1435	0.7969
Carbon Dioxide	0.43	44.01	0.1873	1.0400
Methane	86.90	16.04	13.9414	77.4075
Ethane	11.72	30.07	3.5243	19.5682
Propane	0.36	44.10	0.1567	0.8699
i-Butane	0.02	58.12	0.0125	0.0694
n-Butane	0.03	58.12	0.0194	0.1078
i-Pentane	0.01	72.15	0.0071	0.0393
n-Pentane	0.01	72.15	0.0051	0.0284
C_{6+} Components	0.01	89.09	0.0131	0.0727
Total	100.00	-	18.01	100.00

C_{6+} HAP Composition[2]	Molar Fraction (mole %)	Molecular Weight (lb/lb-mole)	Weighted Sum (lb/lb-mole)	Weight Fraction (weight %)
2,2,4-Trimethylpentane	1.63E-04	114.23	1.86E-04	1.03E-03
Benzene	1.78E-04	78.11	1.39E-04	7.71E-04
Ethylbenzene	7.35E-06	106.17	7.80E-06	4.33E-05
n-Hexane	2.77E-03	86.18	2.39E-03	1.32E-02
Toluene	1.19E-04	92.14	1.10E-04	6.09E-04
Xylenes	5.88E-05	106.17	6.24E-05	3.47E-04
Total HAPs	3.29E-03	-	2.89E-03	1.61E-02

Totals	Mol %	Weight %
Total VOCs	0.44	1.20
Total HAPs	3.29E-03	1.60E-02

Ratios	Mol	Weight
VOC/Methane Ratio	5.08E-03	1.55E-02
HAPs/Methane Ratio	3.79E-05	2.07E-04

Mass Fraction Conversion Data

Compound	Mol Weight (g/mol)	Mass in Gas Sample (g)	Mass Fraction	Mass %
CO2	44.01	18.73	0.0104	1.0400
N2	28.02	14.35	0.0080	0.7970
Methane	16.04	1393.88	0.7739	77.3936
Ethane	30.07	352.43	0.1957	19.5683
Propane	44.09	15.67	0.0087	0.8698
I-Butane	58.12	1.25	0.0007	0.0694
N-Butane	58.12	1.94	0.0011	0.1078
I-Pentane	72.15	0.71	0.0004	0.0393
N-Pentane	72.15	0.51	0.0003	0.0284
Other hexanes	86.18	1.27	0.0007	0.0703
n-hexane	86.18	0.24	0.0001	0.0132
2,2,4 - Trimethylpentane	114.23	0.02	0.0000	0.0010
Benzene	78.11	0.01	0.0000	0.0008
Toluene	92.14	0.01	0.0000	0.0006
Ethylbenzene	106.17	0.001	0.0000	0.0000
Xylenes	106.17	0.01	0.0000	0.0003

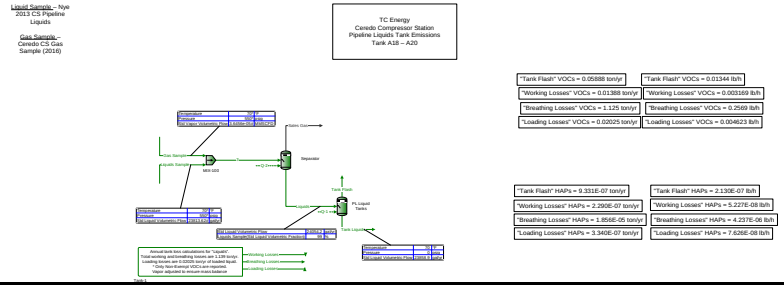
Notes:

[1] Natural gas analysis obtained from gas chromatograph readings from site data sheet.

[2] C_{6+} HAP composition molar fractions were derived from the GRI-GLYCALC v4.0 C_{6+} analysis multipliers for the Natural Gas Transmission Industry Segment.

Pipeline Liquids
Plant Schematic

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	



Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	

Connections

	Breathing Losses	Gas Sample	Liquids	Liquids Sample	Loading Losses
From Block	--	--	Separator	--	--
To Block	--	MIX-100	PL Liquid Tanks	MIX-100	--

Stream Composition

Mole Fraction	Breathing Losses %	Gas Sample %	Liquids %	Liquids Sample %	Loading Losses %
Carbon Dioxide	0.207763 *	0.4256 *	0.0105828	0 *	0.207763 *
Nitrogen	0.0406653 *	0.5123 *	0.0127387	0 *	0.0406653 *
Methane	18.1803 *	86.9 *	2.16083	0 *	18.1803 *
Ethane	8.18678 *	11.7203 *	0.291433	0 *	8.18678 *
Propane	0.351024 *	0.3553 *	0.00883477	0 *	0.351024 *
i-Butane	0.023232 *	0.0215 *	0.000534612	0 *	0.023232 *
n-Butane	0.034668 *	0.0334 *	0.000830513	0 *	0.034668 *
i-Pentane	0.00348395 *	0.0098 *	0.000243683	0 *	0.00348395 *
n-Pentane	0.00184593 *	0.0071 *	0.000176546	0 *	0.00184593 *
i-Hexane	0 *	0 *	0	0 *	0 *
Heptane	0 *	0 *	0	0 *	0 *
Octane	0 *	0 *	0	0 *	0 *
Nonane	0 *	0 *	0	0 *	0 *
Benzene	0 *	0 *	0	0 *	0 *
Toluene	0 *	0 *	0	0 *	0 *
Ethylbenzene	0 *	0 *	0	0 *	0 *
m-Xylene	0 *	0 *	0	0 *	0 *
n-Hexane	0.0014596 *	0.0147 *	0.000365525	0 *	0.0014596 *
2,2,4-Trimethylpentane	0 *	0 *	0	0 *	0 *
Neopentane	0 *	0 *	0	0 *	0 *
DecanesPlus	0 *	0 *	0	0 *	0 *
Water	0 *	0 *	0	0 *	0 *
Helium	0 *	0 *	0	0 *	0 *
Hydrogen	0 *	0 *	0	0 *	0 *
Oxygen	0 *	0 *	0	0 *	0 *
LiquidsSample	72.9688 *	0 *	97.5134	100 *	72.9688 *

Molar Flow	Breathing Losses lbmol/h	Gas Sample lbmol/h	Liquids lbmol/h	Liquids Sample lbmol/h	Loading Losses lbmol/h
Carbon Dioxide	6.99932E-06 *	1.7036E-05 *	1.7036E-05	0 *	1.25966E-07 *
Nitrogen	1.36997E-06 *	2.05064E-05 *	2.05064E-05	0 *	2.46552E-08 *
Methane	0.000612476 *	0.00347845 *	0.00347845	0 *	1.10226E-05 *
Ethane	0.000275804 *	0.000469142 *	0.000469142	0 *	4.96361E-06 *
Propane	1.18257E-05 *	1.4222E-05 *	1.4222E-05	0 *	2.12824E-07 *
i-Butane	7.82662E-07 *	8.60606E-07 *	8.60606E-07	0 *	1.40854E-08 *
n-Butane	1.16793E-06 *	1.33694E-06 *	1.33694E-06	0 *	2.1019E-08 *
i-Pentane	1.17371E-07 *	3.92276E-07 *	3.92276E-07	0 *	2.1123E-09 *
n-Pentane	6.21875E-08 *	2.842E-07 *	2.842E-07	0 *	1.11918E-09 *
i-Hexane	0 *	0 *	0	0 *	0 *
Heptane	0 *	0 *	0	0 *	0 *
Octane	0 *	0 *	0	0 *	0 *
Nonane	0 *	0 *	0	0 *	0 *
Benzene	0 *	0 *	0	0 *	0 *
Toluene	0 *	0 *	0	0 *	0 *
Ethylbenzene	0 *	0 *	0	0 *	0 *
m-Xylene	0 *	0 *	0	0 *	0 *
n-Hexane	4.91724E-08 *	5.88414E-07 *	5.88414E-07	0 *	8.84948E-10 *
2,2,4-Trimethylpentane	0 *	0 *	0	0 *	0 *
Neopentane	0 *	0 *	0	0 *	0 *
DecanesPlus	0 *	0 *	0	0 *	0 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	

Molar Flow	Breathing Losses lbmol/h	Gas Sample lbmol/h	Liquids lbmol/h	Liquids Sample lbmol/h	Loading Losses lbmol/h
Water	0 *	0 *	0	0 *	0 *
Helium	0 *	0 *	0	0 *	0 *
Hydrogen	0 *	0 *	0	0 *	0 *
Oxygen	0 *	0 *	0	0 *	0 *
Liquids Sample	0.00245824 *	0 *	0.156975	0.156975 *	4.42406E-05 *

Mass Fraction	Breathing Losses %	Gas Sample %	Liquids %	Liquids Sample %	Loading Losses %
Carbon Dioxide	0.111878	1.04004 *	0.00456241	0 *	0.111878
Nitrogen	0.0139386	0.796879 *	0.00349572	0 *	0.0139386
Methane	3.56864	77.4093 *	0.339576	0 *	3.56864
Ethane	3.01206	19.5686 *	0.0858429	0 *	3.01206
Propane	0.189393	0.869947 *	0.00381625	0 *	0.189393
i-Butane	0.0165219	0.0693877 *	0.000304387	0 *	0.0165219
n-Butane	0.0246548	0.107793 *	0.000472862	0 *	0.0246548
i-Pentane	0.00307561	0.0392606 *	0.000172227	0 *	0.00307561
n-Pentane	0.00162958	0.0284439 *	0.000124777	0 *	0.00162958
i-Hexane	0	0 *	0	0 *	0
Heptane	0	0 *	0	0 *	0
Octane	0	0 *	0	0 *	0
Nonane	0	0 *	0	0 *	0
Benzene	0	0 *	0	0 *	0
Toluene	0	0 *	0	0 *	0
Ethylbenzene	0	0 *	0	0 *	0
m-Xylene	0	0 *	0	0 *	0
n-Hexane	0.00153903	0.0703401 *	0.000308565	0 *	0.00153903
2,2,4-Trimethylpentane	0	0 *	0	0 *	0
Neopentane	0	0 *	0	0 *	0
DecanesPlus	0	0 *	0	0 *	0
Water	0	0 *	0	0 *	0
Helium	0	0 *	0	0 *	0
Hydrogen	0	0 *	0	0 *	0
Oxygen	0	0 *	0	0 *	0
Liquids Sample	93.0567	0 *	99.5613	100 *	93.0567

Mass Flow	Breathing Losses lb/h	Gas Sample lb/h	Liquids lb/h	Liquids Sample lb/h	Loading Losses lb/h
Carbon Dioxide	0.000308037 *	0.000749746 *	0.000749746	0 *	5.54369E-06 *
Nitrogen	3.83776E-05 *	0.000574455 *	0.000574455	0 *	6.90675E-07 *
Methane	0.00982562 *	0.0558029 *	0.0558029	0 *	0.00017683 *
Ethane	0.00829317 *	0.0141067 *	0.0141067	0 *	0.000149251 *
Propane	0.00052146 *	0.000627129 *	0.000627129	0 *	9.38462E-06 *
i-Butane	4.54901E-05 *	5.00203E-05 *	5.00203E-05	0 *	8.18677E-07 *
n-Butane	6.78826E-05 *	7.7706E-05 *	7.7706E-05	0 *	1.22167E-06 *
i-Pentane	8.46814E-06 *	2.83023E-05 *	2.83023E-05	0 *	1.524E-07 *
n-Pentane	4.48675E-06 *	2.05047E-05 *	2.05047E-05	0 *	8.07473E-08 *
i-Hexane	0 *	0 *	0	0 *	0 *
Heptane	0 *	0 *	0	0 *	0 *
Octane	0 *	0 *	0	0 *	0 *
Nonane	0 *	0 *	0	0 *	0 *
Benzene	0 *	0 *	0	0 *	0 *
Toluene	0 *	0 *	0	0 *	0 *
Ethylbenzene	0 *	0 *	0	0 *	0 *
m-Xylene	0 *	0 *	0	0 *	0 *
n-Hexane	4.23745E-06 *	5.07068E-05 *	5.07068E-05	0 *	7.62607E-08 *
2,2,4-Trimethylpentane	0 *	0 *	0	0 *	0 *
Neopentane	0 *	0 *	0	0 *	0 *
DecanesPlus	0 *	0 *	0	0 *	0 *

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	

Mass Flow	Breathing Losses lb/h	Gas Sample lb/h	Liquids lb/h	Liquids Sample lb/h	Loading Losses lb/h
Water	0 *	0 *	0	0 *	0 *
Helium	0 *	0 *	0	0 *	0 *
Hydrogen	0 *	0 *	0	0 *	0 *
Oxygen	0 *	0 *	0	0 *	0 *
Liquids Sample	0.256215 *	0 *	16.361	16.361 *	0.00461106 *

