Montana Department of
ENVIRONMENTAL QUALITY
Brian Schweitzer, Governor
P. O. Box 200901 Helena, MT 59620-0901 (406) 444-2544 Website: www.deq.mt.gov

September 24, 2012

William Bato
Southern Montana Electric Generation and Transmission Cooperative, Inc.
7250 Entry Way Drive
Billings, MT 59101

Dear Mr. Bato:

Montana Air Quality Permit #4429-01 is deemed final as of September 24, 2012, by the Department of Environmental Quality (Department). This permit is for the natural gas-fired combustion turbine power generation equipment at the Highwood Generating Station. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

Sincerely,

Charles Homer
Manager, Air Permitting, Compliance, and Registration
Air Resources Management Bureau
(406) 444-5279

Tashia Love
Environmental Science Specialist
Air Resources Management Bureau
(406) 444-5280

CH:TL
Enclosures

Montana Department of Environmental Quality
Permitting and Compliance Division

Air Quality Permit #4429-01

Southern Montana Electric Generation and Transmission Cooperative, Inc.
Highwood Generating Station Natural Gas Plant
7250 Entry Way Drive
Billings, MT 59101

September 24, 2012

MONTANA AIR QUALITY PERMIT

Issued To:	Southern Montana Electric Generation and Transmission Cooperative, Inc. 7250 Entry Way Drive Billings MT 59101	Permit: #4429-01 Administrative Amendment (AA) Request Received: July 31, 2012 Department's Decision on AA: September 7, 2012 Permit Final: September 24, 2012 AFS #: 013-0040

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Southern Montana Electric Generation and Transmission Cooperative, Inc. (SME) for the Highwood Generating Station natural gas plant (HGS gas plant), 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

The facility is located approximately 8 miles east of Great Falls, Montana. The legal description of the site is Sections 24 and 25, Township 21 North, Range 5 East, Cascade County, Montana; the HGS gas plant is primarily located in Section 25. The approximate universal transverse Mercator (UTM) coordinates are Zone 12, Easting 497 kilometers (km), and Northing 5,266 km (North American Datum of 1927). The approximate latitude/longitude coordinates are latitude 47.55 decimal degrees and longitude -111.03 decimal degrees. The site elevation is approximately 3,310 feet.

B. Current Permit Action

The Department of Environmental Quality (Department) received notification on July 31, 2012, from SME, indicating a change of responsible official. The current permit action reflects this change of responsible official.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. Each turbine shall have one stack dedicated to emissions from simple cycle operation, and a second stack dedicated to emissions from combined cycle operation. Simple cycle stacks shall be at least 80 feet tall from grade; combined cycle stacks shall be at least 105 feet tall from grade (ARM 17.8.749).

2. A commissioning period (as defined in Attachment 3) is provided for the combined cycle operation of any individual turbine, and shall not exceed 16 weeks in duration (ARM 17.8.749).

3. Simple cycle emissions of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO_2), particulate matter (PM), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), and particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) from each simple cycle stack shall not exceed the following limits on a one-hour basis, where averaging times and definitions of startup, shutdown, steady state, and transient operation are provided in Attachment 3 (ARM 17.8.752):

Pollutant	Simple Cycle Emission Limits (pounds per hour, lb/hr), per stack		
	Startup	Shutdown	Steady State or Transient
NO_x	36.58	36.58	36.58
CO	114.70	114.70	48.96
VOC	3.90	3.90	2.03
SO_2	0.57	0.57	0.57
$PM/PM_{10}/PM_{2.5}$ [a]	4.80	4.80	4.80

a. To be tested as $PM_{2.5}$. If no approved EPA reference test method exists for $PM_{2.5}$, to be tested as PM_{10}.

4. While in simple cycle mode, conveyance or combustion of fuel in each turbine generator shall not exceed 3,200 hours per rolling 12-month period, per turbine, including periods of startup, shutdown, and transient operation (ARM 17.8.749).

5. Any individual simple cycle startup shall not exceed one hour in duration, and any individual simple cycle shutdown shall not exceed one hour in duration (ARM 17.8.752).

6. Combined cycle emissions of NO_x, CO, VOC, SO_2, PM, PM_{10}, and $PM_{2.5}$ from each combined cycle stack shall not exceed the following limits on a one-hour basis, where averaging times and definitions of startup, shutdown, steady state, transient, and commissioning operation are provided in Attachment 3 (ARM 17.8.752):

Pollutant	Combined Cycle Emission Limits (lb/hr), per stack			
	Startup	Shutdown	Steady State or Transient	Commissioning
NO_x	26.12	12.33	4.16	36.58
CO	76.20	4.15	2.03	114.70
VOC	1.86	1.86	1.86	3.90
SO_2	0.69	0.69	0.69	0.69
$PM/PM_{10}/PM_{2.5}$ [a]	7.20	7.20	7.20	7.20

a. To be tested as $PM_{2.5}$. If no approved EPA reference test method exists for $PM_{2.5}$, to be tested as PM_{10}.

7. While in combined cycle mode, conveyance or combustion of fuel in each turbine generator shall not exceed 1,460 startup hours and 730 shutdown hours per rolling 12-month period, per turbine (ARM 17.8.749).

8. Any individual combined cycle startup shall not exceed 2 hours in duration, and any individual combined cycle shutdown shall not exceed one hour in duration (ARM 17.8.752).

9. Emissions of NOx from any stack shall not exceed 25 parts per million dry volume (ppmvd) at 15% oxygen (O2), or 150 nanograms per Joule (ng/J) of useful output (1.2 pound per megawatt-hour, lb/MWh), effective during all periods of operation, including periods of startup, shutdown, transient, and commissioning operation, in accordance with the standards and limitations, and reporting, recordkeeping and notification requirements contained in 40 CFR 60 Subpart KKKK (ARM 17.8.749, ARM 17.8.340, and 40 CFR 60, Subpart KKKK).

10. Emissions of SO_2 from any stack shall not exceed 110 ng/J (0.90 lb/MWh) gross output, effective during all periods of operation, including periods of startup, shutdown, transient, and commissioning operation; or, SME must not burn in the subject stationary combustion turbines any fuel which contains total potential sulfur emissions in excess of 26 ng SO_2/J (0.060 lb SO_2 per million British thermal units, lb/MMBtu) heat input (ARM 17.8.749, ARM 17.8.340, and 40 CFR 60, Subpart KKKK).

11. SME shall comply with all applicable standards and limitations, and the reporting, recordkeeping and notification requirements contained in 40 CFR 60, Subpart KKKK (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

12. SME shall operate and maintain the generating units, monitoring equipment, and ancillary equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including periods of startup, shutdown, transient, and commissioning operation, and periods of malfunction (ARM 17.8.340 and 40 CFR 60 Subparts A and KKKK).

13. SME shall install, operate, and maintain only turbines with integrated dry low NO_x (DLN) burners to control NO_x emissions during both simple cycle and combined cycle operation, including periods of startup, shutdown, transient, and commissioning operation (ARM 17.8.752).

14. SME shall utilize good combustion practices and combust only pipeline quality natural gas in each turbine to control PM, PM_{10}, $PM_{2.5}$, NO_x, and SO_2 emissions during both simple cycle and combined cycle operation, including periods of startup, shutdown, transient, and commissioning operation (ARM 17.8.340, ARM 17.8.752, and 40 CFR 60, Subpart KKKK).

