



September 18, 2015

Vanguard Operations, LLC
Elk Basin Northwest Battery No. 12
5874 San Felipe Street, Suite 3000
Houston, TX 77057

Dear Mr. Brinkerhoff:

Montana Air Quality Permit #3299-03 is deemed final as of August 18, 2015, by the Department of Environmental Quality (Department). This permit is for an administrative amendment. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

A handwritten signature in black ink that reads "Julie A. Merkel".

Julie A. Merkel
Air Permitting Supervisor
Air Quality Bureau
(406) 444-3626

A handwritten signature in black ink that reads "Loni Patterson".

Loni Patterson
Environmental Engineer
Air Quality Bureau
(406) 444-1452

JM:LP
Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

Montana Air Quality Permit #3299-03

Vanguard Operations, LLC
Elk Basin Northwest Battery No. 12
5874 San Felipe Street, Suite 3000
Houston, TX 77057

September 18, 2015



MONTANA AIR QUALITY PERMIT

Issued To: Vanguard Operating, LLC
Elk Basin Northwest Battery No. 12
5874 San Felipe Street, Suite 3000
Houston, TX 77057

MAQP: # 3299-03
Administrative Amendment (AA)
Request Received: August 12, 2015
Department Decision on AA: September 2, 2015
Permit Final: September 18, 2015
AFS #: 009-0005

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Vanguard Operating, LLC (Vanguard) 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

Vanguard owns and operates an oil and gas production tank battery located approximately 3.5 miles northwest of Elk Basin, Wyoming, in Section 28, Township 9 South, Range 23 East, in Carbon County, Montana. The facility is known as Elk Basin Northwest Battery No. 12. A complete list of permitted equipment is contained in Section I.A of the permit analysis.

B. Current Permit Action

On August 12, 2015, the Montana Department of Environmental Quality- Air Quality Bureau (Department) received an emailed administrative amendment request for MAQP #3299-02 to change the emission limit for the 300 barrel (bbl) pop tank to 2.85 million standard cubic feet (MMScf) of gas per rolling 12-month period. The permit action updates the emission limit for the **MAQP #3299-03** replaces MAQP #3299-02.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. Vanguard shall limit the production through the 1,000-barrel (bbl) working oil tank (1-OT) to 49,300 barrels (bbls) of production during any rolling 12-month time period (ARM 17.8.749 and ARM 17.8.1204).
2. Vanguard shall vent emission from the 1000-bbl working oil tank to the continuous burn flare (2-F) (ARM 17.8.749).
3. Vanguard shall daily document the presence of flame at the continuous burn flare (2-F). This may be accomplished by visually determining the presence of the flame or by temperature recorder (ARM 17.8.749).
4. The emergency flare pit (9-EF) and the 300-bbl pop tank shall only be operated during emergency/non-routine situations (ARM 17.8.749).

5. The 300-bbl pop tank (8-PT) shall be used to vent no more than 2.85 million standard cubic feet (MMScf) of gas per rolling 12-month time period (ARM 17.8.749 and ARM 17.8.1204).
6. The emergency flare pit (9-EF) shall be used to flare no more than 3.37 MMScf of gas during any rolling 12-month time period (ARM 17.8.749 and ARM 17.8.1204).
7. Vanguard 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).
8. Vanguard 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).
9. Vanguard 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.8 (ARM 17.8.749). If the permitted equipment is used in conjunction with any other equipment owned or operated by Vanguard, at the same site, production shall be limited to correspond with an emission level that does not exceed 250 tons during any rolling 12-month period. Any calculations used to establish production levels shall be approved by the Department (ARM 17.8.749).

B. Inspection and Repair Requirements

1. Each calendar month, all fugitive piping components (valves, flanges, pump seals, open-ended lines) shall be inspected for leaks. For purposes of this requirement, detection methods incorporating sight, sound, or smell are acceptable (ARM 17.8.105 and ARM 17.8.749).
2. Vanguard shall (ARM 17.8.105 and ARM 17.8.749):
 - a. Make a first attempt at repair for any leak not later than 5 calendar days after the leak is detected; and
 - b. Repair any leak as soon as practicable, but no later than 15 calendar days after it is detected, except as provided in Section II.B.3.
3. Delay of repair of equipment for which a leak has been detected will be allowed if repair is technically infeasible without a source shutdown. Such equipment shall be repaired before the end of the first source shutdown after detection of the leak (ARM 17.8.749).