Stream Properties

Property	Units	Breathing Losses	Gas Sample	Liquids	Liquids Sample	Loading Losses
Temperature	°F	70.3693	70 *	70	70 *	70.3693
Pressure	psia	0.804574	564.696 *	564.696	564.696 *	0.804574
Mole Fraction Vapor	%	100	100	0	0	100
Mole Fraction Light Liquid	%	0	0	100	100	0
Mole Fraction Heavy Liquid	%	0	0	0	0	0
Molecular Weight	lb/lbmol	81.7278	18.0093	102.083	104.227	81.7278
Mass Density	lb/ft^3	0.0115924	1.99518	44.8369	45.0023	0.0115924
Molar Flow	lbmol/h	0.0033689	0.00400282	0.160978	0.156975	6.06295E-05
Mass Flow	lb/h	0.275332	0.0720881	16.4331	16.361	0.00495511
Vapor Volumetric Flow	ft^3/h	23.7511	0.036131	0.366509	0.36356	0.427444
Liquid Volumetric Flow	gpm	2.96117	0.00450465	0.0456946	0.045327	0.0532918
Std Vapor Volumetric Flow	MMSCFD	3.06826E-05	3.64561E-05 *	0.00146612	0.00142967	5.5219E-07
Std Liquid Volumetric Flow	sgpm	0.000824908	0.000457651	0.0457651	0.0453075 *	1.48457E-05
Compressibility		0.997218	0.896727	0.226185	0.230087	0.997218
Specific Gravity		2.82185	0.621816	0.7189	0.721552	2.82185
API Gravity				64.0413	63.3449	
Enthalpy	Btu/h	-206.035	-134.073	-13757.7	-13615.7	-3.70798
Mass Enthalpy	Btu/lb	-748.313	-1859.84	-837.194	-832.201	-748.313
Mass Cp	Btu/(lb*°F)	0.375115	0.576707	0.475266	0.473754	0.375115
Ideal Gas CpCv Ratio		1.06931	1.28373	1.05578	1.05466	1.06931
Dynamic Viscosity	cP	0.00659615	0.0116694	0.468821	0.48919	0.00659615
Kinematic Viscosity	cSt	35.5218	0.365127	0.652755	0.678613	35.5218
Thermal Conductivity	Btu/(h*ft*°F)	0.00847255	0.0202153	0.0636682	0.0637301	0.00847255
Surface Tension	lbf/ft			0.00117485 ?	0.00148828	
Net Ideal Gas Heating Value	Btu/ft^3	4127.53	991.169	5128.96	5234.47	4127.53
Net Liquid Heating Value	Btu/lb	19011.6	20853.1	18907.3	18898.7	19011.6
Gross Ideal Gas Heating Value	Btu/ft^3	4435.38	1097.21	5500.89	5613.19	4435.38
Gross Liquid Heating Value	Btu/lb	20441.1	23087.9	20289.9	20277.6	20441.1

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	

Connections

	Sales Gas	Tank Flash	Tank Liquids	Working Losses	3
From Block	Separator	PL Liquid Tanks	PL Liquid Tanks	--	MIX-100
To Block	--	--	--	--	Separator

Stream Composition

Mole Fraction	Sales Gas %	Tank Flash %	Tank Liquids %	Working Losses %	3 %
Carbon Dioxide		0.304072	0.00470991	0.207763 *	0.0105828
Nitrogen		0.60247	0.000937755	0.0406653 *	0.0127387
Methane		89.3038	0.417038	18.1803 *	2.16083
Ethane		5.66871	0.18383	8.18678 *	0.291433
Propane		0.0615534	0.00777983	0.351024 *	0.00883477
i-Butane		0.00162898	0.000512713	0.023232 *	0.000534612
n-Butane		0.00175188	0.000812076	0.034668 *	0.000830513
i-Pentane		0.000180542	0.000244947	0.00348395 *	0.000243683
n-Pentane		9.65651E-05	0.000178147	0.00184593 *	0.000176546
i-Hexane		0	0	0 *	0
Heptane		0	0	0 *	0
Octane		0	0	0 *	0
Nonane		0	0	0 *	0
Benzene		0	0	0 *	0
Toluene		0	0	0 *	0
Ethylbenzene		0	0	0 *	0
m-Xylene		0	0	0 *	0
n-Hexane		7.82807E-05	0.000371273	0.0014596 *	0.000365525
2,2,4-Trimethylpentane		0	0	0 *	0
Neopentane		0	0	0 *	0
DecanesPlus		0	0	0 *	0
Water		0	0	0 *	0
Helium		0	0	0 *	0
Hydrogen		0	0	0 *	0
Oxygen		0	0	0 *	0
LiquidsSample		4.0557	99.3836	72.9688 *	97.5134

Molar Flow	Sales Gas lbmol/h	Tank Flash lbmol/h	Tank Liquids lbmol/h	Working Losses lbmol/h	3 lbmol/h
Carbon Dioxide	0	9.60283E-06	7.43317E-06	8.63421E-08 *	1.7036E-05
Nitrogen	0	1.90265E-05	1.47996E-06	1.68997E-08 *	2.05064E-05
Methane	0	0.00282028	0.000658168	7.55537E-06 *	0.00347845
Ethane	0	0.000179022	0.00029012	3.40226E-06 *	0.000469142
Propane	0	1.9439E-06	1.22781E-05	1.45879E-07 *	1.4222E-05
i-Butane	0	5.14445E-08	8.09162E-07	9.65475E-09 *	8.60606E-07
n-Butane	0	5.53256E-08	1.28162E-06	1.44073E-08 *	1.33694E-06
i-Pentane	0	5.70164E-09	3.86575E-07	1.44786E-09 *	3.92276E-07
n-Pentane	0	3.0496E-09	2.81151E-07	7.67131E-10 *	2.842E-07
i-Hexane	0	0	0	0 *	0
Heptane	0	0	0	0 *	0
Octane	0	0	0	0 *	0
Nonane	0	0	0	0 *	0
Benzene	0	0	0	0 *	0
Toluene	0	0	0	0 *	0
Ethylbenzene	0	0	0	0 *	0
m-Xylene	0	0	0	0 *	0
n-Hexane	0	2.47216E-09	5.85942E-07	6.0658E-10 *	5.88414E-07
2,2,4-Trimethylpentane	0	0	0	0 *	0
Neopentane	0	0	0	0 *	0
DecanesPlus	0	0	0	0 *	0

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	

Molar Flow	Sales Gas lbmol/h	Tank Flash lbmol/h	Tank Liquids lbmol/h	Working Losses lbmol/h	3 lbmol/h
Water	0	0	0	0 *	0
Helium	0	0	0	0 *	0
Hydrogen	0	0	0	0 *	0
Oxygen	0	0	0	0 *	0
Liquids Sample	0	0.000128082	0.156847	3.03243E-05 *	0.156975

Mass Fraction	Sales Gas %	Tank Flash %	Tank Liquids %	Working Losses %	3 %
Carbon Dioxide		0.649925	0.00199858	0.111878	0.00456241
Nitrogen		0.819676	0.00025329	0.0139386	0.00349572
Methane		69.5795	0.0645074	3.56864	0.339576
Ethane		8.27836	0.0532966	3.01206	0.0858429
Propane		0.131822	0.00330772	0.189393	0.00381625
i-Butane		0.00459831	0.000287329	0.0165219	0.000304387
n-Butane		0.00494523	0.000455095	0.0246548	0.000472862
i-Pentane		0.000632626	0.000170398	0.00307561	0.000172227
n-Pentane		0.000338368	0.000123928	0.00162958	0.000124777
i-Hexane		0	0	0	0
Heptane		0	0	0	0
Octane		0	0	0	0
Nonane		0	0	0	0
Benzene		0	0	0	0
Toluene		0	0	0	0
Ethylbenzene		0	0	0	0
m-Xylene		0	0	0	0
n-Hexane		0.000327626	0.000308489	0.00153903	0.000308565
2,2,4-Trimethylpentane		0	0	0	0
Neopentane		0	0	0	0
Decanes Plus		0	0	0	0
Water		0	0	0	0
Helium		0	0	0	0
Hydrogen		0	0	0	0
Oxygen		0	0	0	0
Liquids Sample		20.5299	99.8753	93.0567	99.5613

Mass Flow	Sales Gas lb/h	Tank Flash lb/h	Tank Liquids lb/h	Working Losses lb/h	3 lb/h
Carbon Dioxide	0	0.000422616	0.00032713	3.79987E-06 *	0.000749746
Nitrogen	0	0.000532996	4.14588E-05	4.73417E-07 *	0.000574455
Methane	0	0.0452442	0.0105586	0.000121207 *	0.0558029
Ethane	0	0.00538303	0.00872363	0.000102303 *	0.0141067
Propane	0	8.57177E-05	0.000541411	6.43261E-06 *	0.000627129
i-Butane	0	2.99007E-06	4.70302E-05	5.61155E-07 *	5.00203E-05
n-Butane	0	3.21565E-06	7.44903E-05	8.37385E-07 *	7.7706E-05
i-Pentane	0	4.11366E-07	2.78909E-05	1.04461E-07 *	2.83023E-05
n-Pentane	0	2.20025E-07	2.02847E-05	5.53475E-08 *	2.05047E-05
i-Hexane	0	0	0	0 *	0
Heptane	0	0	0	0 *	0
Octane	0	0	0	0 *	0
Nonane	0	0	0	0 *	0
Benzene	0	0	0	0 *	0
Toluene	0	0	0	0 *	0
Ethylbenzene	0	0	0	0 *	0
m-Xylene	0	0	0	0 *	0
n-Hexane	0	2.1304E-07	5.04938E-05	5.22722E-08 *	5.07068E-05
2,2,4-Trimethylpentane	0	0	0	0 *	0
Neopentane	0	0	0	0 *	0
Decanes Plus	0	0	0	0 *	0

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	

Mass Flow	Sales Gas lb/h	Tank Flash lb/h	Tank Liquids lb/h	Working Losses lb/h	3 lb/h
Water	0	0	0	0 *	0
Helium	0	0	0	0 *	0
Hydrogen	0	0	0	0 *	0
Oxygen	0	0	0	0 *	0
Liquids Sample	0	0.0133496	16.3477	0.00316061 *	16.361

Stream Properties

Property	Units	Sales Gas	Tank Flash	Tank Liquids	Working Losses	3
Temperature	°F	70 *	70 *	70	70.3693	71.0182
Pressure	psia	564.696 *	14.6959 *	14.6959	0.804574	564.696
Mole Fraction Vapor	%		100	0	100	0
Mole Fraction Light Liquid	%		0	100	0	100
Mole Fraction Heavy Liquid	%		0	0	0	0
Molecular Weight	lb/lbmol		20.5902	103.714	81.7278	102.083
Mass Density	lb/ft^3		0.053423	44.6913	0.0115924	44.8068
Molar Flow	lbmol/h	0	0.00315808	0.15782	4.1558E-05	0.160978
Mass Flow	lb/h	0	0.0650253	16.3681	0.00339644	16.4331
Vapor Volumetric Flow	ft^3/h	0	1.21718	0.366248	0.292988	0.366755
Liquid Volumetric Flow	gpm	0	0.151752	0.0456621	0.0365284	0.0457253
Std Vapor Volumetric Flow	MMSCFD	0	2.87626E-05	0.00143736	3.78494E-07	0.00146612
Std Liquid Volumetric Flow	sgpm	0	0.000371517	0.0453936	1.01759E-05	0.0457651
Compressibility			0.996461	0.00599988	0.997218	0.225903
Specific Gravity			0.710924	0.716565	2.82185	0.718417
API Gravity				64.6582		64.0413
Enthalpy	Btu/h	0	-107.954	-13668.1	-2.5416	-13749.7
Mass Enthalpy	Btu/lb		-1660.19	-835.044	-748.313	-836.709
Mass Cp	Btu/(lb*°F)		0.483185	0.47616	0.375115	0.475935
Ideal Gas CpCv Ratio			1.25049	1.05492	1.06931	1.05567
Dynamic Viscosity	cP		0.0105986	0.458112	0.00659615	0.466059
Kinematic Viscosity	cSt		12.3851	0.639924	35.5218	0.649346
Thermal Conductivity	Btu/(h*ft*°F)		0.0177798	0.0637077	0.00847255	0.0636323
Surface Tension	lbf/ft			0.00147242 ?		0.00117197 ?
Net Ideal Gas Heating Value	Btu/ft^3		1117.74	5209.23	4127.53	5128.96
Net Liquid Heating Value	Btu/lb		20554.3	18900.7	19011.6	18907.3
Gross Ideal Gas Heating Value	Btu/ft^3		1231.61	5586.32	4435.38	5500.89
Gross Liquid Heating Value	Btu/lb		22653.2	20280.5	20441.1	20289.9

