

AIR QUALITY PERMIT

Issued To: Pine Gas Gathering, LLC
Pine Gas Unit
919 South 7th Street, #405
Bismarck, ND 58504

Permit: #3031-01
Administrative Amendment (AA)
Request Received: 02/26/07
Department Decision on AA: 03/13/07
Permit Final: 03/29/07
AFS #: 109-0003

An air quality permit, with conditions, is hereby granted to Pine Gas Gathering, LLC (PGG), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

SECTION I: Permitted Facilities

A. Plant Location

PGG owns and operates a natural gas compressor station located approximately 35 miles northwest of Baker, Montana on the Cedar Creek Anticline. The legal description of the site is the Northeast ¼ of the Northeast ¼ of Section 9, Township 11 North, Range 57 East, in Wibaux County, Montana. A complete list of the permitted equipment is contained in Section I.A of the permit analysis.

B. Current Permit Action

On February 12, 2007, PGG submitted a request to add an emergency flare to Montana Air Quality Permit (MAQP) #3031-00. The current permit action adds the emergency flare to the MAQP according to the provisions of ARM 17.8.745(1) and adds a condition to the permit according to the provisions of ARM 17.8.745(2) that requires that the flare only be operated during emergency situations. In addition, the permit format, language, and rule references were updated.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. Emissions from the 755 brake-horsepower (Bhp) Waukesha Compressor Engine (Unit E-101) shall be controlled by a non-selective catalytic reduction (NSCR) unit and an air to fuel ratio (AFR) controller. Emissions from Unit #E-101 shall not exceed the following (ARM 17.8.752):

Oxides of nitrogen (NO_x): 3.33 pounds per hour (lb/hr);
Carbon Monoxide (CO): 4.99 lb/hr; and
Volatile Organic Compounds (VOC): 1.66 lb/hr.

2. Emissions from the 755 BHp compressor engine (Unit E-102) shall be controlled with by an NSCR unit and an AFR controller. Emissions from Unit #E-102 shall not exceed the following (ARM 17.8.752):

NO_x: 3.33 lb/hr;
CO: 4.99 lb/hr; and
VOC: 1.66 lb/hr.

3. PGG shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).
4. PGG shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).
5. PGG shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.4 (ARM 17.8.749).
6. PGG shall operate the flare stack only for equipment blowdown when shutdown is required for repair or for emergency use. This flare is not permitted to continuously flare gas (ARM 17.8.749).

B. Testing Requirements

1. Unit #E-101 shall be tested and compliance demonstrated with the emission limitations contained in Section II.A.1 on an every 4-year basis or according to another testing/monitoring schedule as may be approved by the Department of Environmental Quality (Department) (ARM 17.8.105 and 17.8.749). The last source test was conducted on September 7, 2004.
2. Unit #E-102 shall be tested and compliance demonstrated with the emission limitations contained in Section II.A.2 within 180 days of initial start up of the engine. Testing shall continue on an every 4-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and 17.8.710).
3. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
4. The Department may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. PGG shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. PGG shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be

submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by PGG as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

D. Notification

1. PGG shall provide the Department with the make, model, and maximum rated design capacity of Unit E-102, within 15 days after the actual purchase date of the engine.
2. PGG shall provide the Department with the actual start-up date of Unit E-102 within 15 days after the initial start-up date of the engine.

SECTION III: General Conditions

- A. Inspection – PGG shall allow the Department’s representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if PGG fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving PGG of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

- G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by PGG may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis
Pine Gas Gathering, LLC
Pine Gas Unit
Permit #3031-01

I. Introduction/Process Description

Pine Gas Gathering, LLC (PGG) owns and operates a natural gas compressor station located approximately 35 miles northwest of Baker, Montana on the Cedar Creek Anticline. The legal description of the site is the Northeast ¼ of the Northeast ¼ of Section 9, Township 11 North, Range 57 East, in Wibaux County, Montana. The facility is known as the Pine Gas Unit.

