

AIR QUALITY PERMIT

Issued To: EOG Resources, Inc.
Irigoin 15-23H Battery
P.O. Box 250
Big Piney, WY 83113

Permit: #3311-01
Administrative Amendment Received: 06/13/05
Department Decision on Administrative
Amendment Issued: 06/27/05
Permit Final: 07/13/05
AFS: #083-0024

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

SECTION I: Permitted Facilities

A. Plant Location

The battery is located in Section 23, Township 25 North, Range 53 East, in Richland County, Montana. The battery's office is located at 1540 Belco Drive, Big Piney, Wyoming.

B. Current Permit Action

On June 13, 2005, the Department of Environmental Quality (Department) received a letter from EOG for an administrative amendment to Permit #3311-00. Specifically, EOG requested to add a new well, Irigoin 2-23H, on the existing Irigoin 15-23H well pad. The new well will require an additional 250,000 British thermal unit per hour (Btu/hr) treater and an additional 85-horsepower (hp) pumping unit engine. The potential emissions from the proposed equipment are less than the de minimis threshold of 15 tons per year. The permit action will update the permit analysis with the new equipment. An emission inventory for EOG is contained in Section IV of the permit analysis.

SECTION II. Conditions and Limitations

A. Emission Control Requirements

1. EOG's Irigoin 15-23H Battery shall be limited to 255,500-barrels (bbls) of oil production during any rolling 12-month time period (ARM 17.8.749).
2. EOG shall control Volatile Organic Compound (VOC) emissions from the heater treaters and the production tanks by routing the emissions to a flare or by routing the emissions to a pipeline (ARM 17.8.752).
3. EOG shall control VOC emissions from truck loading operations by utilizing submerged loading to transfer the oil from the production tanks to the tanker trucks or by routing the emissions to a pipeline (ARM 17.8.752).
4. Emissions from the original 85-hp Waukesha Pumping Unit Engine shall be controlled with a non-selective catalytic reduction (NSCR) unit (ARM 17.8.752).

5. Emissions from the original 85-hp Waukesha Pumping Unit Engine shall not exceed the following (ARM 17.8.749):

NO _x	0.23 lb/hr
CO	0.32 lb/hr

6. EOG 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 six consecutive minutes (ARM 17.8.304).
7. EOG 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).
8. EOG 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.7 (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. EOG shall (ARM 17.8.105 and ARM 17.8.749):
 - a. Make a first attempt at repair for any leak not later than five 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. EOG 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 and sources identified in Section I.A of 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. EOG 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. EOG shall document, by month, the oil production of the facility. By the 25th day of each month, EOG shall total the oil production of the facility 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).

D. Recordkeeping Requirements

1. A record of each monthly leak inspection required by Section II.B.1 of this permit shall be kept on file with EOG. 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. All records compiled in accordance with this permit must be maintained by EOG as a permanent business record for at least five years following the date of the measurement, 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 – EOG 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 (CEMS, CERMS) 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 EOG fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving EOG 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 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 EOG may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

Permit Analysis
 EOG Resources, Inc.
 Irigoin 15-23H Tank Battery
 Permit #3311-01

I. Introduction/Process Description

EOG Resources, Inc. (EOG) owns and operates an oil and gas tank battery located in Section 23, Township 25 North, Range 53 East, in Richland County, Montana. The battery is known as the Irigoin 15-23H Battery. The facility is designed for a maximum storage capacity of 1,200 barrels (bbls). The wells that supply the battery are currently producing at 171-bbls per day. Because oil wells have a steady decline in production upon completion of the well, emission estimates and production limits that were contained in the preliminary determination (PD) for Permit #3311-00 were based on the rate that the wells were producing, or 171 bbls per day. However, EOG submitted comments on the PD and requested that the emission estimates and production limits be based on 700 bbls per day. An increased production rate would allow EOG greater operational flexibility by allowing EOG to eventually route additional wells to the facility while maintaining compliance with the Administrative Rules of Montana (ARM). The new emission estimates and production limits contained in Permit #3311-01 are based on 700 bbls per day, which is the expected production rate of any wells that would be drilled within the oil field.