Remarks

Energy Stream Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	

Energy Streams

Energy Stream	Energy Rate	Power	From Block	To Block
Q-1	-18.3342 Btu/h	-0.00720562 hp	--	PL Liquid Tanks
Q-2	-7.95762 Btu/h	-0.00312746 hp	--	Separator

Remarks

Blocks
MIX-100
Mixer/Splitter Report

Client Name:	TC Energy	Job:	Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	Modified:	11:22 AM, 10/16/2020
Flowsheet:	Pipeline Liquids	Status:	Solved 5:14 PM, 5/17/2021

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
Gas Sample	Inlet		Liquids Sample	Inlet	
3	Outlet	Separator			

Block Parameters

Pressure Drop	0 psi	Fraction to Stream 3	100 %
Flow Multiplier	100 %		

Remarks

Blocks
PL Liquid Tanks
Separator Report

Client Name:	TC Energy	Job:	Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	Modified:	10:08 AM, 8/25/2020
Flowsheet:	Pipeline Liquids	Status:	Solved 5:14 PM, 5/17/2021

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
Liquids	Inlet	Separator	Tank Flash	Vapor Outlet	
Tank Liquids	Light Liquid Outlet		Q-1	Energy	

Block Parameters

Pressure Drop	550	psi	Main Liquid Phase	Light Liquid	
Mole Fraction Vapor	1.96181	%	Heat Duty	-18.3342	Btu/h
Mole Fraction Light Liquid	98.0382	%	Heat Release Curve Type	Plug Flow	
Mole Fraction Heavy Liquid	0	%	Heat Release Curve Increments	10	

Remarks

Blocks
Separator
Separator Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20	
Location:	Ceredo Compressor Station	Modified: 10:09 AM, 8/25/2020	
Flowsheet:	Pipeline Liquids	Status: Solved 5:14 PM, 5/17/2021	

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
3	Inlet	MIX-100	Sales Gas	Vapor Outlet	
Liquids	Light Liquid Outlet	PL Liquid Tanks	Q-2	Energy	

Block Parameters

Pressure Drop	0 psi	Main Liquid Phase	Light Liquid
Mole Fraction Vapor	0 %	Heat Duty	-7.95762 Btu/h
Mole Fraction Light Liquid	100 %	Heat Release Curve Type	Plug Flow
Mole Fraction Heavy Liquid	0 %	Heat Release Curve Increments	10

Remarks

Flowsheet Environment
Environment1

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	
Flowsheet:	Pipeline Liquids	

Environment Settings

Number of Poynting Intervals	0	Phase Tolerance	1 %
Gibbs Excess Model Evaluation Temperature	77 °F	Emulsion Enabled	False
Freeze Out Temperature Threshold Difference	10 °F		

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Carbon Dioxide	False	False	Benzene	False	False
Nitrogen	False	False	Toluene	False	False
Methane	False	False	Ethylbenzene	False	False
Ethane	False	False	m-Xylene	False	False
Propane	False	False	n-Hexane	False	False
i-Butane	False	False	2,2,4-Trimethylpentane	False	False
n-Butane	False	False	Neopentane	False	False
i-Pentane	False	False	Decanes Plus	False	False
n-Pentane	False	False	Water	False	True
i-Hexane	False	False	Helium	False	False
Heptane	False	False	Hydrogen	False	False
Octane	False	False	Oxygen	False	False
Nonane	False	False	Liquids Sample	False	False

Physical Property Method Sets

Liquid Molar Volume	COSTALD	Overall Package	Peng-Robinson
Stability Calculation	Peng-Robinson	Vapor Package	Peng-Robinson
Light Liquid Package	Peng-Robinson	Heavy Liquid Package	Peng-Robinson

Remarks

Environments Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Project-Wide Constants

Atmospheric Pressure	14.6959 psia	Ideal Gas Reference Pressure	14.6959 psia
Ideal Gas Reference Temperature	60 °F	Ideal Gas Reference Volume	379.484 ft^3/lbmol
Liquid Reference Temperature	60 °F		

Environment [Environment1]

Environment Settings

Number of Poynting Intervals	0	Phase Tolerance	1 %
Gibbs Excess Model Evaluation Temperature	77 °F	Emulsion Enabled	False
Freeze Out Temperature Threshold Difference	10 °F		

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Carbon Dioxide	False	False	Benzene	False	False
Nitrogen	False	False	Toluene	False	False
Methane	False	False	Ethylbenzene	False	False
Ethane	False	False	m-Xylene	False	False
Propane	False	False	n-Hexane	False	False
i-Butane	False	False	2,2,4-Trimethylpentane	False	False
n-Butane	False	False	Neopentane	False	False
i-Pentane	False	False	Decanes Plus	False	False
n-Pentane	False	False	Water	False	True
i-Hexane	False	False	Helium	False	False
Heptane	False	False	Hydrogen	False	False
Octane	False	False	Oxygen	False	False
Nonane	False	False	Liquids Sample	False	False

Physical Property Method Sets

Liquid Molar Volume	COSTALD	Overall Package	Peng-Robinson
Stability Calculation	Peng-Robinson	Vapor Package	Peng-Robinson
Light Liquid Package	Peng-Robinson	Heavy Liquid Package	Peng-Robinson

Remarks

Single Oil Report
Decanes Plus

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Properties

	Volume Average Boiling Point	240.832 °F	Low Temperature Viscosity	0.441651	cP
*	Molecular Weight	108.848 lb/lbmol	Temperature of High T Viscosity	210	°F
*	Specific Gravity	0.7432	High Temperature Viscosity	0.256204	cP
	API Gravity	58.8929	Watson K	11.9499	
	Critical Temperature	563.715 °F	ASTM D86 10-90% Slope	0	°F/%
	Critical Pressure	421.397 psia	ASTM D93 Flash Point	47.9739	°F
	Critical Volume	6.98262 ft^3/lbmol	? Pour Point	-22.4869	°F
	Acentric Factor	0.350921	Paraffinic Fraction	56.3105	%
	Carbon to Hydrogen Ratio	5.84021	Naphthenic Fraction	29.8859	%
	Refractive Index	1.41346	Aromatic Fraction	13.8037	%
	Temperature of Low T Viscosity	100 °F	Ideal Gas Heat Capacity	38.2665	Btu/(lbmol*°F)

Warnings

ProMax:ProMax!Project!Oils!Decanes Plus!Properties!Pour Point

Warning: Pour Point calculation: The value of 240.832 °F for Volume Average Boiling Point should be between 340.33 °F and 1040.33 °F.

Remarks

Single Oil Report
Liquids Sample

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Properties

	Volume Average Boiling Point	221.237 °F	Low Temperature Viscosity	0.389635 cP
*	Molecular Weight	104.227 lb/lbmol	Temperature of High T Viscosity	210 °F
*	Specific Gravity	0.721862	High Temperature Viscosity	0.231388 cP
	API Gravity	64.5208	Watson K	12.1873
	Critical Temperature	536.86 °F	ASTM D86 10-90% Slope	0 °F/%
	Critical Pressure	417.121 psia	ASTM D93 Flash Point	34.4537 °F
	Critical Volume	6.79544 ft^3/lbmol	? Pour Point	-14.04 °F
	Acentric Factor	0.339064	Paraffinic Fraction	64.4262 %
	Carbon to Hydrogen Ratio	5.57819	Naphthenic Fraction	26.0787 %
	Refractive Index	1.40218	Aromatic Fraction	9.49512 %
	Temperature of Low T Viscosity	100 °F	Ideal Gas Heat Capacity	37.6486 Btu/(lbmol*°F)

Warnings

ProMax:ProMax!Project!Oils!Liquids Sample!Properties!Pour Point

Warning: Pour Point calculation: The value of 221.237 °F for Volume Average Boiling Point should be between 340.33 °F and 1040.33 °F.

Remarks

Calculator Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Gas Solver

Source Code

Residual Error (for CV1) = LiquidsSample - 99

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!Pipeline Liquids!PStreams!Gas Sample!Phases!Total!Properties!Std Vapor Volumetric Flow
Value	3.64561E-05
Unit	

Measured Variable [LiquidsSample]

Source Moniker	ProMax:ProMax!Project!Flowsheets!Pipeline Liquids!PStreams!Liquids!Phases!Total!Composition!Std Liquid Volumetric Fraction!Liquids Sample
Value	99
Unit	

Solver Properties

Status: Solved

Error	6.08996E-08		Weighting	1
Calculated Value	3.64561E-05	MMSCFD	Priority	0
Lower Bound		MMSCFD	Solver State	Active
Upper Bound		MMSCFD	Group	
Step Size		MMSCFD	Skip Dependency Check	False
Is Minimizer	False		Block Dependencies	2
Algorithm	Default		Recycle Dependencies	0
Iterations	3		Solver Dependencies	1
Max Iterations	20			

Remarks

Liquid Solver

Source Code

Residual Error (for CV1) = Liquids - 24000

Calculated Variable [CV1]

Source Moniker	ProMax:ProMax!Project!Flowsheets!Pipeline Liquids!PStreams!Liquids Sample!Phases!Total!Properties!Std Liquid Volumetric Flow
Value	0.0453075
Unit	

Measured Variable [Liquids]

Source Moniker	ProMax:ProMax!Project!Flowsheets!Pipeline Liquids!PStreams!Tank Liquids!Phases!Total!Properties!Liquid Volumetric Flow
Value	24000
Unit	

Solver Properties

Status: Solved

Error	0.000451137		Max Iterations	20
Calculated Value	0.0453075	sgpm	Weighting	1
Lower Bound		sgpm	* Solver State	Active
Upper Bound		sgpm	* Skip Dependency Check	True
Step Size		sgpm	Block Dependencies	3
Is Minimizer	False		Recycle Dependencies	0
Algorithm	Default		Solver Dependencies	0
Iterations	2			

Remarks

Calculator Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

User Value Sets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Tank-1

User Value [BlockReady]

* Parameter	1		Upper Bound	
Lower Bound			* Enforce Bounds	False

User Value [ShellLength]

* Parameter	23	ft	Upper Bound	ft
Lower Bound		ft	* Enforce Bounds	False

User Value [ShellDiam]

* Parameter	10	ft	Upper Bound	ft
Lower Bound		ft	* Enforce Bounds	False

User Value [BreatherVP]

* Parameter	0.03	psig	Upper Bound	psig
Lower Bound		psig	* Enforce Bounds	False

User Value [BreatherVacP]

* Parameter	-0.03	psig	Upper Bound	psig
Lower Bound		psig	* Enforce Bounds	False

User Value [DomeRadius]

Parameter		ft	Upper Bound	ft
Lower Bound		ft	* Enforce Bounds	False

User Value [OpPress]

* Parameter	0	psig	Upper Bound	psig
Lower Bound		psig	* Enforce Bounds	False

User Value [AvgPercentLiq]

* Parameter	50	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [MaxPercentLiq]

* Parameter	90	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [MinPercentLiq]

* Parameter	10	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [AnnNetTP]

* Parameter	1.55684	bbl/day	Upper Bound	bbl/day
Lower Bound		bbl/day	* Enforce Bounds	False

User Value [OREff]

* Parameter	0	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [MaxAvgT]

* Parameter	65.4	°F	Upper Bound	°F
Lower Bound		°F	* Enforce Bounds	False

User Value [MinAvgT]

* Parameter	45.5	°F	Upper Bound	°F
Lower Bound		°F	* Enforce Bounds	False

User Value Sets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

User Value [BulkLiqT]

* Parameter	58.7899	°F	Upper Bound	°F
Lower Bound		°F	* Enforce Bounds	False

User Value [AvgP]

* Parameter	14.16	psia	Upper Bound	psia
Lower Bound		psia	* Enforce Bounds	False

User Value [ThermI]

* Parameter	1237	Btu/ft^2/day	Upper Bound	Btu/ft^2/day
Lower Bound		Btu/ft^2/day	* Enforce Bounds	False

User Value [AvgWindSpeed]

* Parameter	4	mi/h	Upper Bound	mi/h
Lower Bound		mi/h	* Enforce Bounds	False

User Value [MaxHourlyLoadingRate]

Parameter		bbl/hr	Upper Bound	bbl/hr
Lower Bound		bbl/hr	* Enforce Bounds	False

User Value [SumLiqLevelInc]

Parameter		ft/yr	Upper Bound	ft/yr
Lower Bound		ft/yr	* Enforce Bounds	False

User Value [FlashingT]

* Parameter	70.3693	°F	Upper Bound	°F
Lower Bound		°F	* Enforce Bounds	False

User Value [EntrainedOilFrac]

* Parameter	1	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [TurnoverRate]

* Parameter	0.577925		Upper Bound	
Lower Bound			* Enforce Bounds	False

User Value [LLossSatFactor]

* Parameter	1.45		Upper Bound	
Lower Bound			* Enforce Bounds	False

User Value [AtmPressure]

* Parameter	14.16	psia	Upper Bound	psia
Lower Bound		psia	* Enforce Bounds	False

User Value [TVP]