C. Operational Reporting Requirements

1. Vanguard 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.
2. 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 MAQP limitations (ARM 17.8.505). Vanguard shall submit the following information annually to the Department by March 1 of each year; the information may be submitted along with the annual emission inventory (ARM 17.8.505).
 - a. The dates and times the 300-bbl Pop tank was operated;
 - b. The reason(s) the 300-bbl Pop tank was operated for each time the Pop tank was operated;
 - c. The dates and times the emergency flare was operated; and
 - d. The reason(s) that the flare was operated for each time either flare was operated.
3. Vanguard 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).
4. Vanguard shall document, by month, the production of the 1,000-bbl working oil tank (1-OI). By the 25th day of each month, Encore shall total the production of the 1,000-bbl working oil tank (1-OI) during the previous 12 months to verify compliance with the limitation in Section II.A.1. A written report of the compliance verification shall be submitted along with annual emission inventory (ARM 17.8.749).
5. Vanguard shall document, by month, the volume of gas flared at the emergency flare pit (9-EF). By the 25th day of each month, Encore shall total the volume of gas flared at the emergency flare pit (9-EF) during the previous 12 months to verify compliance with the limitation in Section II.A.3. A written report of the compliance verification shall be submitted along with annual emission inventory (ARM 17.8.749).

6. Vanguard shall document, by month, the volume of gas vented from the 300-bbl pop tank (8-PT). By the 25th day of each month, Encore shall total the volume of gas vented from the 300-bbl pop tank (8-PT) during the previous 12 months to verify compliance with the limitation in Section II.A.4. A written report of the compliance verification shall be submitted along with annual emission inventory (ARM 17.8.749).
7. Vanguard shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204(3)(b). The annual certification shall comply with the certification requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emission inventory information (ARM 17.8.1204).

D. Record Keeping and Requirements

1. A record of each monthly leak inspection required by Section II.B.1 of this MAQP shall be kept on file with Vanguard. Inspection records shall include, at a minimum, the following information (ARM 17.8.749):
 - a. Date of inspection;
 - b. Findings (may indicate no leaks discovered or location, nature, and severity of each leak);
 - c. Leak determination method;
 - d. Corrective action (date each leak repaired and reasons for any repair interval in excess of 15 calendar days); and
 - e. Inspector's name and signature.
2. Vanguard shall compile records in accordance with this MAQP. Vanguard shall maintain all records as a permanent business record for at least five years following the date of the measurement. Records must be available for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

E. Testing Requirements

1. The Department may require testing (ARM 17.8.105).
2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

SECTION III: General Conditions

- A. Inspection – Vanguard 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 (continuous emissions monitoring system (CEMS) or continuous emissions rate monitoring system (CERMS)) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and all the terms, conditions, and matters stated herein shall be deemed accepted if Vanguard fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Vanguard of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided for 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 therefor, 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 permitted source.
- G. Air Quality Operation Fees – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by Vanguard may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within three years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Montana Air Quality Permit (MAQP) Analysis
 Vanguard Operations, LLC
 MAQP #3299-03

I. Introduction/Process Description

Vanguard Operations, LLC (Vanguard) owns and operates an oil and gas production battery located approximately 3.5 miles Northwest of Elk Basin, Wyoming, in Section 28, Township 9 South, Range 23 East, in Carbon County, Montana. The facility is known as the Elk Basin Northwest Battery No. 12.

A. Permitted Equipment

The facility consists of the following equipment:

Source I.D.	Description	Year Constructed
1-OT	1000-(bbl) Working Oil Tank*	Before 11/23/68
2-F	Flare	2003
3-BT	1000-bbl Bad Oil Tank	Before 11/23/68
4-WT	750-bbl Water Tank	2014
5-HT	0.8-MMBtu/hr Heater Treater**	Before 11/23/68
6-FE	Fugitive Emissions	N/A
7-PD	Fugitive Emissions (Pneumatic Devices)	N/A
8-PT	300-bbl Pop Tank	Before 11/23/68
9-EF	Emergency Flare Pit	Before 11/23/68

*barrel (bbl)

** Million British thermal units per hour (MMBtu/hr)

B. Source Description

Oil and gas is routed through the heater treater. The heater treater separates the oil and gas. The oil is then routed to a 1000-bbl working tank and the gas is routed to a gas separator to be sent to the Elk Basin Gas Plant via pipeline. Any fluids from the gas separator and/or the rejected oil from the lease operated custody transfer (LACT) unit are routed to a 1000-bbl bad oil tank. Water from the treater is routed to a 750-bbl water tank until hauled for disposal by tank truck. Oil from the storage tanks is sold via the LACT unit. The vapors from the working tank are routed to a continuous-burn flare for combustion. Any pressure relief gas is vented to the onsite 300-bbl pop tank and through the emergency flare.