A. Permitted Equipment

The facility consists of the following equipment:

Source I.D.	Description	Year Manufactured	Year Installed
OT-1	Connor 400- bbl Production Oil Tank	2003	Planned for 2004
OT-2	Connor 400- bbl Production Oil Tank	2003	Planned for 2004
OT-3	Connor 400- bbl Production Oil Tank	2003	Planned for 2004
OT-4	Connor 400- bbl Produced Water Tank	2003	Planned for 2004
F-1	Tank Vapor Combustor	N/A	Planned for 2004
TL	Truck Loading	N/A	N/A
F-2	Sivalis Treater Gas Flare	2003	Planned for 2004
HTB	Heater Treater Burner	2003	Planned for 2004
HTB 2	Heater Treater Burner	N/A	Planned for 2005
PUE	85-hp Waukesha Pumping Unit Engine	N/A	Planned for 2004
PUE 2	85-hp Waukesha Pumping Unit Engine	N/A	Planned for 2005

B. Source Description

Crude oil from nearby wells is received through tubing from the wells and the natural gas from the wells is received through the casing. The oil and gas commingles at the surface within the flow line. The oil and gas is sent to the heater treaters, which separates oil, gas, and water. From the heater treaters, the water is sent to the 400-bbl “produced water” tank, the gas is sent to a flare, and the oil is sent to the three production oil tanks, which are all interconnected using sealed thief hatches. All of the oil tanks vent through one common vent. The gas vapors from the production oil tanks are vented to a continuous combustion device. The water from the produced water tank is transported by truck to an appropriate disposal site and the oil from the production oil tanks is transported by truck to sales destinations. The pumping unit engines will be utilized to drive the pumping unit that will be installed once the well stops flowing on its own.

C. Permit History

On February 17, 2004, the Department of Environmental Quality (Department) received a complete Montana Air Quality Permit Application from EOG for the construction and operation of the Irigoien 15-23H Tank Battery. Permit #3311-00 became final on May 13, 2004.

D. Current Permit Action

On June 13, 2005, the Department received a letter from EOG for an administrative amendment to Permit #3311-00. Specifically, EOG requested to add a new well, Irigoien 2-23H, on the existing Irigoien 15-23H well pad. The new well will require an additional 250,000 British thermal unit per hour (Btu/hr) treater and an additional 85-horsepower (hp) pumping unit engine. The potential emissions from the proposed equipment are less than the de minimis threshold of 15 tons per year. The permit action will update the permit analysis with the new equipment. An emission inventory for EOG is contained in Section IV of the permit analysis. Permit #3311-01 replaces Permit #3311-00.

E. Additional Information (Changes to an existing permit)

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 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).

EOG shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited, 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 four 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

EOG 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 six 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, EOG 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).

40 CFR 60, Subpart K – Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978, does not apply because the facility was constructed after May 19, 1978. In addition, this subpart does not apply to storage vessels of less than 40,000 bbls and none of the tanks at the facility have a capacity greater than 40,000 bbls. Further, this subpart does not apply to storage vessels for petroleum or condensate stored, processed, or treated at production facilities prior to custody transfer.

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 after July 23, 1984. 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.

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 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. The design capacity of the entire facility is 190.81 m³.

8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR 63, shall comply with the requirements of 40 CFR 63, as applicable:

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 applicable provisions of 40 CFR Part 63, Subpart HH. In order for an oil and natural gas production facility to be subject to 40 CFR Part 63, Subpart HH requirements, certain criteria must be met. First, the facility must be a major source of Hazardous Air Pollutants (HAPs) as determined according to paragraphs (a)(1)(i) through (a)(1)(iii) of 40 CFR 63, Subpart HH. Second, a facility that is determined to be major for HAPs must also either process, upgrade, or store hydrocarbon liquids prior to the point of custody transfer, or process, upgrade, or store natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user. Third, the facility must also contain an affected source as specified in paragraphs (b)(1) through (b)(4) of 40 CFR Part 63, Subpart HH. Finally, if the first three criteria are met, and the exemptions contained in paragraphs (e)(1) and (e)(2) of 40 CFR Part 63, Subpart HH do not apply, the facility is subject to the applicable provisions of 40 CFR Part 63,

Subpart HH. Based on the information submitted by EOG, the Irigoien 15-23H Battery is not subject to the provisions of 40 CFR Part 63, Subpart HH 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. EOG was not required to submit an application fee because the current permit action is considered administrative.
2. ARM 17.8.505 When Permit Required--Exclusions. 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. The EOG facility has a PTE greater than 25 tons per year of nitrogen oxides (NO_x), carbon monoxide (CO), and Volatile Organic Compounds (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, alteration, or use of a source. The current permit action is an administrative amendment, and therefore, does not require the submittal of a permit application.