15. SME shall install, operate, and maintain a catalytic oxidizer on each turbine to control CO and VOC emissions during combined cycle operation, including periods of startup, shutdown, transient, and commissioning operation. The catalytic oxidizer shall commence operation within 2 hours of turbine startup and shall continue until 1 hour or less prior to shutdown (ARM 17.8.752).

16. SME shall install, operate, and maintain a selective catalytic reduction (SCR) system on each turbine to control NO_x emissions during combined cycle operation, including periods of startup, shutdown, transient, and commissioning operation. The SCR shall commence operation within 2 hours of turbine startup and shall continue until 1 hour or less prior to shutdown (ARM 17.8.752).

17. For any request to increase the allowable hours of operation in simple cycle mode (Section II.A.4), or to change fuel quality or quantity which may cause an increase in short or long-term emissions, SME shall submit a full PSD permit application complete with a new proposal of the Best Available Control Technology (BACT) as if the HGS gas plant had never been built (ARM 17.8.749).

18. Operation of the 2,206 brake-horsepower (bhp) diesel-fired emergency generator (1500 kilowatt (kW) generator output) and the 343-bhp fire pump shall not exceed 500 hours per unit per rolling 12-month period (ARM 17.8.749 and ARM 17.8.752).

19. SME 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).

20. SME 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).

21. SME 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.20 (ARM 17.8.749).

B. Testing Requirements

1. For simple cycle operation, SME shall test each turbine generator in simple cycle mode using natural gas to demonstrate compliance with the steady state NO_x and CO emission limits contained in Section II.A.3. Testing shall be conducted concurrently for NO_x and CO within 180 days of initial start-up of each generating unit, and shall conform with the requirements contained in 40 CFR 60, Subpart KKKK. After the initial testing, each generating unit shall be tested annually and the time between tests shall not exceed 14 months since the previous performance test. The Montana Department of Environmental Quality (Department) may approve another testing/monitoring schedule (ARM 17.8.105, ARM 17.8.749, and 40 CFR 60, Subpart KKKK).

2. For combined cycle operation, SME shall test each turbine generator in combined cycle mode using natural gas to demonstrate compliance with the steady state NO_x and CO emission limits contained in Section II.A.6. Testing shall be conducted concurrently for NO_x and CO within 180 days of initial start-up of each generating unit, and shall conform with the requirements contained in 40 CFR 60, Subpart KKKK. After the initial testing, each generating unit shall be tested annually and the time between tests shall not exceed 14 months since the previous performance test. The Department may approve another testing/monitoring schedule (ARM 17.8.105, ARM 17.8.749, and 40 CFR 60, Subpart KKKK).

3. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

4. The Department may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

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

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

2. SME shall document, by month, the hours and mode of operation for each turbine generator, including startup, shutdown, steady state / transient, and commissioning. By the 25th day of each month, SME shall total the hours of operation for the previous month. The monthly information will be used to verify compliance with the rolling 12-month period limitations in Sections II.A.4 and II.A.7, and the hourly SUSD limits in Sections II.A.5 and II.A.8. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

3. SME shall document, by month, the total hours of operation of the diesel-fired emergency generator and fire pump. By the 25th day of each month, SME shall total the hours of operation of each for the previous month. The monthly information will be used to verify compliance with the rolling 12-month period limitation in Section II.A.18. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

4. SME shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include ***the addition of a new emissions unit***, change in control equipment, stack height, stack diameter, stack exit gas flow, stack exit gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup 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 required in ARM 17.8.745(l)(d) (ARM 17.8.745).

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

D. Continuous Emissions Monitoring Systems (CEMS)

1. SME shall comply with all applicable requirements of 40 CFR 60, Subpart KKKK, including requirements for CEMS installation, certification, quality assurance, and relative accuracy and performance testing (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

2. SME shall install, operate, calibrate, and maintain CEMS as follows:

   a. SME shall operate a CEMS consisting of a NOx monitor and a diluent gas (oxygen (O2) or carbon dioxide (CO2)) monitor for the measurement of NO_x on each simple cycle and combined cycle stack, and use the data to monitor compliance with the NO_x emission limits contained in Sections II.A.3 and II.A.6, and the hours of operation limits in Sections II.A.4, II.A.5, II.A.7 and II.A.8. The applicable NO_x CEMS shall be installed and certified within 180 days of initial startup following issuance of MAQP #4429-00 (ARM 17.8.105; ARM 17.8.749; 40 CFR 60, Subpart KKKK; and 40 CFR Parts 72-78).

   b. SME shall operate a CEMS for the measurement of CO on each simple cycle and combined cycle stack, and use the data to monitor compliance with the CO emission limits contained in Sections II.A.3 and II.A.6, and the hours of operation limits in Sections II.A.4, II.A.5, II.A.7 and II.A.8. The applicable CO CEMS shall be installed and certified within 180 days of initial startup following issuance of MAQP #4429-00 (ARM 17.8.105, ARM 17.8.749, and 40 CFR Parts 72-78).

3. All continuous monitors required by this permit and by 40 CFR Part 60 shall be operated, and excess emissions reported, as per 40 CFR 60, Subpart KKKK, and performance tests conducted in accordance with the requirements of 40 CFR 60, Subpart A; 40 CFR Part 60, Appendix B (Performance Specifications #2, #3, #4 and/or #4A); 40 CFR 60, Subpart KKKK; and 40 CFR Parts 72-78, as applicable (ARM 17.8.749; 40 CFR 60, Subpart KKKK; 40 CFR Part 60; and 40 CFR Parts 72-78).

4. SME shall develop and keep on-site a quality assurance plan for all CEMS (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

5. On-going quality assurance for the CEMS must conform to 40 CFR Part 60, Appendix F (ARM 17.8.749 and 40 CFR Part 60, Appendix F).

6. SME shall maintain a file of all measurements from the CEMS and performance testing measurements, including: all CEMS performance evaluations; all CEMS or monitoring device calibration checks and audits; all adjustments and maintenance performed on these systems or devices. These shall be recorded in a permanent form suitable for inspection and shall be retained on-site for at least 5 years following the date of such measurements and reports. SME shall supply these records to the Department upon request (ARM 17.8.749).

E. Notification

SME shall provide the Department with written notification of the following information within the specified time periods (ARM 17.8.749):

1. Commencement of construction of the HGS gas plant facility within 30 working days after beginning of construction.

2. Actual startup date of each turbine generator for each mode of operation (simple cycle and combined cycle) within 15 working days after the actual startup of each turbine generator for each mode of operation.

SECTION III: General Conditions

A. Inspection – SME 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, 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 the terms, conditions, and matters stated herein shall be deemed accepted if SME fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving SME 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, and ARM 17.763.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by SME 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 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Attachment 1

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Attachment 2

Instructions for Completing Excess Emission Reports (EER)

PART 1 Complete as shown. Report total time during the reporting period in hours. The determination of plant operating time (in hours) includes time during unit startup, shutdown, malfunctions, or whenever pollutants of any magnitude are generated, regardless of unit condition or operating load.

Excess emissions include all time periods when emissions, as measured by the CEMS, exceed any applicable emission standard for any applicable time period.

Percent of time in compliance is to be determined as: (1 – (total hours of excess emissions during reporting period / total hours of CEMS availability during reporting period)) x 100

PART 2 Complete as shown. Report total time the point source operated during the reporting period in hours. The determination of point source operating time includes time during unit startup, shutdown, malfunctions, or whenever pollutants (of any magnitude) are generated, regardless of unit condition or operating load.