C. Permit History

Elk Basin Northwest Battery No.12 was constructed prior to November 23, 1968. However, since 1968, new wells were drilled by both previous and current operators, which may have increased the facility's Potential to Emit (PTE) airborne pollutants by more than 25 tons per year. Howell Petroleum Corporation (Howell) stated in Montana Air Quality Permit (MAQP) Application #3299-00 that an accurate assessment of the actual increases caused by the post-1968 facility modifications (drilling of new wells) was difficult to determine due to the number of new wells drilled and the various operators during that time period. Therefore, on March 4, 2004, Howell submitted a complete MAQP application to ensure compliance with the Administrative Rules of Montana (ARM) 17.8.743(1)(d). **MAQP #3299-00** was issued final on June 2, 2004.

On April 16, 2007, and April 19, 2007, the Montana Department of Environmental Quality – Air Resources Management Bureau received written notification from Encore and Howell, respectively, informing the Department of Howell's intent to transfer MAQP #3299-00 from Howell to Encore. The permit action transferred the MAQP from Howell to Encore. **MAQP #3299-01** replaced MAQP #3299-00.

On June 29, 2015, the Montana Department of Environmental Quality- Air Quality Bureau (Department) received an emailed administrative amendment request for MAQP #3299-01 to change the ownership of the permitted facility from Encore to Vanguard Operating, LLC (Vanguard) The permit action updates the ownership of the facility and reflects the de minimis change of replacing existing water tank, 1000 bbl, with a 750 bbl water tank. **MAQP #3299-02** replaced MAQP #3299-01.

D. Current Permit Action

On August 12, 2015, the Montana Department of Environmental Quality- Air Quality Bureau (Department) received an emailed administrative amendment request for MAQP #3299-02 to change the emission limit for the 300 barrel (bbl) pop tank to 2.85 million standard cubic feet (MMScf) of gas per rolling 12-month period. This reduction in allowable volume of gas venting will result in maximum potential emissions from the facility to fall below 80 tons per year of any regulated pollutant. The permit action updates the emission limit for the **MAQP #3299-03** replaces MAQP #3299-02.

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 of Environmental Quality (Department). Upon request, the Department will provide references for locations of complete copies of all applicable rules and regulations 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).

Vanguard 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:

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
11. ARM 17.8.230 Fluoride in Forage

Vanguard 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. (2) Under this rule, Vanguard 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 or authorize to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this section.
4. ARM 17.8.310 Particulate Matter, Industrial Processes. This rule requires that no person shall cause or authorize to be discharged into the atmosphere particulate matter in excess of the amount set forth in this section.
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 section.
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 truck or trailer 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 Part 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 Part 60
 - a. 40 CFR 60, Subpart K – Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstructions, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978, does not apply because

the facility was constructed prior to June 11, 1973. In addition, this subpart does not apply to storage vessels for petroleum or condensate stored, processed, or treated at production facilities prior to custody transfer.

- b. 40 CFR 60 Subpart Ka – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after May 18, 1978, and prior to July 23, 1984, does not apply because the tanks were constructed prior to May 18, 1978. In addition, each petroleum liquid storage vessel with a capacity of less than 420,000 gallons used for petroleum or condensate stored, processed, or treated prior to custody transfer is exempt from the requirements of this subpart.
 - c. 40 CFR 60, Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, is not applicable to any of the tanks at the facility because the tanks were constructed prior to July 23, 1984. In addition, this subpart does not apply to vessels with a design capacity less than or equal to 1,589,874 cubic meters (M³) used for petroleum or condensate stored, processed, or treated prior to custody transfer.
8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Source Categories. Vanguard is considered a NESHAP-affected facility under 40 CFR Part 63 and is subject to the requirements of the following subparts.
- a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAPs Subpart as listed below.
 - b. 40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities. Owners or operators of oil and natural gas production facilities, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR 63, Subpart HH. For area sources of HAP emissions, the affected source includes each triethylene glycol (TEG) dehydration unit located at the facility and all area sources with TEG units need to meet specific requirements of 40 CFR 63, Subpart HH. The Department determined that 40 CFR 63, Subpart HH does not apply to the Elk Basin Northwest Battery No. 12 facility at this time because there are no TEG units.
- 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. A permit fee is not required for the current permit action because the permit action is considered an administrative permit change.
 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.