* Parameter	13.5701	psia	Upper Bound	psia
Lower Bound		psia	* Enforce Bounds	False

User Value [MaxVP]

* Parameter	14.16	psia	Upper Bound	psia
Lower Bound		psia	* Enforce Bounds	False

User Value [MinVP]

* Parameter	12.9984	psia	Upper Bound	psia

User Value Sets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

User Value [MinVP]

Lower Bound		psia	* Enforce Bounds	False

User Value [AvgLiqSurfaceT]

* Parameter	61.8044	°F	Upper Bound	°F
Lower Bound		°F	* Enforce Bounds	False

User Value [MaxLiqSurfaceT]

* Parameter	70.3693	°F	Upper Bound	°F
Lower Bound		°F	* Enforce Bounds	False

User Value [TotalLosses]

* Parameter	1.13896	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [WorkingLosses]

* Parameter	0.00462624	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [StandingLosses]

* Parameter	0.375026	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [RimSealLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [WithdrawalLoss]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [LoadingLosses]

* Parameter	0.0202479	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [MaxHourlyLoadingLoss]

* Parameter	0	lb/hr	Upper Bound	lb/hr
Lower Bound		lb/hr	* Enforce Bounds	False

User Value [PStar]

Parameter			Upper Bound	
Lower Bound			* Enforce Bounds	False

User Value [AllCTotalLosses]

* Parameter	1.22083	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [AllCLoadingLosses]

* Parameter	0.0217034	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [AllCMaxHLoadingLoss]

* Parameter	0	lb/hr	Upper Bound	lb/hr
Lower Bound		lb/hr	* Enforce Bounds	False

User Value Sets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

User Value [AllCFlashingLosses]

* Parameter	0.291171	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [DeckFittingLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [DeckSeamLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [FlashingLosses]

* Parameter	0.0624978	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [TotalResidual]

* Parameter	70.4651	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [GasMoleWeight]

* Parameter	0.0200458	kg/mol	Upper Bound	kg/mol
Lower Bound		kg/mol	* Enforce Bounds	False

User Value [VapReportableFrac]

* Parameter	93.2935	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [LiqReportableFrac]

* Parameter	99.8838	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [FlashReportableFrac]

* Parameter	21.4643	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={CD98EEA3-8B3E-47D7-BCC0-B760573420A8}

Sum Component Flow/Frac

User Value [CompSum]

* Parameter	0.0588777	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={5CABC249-2E47-44D4-A833-4F3D1AF2547A}

Sum Component Flow/Frac.177

User Value [CompSum]

* Parameter	0.0138787	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value Sets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Remarks
This User Value Set was programmatically generated. GUID={0BEE6B58-A118-4655-88B1-C3178E914D1F}

Sum Component Flow/Frac.178

User Value [CompSum]

* Parameter	1.12508	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={1FCF7A22-53BB-4D85-B4D2-98034DCCEAC5}

Sum Component Flow/Frac.179

User Value [CompSum]

* Parameter	0.0202479	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={844D69D0-5266-4B81-8111-87B14F6F1BDC}

Sum Component Flow/Frac.186

User Value [CompSum]

* Parameter	0.0134424	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={16314887-EB06-407D-A4B5-D174F0939D1D}

Sum Component Flow/Frac.187

User Value [CompSum]

* Parameter	9.33114E-07	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={9AFAA5FF-7014-420C-88AF-1F950D754536}

Sum Component Flow/Frac.188

User Value [CompSum]

* Parameter	2.1304E-07	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={8AF72F6D-9B6B-4084-A5B9-70157C63A6B1}

User Value Sets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Sum Component Flow/Frac.189

User Value [CompSum]

* Parameter	0.00316866	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={9CB8D542-8D75-4E89-8AB7-442949EE109B}

Sum Component Flow/Frac.190

User Value [CompSum]

* Parameter	0.256867	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={23E8E7AB-B99D-4098-A3AE-61C1D7D4BA2E}

Sum Component Flow/Frac.191

User Value [CompSum]

* Parameter	1.856E-05	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={63883334-AB8B-4092-A4D0-1E7AED13AEE9}

Sum Component Flow/Frac.192

User Value [CompSum]

* Parameter	4.23745E-06	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={51B0EE06-A063-4115-9274-E1D15BF915CA}

Sum Component Flow/Frac.193

User Value [CompSum]

* Parameter	2.28952E-07	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={55E10691-B7DA-4FAA-9B9E-0B68D87CB072}

Sum Component Flow/Frac.194

User Value [CompSum]

* Parameter	3.34022E-07	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks

User Value Sets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

This User Value Set was programmatically generated. GUID={75C56AB5-55B0-40BE-BD77-0FEA32ACB487}

Sum Component Flow/Frac.195

User Value [CompSum]

* Parameter	0.0046228	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={DFB150C3-5EE6-4635-8FEF-CAC33DC58C42}

Sum Component Flow/Frac.196

User Value [CompSum]

* Parameter	5.22722E-08	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={CA38BC43-757A-43DF-B7AE-5B8482D705C9}

Sum Component Flow/Frac.197

User Value [CompSum]

* Parameter	7.62607E-08	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={D1DB11B0-87F0-46EA-90A6-6AC73B0D6340}

Recoveries Report

Client Name:	TC Energy
Location:	Ceredo Compressor Station
Job:	Pipeline Liquids A18-A20

Component Recoveries - Project Inlets

Status: Solved

Recovery Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Gas Sample	Pipeline Liquids	Liquids Sample

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Pipeline Liquids:Gas Sample lbmol/h	Pipeline Liquids:Liquids Sample lbmol/h	Summary Table lbmol/h	
Carbon Dioxide	1.7036E-05	0	1.7036E-05	
Nitrogen	2.05064E-05	0	2.05064E-05	
Methane	0.00347845	0	0.00347845	
Ethane	0.000469142	0	0.000469142	
Propane	1.4222E-05	0	1.4222E-05	
i-Butane	8.60606E-07	0	8.60606E-07	
n-Butane	1.33694E-06	0	1.33694E-06	
i-Pentane	3.92276E-07	0	3.92276E-07	
n-Pentane	2.842E-07	0	2.842E-07	
i-Hexane	0	0	0	
Heptane	0	0	0	
Octane	0	0	0	
Nonane	0	0	0	
Benzene	0	0	0	
Toluene	0	0	0	
Ethylbenzene	0	0	0	
m-Xylene	0	0	0	
n-Hexane	5.88414E-07	0	5.88414E-07	
2,2,4-Trimethylpentane	0	0	0	
Neopentane	0	0	0	
Decanes Plus	0	0	0	
Water	0	0	0	
Helium	0	0	0	
Hydrogen	0	0	0	
Oxygen	0	0	0	
Liquids Sample	0	0.156975	0.156975	
Total	0.00400282	0.156975	0.160978	

Remarks

Component Recoveries - Project Outlets

Status: Solved

Recovery Stream Data Source - All Outlets in Project

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Sales Gas	Pipeline Liquids	Tank Liquids
Pipeline Liquids	Tank Flash		

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	False	Atomic Basis	False

Recoveries Report

Client Name:	TC Energy
Location:	Ceredo Compressor Station
Job:	Pipeline Liquids A18-A20

Tabulated Data

Index	Pipeline Liquids:Sales Gas lbmol/h	Pipeline Liquids:Tank Flash lbmol/h	Pipeline Liquids:Tank Liquids lbmol/h	Summary Table lbmol/h
Carbon Dioxide		9.60283E-06	7.43317E-06	1.7036E-05
Nitrogen		1.90265E-05	1.47996E-06	2.05064E-05
Methane		0.00282028	0.000658168	0.00347845
Ethane		0.000179022	0.00029012	0.000469142
Propane		1.9439E-06	1.22781E-05	1.4222E-05
i-Butane		5.14445E-08	8.09162E-07	8.60606E-07
n-Butane		5.53256E-08	1.28162E-06	1.33694E-06
i-Pentane		5.70164E-09	3.86575E-07	3.92276E-07
n-Pentane		3.0496E-09	2.81151E-07	2.842E-07
i-Hexane		0	0	0
Heptane		0	0	0
Octane		0	0	0
Nonane		0	0	0
Benzene		0	0	0
Toluene		0	0	0
Ethylbenzene		0	0	0
m-Xylene		0	0	0
n-Hexane		2.47216E-09	5.85942E-07	5.88414E-07
2,2,4-Trimethylpentane		0	0	0
Neopentane		0	0	0
Decanes Plus		0	0	0
Water		0	0	0
Helium		0	0	0
Hydrogen		0	0	0
Oxygen		0	0	0
Liquids Sample		0.000128082	0.156847	0.156975
Total		0.00315808	0.15782	0.160978

Remarks

Component Recoveries - Project Losses

Status: Solved

Reference Stream Data Source - All Outlets in Project

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Sales Gas	Pipeline Liquids	Tank Liquids
Pipeline Liquids	Tank Flash		

Recovery Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Gas Sample	Pipeline Liquids	Liquids Sample

Parameters

Composition Basis	Molar Flow	Summation Option	Summation Only
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Summary Table lbmol/h			
Carbon Dioxide	-3.3613E-21			
Nitrogen	0			
Methane	0			
Ethane	-1.07562E-19			
Propane	-5.04195E-21			

Recoveries Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Tabulated Data

Index	Summary Table lbmol/h			
i-Butane	-1.05041E-22			
n-Butane	-2.10081E-22			
i-Pentane	-1.05041E-22			
n-Pentane	-5.25203E-23			
i-Hexane	0			
Heptane	0			
Octane	0			
Nonane	0			
Benzene	0			
Toluene	0			
Ethylbenzene	0			
m-Xylene	0			
n-Hexane	-2.10081E-22			
2,2,4-Trimethylpentane	0			
Neopentane	0			
Decanes Plus	0			
Water	0			
Helium	0			
Hydrogen	0			
Oxygen	0			
Liquids Sample	-2.75358E-17			
Total	-2.75358E-17			

Remarks

Component Recoveries - Project Recoveries

Status: Solved

Reference Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Gas Sample	Pipeline Liquids	Liquids Sample

Recovery Stream Data Source - All Outlets in Project

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Sales Gas	Pipeline Liquids	Tank Liquids
Pipeline Liquids	Tank Flash		

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	True	Atomic Basis	False

Tabulated Data

Index	Pipeline Liquids:Sales Gas %	Pipeline Liquids:Tank Flash %	Pipeline Liquids:Tank Liquids %	Summary Table %
Carbon Dioxide		56.3679	43.6321	100
Nitrogen		92.7829	7.21706	100
Methane		81.0787	18.9213	100
Ethane		38.1595	61.8405	100
Propane		13.6683	86.3317	100
i-Butane		5.9777	94.0223	100
n-Butane		4.13822	95.8618	100
i-Pentane		1.45348	98.5465	100
n-Pentane		1.07305	98.927	100

Recoveries Report

Client Name:	TC Energy
Location:	Ceredo Compressor Station

Job: Pipeline Liquids A18-A20

Tabulated Data

Index	Pipeline Liquids:Sales Gas %	Pipeline Liquids:Tank Flash %	Pipeline Liquids:Tank Liquids %	Summary Table %
i-Hexane				
Heptane				
Octane				
Nonane				
Benzene				
Toluene				
Ethylbenzene				
m-Xylene				
n-Hexane		0.42014	99.5799	100
2,2,4-Trimethylpentane				
Neopentane				
Decanes Plus				
Water				
Helium				
Hydrogen				
Oxygen				
Liquids Sample		0.081594	99.9184	100
Total		1.96181	98.0382	100

Remarks

Component Recoveries - Pipeline Liquids Inlets

Status: Solved

Recovery Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Gas Sample	Pipeline Liquids	Liquids Sample

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Pipeline Liquids:Gas Sample lbmol/h	Pipeline Liquids:Liquids Sample lbmol/h	Summary Table lbmol/h	
Carbon Dioxide	1.7036E-05	0	1.7036E-05	
Nitrogen	2.05064E-05	0	2.05064E-05	
Methane	0.00347845	0	0.00347845	
Ethane	0.000469142	0	0.000469142	
Propane	1.4222E-05	0	1.4222E-05	
i-Butane	8.60606E-07	0	8.60606E-07	
n-Butane	1.33694E-06	0	1.33694E-06	
i-Pentane	3.92276E-07	0	3.92276E-07	
n-Pentane	2.842E-07	0	2.842E-07	
i-Hexane	0	0	0	
Heptane	0	0	0	
Octane	0	0	0	
Nonane	0	0	0	
Benzene	0	0	0	
Toluene	0	0	0	
Ethylbenzene	0	0	0	
m-Xylene	0	0	0	
n-Hexane	5.88414E-07	0	5.88414E-07	