Percent of time CEMS was available during point source operation is to be determined as: (1–(CEMS downtime in hours during the reporting period* /total hours of point source operation during reporting period)) x 100

* All time required for calibration and to perform preventative maintenance must be included in the CEMS downtime.

PART 3 Complete a separate sheet for each pollutant control device. Be specific when identifying control equipment operating parameters. For example: number of TR units, energizers for electrostatic precipitators (ESP); pressure drop and effluent temperature for baghouses; and bypass flows and pH levels for scrubbers. For the initial EER, include a diagram or schematic for each piece of control equipment.

PART 4 Use Table I as a guideline to report all excess emissions. Complete a separate sheet for each monitor. Sequential numbering of each excess emission is recommended. For each excess emission, indicate: 1) time and duration, 2) nature and cause, and 3) action taken to correct the condition of excess emissions. Do not use computer reason codes for corrective actions or nature and cause; rather, be specific in the explanation. If no excess emissions occur during the quarter, it must be so stated.

PART 5 Use Table II as a guideline to report all CEM system upsets or malfunctions. Complete a separate sheet for each monitor. List the time, duration, nature and extent of problems, as well as the action taken to return the CEM system to proper operation. Do not use reason codes for nature, extent or corrective actions. Include normal calibrations and maintenance as prescribed by the monitor manufacturer. Do not include zero and span checks.

PART 6 Complete a separate sheet for each pollutant control device. Use Table III as a guideline to report operating status of control equipment during the excess emission. Follow the number sequence as recommended for excess emissions reporting. Report operating parameters consistent with Part 3, Subpart e.

PART 7 Complete a separate sheet for each monitor. Use Table IV as a guideline to summarize excess emissions and monitor availability.

PART 8 Have the person in charge of the overall system and reporting certify the validity of the report by signing in Part 8.

EXCESS EMISSIONS REPORT

PART 1

a. Emission Reporting Period _____

b. Report Date _____

c. Person Completing Report _____

d. Plant Name _____

e. Plant Location _____

f. Person Responsible for Review and Integrity of Report _____

g. Mailing Address for 1.f. _____

h. Phone Number of 1.f. _____

i. Total Time in Reporting Period _____

j. Total Time Plant Operated During Quarter _____

k. Permitted Allowable Emission Rates: Opacity _____

SO2 _____ NOx _____ TRS _____

l. Percent of Time Out of Compliance: Opacity _____

SO2 _____ NOx _____ TRS _____

m. Amount of Product Produced During Reporting Period _____

n. Amount of Fuel Used During Reporting Period _____

PART 2 – Monitor Information (Complete for each monitor).

a. Monitor Type (circle one): Opacity SO2 NOx O2 CO2 TRS Flow

b. Manufacturer _____

c. Model No. _____

d. Serial No. _____

e. Automatic Calibration Value: Zero _____ Span _____

f. Date of Last Monitor Performance Test _____

g. Percent of Time Monitor Available:

1) During reporting period _____

2) During plant operation _____

h. Monitor Repairs or Replaced Components Which Affected or Altered Calibration Values _____

_____

i. Conversion Factor (f-Factor, etc.) _____

j. Location of monitor (e.g. control equipment outlet)_____

PART 3 - Parameter Monitor of Process and Control Equipment. (Complete one sheet for each pollutant.)

a. Pollutant (circle one): Opacity SO2 NOx TRS

b. Type of Control Equipment _____

c. Control Equipment Operating Parameters (i.e., delta P, scrubber water flow rate, primary and secondary amps, spark rate)_____

_____

d. Date of Control Equipment Performance Test _____

e. Control Equipment Operating Parameter During Performance Test _____

_____

_____

_____

_____

PART 4 – Excess Emission (by Pollutant)
Use Table I: Complete table as per instructions. Complete one sheet for each monitor.

PART 5 – Continuous Monitoring System Operation Failures
Use Table II: Complete table as per instructions. Complete one sheet for each monitor.

PART 6 – Control Equipment Operation During Excess Emissions
Use Table III: Complete as per instructions. Complete one sheet for each pollutant control device.

PART 7 – Excess Emissions and CEMS performance Summary Report
Use Table IV: Complete one sheet for each monitor.

PART 8 – Certification for Report Integrity, by person in 1.f.

THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THE INFORMATION PROVIDED IN THE ABOVE REPORT IS COMPLETE AND ACCURATE.

SIGNATURE _____

NAME _____

TITLE _____

DATE _____

TABLE I

EXCESS EMISSIONS

Date	Time			Magnitude	Explanation/Corrective Action
	From	To	Duration		

TABLE II

CONTINUOUS MONITORING SYSTEM OPERATION FAILURES

Date	Time			Problem/Corrective Action
	From	To	Duration	

TABLE III

CONTROL EQUIPMENT OPERATION DURING EXCESS EMISSIONS

Date	Time			Operating Parameters	Corrective Action
	From	To	Duration		

TABLE IV

EXCESS EMISSIONS AND CEMS PERFORMANCE SUMMARY REPORT

Pollutant (circle one): SO2 NOx TRS H2S CO Opacity

Monitor ID _____

Emission data summary [1]	CEMS performance summary [1]
1. Duration of excess emissions in reporting period due to: a. Startup/shutdown b. Control equipment problems c. Process problems d. Other known causes e. Unknown causes 2. Total duration of excess emissions 3. Total duration of excess emissions × 100 = Total time CEM operated	1. CEMS[2] downtime in reporting due to: a. Monitor equipment malfunctions b. Non-monitor equipment malfunctions c. Quality assurance calibration d. Other known causes e. Unknown causes 2. Total CEMS downtime 3. Total CEMS downtime × 100 = Total time source emitted

1. For opacity, record all times in minutes. For gases, record all times in hours. Fractions are acceptable (e.g., 4.06 hours)
2. CEMS downtime shall be regarded as any time CEMS is not measuring emissions.

Attachment 3

Definition of Operating Conditions, MAQP #4429-01

Dispatched Power Set-Point – The electricity generation level to be transmitted to the grid as requested by SME and approved by the grid operator. The grid operator instructs the plant to startup and go to the desired megawatt output level (i.e., dispatched set-point). If the generation load is not needed a shutdown is requested by SME and approved by the grid operator who then instructs the plant to shutdown.

Simple Cycle Startup – Any process that begins with the introduction of fuel into a combustion turbine (i.e., from fuel no-flow to fuel flow condition) following hydraulic spin-up and ends when the dispatched power set-point is reached, where turbine combustion emissions are vented to a simple cycle stack upstream of the heat recovery steam generator. Any individual simple cycle startup shall not exceed one hour in duration. The averaging time for compliance with startup emission limits is one hour. The emission limit applies to any clock hour in which any part of a startup event occurs.

Simple Cycle Shutdown – Any process that begins when the turbine initiates a transition from a final dispatched power set-point and ends when fuel is cut off to the combustion turbine, where turbine combustion emissions are vented to a simple cycle stack upstream of the heat recovery steam generator. Any individual shutdown shall not exceed one hour in duration. The averaging time for compliance with shutdown emission limits is one hour. The emission limit applies to any clock hour in which any part of a shutdown event occurs.

Simple Cycle Steady-State/Transient Operation – Any process in which fuel is combusted in the turbine and emissions are vented to a simple cycle stack upstream of the heat recovery steam generator, excluding startup or shutdown operation as defined above, but including periods of time in which a combustion turbine transitions between non-zero power set-points. The averaging time for compliance with steady-state/transient emission limits is one hour. The emission limit applies to any clock hour in which any part of a startup or shutdown does not occur.