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 current permit action is an administrative amendment, and therefore, a BACT analysis was not required.
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 EOG 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 > 100 tons/year of any pollutant;
 - b. PTE > 10 tons/year of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
 - 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. (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 #3311-01 for EOG, 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 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 EOG 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. EOG shall install on the new or altered source the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The current permit action is an administrative amendment and does not require a BACT analysis.

IV. Emission Inventory

Source I.D.#	Source	Tons/year						
		PM	NO _x	CO	VOC	SO _x	HAPs	H ₂ S
OT-1 OT-2 OT-3	400-bbl Production Oil Tanks (Commingled)	-----	-----	-----	1.41	-----	0.06	0.00
F-1	Tank Vapor Combustor (Flare)	-----	0.31	0.61	-----	-----	-----	0.00
HTB	Heater Treater Burner	0.01	0.13	0.13	0.00	0.00	-----	-----
HTB 2	Heater Treater Burner	0.01	0.13	0.13	0.00	0.00	-----	-----
F-2	Heater Treater Gas Flare	-----	26.28	52.52	83.62	-----	0.33	0.00
TL	Truck Loading	-----	-----	-----	7.62	-----	-----	-----
FE	Fugitive Emissions-Piping	-----	-----	-----	1.78	-----	-----	-----
PUE	85-hp Pumping Unit Engine	0.04	1.01	1.40	1.23	0.00	-----	-----
PUE 2	85-hp Pumping Unit Engine	0.04	9.03	9.03	1.23	0.00	-----	-----
Totals		0.10	36.89	63.82	96.89	0.00	0.39	0.00

*The facility is designed for a maximum capacity of 1,200-barrels. The wells that supply the battery is currently producing at 171-bbl per day. However, emission estimates are based on the rate that new wells within the oil field are expected to produce upon completion of the new wells, or 700-bbls per day.

(3) 400-bbl and (3) 500-bbl Commingled Production Oil Tanks (OT-1, OT-2, OT-3, OT-4, OT-5, and OT-6)

Tank Emissions include all vapor losses (standing, working, and flashing from all tanks combined-tanks are commingled)

Permit Limitation: 700 bbl/day (Maximum Capacity of Wells)
 Vapor Gas Volume (vpg): 6,000.0 Scf/day or 250.0 Scf/hr (Worst case from facilities within the same oil field)
 VOC Weight Fraction: 0.7030 (Worst case from facilities within the same oil field)
 HAP Weight Fraction: 0.0300 (Worst case from facilities within the same oil field)
 H₂S Weight Fraction: 0.0000 (Worst case from facilities within the same oil field)
 Molecular Weight: 34.7799 lb/lb-mole (Company Gas Stream Analysis)
 Control Efficiency: 98% (Tank Vapor Combustor)

VOC Emissions:

Calculations: 250.0 Scf/hr * 1/379 Scf/lb-mole * 34.7799 lb/lb-mole * 0.7030 VOC fraction = 16.13 lb/hr
 16.13 lb/hr * 8,760 hr/yr * 0.0005 ton/lb * (1.0-0.98) = 1.41 ton/yr

HAP Emissions:

Calculations: 250.0 Scf/hr 1/379 Scf/lb-mole * 34.7799 lb/lb-mole * 0.0300 HAP fraction = 0.69 lb/hr
 0.69 lb/ton * 8,760 hr/yr * 0.0005 ton/lb * (1.0-0.98) = 0.06 ton/yr

H₂S Emissions

0.00 ton/yr (Worst case from facilities within the same oil field)

Tank Vapor Combustor (F-1)