Recoveries Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Tabulated Data

Index	Pipeline Liquids:Gas Sample lbmol/h	Pipeline Liquids:Liquids Sample lbmol/h	Summary Table lbmol/h	
2,2,4-Trimethylpentane	0	0	0	
Neopentane	0	0	0	
Decanes Plus	0	0	0	
Water	0	0	0	
Helium	0	0	0	
Hydrogen	0	0	0	
Oxygen	0	0	0	
Liquids Sample	0	0.156975	0.156975	
Total	0.00400282	0.156975	0.160978	

Remarks

Component Recoveries - Pipeline Liquids Outlets

Status: Solved

Recovery Stream Data Source - All Outlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Sales Gas	Pipeline Liquids	Tank Liquids
Pipeline Liquids	Tank Flash		

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Pipeline Liquids:Sales Gas lbmol/h	Pipeline Liquids:Tank Flash lbmol/h	Pipeline Liquids:Tank Liquids lbmol/h	Summary Table lbmol/h
Carbon Dioxide		9.60283E-06	7.43317E-06	1.7036E-05
Nitrogen		1.90265E-05	1.47996E-06	2.05064E-05
Methane		0.00282028	0.000658168	0.00347845
Ethane		0.000179022	0.00029012	0.000469142
Propane		1.9439E-06	1.22781E-05	1.4222E-05
i-Butane		5.14445E-08	8.09162E-07	8.60606E-07
n-Butane		5.53256E-08	1.28162E-06	1.33694E-06
i-Pentane		5.70164E-09	3.86575E-07	3.92276E-07
n-Pentane		3.0496E-09	2.81151E-07	2.842E-07
i-Hexane		0	0	0
Heptane		0	0	0
Octane		0	0	0
Nonane		0	0	0
Benzene		0	0	0
Toluene		0	0	0
Ethylbenzene		0	0	0
m-Xylene		0	0	0
n-Hexane		2.47216E-09	5.85942E-07	5.88414E-07
2,2,4-Trimethylpentane		0	0	0
Neopentane		0	0	0
Decanes Plus		0	0	0
Water		0	0	0
Helium		0	0	0
Hydrogen		0	0	0
Oxygen		0	0	0
Liquids Sample		0.000128082	0.156847	0.156975

Recoveries Report

Client Name:	TC Energy
Location:	Ceredo Compressor Station

Job: Pipeline Liquids A18-A20

Tabulated Data

Index	Pipeline Liquids:Sales Gas lbmol/h	Pipeline Liquids:Tank Flash lbmol/h	Pipeline Liquids:Tank Liquids lbmol/h	Summary Table lbmol/h
Total		0.00315808	0.15782	0.160978

Remarks

Component Recoveries - Pipeline Liquids Losses

Status: Solved

Reference Stream Data Source - All Outlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Sales Gas	Pipeline Liquids	Tank Liquids
Pipeline Liquids	Tank Flash		

Recovery Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Gas Sample	Pipeline Liquids	Liquids Sample

Parameters

Composition Basis	Molar Flow	Summation Option	Summation Only
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Summary Table lbmol/h			
Carbon Dioxide	-3.3613E-21			
Nitrogen	0			
Methane	0			
Ethane	-1.07562E-19			
Propane	-5.04195E-21			
i-Butane	-1.05041E-22			
n-Butane	-2.10081E-22			
i-Pentane	-1.05041E-22			
n-Pentane	-5.25203E-23			
i-Hexane	0			
Heptane	0			
Octane	0			
Nonane	0			
Benzene	0			
Toluene	0			
Ethylbenzene	0			
m-Xylene	0			
n-Hexane	-2.10081E-22			
2,2,4-Trimethylpentane	0			
Neopentane	0			
Decanes Plus	0			
Water	0			
Helium	0			
Hydrogen	0			
Oxygen	0			
Liquids Sample	-2.75358E-17			
Total	-2.75358E-17			

Remarks

Recoveries Report

Client Name:	TC Energy
Location:	Ceredo Compressor Station

Job: Pipeline Liquids A18-A20

Component Recoveries - Pipeline Liquids Recoveries

Status: Solved

Reference Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Gas Sample	Pipeline Liquids	Liquids Sample

Recovery Stream Data Source - All Outlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Pipeline Liquids	Sales Gas	Pipeline Liquids	Tank Liquids
Pipeline Liquids	Tank Flash		

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	True	Atomic Basis	False

Tabulated Data

Index	Pipeline Liquids:Sales Gas %	Pipeline Liquids:Tank Flash %	Pipeline Liquids:Tank Liquids %	Summary Table %
Carbon Dioxide		56.3679	43.6321	100
Nitrogen		92.7829	7.21706	100
Methane		81.0787	18.9213	100
Ethane		38.1595	61.8405	100
Propane		13.6683	86.3317	100
i-Butane		5.9777	94.0223	100
n-Butane		4.13822	95.8618	100
i-Pentane		1.45348	98.5465	100
n-Pentane		1.07305	98.927	100
i-Hexane				
Heptane				
Octane				
Nonane				
Benzene				
Toluene				
Ethylbenzene				
m-Xylene				
n-Hexane		0.42014	99.5799	100
2,2,4-Trimethylpentane				
Neopentane				
Decanes Plus				
Water				
Helium				
Hydrogen				
Oxygen				
Liquids Sample		0.081594	99.9184	100
Total		1.96181	98.0382	100

Remarks

Energy Budgets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Power Budget - Project Power Budget

Status: Solved

Parameters

Net Power	0 hp	Total Power Required	0 hp
Total Power Supplied	0 hp	External Energy Only	True

Remarks

Heat Budget - Project Heat Budget

Status: Solved

Heat Budget Data Source - All Exchangers in Project

Flowsheet	Block	Flowsheet	Block
Pipeline Liquids	PL Liquid Tanks	Pipeline Liquids	Separator

Parameters

Net Duty	-26.2918 Btu/h	Total Duty Required	0 Btu/h
Total Duty Supplied	26.2918 Btu/h	External Energy Only	True

Tabulated Data

Index	Block Duty Btu/h	Block Highest Temperature °F	Block Lowest Temperature °F	
Pipeline Liquids:PL Liquid Tanks	-18.3342	70	70	
Pipeline Liquids:Separator	-7.95762	71.0182	70	

Remarks

Power Budget - Pipeline Liquids Power Budget

Status: Solved

Parameters

Net Power	0 hp	Total Power Required	0 hp
Total Power Supplied	0 hp	External Energy Only	True

Remarks

Heat Budget - Pipeline Liquids Heat Budget

Status: Solved

Heat Budget Data Source - All Exchangers in Flowsheet

Flowsheet	Block	Flowsheet	Block
Pipeline Liquids	PL Liquid Tanks	Pipeline Liquids	Separator

Parameters

Net Duty	-26.2918 Btu/h	Total Duty Required	0 Btu/h
Total Duty Supplied	26.2918 Btu/h	External Energy Only	True

Tabulated Data

Index	Block Duty Btu/h	Block Highest Temperature °F	Block Lowest Temperature °F	
Pipeline Liquids:PL Liquid	-18.3342	70	70	

Energy Budgets Report

Client Name:	TC Energy	Job: Pipeline Liquids A18-A20
Location:	Ceredo Compressor Station	

Tabulated Data

Index	Block Duty Btu/h	Block Highest Temperature °F	Block Lowest Temperature °F	
Tanks				
Pipeline Liquids:Separator	-7.95762	71.0182	70	

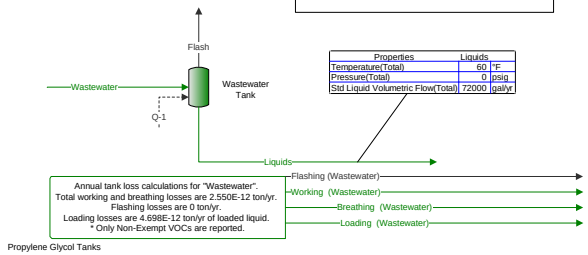
Remarks

Wastewater
Plant Schematic

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Assumptions
- 95% Water , 5% Lube Oil
- 60 F, 0 PSIG

TC Energy
Ceredo Compressor Station
Wastewater Tank Emissions
Tank A21



"Flashing (Wastewater)" VOCs = 0 ton/yr	"Flashing (Wastewater)" VOCs = 0 lb/h
"Breathing (Wastewater)" VOCs = 6.001E-13 ton/yr	"Breathing (Wastewater)" VOCs = 1.370E-13 lb/h
"Loading (Wastewater)" VOCs = 4.698E-12 ton/yr	"Loading (Wastewater)" VOCs = 1.072E-12 lb/h
"Working (Wastewater)" VOCs = 1.950E-12 ton/yr	"Working (Wastewater)" VOCs = 4.451E-13 lb/h
"Flashing (Wastewater)" HAPs = 0 ton/yr	"Flashing (Wastewater)" HAPs = 0 lb/h
"Breathing (Wastewater)" HAPs = 0 ton/yr	"Breathing (Wastewater)" HAPs = 0 lb/h
"Loading (Wastewater)" HAPs = 0 ton/yr	"Loading (Wastewater)" HAPs = 0 lb/h
"Working (Wastewater)" HAPs = 0 ton/yr	"Working (Wastewater)" HAPs = 0 lb/h

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Connections

	Breathing (Wastewater)	Flash	Flashing (Wastewater)	Liquids	Loading (Wastewater)
From Block	--	Wastewater Tank	--	Wastewater Tank	--
To Block	--	--	--	--	--

Stream Composition

Mole Fraction	Breathing (Wastewater) %	Flash %	Flashing (Wastewater) %	Liquids %	Loading (Wastewater) %
Carbon Dioxide	0 *			0	0 *
Nitrogen	0 *			0	0 *
Methane	0 *			0	0 *
Ethane	0 *			0	0 *
Propane	0 *			0	0 *
i-Butane	0 *			0	0 *
n-Butane	0 *			0	0 *
i-Pentane	0 *			0	0 *
n-Pentane	0 *			0	0 *
i-Hexane	0 *			0	0 *
Heptane	0 *			0	0 *
Octane	0 *			0	0 *
Nonane	0 *			0	0 *
Benzene	0 *			0	0 *
Toluene	0 *			0	0 *
Ethylbenzene	0 *			0	0 *
m-Xylene	0 *			0	0 *
n-Hexane	0 *			0	0 *
2,2,4-Trimethylpentane	0 *			0	0 *
Neopentane	0 *			0	0 *
DecanesPlus	0 *			0	0 *
Water	100 *			95	100 *
Helium	0 *			0	0 *
Hydrogen	0 *			0	0 *
Oxygen	0 *			0	0 *
Lube Oil	3.82531E-09 *			5	3.82531E-09 *
Propylene Glycol	0 *			0	0 *

Molar Flow	Breathing (Wastewater) lbmol/h	Flash lbmol/h	Flashing (Wastewater) lbmol/h	Liquids lbmol/h	Loading (Wastewater) lbmol/h
Carbon Dioxide	0 *	0	0	0	0 *
Nitrogen	0 *	0	0	0	0 *
Methane	0 *	0	0	0	0 *
Ethane	0 *	0	0	0	0 *
Propane	0 *	0	0	0	0 *
i-Butane	0 *	0	0	0	0 *
n-Butane	0 *	0	0	0	0 *
i-Pentane	0 *	0	0	0	0 *
n-Pentane	0 *	0	0	0	0 *
i-Hexane	0 *	0	0	0	0 *
Heptane	0 *	0	0	0	0 *
Octane	0 *	0	0	0	0 *
Nonane	0 *	0	0	0	0 *
Benzene	0 *	0	0	0	0 *
Toluene	0 *	0	0	0	0 *
Ethylbenzene	0 *	0	0	0	0 *
m-Xylene	0 *	0	0	0	0 *
n-Hexane	0 *	0	0	0	0 *
2,2,4-Trimethylpentane	0 *	0	0	0	0 *
Neopentane	0 *	0	0	0	0 *

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Molar Flow	Breathing (Wastewater) lbmol/h	Flash lbmol/h	Flashing (Wastewater) lbmol/h	Liquids lbmol/h	Loading (Wastewater) lbmol/h
Decanes Plus	0 *	0	0	0	0 *
Water	9.42481E-06 *	0	0	1.70304	7.37807E-05 *
Helium	0 *	0	0	0	0 *
Hydrogen	0 *	0	0	0	0 *
Oxygen	0 *	0	0	0	0 *
Lube Oil	3.60528E-16 *	0	0	0.0896339	2.82234E-15 *
Propylene Glycol	0 *	0	0	0	0 *

Mass Fraction	Breathing (Wastewater) %	Flash %	Flashing (Wastewater) %	Liquids %	Loading (Wastewater) %
Carbon Dioxide	0			0	0
Nitrogen	0			0	0
Methane	0			0	0
Ethane	0			0	0
Propane	0			0	0
i-Butane	0			0	0
n-Butane	0			0	0
i-Pentane	0			0	0
n-Pentane	0			0	0
i-Hexane	0			0	0
Heptane	0			0	0
Octane	0			0	0
Nonane	0			0	0
Benzene	0			0	0
Toluene	0			0	0
Ethylbenzene	0			0	0
m-Xylene	0			0	0
n-Hexane	0			0	0
2,2,4-Trimethylpentane	0			0	0
Neopentane	0			0	0
Decanes Plus	0			0	0
Water	100			47.3896	100
Helium	0			0	0
Hydrogen	0			0	0
Oxygen	0			0	0
Lube Oil	8.06881E-08			52.6104	8.06881E-08
Propylene Glycol	0			0	0