Combined Cycle Startup – Any process that begins with the introduction of fuel into a combustion turbine (i.e., from fuel no-flow to fuel flow condition) following hydraulic spin-up and ends when the dispatched power set-point is reached, excluding any commissioning period as defined below, where turbine combustion emissions are vented to a combined cycle stack downstream of the heat recovery steam generator, catalytic oxidizer, and SCR. Any individual combined cycle startup shall not exceed two hours in duration. The averaging time for compliance with startup emission limits is one hour. The emission limit applies to any clock hour in which any part of a startup event occurs.

Combined Cycle Shutdown – Any process that begins when the turbine initiates a transition from a final dispatched power set-point and ends when fuel is cut off to the combustion turbine, excluding any commissioning period as defined below, where turbine combustion emissions are vented to a combined cycle stack downstream of the heat recovery steam generator, catalytic oxidizer, and SCR. Any individual combined cycle shutdown shall not exceed one hour in duration. The averaging time for compliance with shutdown emission limits is one hour. The emission limit applies to any clock hour in which any part of a shutdown event occurs.

Combined Cycle Steady-State/Transient Operation – Any process in which fuel is combusted in the turbine and emissions are vented to a combined cycle stack downstream of the heat recovery steam generator, catalytic oxidizer, and SCR, excluding any commissioning period as defined below, excluding startup or shutdown operation as defined above, but including periods of time in which a combustion turbine transitions between non-zero power set-points. The averaging time for compliance with steady-state/transient emission limits is one hour. The emission limit applies to any clock hour in which any part of a startup or shutdown does not occur.

Combined Cycle Commissioning – The process that begins with the first episode of fuel combustion in a turbine undergoing combined cycle operation, following any time a new or refurbished turbine or catalyst is installed or re-installed at the facility. The commissioning period for an individual turbine shall not exceed 16 weeks following the first episode of fuel combustion in the affected turbine. The commissioning period applies to combined cycle operation only since there are no post-combustion controls to adjust for simple cycle operation.

Montana Air Quality Permit (MAQP) Analysis
Southern Montana Electric Generation and Transmission Cooperative, Inc. –
Highwood Generating Station Natural Gas Plant
Montana Air Quality Permit #4429-01

I. Introduction/Process Description

The HGS gas plant consists of two natural gas-fired combustion turbines for electric power generation, with combined net output of approximately 120 megawatts (MW), including heat recovery. The facility is operated in either a simple cycle mode (no heat recovery) or combined cycle mode (heat recovery used to operate a steam power electric generator). The facility site is approximately 8 miles east of Great Falls, Montana. The legal description of the site is Sections 24 and 25, Township 21 North, Range 5 East, Cascade County, Montana.

A. Permitted Equipment and Source Description

The facility consists of two combustion turbine generators each with duct firing and a heat recovery steam generator (HRSG), a third steam turbine generator that utilizes heat output from the two combustion turbines, three grouped cooling towers, miscellaneous building heaters, a black-start emergency generator, and an emergency fire pump.

The generating units for the HGS gas plant are two General Electric LM6000PF Dry Low Emissions (DLE) combustion turbines (DLE is the turbine manufacturer term for Dry Low NOx burners or DLN). The LM6000PF is a simple cycle combustion unit containing one aeroderivative combustion turbine and a single shaft-driven electric generator. Within each combustion turbine, combustion air is compressed and mixed with fuel, then fired in the combustor to produce compressed hot combustion gases. Expansion of these gases in the turbine rotates the turbine shaft, which turns a generator to produce electricity. Each of the two LM6000PF generating units is rated at approximately 43 MW at 100% load at 54.7 degrees Fahrenheit (°F) ambient temperature. Including the electricity generated from the heat recovery steam generators and steam turbine, the plant gross total is approximately 120 MW. Pipeline quality natural gas is the selected operations and startup fuel.

In addition to the power block, other tanks and machinery are installed at this facility. A black-start emergency generator and fire pump are installed, both diesel-powered. Aqueous ammonia will be stored in above-ground horizontal tanks for use in the Selective Catalytic Reduction (SCR) air pollution control device that has been selected as best available control technology (BACT) for control of nitrogen oxides (NO_x) emissions during combined cycle operation, as detailed in Section III.

Cooling towers are used to dissipate the heat from the condenser by using the latent heat of water vaporization to exchange heat between the process and the air passing through the cooling towers. The cooling towers are an induced, counter flow draft design equipped with drift eliminators. The average make-up water rate for the proposed cooling towers is approximately 394 gallons per minute (gpm).

SME constructed the facility in two phases. Phase I included the construction and operation of two natural gas-fired turbines to operate in simple cycle mode. In Phase II, SME added duct burners, heat recovery equipment and a steam-driven turbine to make the facility a combined cycle system. During initial Phase I service (defined as operations before the HRSG and steam plant are installed), permit conditions were limited the hours of simple cycle operation to 3,200 hours per year, including startup and shutdown time. During Phase II, following the installation of the steam plant, the simple cycle hours of operation shall maintain a limit of 3,200 hours per year, and combined cycle operation will include a limit on startup and shutdown time. However,

Phase II will not limit steady state operation in combined cycle mode. SME proposed to permit the facility for continuous combined cycle operation of both generating units to service all eventualities including an emergency electrical power demand.

For simple cycle operation, proper design and operation, and the use of pipeline quality natural gas, will control emissions of sulfur dioxide (SO_2), particulate matter (PM), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), and particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$). SME is required by permit to combust only pipeline quality natural gas, which will result in reduced SO_2 and $PM_{10}/PM_{2.5}$ emissions. DLN will control NO_x emissions. The 3,200 hour annual limit on operations will also limit emissions while in simple cycle mode.

For combined cycle operation, SCR will control post-combustion exhaust emissions of NO_x, and catalytic oxidation will control post-combustion exhaust emissions of carbon monoxide (CO) and volatile organic compounds (VOC). DLN burners will also contribute to reduced CO and VOC emissions by leaning out the air fuel mixture. Proper design and operation, and the use of pipeline quality natural gas, will control emissions of SO_2 and $PM_{10}/PM_{2.5}$. Permit conditions limit the number of hours per year that the facility is in startup or shutdown mode during combined cycle operation.

B. Permit History

On November 1, 2009, Southern Montana Electric Generation and Transmission Cooperative, Inc. (SME) was issued **MAQP #4429-00** for the operation of the Highwood Generating Station natural gas plant (HGS gas plant).

C. Current Permit Action

The Department of Environmental Quality (Department) received notification on July 31, 2012, from SME, indicating a change of responsible official. The current permit action reflects this change of responsible official. **MAQP # 4429-01** replaces MAQP #4429-00.