3. 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 pro-rate 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 modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. The Vanguard facility was constructed and operating prior to November 23, 1968. However, the drilling of new wells that occurred after November 23, 1968, represents a change in the method of operation (higher throughput through the production tanks) that increased the facility's PTE volatile organic compounds (VOC) by more than 25 tons per year. Vanguard has a PTE greater than 25 tons per year of VOC; 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, modification, or use of a source. A permit application was not required for the current permit action because the permit change is considered an administrative permit change. (7) This rule requires that the applicant notify the public by means of legal publication in an MAQP. An affidavit of publication of public notice was not required for the current permit action because the permit change is considered an administrative permit change.
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 required BACT analysis is included 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 VANGUARD 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 modified 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 1 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. (1) This rule states that an MAQP may be transferred from one location to another if the Department receives a complete notice of intent to transfer location, the facility will operate in the new location for less than 1 year, the facility will comply with the FCAA and the Clean Air Act of Montana, and the facility complies with other applicable rules.
- 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 because it is not a listed source and the facility's PTE is less than 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 stationary source having:
 - a. PTE > 100 tons/year of any pollutant.
 - b. PTE > 10 tons/year of any one hazardous air pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule.
 - c. PTE > 70 tons/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 Applicability. (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 MAQP #3299-02 for Vanguard, the following conclusions were made:
 - a. The facility's PTE is less than 100 tons/year for any pollutant.
 - b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year of 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
 - g. This source is not a solid waste combustion unit.
 - h. This source is not an EPA designated Title V source.
 - i. As allowed by ARM 17.8.1204(3), the Department may exempt a source from the requirement to obtain an air quality operating permit by establishing federally enforceable limitations which limit that source's PTE.

- i. In applying for an exemption under this section the owner or operator of the facility shall certify to the Department that the source's PTE does not require the source to obtain an air quality operating permit.
- ii. Any source that obtains a federally enforceable limit on PTE shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit.

Vanguard has taken federally enforceable MAQP limits to keep potential emissions below major source permitting thresholds. Therefore, the facility is not a major source and a Title V operating permit is not required.

The Department determined that the annual reporting requirements contained in the MAQP are sufficient to satisfy this requirement.

3. ARM 17.8.1207 Certification of Truth, Accuracy, and Completeness.

Vanguard shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204 (3)(b). The annual certification shall comply with requirements of ARM 17.8.1207. The annual certification shall be submitted along with annual emission inventory information. The compliance certification submittal required by ARM 17.8.1204(3)(a) shall contain certification by a responsible official of truth, accuracy, and completeness. This certification and any other certification required under this subchapter shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

The Department determined that Vanguard will be minor source of emissions as defined under Title V based on a requested federally enforceable permit limit.

III. BACT Determination

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

IV. Emission Inventory

Tons/year								
Source I.D.#	Source	PM	NO _x	CO	VOC	SO _x	HAPs	H ₂ S
1-OT	1000-bbl Working Oil Tank	-----	-----	-----	-----	-----	-----	-----
2-F	Flare	0.03	0.52	1.04	3.72	5.46	0.06	0.06
3-BT	1000-bbl Bad Oil Tank	-----	-----	-----	1.88	-----	0.20	-----
4-WT	750-bbl Water Tank	-----	-----	-----	-----	-----	-----	-----
5-HT	0.8-MMBtu/hr Heater Treater	0.05	0.67	0.57	0.04	-----	0.01	-----
6-FE	Fugitive Emissions (Piping)	-----	-----	-----	5.61	-----	0.06	0.04
7-PD	Fugitive Emissions (Pneumatic Devices)	-----	-----	-----	0.19	-----	-----	-----
8-PT	300-bbl Pop Tank	-----	-----	-----	63.52	-----	0.03	15.76
9-EF	Emergency Flare Pit	0.02	0.35	0.69	1.29	43.17	-----	0.47
Totals		0.10	1.54	2.30	76.25	48.63	0.36	21.85

Footnotes:

Inventory reflects enforceable limits on production for the 1,000 bbl working oil tank at 135 bbl/day requested by the company.