Mass Flow	Breathing (Wastewater) lb/h	Flash lb/h	Flashing (Wastewater) lb/h	Liquids lb/h	Loading (Wastewater) lb/h
Carbon Dioxide	0 *	0	0	0	0 *
Nitrogen	0 *	0	0	0	0 *
Methane	0 *	0	0	0	0 *
Ethane	0 *	0	0	0	0 *
Propane	0 *	0	0	0	0 *
i-Butane	0 *	0	0	0	0 *
n-Butane	0 *	0	0	0	0 *
i-Pentane	0 *	0	0	0	0 *
n-Pentane	0 *	0	0	0	0 *
i-Hexane	0 *	0	0	0	0 *
Heptane	0 *	0	0	0	0 *
Octane	0 *	0	0	0	0 *
Nonane	0 *	0	0	0	0 *
Benzene	0 *	0	0	0	0 *
Toluene	0 *	0	0	0	0 *
Ethylbenzene	0 *	0	0	0	0 *
m-Xylene	0 *	0	0	0	0 *
n-Hexane	0 *	0	0	0	0 *

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Mass Flow	Breathing (Wastewater) lb/h	Flash lb/h	Flashing (Wastewater) lb/h	Liquids lb/h	Loading (Wastewater) lb/h
2,2,4-Trimethylpentane	0 *	0	0	0	0 *
Neopentane	0 *	0	0	0	0 *
DecanesPlus	0 *	0	0	0	0 *
Water	0.000169791 *	0	0	30.6808	0.00132918 *
Helium	0 *	0	0	0	0 *
Hydrogen	0 *	0	0	0	0 *
Oxygen	0 *	0	0	0	0 *
Lube Oil	1.37001E-13 *	0	0	34.0609	1.07249E-12 *
Propylene Glycol	0 *	0	0	0	0 *

Stream Properties

Property	Units	Breathing (Wastewater)	Flash	Flashing (Wastewater)	Liquids	Loading (Wastewater)
Temperature	°F	70.278	60 *	70.278	60	70.278
Pressure	psia	0.366931	14.6959 *		14.6959	0.366931
Mole Fraction Vapor	%	100		100	0	100
Mole Fraction Light Liquid	%	0			5.00236	0
Mole Fraction Heavy Liquid	%	0			94.9976	0
Molecular Weight	lb/lbmol	18.0153			36.1145	18.0153
Mass Density	lb/ft^3	0.00116278			58.9286	0.00116278
Molar Flow	lbmol/h	9.42481E-06	0	0	1.79268	7.37807E-05
Mass Flow	lb/h	0.000169791	0	0	64.7417	0.00132918
Vapor Volumetric Flow	ft^3/h	0.146021	0	0	1.09865	1.1431
Liquid Volumetric Flow	gpm	0.0182052	0	0	0.136974	0.142517
Std Vapor Volumetric Flow	MMSCFD	8.58376E-08	0	0	0.016327	6.71966E-07
Std Liquid Volumetric Flow	sgpm	3.39424E-07	0	0	0.136986	2.65713E-06
Compressibility		0.999608			0.00161496	0.999608
Specific Gravity		0.622021			0.944842	0.622021
API Gravity					18.2605	
Enthalpy	Btu/h	-0.980386	0	0	-236493	-7.6748
Mass Enthalpy	Btu/lb	-5774.09			-3652.87	-5774.09
Mass Cp	Btu/(lb*°F)	0.44869			0.695212	0.44869
Ideal Gas CpCv Ratio		1.32583			1.16084	1.32583
Dynamic Viscosity	cP	0.00982898			63.1742	0.00982898
Kinematic Viscosity	cSt	527.702			66.9257	527.702
Thermal Conductivity	Btu/(h*ft*°F)	0.0116894			0.195502	0.0116894
Surface Tension	lbf/ft				0.0035681	
Net Ideal Gas Heating Value	Btu/ft^3	6.95865E-07			909.553	6.95865E-07
Net Liquid Heating Value	Btu/lb	-1059.76			8979.21	-1059.76
Gross Ideal Gas Heating Value	Btu/ft^3	50.31			1013.94	50.31
Gross Liquid Heating Value	Btu/lb	1.54535E-05			10076.1	1.54535E-05

Remarks

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Connections

	Wastewater	Working (Wastewater)			
From Block	--	--			
To Block	Wastewater Tank	--			

Stream Composition

Mole Fraction	Wastewater %	Working (Wastewater) %			
Carbon Dioxide	0 *	0 *			
Nitrogen	0 *	0 *			
Methane	0 *	0 *			
Ethane	0 *	0 *			
Propane	0 *	0 *			
i-Butane	0 *	0 *			
n-Butane	0 *	0 *			
i-Pentane	0 *	0 *			
n-Pentane	0 *	0 *			
i-Hexane	0 *	0 *			
Heptane	0 *	0 *			
Octane	0 *	0 *			
Nonane	0 *	0 *			
Benzene	0 *	0 *			
Toluene	0 *	0 *			
Ethylbenzene	0 *	0 *			
m-Xylene	0 *	0 *			
n-Hexane	0 *	0 *			
2,2,4-Trimethylpentane	0 *	0 *			
Neopentane	0 *	0 *			
DecanesPlus	0 *	0 *			
Water	95 *	100 *			
Helium	0 *	0 *			
Hydrogen	0 *	0 *			
Oxygen	0 *	0 *			
Lube Oil	5 *	3.82531E-09 *			
Propylene Glycol	0 *	0 *			

Molar Flow	Wastewater lbmol/h	Working (Wastewater) lbmol/h			
Carbon Dioxide	0 *	0 *			
Nitrogen	0 *	0 *			
Methane	0 *	0 *			
Ethane	0 *	0 *			
Propane	0 *	0 *			
i-Butane	0 *	0 *			
n-Butane	0 *	0 *			
i-Pentane	0 *	0 *			
n-Pentane	0 *	0 *			
i-Hexane	0 *	0 *			
Heptane	0 *	0 *			
Octane	0 *	0 *			
Nonane	0 *	0 *			
Benzene	0 *	0 *			
Toluene	0 *	0 *			
Ethylbenzene	0 *	0 *			
m-Xylene	0 *	0 *			
n-Hexane	0 *	0 *			
2,2,4-Trimethylpentane	0 *	0 *			
Neopentane	0 *	0 *			

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Molar Flow	Wastewater lbmol/h	Working (Wastewater) lbmol/h			
Decanes Plus	0 *	0 *			
Water	1.70304 *	3.062E-05 *			
Helium	0 *	0 *			
Hydrogen	0 *	0 *			
Oxygen	0 *	0 *			
Lube Oil	0.0896339 *	1.17131E-15 *			
Propylene Glycol	0 *	0 *			

Mass Fraction	Wastewater %	Working (Wastewater) %			
Carbon Dioxide	0 *	0			
Nitrogen	0 *	0			
Methane	0 *	0			
Ethane	0 *	0			
Propane	0 *	0			
i-Butane	0 *	0			
n-Butane	0 *	0			
i-Pentane	0 *	0			
n-Pentane	0 *	0			
i-Hexane	0 *	0			
Heptane	0 *	0			
Octane	0 *	0			
Nonane	0 *	0			
Benzene	0 *	0			
Toluene	0 *	0			
Ethylbenzene	0 *	0			
m-Xylene	0 *	0			
n-Hexane	0 *	0			
2,2,4-Trimethylpentane	0 *	0			
Neopentane	0 *	0			
Decanes Plus	0 *	0			
Water	47.3896 *	100			
Helium	0 *	0			
Hydrogen	0 *	0			
Oxygen	0 *	0			
Lube Oil	52.6104 *	8.06881E-08			
Propylene Glycol	0 *	0			

Mass Flow	Wastewater lb/h	Working (Wastewater) lb/h			
Carbon Dioxide	0 *	0 *			
Nitrogen	0 *	0 *			
Methane	0 *	0 *			
Ethane	0 *	0 *			
Propane	0 *	0 *			
i-Butane	0 *	0 *			
n-Butane	0 *	0 *			
i-Pentane	0 *	0 *			
n-Pentane	0 *	0 *			
i-Hexane	0 *	0 *			
Heptane	0 *	0 *			
Octane	0 *	0 *			
Nonane	0 *	0 *			
Benzene	0 *	0 *			
Toluene	0 *	0 *			
Ethylbenzene	0 *	0 *			
m-Xylene	0 *	0 *			
n-Hexane	0 *	0 *			

* User Specified Values
? Extrapolated or Approximate Values

Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Mass Flow	Wastewater lb/h	Working (Wastewater) lb/h			
2,2,4-Trimethylpentane	0 *	0 *			
Neopentane	0 *	0 *			
DecanesPlus	0 *	0 *			
Water	30.6808 *	0.000551627 *			
Helium	0 *	0 *			
Hydrogen	0 *	0 *			
Oxygen	0 *	0 *			
Lube Oil	34.0609 *	4.45097E-13 *			
Propylene Glycol	0 *	0 *			

Stream Properties

Property	Units	Wastewater	Working (Wastewater)			
Temperature	°F	60 *	70.278			
Pressure	psia	14.6959 *	0.366931			
Mole Fraction Vapor	%	0	100			
Mole Fraction Light Liquid	%	5.00236	0			
Mole Fraction Heavy Liquid	%	94.9976	0			
Molecular Weight	lb/lbmol	36.1145	18.0153			
Mass Density	lb/ft^3	58.9286	0.00116278			
Molar Flow	lbmol/h	1.79268	3.062E-05			
Mass Flow	lb/h	64.7417	0.000551627			
Vapor Volumetric Flow	ft^3/h	1.09865	0.474403			
Liquid Volumetric Flow	gpm	0.136974	0.0591463			
Std Vapor Volumetric Flow	MMSCFD	0.016327	2.78875E-07			
Std Liquid Volumetric Flow	sgpm	0.136986 *	1.10274E-06			
Compressibility		0.00161496	0.999608			
Specific Gravity		0.944842	0.622021			
API Gravity		18.2605				
Enthalpy	Btu/h	-236493	-3.18514			
Mass Enthalpy	Btu/lb	-3652.87	-5774.09			
Mass Cp	Btu/(lb*°F)	0.695212	0.44869			
Ideal Gas CpCv Ratio		1.16084	1.32583			
Dynamic Viscosity	cP	63.1742	0.00982898			
Kinematic Viscosity	cSt	66.9257	527.702			
Thermal Conductivity	Btu/(h*ft*°F)	0.195502	0.0116894			
Surface Tension	lbf/ft	0.0035681				
Net Ideal Gas Heating Value	Btu/ft^3	909.553	6.95865E-07			
Net Liquid Heating Value	Btu/lb	8979.21	-1059.76			
Gross Ideal Gas Heating Value	Btu/ft^3	1013.94	50.31			
Gross Liquid Heating Value	Btu/lb	10076.1	1.54535E-05			

Remarks

Energy Stream Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Energy Streams

Energy Stream	Energy Rate	Power	From Block	To Block
Q-1	0 Btu/h	0 hp	--	Wastewater Tank

Remarks

Blocks
Wastewater Tank
Separator Report

Client Name:	TC Energy	Job: Wastewater Tank A21	
Location:	Ceredo Compressor Station	Modified: 3:18 PM, 10/16/2020	
Flowsheet:	Wastewater	Status: Solved 5:36 PM, 5/17/2021	

Connections

Stream	Connection Type	Other Block	Stream	Connection Type	Other Block
Wastewater	Inlet		Flash	Vapor Outlet	
Liquids	Light Liquid Outlet		Q-1	Energy	

Block Parameters

Pressure Drop	0	psi	Main Liquid Phase	Light Liquid	
Mole Fraction Vapor	0	%	Heat Duty	0	Btu/h
Mole Fraction Light Liquid	5.00236	%	Heat Release Curve Type	Plug Flow	
Mole Fraction Heavy Liquid	94.9976	%	Heat Release Curve Increments	10	

Remarks

Flowsheet Environment
PR

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	
Flowsheet:	Wastewater	

Environment Settings

Number of Poynting Intervals	0	Phase Tolerance	1 %
Gibbs Excess Model Evaluation Temperature	77 °F	Emulsion Enabled	False
Freeze Out Temperature Threshold Difference	10 °F		