D. Facility History

On March 30, 2006, the Department of Environmental Quality (Department) issued a preliminary determination on Montana Air Quality Permit (MAQP) #3423-00 for the HGS coal plant, and accepted comments on the preliminary determination through May 1, 2006. On April 25, 2006, Bison Engineering, Inc. (Bison), on behalf of SME-HGS, verbally notified the Department of additional emitting units that were not previously analyzed and permitted under the preliminary determination and were deemed necessary for the construction and operation of the circulating fluidized bed (CFB) Boiler. Specifically, SME-HGS determined that during the CFB Boiler construction phase and periodically thereafter, as necessary, SME-HGS would need to operate portable/temporary propane-fired heaters for the purpose of curing the CFB Boiler refractory brick. SME-HGS submitted an application for the proposed additional emitting units on May 16, 2006, and the Department issued a supplemental preliminary determination on MAQP #3423-00 to include the new units. The Department's supplemental preliminary determination was issued as an attachment to the Draft Environmental Impact Statement (DEIS), which was published on June 30, 2006, and was therefore subject to public comment in accordance with the applicable DEIS timeframes. The only changes to the initial preliminary determination under the supplemental preliminary determination were related to the refractory brick curing heaters and administrative errors contained in the initial preliminary determination on MAQP #3423-00.

Based on comments received during the public comment period on the Department's initial preliminary determination and additional comments received on the Department's supplemental preliminary determination during the DEIS comment period, the Department's final decision on MAQP #3423-00 included the following changes:

- Modification of the mercury emission control requirements.
- Modification of the CFB Boiler Start-Up and Shutdown Plan.
- Modification of CFB Boiler Start-Up and Shutdown requirements.
- Removal of the Start-Up and Shutdown CO emission limit.
- Modification to include propane as an allowable CFB Boiler start-up and shutdown fuel.
- Modification of the language to clarify the applicable BACT-determined emission control requirements for the affected material handling transfer points.
- Modification of the source testing schedule for material handling baghouses.
- Removal of the term "belt" from the conveyor transfer requirement in Section II.E.5.
- Modification to remove the requirement that all limestone haul trucks be "covered" during transport.
- Removal of the language "…for transfer to the on-site ash monofill/landfill" from Section II.G.4.
- Inclusion of the language "…by manufacturer's design…" to Section II.K.2, because the existing condition contained in the Department's preliminary determination on MAQP #3423-00 was not practically enforceable, as written.
- Removal of the language "…or according to another testing/monitoring schedule as may be approved by the Department in writing" from Section II.N.1.a, b, d, and f, as the Department does not have the authority to require a less stringent testing schedule than that required under 40 CFR Part 60.
- Inclusion of the language "…SME-HGS may use testing in conjunction with the Relative Accuracy Test completed for certification of the CEMS, as a compliance test, if maximum achievable process rates are maintained" to Section II.N.1.a, d, f, and j.
- Inclusion of 40 CFR Part 60, Appendix B, Performance Specification #12A, to Section II.P.3.
- Modification of Section III.H, Construction Commencement, to require that construction commence within 18 months of permit issuance.
- Correction of various administrative errors contained in the initial and supplemental preliminary determination(s) on MAQP #3423-00.
- Update to the Ambient Impact Analysis contained in Section VI of Permit Analysis to include modeling based on the proposed change in plant footprint to mitigate impacts to the Lewis and Clark historical portage recognized through the EIS process.
- Removal of all requirements and references to the Acid Rain Program under 40 CFR Parts 72-78.

The HGS coal plant air quality permit was appealed to the Montana Board of Environmental Review (BER) prior to being issued final on May 30, 2007. The BER ruled on April 21, 2008, that MAQP #3423-00 should be remanded to the Department to complete a Best Available Control Technology (BACT) analysis for $PM_{2.5}$. The BER issued their final order on May 30, 2008, stating that "Permit No. 3423-00 is remanded for a thorough top-down BACT analysis of $PM_{2.5}$ of the CFB boiler. A surrogate analysis for $PM_{2.5}$ is not acceptable. A top-down BACT analysis conforming to the NSR Manual will be deemed to be sufficiently thorough."

On June 6, 2008, the Department received an "Addendum to Application for Air Quality and Operating Permits" from SME for MAQP #3423-00. The addendum application included a proposed BACT determination for $PM_{2.5}$. On September 29, 2008, the Department received a revised addendum application, and the Department determined the application materials complete.

MAQP #3423-01 was issued as a preliminary determination on October 6, 2008, and the public comment period closed on November 5, 2008. The preliminary determination established permit limitations, conditions and reporting requirements in accordance with the results of the ordered $PM_{2.5}$ specific top-down BACT determination for the CFB Boiler. Additionally, SME requested in the application to take federally enforceable permit limits for hazardous air pollutants (HAPs) in order to avoid major source status with respect to HAPs. Pursuant to this request, emission limitations were included for hydrochloric acid (HCl), hydrofluoric acid (HF), as well as, boiler heat input rate and control technology requirements. The Department received a multitude of comments on the preliminary determination. In response to comments, the Department made the boiler heat input, HCl, and HF limitations more stringent to further ensure that SME's potential emissions would fall below the major source threshold for HAPs. The Department also increased the testing frequency for these pollutants to annually. On November 26, 2008, MAQP #3423-01 pursuant to the Order issued by the BER in the matter of contested case number BER 2007-07 AQ became final.

On August 3, 2009, SME sent a letter to the Department stating that SME would voluntarily rescind MAQP #3423-01 to the Department. Pursuant to SME's request, the Department sent a letter to SME to revoke MAQP #3423-01; SME received the letter on August 4, 2009. Following a 15-day appeal period, revocation of MAQP #3423-01 became final on August 20, 2009.

E. Additional Information

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

II. Applicable Rules and Regulations

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

   Based on the emissions from the turbine, the Department determined that initial testing for NO_x and CO is necessary. Furthermore, based on the emissions from the turbines, the Department determined that annual testing is necessary to demonstrate compliance with the NO_x and CO emission limits.

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).

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

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

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

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

SME 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, SME 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 Part 60, Standards of Performance for New Stationary Sources (NSPS). The turbine generators are considered NSPS affected equipment under 40 CFR Part 60 and are subject to the requirements of the following subparts.

   a. 40 CFR 60, Subpart A – General Provisions. This subpart applies to all equipment or facilities subject to an NSPS Subpart as listed below:

   b. 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition (CI) Combustion Engines (ICE). This subpart indicates that NSPS requirements apply to owners or operators of stationary CI ICE that commence construction after July 11, 2005, or are manufactured after April 1, 2006. This subpart also applies to fire pump engines manufactured and certified by the National Fire Protection Association after July 1, 2006. This subpart could apply to the proposed emergency generator/engine and the fire pump depending upon the manufacture date.

   c. 40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines. This subpart applies to the proposed facility because SME proposes to install and operate stationary combustion turbines with a heat input greater than 10 million British thermal units (MMBtu) per hour, which commenced construction, modification, or reconstruction after February 18, 2005.

8. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This source shall comply with the standards and provisions of 40 CFR Part 61, as appropriate.

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

   a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to an NESHAP Subpart as may be listed below:

   b. 40 CFR 63, Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines: This subpart applies to stationary combustion turbines located at a major sources of HAP emissions which emit any single HAP at a rate of at least 10 tons per year (TPY), or a combination of HAPs of at least 25 TPY. This subpart does not apply to the HGS gas plant because emissions from the HGS gas plant do not meet or exceed 10 TPY for a single HAP or 25 TPY for a combination of HAPs.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.402 Requirements. SME must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed heights of the stacks for the turbine generators are below the allowable 65-meter GEP stack height.

E. 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. 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.

F. 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 TPY of any pollutant. The SME facility has a PTE greater than 25 TPY for NO_x, CO and $PM_{10}/PM_{2.5}$; 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 a newspaper of general circulation in the area affected by the application for a permit. 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 SME 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 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.

12. 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.

13. 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).

14. 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 BER 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.