Fuel Gas Heating Value: 2,015 Btu/Scf (Company Information)
 Fuel Gas Usage: 250 Scf/hr (Worst case from facilities within the same oil field)
 Pilot Gas Heating Value: 1,647 Btu/Scf (Company Information)
 Pilot Gas Usage: 1 Scf/hr (Company Information)

Flare

NO_x Emissions

Emission Factor: 0.1380 lb/MMScf (Chemical Manufacturers Association (CMA), Flare Study)
Calculations: 250 Scf/hr * 2,015 Btu/Scf * 0.1380 lb/MMBtu = 0.07 lb/hr
0.07 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.31 ton/yr

CO Emissions

Emission Factor: 0.2755 lb/MMScf (CMA Flare Study)
Calculations: 250.0 Scf/hr * 2,015 Btu/Scf * 0.2755 lb/MMBtu = 0.14 lb/hr
0.14 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.61 ton/yr

Pilot

NO_x Emissions

Emission Factor: 0.1380 lb/MMBtu (CMA Flare Study)
Calculations: 1 Scf/hr * 1,647 Btu/Scf * 0.1380 lb/MMBtu = 0.0002 lb/hr
0.0002 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

CO Emissions

Emission Factor: 0.2755 lb/MMBtu (CMA Flare Study)
Calculations: 1 Scf/hr * 1,647 Btu/Scf * 0.2755 lb/MMBtu = 0.0005 lb/hr
0.0005 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

Flare Total

NO_x Emissions

Calculations: 0.31 ton/yr + 0.00 ton/year = 0.31 ton/yr

CO Emissions

Calculations: 0.61 ton/yr + 0.00 ton/year = 0.61 ton/yr

Heater Treater Burner

Fuel Heating Value: 1,647 MMBtu/MMScf (Company Information)
Fuel Consumption: 0.50 MMBtu/hr (Maximum Rated Design Capacity)

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/1,647 MMBtu * 0.50 MMBtu/hr = 0.0023 lb/hr
0.0023 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.01 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/1,647 MMBtu * 0.50 MMBtu/hr = 0.03 lb/hr
0.03 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.13 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/1,647 MMBtu * 0.50 MMBtu/hr = 0.03 lb/hr
0.03 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.13 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/1,647 MMBtu * 0.50 MMBtu/hr = 0.001 lb/hr
0.001 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.00 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/1,647 MMBtu * 0.50 MMBtu/hr = 0.0002 lb/hr
0.0002 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

Heater Treater Burner 2

Fuel Heating Value: 1,647 MMBtu/MMScf (Company Information)
Fuel Consumption: 0.50 MMBtu/hr (Maximum Rated Design Capacity)

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/1,647 MMBtu * 0.50 MMBtu/hr = 0.0023 lb/hr
0.0023 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.01 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/1,647 MMBtu * 0.50 MMBtu/hr = 0.03 lb/hr
0.03 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.13 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/1,647 MMBtu * 0.50 MMBtu/hr = 0.03 lb/hr
0.03 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.13 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/1,647 MMBtu * 0.50 MMBtu/hr = 0.001 lb/hr
0.001 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.00 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/1,647 MMBtu * 0.50 MMBtu/hr = 0.0002 lb/hr
0.0002 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

Heater Treater Gas Flare

Fuel Gas Heating Value: 1,647 Btu/Scf
Fuel Gas Usage: 26,417 Scf/hr
Control Efficiency: 98%

NO_x Emissions

Emission Factor: 0.1380 lb/MMScf (CMA Flare Study)
Calculations: 26,417 Scf/hr * 1,647 Btu/Scf * 0.1380 lb/MMBtu = 6.00 lb/hr
6.00 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 26.28 ton/yr

CO Emissions

Emission Factor: 0.2755 lb/MMScf (CMA Flare Study)
Calculations: 26,417 Scf/hr * 1,647 Btu/Scf * 0.2755 lb/MMBtu = 11.99 lb/hr
11.99 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 52.52 ton/yr

VOC Emissions

Calculations 26,417 Scf/hr * 1/379 Scf/lb-mole * 27.87 MW (lb/lb-mole) * 0.4914 VOC fraction = 954.59 lb/hr
954.59 lb/hr * 8,760 hr/yr * 0.0005 ton/lb * (1.0-0.98) = 83.62 ton/yr