A. Permitted Equipment

The facility consists of the following equipment:

1. One 755 brake-horsepower (Bhp) Waukesha L7042GU compressor engine with a non-selective catalytic reduction (NSCR) unit and an air to fuel ratio (AFR) controller
2. One 755 Bhp compressor engine with an NSCR unit and an AFR controller
3. One 200,000 British thermal unit per hour (Btu/hr) glycol dehydration unit
4. One Flare to be used for emergency purposes
5. Associated equipment

B. Source Description

PGG is a wholly owned subsidiary of Jurassic Resources Development, N.A., LLC. The facility delivers gas to Williston Basin Interstate Pipeline Company (WBI). Initially, Pine Gas Gathering installed a 755 Bhp Waukesha L7042GU compressor engine to move an initial 4-5 million standard cubic feet per day (MMScfd) of natural gas. PGG is permitted to install a second compressor engine of equal size, increasing the capacity to 8-10 MMScfd of natural gas per year. The tri-ethylene glycol dehydrator is sized to handle 8-10 MMScfd.

Gas is gathered in the field to the suction of the compressor station at 10-50 psig. The gas is compressed in two stages to 350-450 psig. The gas is dehydrated to remove water vapor and is then delivered to the WBI receipt point or to a Shell Western E&P fuel line.

C. Permit History

On January 16, 1999, the Department of Environmental Quality (Department) issued Montana Air Quality Permit (MAQP) #3031-00 to PGG for the construction and operation of the Pine Gas Unit.

D. Current Permit Action

On February 12, 2007, PGG submitted a request to add an emergency flare to MAQP #3031-00. PGG informed the Department that the emergency flare was not listed as an emitting unit in the original MAQP application; therefore, the emergency flare was not included in MAQP #3031-00. The current permit action adds the emergency flare to the MAQP according to the provisions of ARM 17.8.745(1) and adds a condition to the permit according to the provisions of ARM 17.8.745(2) that requires that the flare only be operated during emergency situations. In addition, the permit format, language, and rule references were updated. MAQP #3031-01 replaces MAQP #3031-00.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

PGG shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.
5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide

7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM₁₀

PGG must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne Particulate Matter (PM). (2) Under this rule, PGG shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.
4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.
6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.
7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). This facility is not an NSPS affected source because it does not meet the definition of any NSPS subpart defined in 40 CFR 60.
8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. A major Hazardous Air Pollutant (HAP) source, as defined and applied in 40 CFR 63, shall comply with the requirements of 40 CFR 63, as applicable, including the following subparts:
 - 40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants (NESHAP) From Oil and Natural Gas Production Facilities
 - 40 CFR 63, Subpart HHH National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities

- 40 CFR 63, Subpart ZZZZ National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

Based on the information submitted by PGG, the facility is not subject to the provisions of 40 CFR Part 63, because the facility is not a major source of HAPs.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. PGG is not required to submit a permit application fee because the current permit action is considered an administrative action.
2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit alteration to construct, alter, or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. PGG has a PTE greater than 25 tons per year of oxides of nitrogen (NO_x) and carbon monoxide (CO); therefore, an air quality permit is required.
3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.
4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.
5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. PGG was not required to submit a permit application because the current permit action is an administrative action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. PGG was not required to submit an affidavit of public notice because the current permit action is an administrative action.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The BACT analysis is discussed in Section III of this permit analysis.
8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving PGG of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.
11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than one year after the permit is issued.
12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

- F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:
1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.
 2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source since this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

- G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:
1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:
 - a. PTE greater than 100 tons per year of any pollutant
 - b. PTE greater than 10 tons per year of any one HAP, PTE greater than 25 tons per year of a combination of all HAPs, or lesser quantity as the Department may establish by rule or
 - c. PTE greater than 70 tons per year of particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀) in a serious PM₁₀ nonattainment area
 2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #3031-01 for PGG, the following conclusions were made:
 - a. The facility's PTE is less than 100 tons per year for any pollutant.
 - b. The facility's PTE is less than 10 tons per year for any one HAP and less than 25 tons per year for all HAPs.
 - c. This source is not located in a serious PM₁₀ nonattainment area.
 - d. This facility is not subject to any current NSPS.
 - e. This facility is not subject to any current NESHAP standards.
 - f. This source is not a Title IV affected source, nor a solid waste combustion unit.
 - g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that PGG will be a minor source of emissions as defined under Title V.