15. 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.

G. 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.

   The HGS gas plant is a major stationary source under the Prevention of Signficant Deterioration of Air Quality Program (PSD) because it belongs to the list of 28 source categories which emit or has the potential to emit 100 tons per year or more of any pollutant subject to regulation. The PSD source category that applies to the HGS gas plant is "fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input" (ARM 17.8.801(22)). Emissions from the gas combustion turbines exceed 100 TPY for CO and NO_x. Furthermore, because the HGS gas plant is a major source with respect to PSD, emissions of PM and PM_{10} are considered "significant" because they exceed thresholds of 25 TPY for PM and 15 TPY for PM_{10}.

H. 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 TPY of any pollutant;

   b. PTE > 10 TPY 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 TPY of PM_{10} in a serious PM_{10} 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 MAQP #4429-01 for SME, the following conclusions were made:

   a. Emissions from the HGS gas plant are greater than 100 TPY for NO_x and CO.

   b. Emissions from the HGS gas plant are less than 10 TPY for any one HAP and less than 25 TPY for all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. The HGS gas plant facility is subject to a current NSPS (40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines).

   e. The HGS gas plant is potentially subject to area source provisions of a NESHAP standard (40 CFR 63, Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, depending on the date of manufacture of the emergency diesel generator and fire pump).

f. The HGS gas plant is a Title IV affected source; however, it is not a solid waste combustion unit.

g. The HGS gas plant is not an EPA designated Title V source.

Based on these facts, the Department determined that SME is subject to the Title V operating permit program. SME applied for a Title V Operating Permit concurrent to the MAQP application.

III. BACT Determination

A BACT determination is required for each new or modified source. SME shall install on the new or modified source the maximum air pollution control capability which is technically 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 change.

IV. Emission Inventory

To determine maximum potential emissions, PTE calculations considered the two maximum operating scenarios:

- Simple cycle operation for permit limit of 3,200 hours per turbine per year; combined cycle operation for balance of year (i.e., 5,560 hours per turbine per year).
- No simple cycle operation; combined cycle operation for 8,760 hours per turbine per year.

Then, results from the two scenarios were compared and the highest result for each pollutant was selected as the PTE. For simple cycle operation, SUSD emission factors were used because there are no limits on the number of startup/shutdown cycles. Simple cycle SUSD factors are equal to or higher than the steady state factors and thus represent a worst-case scenario. For combined cycle operation, permit conditions limit startup to 1,460 hours per unit per year, and shutdown to 730 hours per unit per year; therefore, the SUSD emission factors are used for the respective annual hour limits and the steady state emission factor is used for the balance of the year.

Table IV. Annual Emissions

Source	Annual Emissions (TPY)						
	PM	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**CO**	**VOC**	**SO_2**
Turbine East	31.54	31.54	31.54	89.11	244.08	11.41	3.02
Turbine West	31.54	31.54	31.54	89.11	244.08	11.41	3.02
Emergency Generator	0.04	0.04	0.04	6.04	0.55	0.13	0.09
Fire Pump Engine	0.04	0.04	0.04	1.02	0.24	0.04	0.02
Cooling Towers	1.14	1.14	1.14	--	--	--	--
Building Heaters	0.09	0.09	0.09	1.68	1.01	0.07	0.01
Haul Roads	5.68	1.57	--	--	--	--	--
Total	**70.07**	**65.96**	**64.39**	**186.96**	**489.96**	**23.06**	**6.16**

Combustion Turbines

$PM/PM_{10}/PM_{2.5}$ Emissions

Note: The highest $PM/PM_{10}/PM_{2.5}$ emissions occur when both turbines operate in combined cycle only, 8,760 hours per turbine per year (startup 1,460 hr/turbine/yr, shutdown 730 hr/turbine/yr, steady state 6,570 hr/turbine/yr).
Simple Cycle Operation (per turbine): 0 hr/turbine/yr (Permit limit, including startup and shutdown)
Simple Cycle Emission Factor = 4.8 lb/hr (BACT limit, maximum)
Calculation: (2 turbines) * (0 hr/turbine/yr) * (4.8 lb/hr) * (1 ton/ 2000 lb) = 0.00 tons/yr

Combined Cycle Startup (per turbine): 1,460 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Startup Emission Factor = 7.2 lb/hr (BACT limit, startup)
Calculation: (2 turbines) * (1460 hr/turbine/yr) * (7.2 lb/hr) * (1 ton/ 2000 lb) = 10.51 tons/yr

Combined Cycle Shutdown (per turbine): 730 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Shutdown Emission Factor = 7.2 lb/hr (BACT limit, shutdown)
Calculation: (2 turbines) * (730 hr/turbine/yr) * (7.2 lb/hr) * (1 ton/ 2000 lb) = 5.26 tons/yr

Combined Cycle Steady State (per turbine): 6,570 hr/turbine/yr
Combined Cycle Steady State Emission Factor = 7.2 lb/hr (BACT limit, steady state)
Calculation: (2 turbines) * (6570 hr/turbine/yr) * (7.2 lb/hr) * (1 ton/ 2000 lb) = 47.30 tons/yr

Total $PM/PM_{10}/PM_{2.5}$ Emissions = 63.07 tons/yr

NO_x Emissions

Note: The highest NO_x emissions occur when both turbines operate in simple cycle for 3,200 hours per turbine per year, and the balance of the year in combined cycle (startup 1,460 hr/turbine/yr, shutdown 730 hr/turbine/yr, steady state 3,370 hr/turbine/yr).

Simple Cycle Operation (per turbine): 3,200 hr/turbine/yr (Permit limit, including startup and shutdown)
Simple Cycle Emission Factor = 36.58 lb/hr (BACT limit, maximum)
Calculation: (2 turbines) * (3200 hr/turbine/yr) * (36.58 lb/hr) * (1 ton/ 2000 lb) = 117.06 tons/yr

Combined Cycle Startup (per turbine): 1,460 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Startup Emission Factor = 26.12 lb/hr (BACT limit, startup)
Calculation: (2 turbines) * (1460 hr/turbine/yr) * (26.12 lb/hr) * (1 ton/ 2000 lb) = 38.14 tons/yr

Combined Cycle Shutdown (per turbine): 730 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Shutdown Emission Factor = 12.33 lb/hr (BACT limit, shutdown)
Calculation: (2 turbines) * (730 hr/turbine/yr) * (12.33 lb/hr) * (1 ton/ 2000 lb) = 9.00 tons/yr

Combined Cycle Steady State (per turbine): 3,370 hr/turbine/yr
Combined Cycle Steady State Emission Factor = 4.16 lb/hr (BACT limit, steady state)
Calculation: (2 turbines) * (3370 hr/turbine/yr) * (4.16 lb/hr) * (1 ton/ 2000 lb) = 14.02 tons/yr

Total NO_x Emissions = 178.21 tons/yr

CO Emissions

Note: The highest CO emissions occur when both turbines operate in simple cycle for 3,200 hours per turbine per year, and the balance of the year in combined cycle (startup 1,460 hr/turbine/yr, shutdown 730 hr/turbine/yr, steady state 3,370 hr/turbine/yr).