HAP Emissions

Calculations 26,417 Scf/hr * 1/379 Scf/lb-mole * 27.87 MW (lb/lb-mole) * 0.001959 VOC fraction = 3.810 lb/hr
3.8 lb/hr * 8,760 hr/yr * 0.0005 ton/lb * (1.0-0.98) = 0.33 ton/yr

Truck Loading (TL)

VOC Emissions

Production = 700 bbl/day * 42 gal/bbl * 1 day/24 hr = 1225.00 gal/hr (maximum capacity of wells)

$L_L = 12.46 * SPM/T$ (AP-42, Chapter 5, equation 1, page 5.2-4, 1/95)

Where:

L_L = loading loss, lb/10³ gallons of liquid loaded

S = Saturation Factor from Table 5.2-1 = 0.60

P = true vapor pressure of liquid loaded (psia) from Table 7.1-2 = 2.3

M = molecular weight of vapors (lb/lb/mole) = 42

T = temperature of bulk liquid loaded in °R (°F + 460) = 510

$L_L = 12.46 * 0.60 * 2.3 * 42 / 510 = 1.42$ lb/1,000 gal

$L_L = 1.42$ lb/1000 gal * 1,225.00 gal/hr * 8,760 hr/yr * 0.0005 ton/lb = 7.62 ton/yr

Fugitive Emissions – Piping (12-FE)

VOC Emissions

Emission Factors from: Equipment Leak Factor for Oil and Gas Production Operations; American Petroleum Institute; TNRCC Memorandum 1/3/96

Oil & Gas

VOC Weight Fraction: 0.4914 (Company Estimate)

Valves: 66 valves (Company Information)

Emission Factor: 0.00992 lb/hr - valve

Calculation: 66 valves * 0.00992 lb/hr-valve * 0.4914 * 8,760 hr/yr * 0.0005 ton/lb = 1.41 ton/yr

Relief Valves: 6 relief valves (Company Information)

Emission Factor: 0.01940 lb/hr – relief valve

Calculation: 6 relief valves * 0.01940 lb/hr – relief valve * 0.4914 = 0.06

0.06 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.25 ton/yr

Flanges: 36 flanges (Company Information)

Emission Factor: 0.00086 lb/hr - flange

Calculation: 36 flanges * 0.00086 lb/hr-flange * 0.4914 * 8,760 hr/yr * 0.0005 ton/lb = 0.07 ton/yr

Pump Seals: 4 pump seals (Company Information)

Emission Factor: 0.00529 lb/hr – pump seal

Calculation: 4 pump seals * 0.00529 lb/hr-pump seal * 0.4914 * 8,760 hr/yr * 0.0005 ton/lb = 0.05 ton/yr

Total fugitive emissions – piping = 1.41 ton/yr + 0.25 ton/yr + 0.07 ton/yr + 0.05 ton/yr = 1.78 ton/yr

85-hp Waukesha Pumping Unit Engine

Fuel Heating Value: 1,647 MMBtu/MMScf (Company Information)

Fuel Usage: 0.00054 MMScf/hr (Company Information)

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

Emission Factor: 0.00991 lb/MMBtu * 1,647 MMBtu/MMScf * 0.00054 MMScf/hr = 0.01 lb/hr

Calculations: 0.01 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 0.04 ton/yr

NO_x Emissions:

Emission Factor: 1.23 g/hp-hr (Company Information)

Calculations: 1.23 g/hp-hr * 0.002205 lb/g * * 85 hp = 0.23 lb/hr

0.23 lb/hr * 8,760 hr/yr * 0.0005 ton/lb = 1.01 ton/yr

CO Emissions:

Emission Factor: 1.71 g/hp-hr (Company Information)
Calculations: $1.71 \text{ g/hp-hr} * 0.002205 \text{ lb/g} * 85 \text{ hp} = 0.37 \text{ lb/hr}$
 $0.37 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 1.40 \text{ ton/yr}$

VOC Emissions:

Emission Factor: $1.5 \text{ g/hp-hr} * 0.002205 \text{ lb/g} * 85 \text{ hp} = 0.32 \text{ lb/hr}$
 $0.32 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 1.23 \text{ ton/yr}$