III. BACT Determination

A BACT determination is required for each new or altered source. PGG shall install on the new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized. A BACT analysis was not required for the current permit action because the current permit action is considered an administrative action.

IV. Emission Inventory

Source	Tons/year				
	PM ₁₀	NO _x	VOC	CO	SO _x
755-Bhp Waukesha Compressor Engine	0.27	14.58	7.29	21.88	0.02
842-bhp Waukesha Compressor Engine	0.27	14.58	7.29	21.88	0.02
Glycol Regenerator	0.00	0.09	0.01	0.02	0.00
Emergency Flare	0.00	1.44	1.47	2.88	0.00
Total	0.54	30.69	16.06	46.66	0.04

755 Bhp Waukesha L7042GU Compressor Engine (Source #E-101)

Brake Horsepower: 755 Bhp
 Hours of Operation: 8760 hr/yr
 Max Fuel Combustion Rate: 6.0 MMBtu/hr
 Fuel Heating Value: 970 Btu/Mscf or 0.001031 MMscf/MMBtu

PM₁₀ Emissions

Emission Factor: 10.0 lb/MMScf (2-02-002-02)
 Calculations: 10.0 lb/MMScf * 0.001031 MMscf/MMBtu * 6.0 MMBtu/hr = 0.062 lb/hr
 0.062 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.27 ton/yr

NO_x Emissions

Emission Factor: 2.00 gram/Bhp-hr (BACT Determination)
 Calculations: 2.00 gram/Bhp-hr * 755 Bhp * 0.002205 lb/gram = 3.33 lb/hr
 3.33 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 14.58 ton/yr

VOC Emissions

Emission Factor: 1.0 gram/Bhp-hr (BACT Determination)
 Calculations: 1.0 gram/Bhp-hr * 755 Bhp * 0.002205 lb/gram = 1.66 lb/hr
 1.66 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 7.29 ton/yr

CO Emissions

Emission Factor: 3.00 gram/Bhp-hr (BACT Determination)
 Calculations: 3.00 gram/Bhp-hr * 755 Bhp * 0.002205 lb/gram = 4.99 lb/hr
 4.99 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 21.88 ton/yr

SO_x Emissions

Emission Factor: 0.6 lb/MMScf (2-02-002-02)
 Calculations: 0.6 lb/MMScf * 0.001031 MMscf/MMBtu * 6.0 MMBtu/hr = 0.0037 lb/hr
 0.0037 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.02 ton/yr

755 Bhp Compressor Engine (Source #E-102)

Brake Horsepower: 755 Bhp
 Hours of Operation: 8760 hr/yr
 Max Fuel Combustion Rate: 6.0 MMBtu/hr
 Fuel Heating Value: 970 Btu/Mscf or 0.001031 MMscf/MMBtu

PM₁₀ Emissions

Emission Factor: 10.0 lb/MMScf (2-02-002-02)
 Calculations: 10.0 lb/MMScf * 0.001031 MMscf/MMBtu * 6.0 MMBtu/hr = 0.062 lb/hr
 0.062 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.27 ton/yr

NO_x Emissions

Emission Factor: 2.00 gram/Bhp-hr (BACT Determination)
Calculations: 2.00 gram/Bhp-hr * 755 Bhp * 0.002205 lb/gram = 3.33 lb/hr
3.33 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 14.58 ton/yr

VOC Emissions

Emission Factor: 1.0 gram/Bhp-hr (BACT Determination)
Calculations: 1.0 gram/Bhp-hr * 755 Bhp * 0.002205 lb/gram = 1.66 lb/hr
1.66 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 7.29 ton/yr

CO Emissions

Emission Factor: 3.00 gram/Bhp-hr (BACT Determination)
Calculations: 3.00 gram/Bhp-hr * 755 Bhp * 0.002205 lb/gram = 4.99 lb/hr
4.99 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 21.88 ton/yr

SO_x Emissions

Emission Factor: 0.6 lb/MMScf (2-02-002-02)
Calculations: 0.6 lb/MMScf * 0.00103 MMScf/MMBtu * 6.0 MMBtu/hr = 0.0037 lb/hr
0.0037 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.02 ton/yr

Glycol Regenerator (Source #E-103)