Simple Cycle Operation (per turbine): 3,200 hr/turbine/yr (Permit limit, including startup and shutdown)
Simple Cycle Emission Factor = 114.7 lb/hr (BACT limit, maximum)
Calculation: (2 turbines) * (3200 hr/turbine/yr) * (114.7 lb/hr) * (1 ton/ 2000 lb) = 367.04 tons/yr

Combined Cycle Startup (per turbine): 1,460 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Startup Emission Factor = 76.2 lb/hr (BACT limit, startup)
Calculation: (2 turbines) * (1460 hr/turbine/yr) * (76.2 lb/hr) * (1 ton/ 2000 lb) = 111.25 tons/yr

Combined Cycle Shutdown (per turbine): 730 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Shutdown Emission Factor = 4.15 lb/hr (BACT limit, shutdown)
Calculation: (2 turbines) * (730 hr/turbine/yr) * (4.15 lb/hr) * (1 ton/ 2000 lb) = 3.03 tons/yr
Combined Cycle Steady State (per turbine): 3,370 hr/turbine/yr
Combined Cycle Steady State Emission Factor = 2.03 lb/hr (BACT limit, steady state)
Calculation: (2 turbines) * (3370 hr/turbine/yr) * (2.03 lb/hr) * (1 ton/ 2000 lb) = 6.84 tons/yr

Total CO Emissions = 488.16 tons/yr

VOC Emissions

Note: The highest VOC emissions occur when both turbines operate in simple cycle for 3,200 hours per turbine per year, and the balance of the year in combined cycle (startup 1,460 hr/turbine/yr, shutdown 730 hr/turbine/yr, steady state 3,370 hr/turbine/yr).

Simple Cycle Operation (per turbine): 3,200 hr/turbine/yr (Permit limit, including startup and shutdown)
Simple Cycle Emission Factor = 3.9 lb/hr (BACT limit, maximum)
Calculation: (2 turbines) * (3200 hr/turbine/yr) * (3.9 lb/hr) * (1 ton/ 2000 lb) = 12.48 tons/yr

Combined Cycle Startup (per turbine): 1,460 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Startup Emission Factor = 1.86 lb/hr (BACT limit, startup)
Calculation: (2 turbines) * (1460 hr/turbine/yr) * (1.86 lb/hr) * (1 ton/ 2000 lb) = 2.72 tons/yr

Combined Cycle Shutdown (per turbine): 730 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Shutdown Emission Factor = 1.86 lb/hr (BACT limit, shutdown)
Calculation: (2 turbines) * (730 hr/turbine/yr) * (1.86 lb/hr) * (1 ton/ 2000 lb) = 1.36 tons/yr

Combined Cycle Steady State (per turbine): 3,370 hr/turbine/yr
Combined Cycle Steady State Emission Factor = 1.86 lb/hr (BACT limit, steady state)
Calculation: (2 turbines) * (3370 hr/turbine/yr) * (1.86 lb/hr) * (1 ton/ 2000 lb) = 6.27 tons/yr

Total VOC Emissions = 22.82 tons/yr

SO_2 Emissions

Note: The highest SO_2 emissions occur when both turbines operate in combined cycle only, 8,760 hours per turbine per year (startup 1,460 hr/turbine/yr, shutdown 730 hr/turbine/yr, steady state 6,570 hr/turbine/yr).

Simple Cycle Operation (per turbine): 0 hr/turbine/yr (Permit limit, including startup and shutdown)
Simple Cycle Emission Factor = 0.57 lb/hr (BACT limit, maximum)
Calculation: (2 turbines) * (0 hr/turbine/yr) * (0.57 lb/hr) * (1 ton/ 2000 lb) = 0.00 tons/yr

Combined Cycle Startup (per turbine): 1,460 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Startup Emission Factor = 0.69 lb/hr (BACT limit, startup)
Calculation: (2 turbines) * (1460 hr/turbine/yr) * (0.69 lb/hr) * (1 ton/ 2000 lb) = 1.01 tons/yr

Combined Cycle Shutdown (per turbine): 730 hr/turbine/yr (Permit limit, based on two SUSD cycles per day)
Combined Cycle Shutdown Emission Factor = 0.69 lb/hr (BACT limit, shutdown)
Calculation: (2 turbines) * (730 hr/turbine/yr) * (0.69 lb/hr) * (1 ton/ 2000 lb) = 0.50 tons/yr

Combined Cycle Steady State (per turbine): 6,570 hr/turbine/yr
Combined Cycle Steady State Emission Factor = 0.69 lb/hr (BACT limit, steady state)
Calculation: (2 turbines) * (6570 hr/turbine/yr) * (0.69 lb/hr) * (1 ton/ 2000 lb) = 4.53 tons/yr

Total SO_2 Emissions = 6.04 tons/yr

Emergency Diesel Generator

Note: Emissions are based on the power output of the engine (i.e., shaft power, or "brake horsepower", bhp), not the generator output.
Generator Output = 1,500 kW (2,011 hp) (vendor data)
Engine Output = 2,206 bhp (vendor data)
Hours of Operation = 500 hr/yr (Permit limit)

$PM/PM_{10}/PM_{2.5}$ Emissions

Assume vendor data represents total filterable particulate. According to AP-42, Table 3.4-2 (10/96), the ratio of total $PM_{2.5}$ (filterable $PM_{2.5}$ plus all condensable particulate) to total filterable particulate is 0.897; i.e., total $PM_{2.5}$ is approximately 90% of the total filterable particulate. Thus, estimation of $PM_{2.5}$ is conservative since it is approximately 90% of vendor value.

Emission Factor = 0.03 g/hp-hr (vendor data)
Calculation: (500 hr/yr) * (2,206 bhp) * (0.03 g/hp-hr) * (lb /453.59 g) * (ton/2000 lb) = 0.04 tons/yr

NO_x Emissions

Emission Factor = 4.97 g/hp-hr (vendor data)
Calculation: (500 hr/yr) * (2,206 bhp) * (4.97 g/hp-hr) * (lb /453.59 g) * (ton/2000 lb) = 6.04 tons/yr

CO Emissions

Emission Factor = 0.45 g/hp-hr (vendor data)
Calculation: (500 hr/yr) * (2,206 bhp) * (0.45 g/hp-hr) * (lb /453.59 g) * (ton/2000 lb) = 0.55 tons/yr

VOC Emissions

Emission Factor = 0.11 g/hp-hr (vendor data)
Calculation: (500 hr/yr) * (2,206 bhp) * (0.11 g/hp-hr) * (lb /453.59 g) * (ton/2000 lb) = 0.13 tons/yr

SO_2 Emissions

Assume all fuel sulfur is converted to SO_x.
Diesel Fuel Sulfur Content = 500 ppm = (500/1,000,000) = 0.0005 (sulfur limit, nonroad diesel fuel, 40 CFR 80.510)
Fuel Flow at 100% Load = 104.8 gal/hr (vendor data)
Diesel Density = 7.001 lb/gal (vendor data)
Sulfur content = 0.0005 * (7.001 lb/gal) = 0.0035005 lb/gal
Calculation: (500 hr/yr) * (104.8 gal/hr) * (0.0035005 lb/gal) * (ton/2000 lb) = 0.09 tons/yr

Fire Pump Engine

Note: Emissions are based on the power output of the engine (i.e., shaft power, or "brake horsepower", bhp), not pump power output.
Engine Output = 343 bhp (vendor data)
Hours of Operation = 500 hr/yr (Permit limit)

$PM/PM_{10}/PM_{2.5}$ Emissions

Assume vendor data represents total filterable particulate. According to AP-42, Table 3.4-2 (10/96), the ratio of total $PM_{2.5}$ (filterable $PM_{2.5}$ plus all condensable particulate) to total filterable particulate is 0.897; i.e., total $PM_{2.5}$ is approximately 90% of the total filterable particulate. Thus, estimation of $PM_{2.5}$ is conservative since it is approximately 90% of vendor value.