**** CO = carbon monoxide**

HAPs = hazardous air pollutants

hp = horsepower

lb = pound

N/A = not applicable

ND = no data available

NO_x = oxides of nitrogen

PM = particulate matter

PM₁₀ = particulate matter with an aerodynamic diameter of 10 microns or less

PM_{2.5} = particulate matter with an aerodynamic diameter of 2.5 microns or less

SO₂ = sulfur dioxide

TPH = tons per hour

TPY = tons per year

VOC = volatile organic compounds

yr = year

H₂S = hydrogen sulfide

1,000 bbl Working Oil Tank (1-OT, 2-F)

Permit Limitation – 135 bbl/day (Requested by Company)
 Control efficiency estimated to be 98% for Continuous-Burn Flare (Company Information)

Fuel Consumption: 625 scf/hr (Company Information)
 Control Efficiency: 98% (Company Information)
 Heat Content: 1462 BTU/scf (Company Information)
 Specific Gravity: 1.285 (Company Information)
 Heat Input Rate: 0.8601 mmBTU/hr (Company Information)
 Fuel Consumption: 601 scf/hr (Actual Fuel Consumption)
 Permit Limitation: 8760 hours (Company Requested)

VOC Emissions:

Standing and working losses = $3738.47 \text{ lb/yr} * 0.0005 \text{ ton/lb} * (1.0-0.98) = 0.037 \text{ ton/yr}$ (EPA Tanks 4.0)
 Flashing losses = $42.06 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 3.68 \text{ ton/yr}$ (EPA Tanks 4.0)
 Total losses = $0.037 \text{ ton/yr} + 3.68 \text{ ton/yr} = 3.72$

NOx Emissions

Emission Factor: 0.138 lb/mmBTU (1983 CMA “A Report on a Flare Efficiency Study”)
 Calculation: $0.8601 \text{ mmBTU/Hr} * 0.138 \text{ lbs/mmBTU} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lbs} = 0.52 \text{ ton/yr}$

CO Emissions

Emission Factor: 0.2755 lb/mmBTU (1983 CMA “A Report on a Flare Efficiency Study”)
 Calculation: $0.8601 \text{ mmBTU/Hr} * 0.2755 \text{ lb/mmBTU} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lbs} = 1.04 \text{ ton/yr}$

SO₂ Emissions

Emission Factor: 0.002075 lb/scf (Based on H₂S concentration of 1.11% by weight in flare gas)
 Calculation: $601 \text{ scf/hr} * 0.002075 \text{ lb/scf} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lbs} = 5.46 \text{ ton/yr}$

PM10 emissions:

Emission Factor: 0.000011 lb/scf (AP-42, Chapter 13.5 Industrial Flares 9/91)
 Calculation: $601 \text{ scf/hr} * 0.000011 \text{ lb/scf} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lbs} = 0.03 \text{ ton/yr}$

HAP Emissions:

Standing and working losses
 Basis for Speciation Factors: EPA Speciate Program Profile No. 1210 – Pipeline Terminal Tanks

HAP	Speciation Factor (% HAP in vapor phase)	VOC Emissions (ton/yr)	Control Efficiency (%)	HAP Emissions (ton/yr)
Benzene	0.0054	3.72	98	0.0004
Toluene	0.0559	3.72	98	0.0042
Ethylbenzene	0.0073	3.72	98	0.0005
Xylene	0.0089	3.72	98	0.0007
Tolulene	0.0303	3.72	98	0.0023

Total HAPs from Tanks 0.0081 ton/yr
 Flashing losses = $0.001 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} * (1.0 - 0.98) = 0.0001 \text{ ton/yr}$
 Total losses = $0.0081 + 0.0001 = 0.0082 \text{ ton/yr}$

H₂S Emissions

0.06 ton/yr (HYSIS Flash Emission Estimation Program V.3.1)

1,000-bbl Bad Oil Tank (3-BT)

VOC Emissions:

Standing and working losses = $3750.30 \text{ lb/yr} * 0.0005 \text{ ton/lb} = 1.88 \text{ ton.yr}$
 Flashing losses = No flash emissions result from this tank
 Total losses = $1.88 \text{ ton/yr} + 0.00 \text{ ton/yr} = 1.88$