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Carbon Dioxide	False	False	Toluene	False	False
Nitrogen	False	False	Ethylbenzene	False	False
Methane	False	False	m-Xylene	False	False
Ethane	False	False	n-Hexane	False	False
Propane	False	False	2,2,4-Trimethylpentane	False	False
i-Butane	False	False	Neopentane	False	False
n-Butane	False	False	Decanes Plus	False	False
i-Pentane	False	False	Water	False	True
n-Pentane	False	False	Helium	False	False
i-Hexane	False	False	Hydrogen	False	False
Heptane	False	False	Oxygen	False	False
Octane	False	False	Lube Oil	False	False
Nonane	False	False	Propylene Glycol	False	True
Benzene	False	False			

Physical Property Method Sets

Liquid Molar Volume	COSTALD	Overall Package	Peng-Robinson
Stability Calculation	Peng-Robinson	Vapor Package	Peng-Robinson
Light Liquid Package	Peng-Robinson	Heavy Liquid Package	Peng-Robinson

Remarks

Environments Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Project-Wide Constants

Atmospheric Pressure	14.6959 psia	Ideal Gas Reference Pressure	14.6959 psia
Ideal Gas Reference Temperature	60 °F	Ideal Gas Reference Volume	379.484 ft^3/lbmol
Liquid Reference Temperature	60 °F		

Environment [PR]

Environment Settings

Number of Poynting Intervals	0	Phase Tolerance	1 %
Gibbs Excess Model Evaluation Temperature	77 °F	Emulsion Enabled	False
Freeze Out Temperature Threshold Difference	10 °F		

Components

Component Name	Henry's Law Component	Phase Initiator	Component Name	Henry's Law Component	Phase Initiator
Carbon Dioxide	False	False	Toluene	False	False
Nitrogen	False	False	Ethylbenzene	False	False
Methane	False	False	m-Xylene	False	False
Ethane	False	False	n-Hexane	False	False
Propane	False	False	2,2,4-Trimethylpentane	False	False
i-Butane	False	False	Neopentane	False	False
n-Butane	False	False	Decanes Plus	False	False
i-Pentane	False	False	Water	False	True
n-Pentane	False	False	Helium	False	False
i-Hexane	False	False	Hydrogen	False	False
Heptane	False	False	Oxygen	False	False
Octane	False	False	Lube Oil	False	False
Nonane	False	False	Propylene Glycol	False	True
Benzene	False	False			

Physical Property Method Sets

Liquid Molar Volume	COSTALD	Overall Package	Peng-Robinson
Stability Calculation	Peng-Robinson	Vapor Package	Peng-Robinson
Light Liquid Package	Peng-Robinson	Heavy Liquid Package	Peng-Robinson

Remarks

Single Oil Report
Decanes Plus

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Properties

	Volume Average Boiling Point	240.832 °F	Low Temperature Viscosity	0.441651	cP
*	Molecular Weight	108.848 lb/lbmol	Temperature of High T Viscosity	210	°F
*	Specific Gravity	0.7432	High Temperature Viscosity	0.256204	cP
	API Gravity	58.8929	Watson K	11.9499	
	Critical Temperature	563.715 °F	ASTM D86 10-90% Slope	0	°F/%
	Critical Pressure	421.397 psia	ASTM D93 Flash Point	47.9739	°F
	Critical Volume	6.98262 ft^3/lbmol	? Pour Point	-22.4869	°F
	Acentric Factor	0.350921	Paraffinic Fraction	56.3105	%
	Carbon to Hydrogen Ratio	5.84021	Naphthenic Fraction	29.8859	%
	Refractive Index	1.41346	Aromatic Fraction	13.8037	%
	Temperature of Low T Viscosity	100 °F	Ideal Gas Heat Capacity	38.2665	Btu/(lbmol*°F)

Warnings

ProMax:ProMax!Project!Oils!Decanes Plus!Properties!Pour Point

Warning: Pour Point calculation: The value of 240.832 °F for Volume Average Boiling Point should be between 340.33 °F and 1040.33 °F.

Remarks

Single Oil Report
Lube Oil

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Properties

	Volume Average Boiling Point	791.482 °F	Low Temperature Viscosity	32.6194	cP
*	Molecular Weight	380 lb/lbmol	Temperature of High T Viscosity	210	°F
*	Specific Gravity	0.9	High Temperature Viscosity	4.52357	cP
	API Gravity	25.7222	Watson K	11.9728	
	Critical Temperature	1077.76 °F	ASTM D86 10-90% Slope	0	°F/%
	Critical Pressure	162.989 psia	ASTM D93 Flash Point	427.922	°F
	Critical Volume	20.2275 ft^3/lbmol	Pour Point	89.7805	°F
	Acentric Factor	1.0209	Paraffinic Fraction	58.4435	%
?	Carbon to Hydrogen Ratio	6.55722	Naphthenic Fraction	30.863	%
	Refractive Index	1.49164	Aromatic Fraction	10.6935	%
	Temperature of Low T Viscosity	100 °F	Ideal Gas Heat Capacity	133.295	Btu/(lbmol*°F)

Warnings

ProMax:ProMax!Project!Oils!Lube Oil!Properties!Carbon to Hydrogen Ratio

Warning: Carbon to Hydrogen Ratio calculation: The value of 791.482 °F for Volume Average Boiling Point should be between 80 °F and 650 °F.

Remarks

User Value Sets Report

Client Name:	TC Energy	Job: Wastewater Tank A21	
Location:	Ceredo Compressor Station		

Process Inputs

User Value [Sales Gas Target]

*	Parameter	5 MMSCFD	Upper Bound		MMSCFD
	Lower Bound	MMSCFD	* Enforce Bounds	False	

User Value [Water Rate Target]

*	Parameter	100 gal/yr	Upper Bound		gal/yr
	Lower Bound	gal/yr	* Enforce Bounds	False	

User Value [Condensate Rate Target]

*	Parameter	0 gal/yr	Upper Bound		gal/yr
	Lower Bound	gal/yr	* Enforce Bounds	False	

Remarks

Propylene Glycol Tanks

User Value [BlockReady]

*	Parameter	1	Upper Bound		
	Lower Bound		* Enforce Bounds	False	

User Value [ShellLength]

*	Parameter	11 ft	Upper Bound		ft
	Lower Bound	ft	* Enforce Bounds	False	

User Value [ShellDiam]

*	Parameter	4 ft	Upper Bound		ft
	Lower Bound	ft	* Enforce Bounds	False	

User Value [BreatherVP]

*	Parameter	0.03 psig	Upper Bound		psig
	Lower Bound	psig	* Enforce Bounds	False	

User Value [BreatherVacP]

*	Parameter	-0.03 psig	Upper Bound		psig
	Lower Bound	psig	* Enforce Bounds	False	

User Value [DomeRadius]

	Parameter	ft	Upper Bound		ft
	Lower Bound	ft	* Enforce Bounds	False	

User Value [OpPress]

*	Parameter	0 psig	Upper Bound		psig
	Lower Bound	psig	* Enforce Bounds	False	

User Value [AvgPercentLiq]

*	Parameter	50 %	Upper Bound		%
	Lower Bound	%	* Enforce Bounds	False	

User Value [MaxPercentLiq]

*	Parameter	90 %	Upper Bound		%
	Lower Bound	%	* Enforce Bounds	False	

User Value Sets Report

Client Name:	TC Energy	Job: Wastewater Tank A21	
Location:	Ceredo Compressor Station		

User Value [MinPercentLiq]

*	Parameter	10 %	Upper Bound		%
	Lower Bound	%	*	Enforce Bounds	False

User Value [AnnNetTP]

*	Parameter	4.69867 bbl/day	Upper Bound		bbl/day
	Lower Bound	bbl/day	*	Enforce Bounds	False

User Value [OREff]

*	Parameter	0 %	Upper Bound		%
	Lower Bound	%	*	Enforce Bounds	False

User Value [MaxAvgT]

*	Parameter	65.4 °F	Upper Bound		°F
	Lower Bound	°F	*	Enforce Bounds	False

User Value [MinAvgT]

*	Parameter	45.5 °F	Upper Bound		°F
	Lower Bound	°F	*	Enforce Bounds	False

User Value [BulkLiqT]

*	Parameter	58.7899 °F	Upper Bound		°F
	Lower Bound	°F	*	Enforce Bounds	False

User Value [AvgP]

*	Parameter	14.16 psia	Upper Bound		psia
	Lower Bound	psia	*	Enforce Bounds	False

User Value [Therml]

*	Parameter	1237 Btu/ft^2/day	Upper Bound		Btu/ft^2/day
	Lower Bound	Btu/ft^2/day	*	Enforce Bounds	False

User Value [AvgWindSpeed]

*	Parameter	4 mi/h	Upper Bound		mi/h
	Lower Bound	mi/h	*	Enforce Bounds	False

User Value [MaxHourlyLoadingRate]

	Parameter	bbl/hr	Upper Bound		bbl/hr
	Lower Bound	bbl/hr	*	Enforce Bounds	False

User Value [SumLiqLevelInc]

	Parameter	ft/yr	Upper Bound		ft/yr
	Lower Bound	ft/yr	*	Enforce Bounds	False

User Value [FlashingT]

*	Parameter	70.278 °F	Upper Bound		°F
	Lower Bound	°F	*	Enforce Bounds	False

User Value [EntrainedOilFrac]

*	Parameter	1 %	Upper Bound		%
	Lower Bound	%	*	Enforce Bounds	False

User Value [TurnoverRate]

*	Parameter	68.3814	Upper Bound		
	Lower Bound		*	Enforce Bounds	False

User Value Sets Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

User Value [LLossSatFactor]

* Parameter	1.45		Upper Bound	
Lower Bound			* Enforce Bounds	False

User Value [AtmPressure]

* Parameter	14.16	psia	Upper Bound	psia
Lower Bound		psia	* Enforce Bounds	False

User Value [TVP]

* Parameter	0.258949	psia	Upper Bound	psia
Lower Bound		psia	* Enforce Bounds	False

User Value [MaxVP]

* Parameter	0.34849	psia	Upper Bound	psia
Lower Bound		psia	* Enforce Bounds	False

User Value [MinVP]

* Parameter	0.190248	psia	Upper Bound	psia
Lower Bound		psia	* Enforce Bounds	False

User Value [AvgLiqSurfaceT]

* Parameter	61.7293	°F	Upper Bound	°F
Lower Bound		°F	* Enforce Bounds	False

User Value [MaxLiqSurfaceT]

* Parameter	70.278	°F	Upper Bound	°F
Lower Bound		°F	* Enforce Bounds	False

User Value [TotalLosses]

* Parameter	2.54959E-12	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [WorkingLosses]

* Parameter	1.94953E-12	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [StandingLosses]

* Parameter	6.00063E-13	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [RimSealLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [WithdrawalLoss]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [LoadingLosses]

* Parameter	4.6975E-12	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [MaxHourlyLoadingLoss]

* Parameter	0	lb/hr	Upper Bound	lb/hr

User Value Sets Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

User Value [MaxHourlyLoadingLoss]

Lower Bound		lb/hr	* Enforce Bounds	False

User Value [PStar]

Parameter			Upper Bound	
Lower Bound			* Enforce Bounds	False

User Value [AllCTotalLosses]

* Parameter	0.00315981	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [AllCLoadingLosses]

* Parameter	0.0058218	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [AllCMaxHLoadingLoss]

Parameter		lb/hr	Upper Bound	lb/hr
Lower Bound		lb/hr	* Enforce Bounds	False

User Value [AllCFlashingLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [DeckFittingLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [DeckSeamLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [FlashingLosses]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [TotalResidual]

* Parameter	283.565	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

User Value [GasMoleWeight]

* Parameter	0.0180153	kg/mol	Upper Bound	kg/mol
Lower Bound		kg/mol	* Enforce Bounds	False

User Value [VapReportableFrac]

* Parameter	8.06881E-08	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [LiqReportableFrac]

* Parameter	52.6104	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value [FlashReportableFrac]

* Parameter	0	%	Upper Bound	%
Lower Bound		%	* Enforce Bounds	False

User Value Sets Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Remarks
This User Value Set was programmatically generated. GUID={2B36A6D8-C8D1-4CD2-9AE9-43032096E4C0}

Sum Component Flow/Frac.22

User Value [CompSum]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={4357C5FC-CEB2-4442-A1F4-459C0F79940A}

Sum Component Flow/Frac.29

User Value [CompSum]

* Parameter	6.00063E-13	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={9857F953-08E3-4933-8F92-2C95AAAA906A}

Sum Component Flow/Frac.30

User Value [CompSum]

* Parameter	4.6975E-12	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={9C3A165A-84A6-4C39-B59F-E141C34E0C72}

Sum Component Flow/Frac.31

User Value [CompSum]

* Parameter	1.94953E-12	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={071E1B34-05C2-47CC-A085-3899527648C5}

Sum Component Flow/Frac.32

User Value [CompSum]

* Parameter	0	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={F5A120A0-A5E7-452A-A7E7-C242FA991327}

User Value Sets Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Sum Component Flow/Frac.33

User Value [CompSum]