Control Efficiency: 0%
Hours of Operation: 8760 hr/yr
Max Fuel Combustion Rate: 200,000 Btu/hr
Fuel Heating Value: 970 Btu/MScf or 0.001031 MMScf/MMBtu

PM₁₀ Emissions

Emission Factor: 3.0 lb/MMScf (1-03-006-03)
Calculations: 3.0 lb/MMScf * 200,000 Btu/hr * 0.001 Scf/Btu * 1 MMScf/1E06 Scf = 0.0006 lb/hr
0.0006 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.0026 ton/yr

NO_x Emissions

Emission Factor: 100.0 lb/MMScf (1-03-006-03)
Calculations: 100.0 lb/MMScf * 200,000 Btu/hr * 0.001 Scf/Btu * 1 MMScf/1E06 Scf = 0.02 lb/hr
0.02 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.088 tons/yr

VOC Emissions

Emission Factor: 5.3 lb/MMScf (1-03-006-03)
Calculations: 5.3 lb/MMScf * 200,000 Btu/hr * 0.001 Scf/Btu * 1 MMScf/1E06 Scf = 0.0011 lb/hr
0.0011 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.0046 ton/yr

CO Emissions

Emission Factor: 20.0 lb/MMScf (1-03-006-03)
Calculations: 20.0 lb/MMScf * 200,000 Btu/hr * 0.001 Scf/Btu * 1 MMScf/1E06 Scf = 0.0040 lb/hr
0.0040 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.0175 ton/yr

SO_x Emissions

Emission Factor: 0.6 lb/MMScf (1-03-006-03)
Calculations: 0.6 lbs/MMScf * 200,000 Btu/hr * 0.001 Scf/Btu * 1 MMScf/1E06 Scf = 0.0001 lb/hr
0.0001 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.0005 ton/yr

Emergency Flare

Fuel Type: Sweet Natural Gas with 0% H₂S (Gas Analysis)
Hours of Operation: 500 hr/yr (EPA Memo)
Max Fuel Combustion Rate: 43,000 Scf/hr (Max Capacity of Well)
Fuel Heating Value: 974 Btu/Scf (Gas Analysis)

PM₁₀ Emissions

Emission Factor: 0.00 lb/MMBtu (Smokeless Flare Combusting Natural Gas)

NO_x Emissions

Emission Factor: 0.1380 lb/MMBtu (Chemical Manufacturer's Association (CMA) Flare Study)
Calculations: 0.1380 lb/MMBtu * 1 MMBtu/1E06 Btu * 974 Btu/Scf * 43000 Scf/hr = 5.78 lb/hr
5.78 lb/hr * 500 hr/yr * 0.0005 ton/lb = 1.44 ton/yr

VOC Emissions

Emission Factor: 0.14 lb/MMBtu (AP-42, Table 13.5-1, 09/91)
Calculations: 0.14 lb/MMBtu * 1 MMBtu/1E06 Btu * 974 Btu/Scf * 43000 Scf/hr = 5.86 lb/hr
5.86 lb/hr * 500 hr/yr * 0.0005 ton/lb = 1.47 ton/yr

CO Emissions

Emission Factor: 0.2755 lb/MMBtu (CMA Flare Study)
Calculations: 0.2755 lb/MMBtu * 1 MMBtu/1E06 Btu * 974 Btu/Scf * 43000 Scf/hr = 11.54 lb/hr
11.54 lb/hr * 500 hr/yr * 0.0005 ton/lb = 2.88 ton/yr

SO₂ Emissions

Emission Factor: 0.00 lb/MMBtu (0% H₂S in Gas)

V. Existing Air Quality

The surrounding area is considered attainment/unclassified for the Montana and National Ambient Air Quality Standards (MAAQS and NAAQS).

VI. Ambient Air Impact Analysis

The Department determined, based on the relatively small size of the facility and the corresponding emissions, that the impacts from this permitting action will be minor. The Department believes the proposed project will not cause or contribute to a violation of any ambient air quality standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Environmental Assessment

The current permit action will only result in a minor increase of emissions from the facility and is considered an administrative action; therefore, an Environmental Assessment is not required.

Analysis Prepared By: Dave Aguirre

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