HAP Emissions:

Standing and working losses

Basis for Speciation Factors: EPA Speciate Program Profile No. 1210 – Pipeline Terminal Tanks

HAP	Speciation Factor (% HAP in vapor phase)	VOC Emissions (ton/yr)	Control Efficiency (%)	HAP Emissions (ton/yr)
Benzene	0.0054	1.88	0	0.0102
Toluene	0.0559	1.88	0	0.1051
Ethylbenzene	0.0073	1.88	0	0.0137
Xylene	0.0089	1.88	0	0.0167
Tolulene	0.0303	1.88	0	0.0570

Total HAPs from Tanks 0.2027 ton/yr

Flashing losses = No flash emissions result from this tank

Total losses = 0.2027 + 0.00 = 0.203

0.8 MMBtu/hr Heater Treaters (5-HT)

Fuel Consumption: 0.8 MMBtu/hr

Fuel Heating Value: 520 Btu/Scf

PM Emissions (PM emissions include PM₁₀ and PM_{2.5}):

Emission Factor: 7.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)

Calculations: 7.6 lb/MMScf * 1 MMScf/520 MMBtu * 0.8 MMBtu/hr = 0.01 lb/hr

0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.05 ton/yr

NO_x Emissions:

Emission Factor: 100 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)

Calculations: 100 lb/MMScf * 1 MMScf/520 MMBtu * 0.8 MMBtu/hr = 0.15 lb/hr

0.15 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.67 ton/yr

CO Emissions:

Emission Factor: 84 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)

Calculations: 84 lb/MMScf * 1 MMScf/520 MMBtu * 0.8 MMBtu/hr = 0.13 lb/hr

0.13 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.57 ton/yr

VOC Emissions:

Emission Factor: 5.5 lb/MMScf (AP-42, Chapter 1, Table 1.4-2, 7/98)

Calculations: 5.5 lb/MMScf * 1 MMScf/520 MMBtu * 0.8 MMBtu/hr = 0.008 lb/hr

0.008 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.04 ton/yr

SO₂ Emissions:

Emission Factor: 0.6 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98)

Calculations: 0.6 lb/MMScf * 1 MMScf/520 MMBtu * 0.8 MMBtu/hr = 0.0009 lb/hr

0.0009 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.004 ton/yr

HAP Emissions:

Emission Factor: 1.88 lb/MMScf (AP-42, Chapter 1, Table 1.4-1, 7/98 (*sum of all HAPs listed))

Calculations: 1.88 lb/MMScf * 1 MMScf/520 MMBtu * 0.8 MMBtu/hr = 0.0029 lb/hr

0.0029 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.01 ton/yr

Fugitive Emissions – Piping (6-FE)

VOC Emissions

Basis for Emission Factors: EPA Protocol for Equipment Leak Emission Estimates, November 1995 (EPA-453/R-95-017)

Connector (Oil): 151 components in light oil service (>=20 API Gravity)

Emission Factor: 0.000210 kg/hr - component or 0.0111 lb/day - component

Calculation: 151 components * 0.0111 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.31 ton/yr

Connector (Gas): 232 components in light oil service (>=20 API Gravity)

Emission Factor: 0.0002 kg/hr - component or 0.0106 lb/day - component

Calculation: 232 components * 0.0106 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.45 ton/yr

Total connector emissions (Oil & gas) = 0.31 ton/yr + 0.45 ton/yr = 0.76 ton/yr

Flange (Oil): 62 components in light oil service (>=20 API Gravity)

Emission Factor: 0.00011 kg/hr - component or 0.0058 lb/day - component

Calculation: 62 components * 0.0058 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.07 ton/yr

Flange (Gas): 38 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.00039 kg/hr - component or 0.0206 lb/day - component
 Calculation: 38 components * 0.0206 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.14 ton/yr

Total flange emissions (Oil & gas) = 0.07 ton/yr + 0.14 ton/yr = 0.21 ton/yr

Open-Ended Lines (Oil): 5 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.0014 kg/hr - component or 0.0741 lb/day - component
 Calculation: 5 components * 0.0741 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.07 ton/yr

Open-Ended Lines (Gas): 8 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.002 kg/hr - component or 0.1058 lb/day - component
 Calculation: 8 components * 0.1058 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.16 ton/yr

Total open-ended line emissions (Oil & gas) = 0.07 ton/yr + 0.16 ton/yr = 0.23 ton/yr