SO₂ Emissions:

Emission Factor: $0.000588 \text{ lb/MMBtu} * 1,647 \text{ MMBtu/MMScf} * 0.00054 \text{ MMScf/hr} = 0.0005 \text{ lb/hr}$
Calculations: $0.0005 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.00 \text{ ton/yr}$

85-hp Waukesha Pumping Unit Engine 2

Fuel Heating Value: 1,647 MMBtu/MMScf (Company Information)
Fuel Usage: 0.00054 MMScf/hr (Company Information)

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

Emission Factor: $0.00991 \text{ lb/MMBtu} * 1,647 \text{ MMBtu/MMScf} * 0.00054 \text{ MMScf/hr} = 0.01 \text{ lb/hr}$
Calculations: $0.01 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.04 \text{ ton/yr}$

NO_x Emissions:

Emission Factor: 11.0 g/hp-hr (Company Information)
Calculations: $11.0 \text{ g/hp-hr} * 0.002205 \text{ lb/g} * 85 \text{ hp} = 2.06 \text{ lb/hr}$
 $2.06 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 9.03 \text{ ton/yr}$

CO Emissions:

Emission Factor: 11.0 g/hp-hr (Company Information)
Calculations: $11.0 \text{ g/hp-hr} * 0.002205 \text{ lb/g} * 85 \text{ hp} = 2.06 \text{ lb/hr}$
 $2.06 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 9.03 \text{ ton/yr}$

VOC Emissions:

Emission Factor: $1.5 \text{ g/hp-hr} * 0.002205 \text{ lb/g} * 85 \text{ hp} = 0.32 \text{ lb/hr}$
 $0.32 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 1.23 \text{ ton/yr}$

SO₂ Emissions:

Emission Factor: $0.000588 \text{ lb/MMBtu} * 1,647 \text{ MMBtu/MMScf} * 0.00054 \text{ MMScf/hr} = 0.0005 \text{ lb/hr}$
Calculations: $0.0005 \text{ lb/hr} * 8,760 \text{ hr/yr} * 0.0005 \text{ ton/lb} = 0.00 \text{ ton/yr}$

V. Existing Air Quality

The EOG 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 23, Township 25 North, Range 53 East, in Richland County, Montana. Richland County is unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants.

VI. Ambient Air Impact Analysis

The Department conducted Screen View air dispersion modeling, an EPA-approved screening model, using the maximum inputs obtained from EOG's permit application and PD comment letter of April 7, 2004, and an emission rate of 6.34E-03 grams per second, which is the sum of all the

HAPs emissions from the proposed flares. The individual one-hour results for each pollutant were then calculated by multiplying the modeled impact of 5.88E-03 $\mu\text{g}/\text{m}^3$ by the percentage of each individual HAP making up the total of the HAP emissions. The maximum 1-hour concentrations were then converted to an annual average and used in the risk assessment. The results are contained in Section VII, Health Risk Assessment, of this permit analysis. A complete copy of the HAP emission inventory that was calculated for the flares to conduct the health risk assessment and a complete copy of the Screen 3 Model is on file with the Department.

SCREEN3 Model Run
Simple Terrain Inputs:

Source Type	=	Flare
Emission Rate (G/S)	=	0.63400E-02
Stack Height (M)	=	0.91
Total Heat Release (Cal/s)	=	0.304558E07
Receptor Height (M)	=	0.0000
Urban/Rural Option	=	RURAL
Building Height (M)	=	0.0000
Minimum Horizontal Building Dimension (M)	=	0.0000
Maximum Horizontal Building Dimension (M)	=	0.0000

Summary of ScreenView Model Results

Calculation Procedure	Maximum 1 Hour Concentration ($\mu\text{g}/\text{m}^3$)	Maximum 24-Hour Concentration ($\mu\text{g}/\text{m}^3$)	Maximum Annual Concentration ($\mu\text{g}/\text{m}^3$)	Distance to Maximum (M)	Terrain Height (M)
Simple Terrain	0.05876	0.023504	0.005876	453	0

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 is an administrative action and does not require an environmental assessment.

Analysis prepared by: Chris Ames
Date: June 17, 2005