Emission Factor = 0.211 g/hp-hr (vendor data)
Calculation: (500 hr/yr) * (343 bhp) * (0.211 g/hp-hr) * (lb /453.59 g) * (ton/2000 lb) = 0.04 tons/yr

NO_x Emissions

Emission Factor = 5.41 g/hp-hr (vendor data)
Calculation: (500 hr/yr) * (343 bhp) * (5.41 g/hp-hr) * (lb /453.59 g) * (ton/2000 lb) = 1.02 tons/yr

CO Emissions

Emission Factor = 1.25 g/hp-hr (vendor data)
Calculation: (500 hr/yr) * (343 bhp) * (1.25 g/hp-hr) * (lb /453.59 g) * (ton/2000 lb) = 0.24 tons/yr

VOC Emissions
Emission Factor = 0.2 g/hp-hr (vendor data)
Calculation: (500 hr/yr) * (343 bhp) * (0.2 g/hp-hr) * (lb /453.59 g) * (ton/2000 lb) = 0.04 tons/yr

SO_2 Emissions

Assume all fuel sulfur is converted to SOx.
Diesel Fuel Sulfur Content = 500 ppm = (500/1,000,000) = 0.0005 (sulfur limit, nonroad diesel fuel, 40 CFR 80.510)
Fuel Flow at 100% Load = 17.9 gal/hr (vendor data)
Diesel Density = 7 lb/gal
Sulfur content = 0.0005 * (7 lb/gal) = 0.0035 lb/gal
Calculation: (500 hr/yr) * (17.9 gal/hr) * (0.0035 lb/gal) * (ton/2000 lb) = 0.02 tons/yr

Cooling Towers

Circulating Flow: 28,000 gal/min (Based on analysis by Bison and Stanley Consultants)

Drift %: 0.002 % (estimate) (Drift is "shedding" of water droplets from the mist eliminators in the cooling towers that are ejected into the water vapor stream. As they are water droplets, and not vapor, they can carry minute amounts of minerals, which then become airborne particulate after the water droplet evaporates downrange. The evaporate from the cooling towers is just vapor, and therefore does not become particulate.)

Drift Flow = 28,000 gal/min * 0.002/100 = 0.56 gal/min

Number of Concentration Cycles: 5 ("Concentration cycles" are the number of times that steam/water can cycle before mineral content exceeds the threshold for boiler operation capacity due to evaporative losses. When the saturated steam from the turbine is recirculated to the cooling towers, a portion of the water evaporates which removes the energy from the steam, causing it condense back to liquid. The evaporated portion is added back to the cycle as demineralized make-up water, with the specified amount of minerals in solution. However, the evaporated water leaves behind mineral content. After so many "concentration cycles," the mineral content builds and eventually exceeds the thresholds of boiler quality demineralized make-up water, and then must be flushed out of the system. The make-up water cannot be circulated indefinitely.)

Dissolved Solids Concentration: 186 mg/liter (Based on analysis by Bison and Stanley Consultants)

$PM/PM_{10}/PM_{2.5}$ Emissions

Calculation: (0.56 gal/min) * (3.7854 liters/gal) * (186 mg/liter) * (5 cycles) = 1,971.44 mg/min
Conversion: (1,971.44 mg/min) * (lb/ 453592.37 mg) * (1 ton/ 2000 lb) * (60 min/ hr) * (8,760 hr/ yr) = 1.14 tons/yr

Building Heaters

Heat Rate of Buildings:
- Turbine Enclosures = 0.25 MMBtu/hr
- Admin/Maintenance/Electrical/STG Building = 1.00 MMBtu/hr
- Water Treatment Building = 0.50 MMBtu/hr
- Warehouse = 0.50 MMBtu/hr

- Water Pumphouse = 0.25 MMBtu/hr
- Fuel Gas Compressor Building = 0.25 MMBtu/hr
- CEMS Enclosures (2ea) = 0.05 MMBtu/hr

Total = 2.80 MMBtu/hr

Average natural gas higher heating value = 1,020 Btu/scf (AP-42, Table 1.4-1, 7/98)

PM/PM_{10}/$PM_{2.5}$ Emissions

Emission Factor = 7.6 lb/ 10^6 scf (AP-42, Table 1.4-2, 7/98)
Calculation: (8,760 hrs/yr) * (2.8 MMBtu/hr) * (1 / 1020 Btu/scf) * (7.6 lb/ 10^6 scf) * (ton/2000 lb) = 0.09 tons/yr

NO_x Emissions

Emission Factor = 140 lb/10^6 scf (AP-42, Table 1.4-1, 7/98)
Calculation: (8,760 hrs/yr) * (2.8 MMBtu/hr) * (1 / 1020 Btu/scf) * (140 lb/10^6 scf) * (ton/2000 lb) = 1.68 tons/yr

CO Emissions

Emission Factor = 84 lb/10^6 scf (AP-42, Table 1.4-1, 7/98)
Calculation: (8,760 hrs/yr) * (2.8 MMBtu/hr) * (1 / 1020 Btu/scf) * (84 lb/10^6 scf) * (ton/2000 lb) = 1.01 tons/yr

VOC Emissions

Emission Factor = 5.5 lb/10^6 scf (AP-42, Table 1.4-2, 7/98)
Calculation: (8,760 hrs/yr) * (2.8 MMBtu/hr) * (1 / 1020 Btu/scf) * (5.5 lb/10^6 scf) * (ton/2000 lb) = 0.07 tons/yr

SO_2 Emissions

Emission Factor = 0.6 lb/10^6 scf (AP-42, Table 1.4-2, 7/98)
Calculation: (8,760 hrs/yr) * (2.8 MMBtu/hr) * (1 / 1020 Btu/scf) * (0.6 lb/10^6 scf) * (ton/2000 lb) = 0.01 tons/yr

Haul Roads

Vehicle Miles Traveled (VMT) per Day = 5 VMT/day (Estimate)
VMT per hour = (5 VMT/day) * (day/24 hrs) = 0.21 VMT/hr
Hours of Operation = 8,760 hrs/yr

PM Emissions

Predictive equation for emission factor for unpaved roads at industrial sites provided per AP 42, Ch. 13.2.2, 11/06.
Emission Factor = k * (s / 12) ^{a} * (W / 3) ^{b} = 12.46 lb/VMT
Where: k = constant = 4.9 lbs/VMT (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)
a = constant = 0.7 (Value for PM_{30}/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM_{30}/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.21 VMT/hr) * (12.46 lb/VMT) * (ton/2000 lb) * (1-50/100) = 5.68 tons/yr

PM_{10} Emissions

Predictive equation for emission factor for unpaved roads at industrial sites provided per AP 42, Ch. 13.2.2, 11/06.
Emission Factor = k * (s / 12) ^{a} * (W / 3) ^{b} = 3.43 lb/VMT
Where: k = constant = 1.5 lbs/VMT (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)
a = constant = 0.9 (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.21 VMT/hr) * (3.43 lb/VMT) * (ton/2000 lb) * (1-50/100) = 1.57 tons/yr

V. Existing Air Quality

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.

VI. Ambient Air Impact Analysis

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 a private property taking and damaging assessment and determined there are no taking or damaging implications.

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.

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Date: 08/21/12