Pumps (Oil): 3 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.013 kg/hr - component or 0.6878 lb/day - component
 Calculation: 3 components * 0.6878 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.38 ton/yr

Pumps (Gas): 0 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.0024 kg/hr - component or 0.127 lb/day - component
 Calculation: 0 components * 0.127 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.00 ton/yr

Total pump emissions (Oil & gas) = 0.38 ton/yr + 0.00 ton/yr = 0.38 ton/yr

Valves (Oil): 50 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.0025 kg/hr - component or 0.1323 lb/day - component
 Calculation: 50 components * 0.1323 lb/day-component * 365 day/yr * 0.0005 ton/lb = 1.21 ton/yr

Valves (Gas): 50 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.0045 kg/hr - component or 0.2381 lb/day - component
 Calculation: 50 components * 0.2381 lb/day-component * 365 day/yr * 0.0005 ton/lb = 2.17 ton/yr

Total valve emissions (Oil & gas) = 1.21 ton/yr + 2.17 ton/yr = 3.38 ton/yr

Others (Oil): 3 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.0075 kg/hr - component or 0.3968 lb/day - component
 Calculation: 3 components * 0.3968 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.22 ton/yr

Others (Gas): 5 components in light oil service (≥ 20 API Gravity)
 Emission Factor: 0.0088 kg/hr - component or 0.4656 lb/day - component
 Calculation: 5 components * 0.4656 lb/day-component * 365 day/yr * 0.0005 ton/lb = 0.43 ton/yr

Total other emissions (Oil & gas) = 0.22 ton/yr + 0.43 ton/yr = 0.65 ton/yr

Total fugitive emissions – piping (6-FE) = 0.76 ton/yr + 0.21 ton/yr + 0.23 ton/yr + 0.38 ton/yr +
 3.38 ton/yr + 0.65 ton/yr = 5.61 ton/yr

HAP Emissions

Basis for Emission Factors: EPA Protocol for Equipment Leak Emission Estimates, November 1995 (EPA-453/R-95-017)

HAP	Speciation Factor (% HAP in vapor phase)	VOC Emissions (ton/yr)	Control Efficiency (%)	HAP Emissions (ton/yr)
Benzene	0.0054	5.61	0	0.0303
Toluene	0.0559	5.61	0	0.3136
Ethylbenzene	0.0073	5.61	0	0.0410
Xylene	0.0089	5.61	0	0.0499
Tolulene	0.0303	5.61	0	0.1700
Total HAPs from Tanks				0.6048 ton/yr

H₂S Emissions:

Calculation: 0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.04 ton/yr (HYSIS Flash Emission Estimation Program V.3.1) **Fugitive Emissions – Pneumatic Devices (7-PD)**

VOC Emissions

Fuel Consumption Rate: 0.2 Scf/min or 12 Scf/hr (Company Information (EPA Estimate))
Fuel Gas MW: 24.84 lb/lb-mole
of Pneumatic Devices: 5
VOC Weight %: 0.0109

Weight % of VOC based on analysis of the fuel gas from the Elk Basin Gas Plant

Calculation: $12 \text{ Scf/hr} * \text{lb-mole}/379 \text{ Scf} * 24.84 \text{ lb/lb-mole} * 0.0109 * 5 = 0.043 \text{ lb/hr}$

$0.043 \text{ lb/hr} * 8760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.19 \text{ ton/yr}$

HAP Emissions

0 % HAPs based on analysis of the fuel gas from the Elk Basin Gas Plant

300 bbl Pop Tank (8-PT)

Production Vessels

Estimated Volume: 45000 scf/day (Company Information)
Specific Gravity: 1.166
Permit Limitation: 1200 hours/year (Requested by Company)
Total Gas Vented: 168.43 lb/hr
Annual Gas Vented 101.06 tons/year (Permit Limit)

Flash Gas From Oil Production

Estimated Volume: 12000 scf/day (Company Information)
Specific Gravity: 1.285
Permit Limitation: 1200 hours/year (Requested by Company)
Total Gas Vented: 49.47 lb/hr
Annual Gas Vented 40.09 tons/year (Permit Limit)

VOC Emissions:

Weight % of Total VOC = 41.9 % for Production Vessels (Company Information)

Weight % of Total VOC = 71.33 % for Flash Gas (Company Information)