* Parameter	1.37001E-13	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={CB3705AB-1F89-4C62-BF55-8508907E81B4}

Sum Component Flow/Frac.34

User Value [CompSum]

* Parameter	1.07249E-12	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={DCFE8712-5BB2-48D4-BC97-394C435488B4}

Sum Component Flow/Frac.35

User Value [CompSum]

* Parameter	4.45097E-13	lb/h	Upper Bound	lb/h
Lower Bound		lb/h	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={A5869694-840B-429A-B69A-1E3888ACE8B3}

Sum Component Flow/Frac.36

User Value [CompSum]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={F59DBD0E-0AC2-4422-AB61-597DB81EEC86}

Sum Component Flow/Frac.37

User Value [CompSum]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks
This User Value Set was programmatically generated. GUID={21936257-C6B2-46EC-958E-B899560405D5}

Sum Component Flow/Frac.38

User Value [CompSum]

* Parameter	0	ton/yr	Upper Bound	ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False

Remarks

User Value Sets Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

This User Value Set was programmatically generated. GUID={673602E1-F687-4A48-B880-B62DA6D53544}

Sum Component Flow/Frac.39

User Value [CompSum]

* Parameter	0	ton/yr	Upper Bound		ton/yr
Lower Bound		ton/yr	* Enforce Bounds	False	

Remarks
This User Value Set was programmatically generated. GUID={A66874FE-5757-4A82-A90D-461551A14FE0}

Sum Component Flow/Frac.40

User Value [CompSum]

* Parameter	0	lb/h	Upper Bound		lb/h
Lower Bound		lb/h	* Enforce Bounds	False	

Remarks
This User Value Set was programmatically generated. GUID={BB8F1CA3-71BF-4669-98B6-38EA67AE9556}

Sum Component Flow/Frac.41

User Value [CompSum]

* Parameter	0	lb/h	Upper Bound		lb/h
Lower Bound		lb/h	* Enforce Bounds	False	

Remarks
This User Value Set was programmatically generated. GUID={15B556F6-F294-4267-BD11-BC8C5F036006}

Sum Component Flow/Frac.42

User Value [CompSum]

* Parameter	0	lb/h	Upper Bound		lb/h
Lower Bound		lb/h	* Enforce Bounds	False	

Remarks
This User Value Set was programmatically generated. GUID={160EBD9C-29DD-4770-9C07-6B583A1CF55A}

Sum Component Flow/Frac.43

User Value [CompSum]

* Parameter	0	lb/h	Upper Bound		lb/h
Lower Bound		lb/h	* Enforce Bounds	False	

Remarks
This User Value Set was programmatically generated. GUID={C0316A6A-5A27-4BFC-8CB0-59283A21D199}

Recoveries Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Component Recoveries - Project Inlets

Status: Solved

Recovery Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Wastewater		

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Wastewater:Wastewater lbmol/h	Summary Table lbmol/h		
Carbon Dioxide	0	0		
Nitrogen	0	0		
Methane	0	0		
Ethane	0	0		
Propane	0	0		
i-Butane	0	0		
n-Butane	0	0		
i-Pentane	0	0		
n-Pentane	0	0		
i-Hexane	0	0		
Heptane	0	0		
Octane	0	0		
Nonane	0	0		
Benzene	0	0		
Toluene	0	0		
Ethylbenzene	0	0		
m-Xylene	0	0		
n-Hexane	0	0		
2,2,4-Trimethylpentane	0	0		
Neopentane	0	0		
Decanes Plus	0	0		
Water	1.70304	1.70304		
Helium	0	0		
Hydrogen	0	0		
Oxygen	0	0		
Lube Oil	0.0896339	0.0896339		
Propylene Glycol	0	0		
Total	1.79268	1.79268		

Remarks

Component Recoveries - Project Outlets

Status: Solved

Recovery Stream Data Source - All Outlets in Project

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Flash	Wastewater	Liquids

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	False	Atomic Basis	False

Recoveries Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Tabulated Data

Index	Wastewater:Flash lbmol/h	Wastewater:Liquids lbmol/h	Summary Table lbmol/h	
Carbon Dioxide		0	0	
Nitrogen		0	0	
Methane		0	0	
Ethane		0	0	
Propane		0	0	
i-Butane		0	0	
n-Butane		0	0	
i-Pentane		0	0	
n-Pentane		0	0	
i-Hexane		0	0	
Heptane		0	0	
Octane		0	0	
Nonane		0	0	
Benzene		0	0	
Toluene		0	0	
Ethylbenzene		0	0	
m-Xylene		0	0	
n-Hexane		0	0	
2,2,4-Trimethylpentane		0	0	
Neopentane		0	0	
Decanes Plus		0	0	
Water		1.70304	1.70304	
Helium		0	0	
Hydrogen		0	0	
Oxygen		0	0	
Lube Oil		0.0896339	0.0896339	
Propylene Glycol		0	0	
Total		1.79268	1.79268	

Remarks

Component Recoveries - Project Losses

Status: Solved

Reference Stream Data Source - All Outlets in Project

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Flash	Wastewater	Liquids

Recovery Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Wastewater		

Parameters

Composition Basis	Molar Flow	Summation Option	Summation Only
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Summary Table lbmol/h			
Carbon Dioxide	0			
Nitrogen	0			
Methane	0			
Ethane	0			
Propane	0			
i-Butane	0			

Recoveries Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Tabulated Data

Index	Summary Table lbmol/h			
n-Butane	0			
i-Pentane	0			
n-Pentane	0			
i-Hexane	0			
Heptane	0			
Octane	0			
Nonane	0			
Benzene	0			
Toluene	0			
Ethylbenzene	0			
m-Xylene	0			
n-Hexane	0			
2,2,4-Trimethylpentane	0			
Neopentane	0			
Decanes Plus	0			
Water	0			
Helium	0			
Hydrogen	0			
Oxygen	0			
Lube Oil	0			
Propylene Glycol	0			
Total	0			

Remarks

Component Recoveries - Project Recoveries

Status: Solved

Reference Stream Data Source - All Inlets in Project

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Wastewater		

Recovery Stream Data Source - All Outlets in Project

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Flash	Wastewater	Liquids

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	True	Atomic Basis	False

Tabulated Data

Index	Wastewater:Flash %	Wastewater:Liquids %	Summary Table %	
Carbon Dioxide				
Nitrogen				
Methane				
Ethane				
Propane				
i-Butane				
n-Butane				
i-Pentane				
n-Pentane				
i-Hexane				
Heptane				

Recoveries Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Tabulated Data

Index	Wastewater:Flash %	Wastewater:Liquids %	Summary Table %	
Octane				
Nonane				
Benzene				
Toluene				
Ethylbenzene				
m-Xylene				
n-Hexane				
2,2,4-Trimethylpentane				
Neopentane				
Decanes Plus				
Water		100	100	
Helium				
Hydrogen				
Oxygen				
Lube Oil		100	100	
Propylene Glycol				
Total		100	100	

Remarks

Component Recoveries - Wastewater Inlets

Status: Solved

Recovery Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Wastewater		

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Wastewater:Wastewater lbmol/h	Summary Table lbmol/h		
Carbon Dioxide	0	0		
Nitrogen	0	0		
Methane	0	0		
Ethane	0	0		
Propane	0	0		
i-Butane	0	0		
n-Butane	0	0		
i-Pentane	0	0		
n-Pentane	0	0		
i-Hexane	0	0		
Heptane	0	0		
Octane	0	0		
Nonane	0	0		
Benzene	0	0		
Toluene	0	0		
Ethylbenzene	0	0		
m-Xylene	0	0		
n-Hexane	0	0		
2,2,4-Trimethylpentane	0	0		
Neopentane	0	0		
Decanes Plus	0	0		

Recoveries Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Tabulated Data

Index	Wastewater:Wastewater lbmol/h	Summary Table lbmol/h		
Water	1.70304	1.70304		
Helium	0	0		
Hydrogen	0	0		
Oxygen	0	0		
Lube Oil	0.0896339	0.0896339		
Propylene Glycol	0	0		
Total	1.79268	1.79268		

Remarks

Component Recoveries - Wastewater Outlets

Status: Solved

Recovery Stream Data Source - All Outlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Flash	Wastewater	Liquids

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Wastewater:Flash lbmol/h	Wastewater:Liquids lbmol/h	Summary Table lbmol/h	
Carbon Dioxide		0	0	
Nitrogen		0	0	
Methane		0	0	
Ethane		0	0	
Propane		0	0	
i-Butane		0	0	
n-Butane		0	0	
i-Pentane		0	0	
n-Pentane		0	0	
i-Hexane		0	0	
Heptane		0	0	
Octane		0	0	
Nonane		0	0	
Benzene		0	0	
Toluene		0	0	
Ethylbenzene		0	0	
m-Xylene		0	0	
n-Hexane		0	0	
2,2,4-Trimethylpentane		0	0	
Neopentane		0	0	
Decanes Plus		0	0	
Water		1.70304	1.70304	
Helium		0	0	
Hydrogen		0	0	
Oxygen		0	0	
Lube Oil		0.0896339	0.0896339	
Propylene Glycol		0	0	
Total		1.79268	1.79268	

Remarks

Recoveries Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Component Recoveries - Wastewater Losses

Status: Solved

Reference Stream Data Source - All Outlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Flash	Wastewater	Liquids

Recovery Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Wastewater		

Parameters

Composition Basis	Molar Flow	Summation Option	Summation Only
Calculate Ratios	False	Atomic Basis	False

Tabulated Data

Index	Summary Table lbmol/h			
Carbon Dioxide	0			
Nitrogen	0			
Methane	0			
Ethane	0			
Propane	0			
i-Butane	0			
n-Butane	0			
i-Pentane	0			
n-Pentane	0			
i-Hexane	0			
Heptane	0			
Octane	0			
Nonane	0			
Benzene	0			
Toluene	0			
Ethylbenzene	0			
m-Xylene	0			
n-Hexane	0			
2,2,4-Trimethylpentane	0			
Neopentane	0			
Decanes Plus	0			
Water	0			
Helium	0			
Hydrogen	0			
Oxygen	0			
Lube Oil	0			
Propylene Glycol	0			
Total	0			

Remarks

Component Recoveries - Wastewater Recoveries

Status: Solved

Reference Stream Data Source - All Inlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Wastewater		

Recoveries Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Recovery Stream Data Source - All Outlets in Flowsheet

Flowsheet	PStream	Flowsheet	PStream
Wastewater	Flash	Wastewater	Liquids

Parameters

Composition Basis	Molar Flow	Summation Option	Streams and Summation
Calculate Ratios	True	Atomic Basis	False

Tabulated Data

Index	Wastewater:Flash %	Wastewater:Liquids %	Summary Table %	
Carbon Dioxide				
Nitrogen				
Methane				
Ethane				
Propane				
i-Butane				
n-Butane				
i-Pentane				
n-Pentane				
i-Hexane				
Heptane				
Octane				
Nonane				
Benzene				
Toluene				
Ethylbenzene				
m-Xylene				
n-Hexane				
2,2,4-Trimethylpentane				
Neopentane				
Decanes Plus				
Water		100	100	
Helium				
Hydrogen				
Oxygen				
Lube Oil		100	100	
Propylene Glycol				
Total		100	100	

Remarks

Energy Budgets Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Power Budget - Project Power Budget

Status: Solved

Parameters

Net Power	0 hp	Total Power Required	0 hp
Total Power Supplied	0 hp	External Energy Only	True

Remarks

Heat Budget - Project Heat Budget

Status: Solved

Heat Budget Data Source - All Exchangers in Project

Flowsheet	Block	Flowsheet	Block
Wastewater	Wastewater Tank		

Parameters

Net Duty	0 Btu/h	Total Duty Required	0 Btu/h
Total Duty Supplied	0 Btu/h	External Energy Only	True

Tabulated Data

Index	Block Duty Btu/h	Block Highest Temperature °F	Block Lowest Temperature °F	
Wastewater:Wastewater Tank	0	60	60	

Remarks

Power Budget - Wastewater Power Budget

Status: Solved

Parameters

Net Power	0 hp	Total Power Required	0 hp
Total Power Supplied	0 hp	External Energy Only	True

Remarks

Heat Budget - Wastewater Heat Budget

Status: Solved

Heat Budget Data Source - All Exchangers in Flowsheet

Flowsheet	Block	Flowsheet	Block
Wastewater	Wastewater Tank		

Parameters

Net Duty	0 Btu/h	Total Duty Required	0 Btu/h
Total Duty Supplied	0 Btu/h	External Energy Only	True

Tabulated Data

Index	Block Duty Btu/h	Block Highest Temperature °F	Block Lowest Temperature °F	
Wastewater:Wastewater Tank	0	60	60	

* User Specified Values
? Extrapolated or Approximate Values

Energy Budgets Report

Client Name:	TC Energy	Job: Wastewater Tank A21
Location:	Ceredo Compressor Station	

Remarks