Calculation: $101.06 \text{ tons gas vented} * 0.419 \text{ VOC\%} = 42.34 \text{ tons VOC (Production Vessel Contribution)}$

$29.68 \text{ tons gas vented} * 0.7133 \text{ VOC\%} = 21.17 \text{ Tons VOC (Flash Gas Contribution)}$

$42.34 \text{ ton/yr} + 21.17 \text{ ton/yr} = 63.52 \text{ tons/yr}$

HAP Emissions:

0.03 ton/yr (HYSIS Flash Emission Estimation Program V.3.1)

H₂S Emissions

Weight % of Total H₂S = 15.27 % for Production Vessels

Weight % of Total H₂S = 1.11 % for Flash Gas

Calculation: $101.06 \text{ tons gas vented} * 0.1527 \text{ H}_2\text{S \%} = 15.43 \text{ tons H}_2\text{S (Production Vessel Contribution)}$

$40.09 \text{ Tons Gas Vented} * 0.011 \text{ H}_2\text{S \%} = 0.33 \text{ Tons H}_2\text{S (Flash Gas Contribution)}$

$15.43 \text{ ton/yr} + 0.33 \text{ ton/yr} = 15.76 \text{ tons/yr of H}_2\text{S}$

Emergency Flare Pit (9-EF)

Fuel Consumption: 45,000 scf/day or 1875 scf/hr (Company Information)
Control Efficiency: 98% (Company Information)
Heat Content: 1575.3 btu/scf (Company Information)
Specific Gravity: 1.166 (Company Information)
Heat Input Rate: 2.7880 mmBTU/hr (Company Information)
Fuel Consumption: 1838 scf/hr (Actual Fuel Consumption)
Permit Limitation: 1800 hours (Company Requested)

PM10 emissions:

Emission Factor: 0.000011 lb/scf (AP-42, Chapter 13.5 Industrial Flares 9/91)

Calculation: $1838 \text{ scf/hr} * 0.000011 \text{ lb/scf} * 1800 \text{ hr/yr} * 0.0005 \text{ ton/lbs} = 0.02 \text{ ton/yr}$

NO_x Emissions:

Emission Factor: 0.138 lb/mmBTU (1983 CMA "A Report on a Flare Efficiency Study)

Calculation: $2.7880 \text{ mmBTU/Hr} * 0.138 \text{ lb/mmBTU} * 1800 \text{ hr/yr} * 0.0005 \text{ ton/lbs} = 0.35 \text{ ton/yr}$

CO Emissions:

Emission Factor: 0.2755 lb/mmBTU (1983 CMA "A Report on a Flare Efficiency Study")
Calculation: 2.7880 mmBTU/Hr * 0.2755 lb/mmBTU * 1800 hr/yr * 0.0005 ton/lbs = 0.69 ton/yr

VOC Emissions:

Weight % of Total VOC = 41.9 % for Production Vessels (Company Information)
Calculation: 3.06 Tons gas flared*0.419 VOC% = 1.29 Tons VOC

SO₂ Emissions:

Emission Factor: 0.0261 lb/scf (Based on H₂S concentration of 15.2685% by weight in flare gas)
Calculation: 1838 scf/hr * 0.0261 lb/scf * 1800 hr/yr * 0.0005 ton/lbs = 43.17 ton/yr

HAP Emissions:

0 % HAPs based on analysis of the fuel gas from the Elk Basin Gas Plant

H₂S Emissions:

Emissions rate: 3.41 Lb/hr (Based on 98% efficiency of Flare)
H₂S concentration: 15.2685% by weight in flare gas (Company Information)

Calculation: 3.41 lb/hr * .152685 % H₂S * 1800 hr/yr * 0.0005 ton/lbs = 0.47 ton/yr

V. Existing Air Quality

The Vanguard facility is located in eastern Montana in a sparsely populated area with generally very good ventilation throughout the year. The legal description of the facility is Section 28, Township 9 South, Range 23 East, in Carbon County, Montana. Carbon County is unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants.

VI. Air Quality Impacts

The Department determined that there will be no impacts from this permitting action because this permitting action is considered an administrative action. Therefore, the Department believes this action 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 the following private property taking and damaging assessment.

YES	NO	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	8. Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

This permitting action will not result in an increase of emissions from the facility and is considered an administrative action; therefore, an environmental assessment is not required.

Analysis Prepared By: Loni Patterson

Date: August 27, 2015