DEQ
Montana Department
of Environmental Quality

Air, Energy & Mining Division

May 3, 2021

Mr. Jim Williams
Basin Creek Equity Partners, LLC
65 East Broadway
Butte, MT 59701

Dear Mr. Williams:

Montana Air Quality Permit #3211-05 is deemed final as of May 1, 2021, by the Department of Environmental Quality (Department). All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

Julie A Merkel

Craig Henrikson

Julie A. Merkel
Permitting Services Section Supervisor
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Montana Department of Environmental Quality
Air, Energy & Mining Division

Montana Air Quality Permit #3211-05

Basin Creek Equity Partners, LLC
65 East Broadway
Butte, MT 59701

May 1, 2021

MONTANA AIR QUALITY PERMIT

Issued To:	Basin Creek Equity Partners, LLC 65 East Broadway Butte, MT 59701	Permit #3211-05 Application Received: 10/8/2020 Preliminary Determination: 03/30/2021 Department Decision: April 15, 2021 Appeal Period Ends: May 17, 2021 Permit Final: May 1, 2021

A Montana air quality permit (MAQP), with conditions, is hereby granted to Basin Creek Equity Partners, LLC (BCEP), pursuant to Sections 75-2-204 and 211, 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

BCEP operates a nominal 54.9-megawatt (MW) electrical power generation facility incorporating nine (6.1 MW per engine) four-stroke, lean-burn, natural gas fired reciprocating internal combustion engines (RICE). The legal description of the site is Section 18, Township 2 North, Range 7 West, in Silver Bow County, Montana.

B. Current Permit Action

The Department of Environmental Quality (Department) received an application on October 8, 2020, from BCEP requesting the addition of six new 6.1 MW RICE and to increase the allowable annual hours of operation of the existing nine RICE. Emissions of nitrogen oxides (NO_x) are minimized by installing selective catalytic reduction (SCR) to the six new RICE and the existing nine RICE. The new RICE would also be equipped with oxidation-catalyst technology to control carbon monoxide (CO), volatile organic compounds (VOC) and hazardous air pollutants (HAP) emissions. The proposal also includes the addition of a liquified natural gas (LNG) facility to store natural gas during periods of interrupted pipeline supply. An incompleteness letter was issued on November 6, 2020, and two subsequent extension requests were received (and approved by the Department). The response to the incompleteness letter was received on February 22, 2021.

Section II: Limitations and Conditions

A. Emission Limitations and Control Requirements

1. Emissions from each 6.1 MW RICE shall not exceed the following based on a 1-hour average (ARM 17.8.752):

   i. NO_x[1] 3.84 lb/hr for all 15 RICE

1 NO_x reported as NO_2.

ii. CO 5.10 lb/hr for the original nine RICE
iii. CO 3.0 lb/hr for the six new RICE
iv. VOC 4.60 lb/hr as methane for all 15 RICE

2. BCEP shall combust only pipeline quality natural gas for RICE operations (ARM 17.8.752).

3. BCEP shall install, operate, and maintain an oxidation catalyst on each RICE (ARM 17.8.752).

4. BCEP shall install, operate, and maintain an SCR on each RICE (ARM 17.8.752).

5. BCEP shall limit the combined RICE operation (15 engines total) to 96,000 hours during any rolling 12-month time period (ARM 17.8.749).

6. BCEP 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).

7. BCEP shall not cause or authorize emissions to be discharged into the atmosphere from haul roads, access roads, parking lots, or the general plant property without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

8. BCEP shall treat all unpaved portions of the access roads, parking lots, and general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.6 (ARM 17.8.752).

9. BCEP shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements of the Acid Rain Program contained in 40 CFR 72-78 (40 CFR 72 through 40 CFR 78).

10. BCEP shall meet the emission standards for the six new RICE according to 40 CFR 60 Subpart JJJJ (40 CFR 60 Subpart JJJJ, and ARM 17.8.749)

11. The six proposed RICE engines will be classified as new stationary RICE. When the facility changes classification from an area source of HAPs, the existing RICE engines will be re-classified as new stationary sources and all RICE will be subject to 40 CFR 63 Subpart ZZZZ and the applicable emissions limit requirements and compliance source tests identified in 40 CFR 63 Subpart ZZZZ (40 CFR 63 Subpart A, 40 CFR 63 Subpart ZZZZ, ARM 17.8.342 and ARM 17.8.749).

B. Testing Requirements

1. For the existing nine RICE, BCEP shall test each RICE for NO_x and CO, concurrently, to demonstrate compliance with the NO_x and CO emission limits

contained in Section II.A.1. The testing shall continue on an every 2-year basis, or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and 17.8.749).

2. For the new six RICE, if BCEP does not operate and maintain the RICE engine and control device according to the manufacturer's written instructions, as identified in 40 CFR 60.4243, BCEP shall conduct an initial performance test within one year of startup, and conduct subsequent performance testing every 8760 hours or three years whichever comes first. If BCEP operates the RICE and control device according to the manufacturer's written instructions, the RICE are considered certified and must comply with the emission standards and performance test requirements in Table 1 of 40 CFR 60.4233 (40 CFR 60 Subpart A, 40 CFR 60 Subpart JJJJ, ARM 17.8.105 and 17.8.749).

3. The proposed RICE engines will be classified as new stationary RICE. When the facility changes classification from an area source of HAPs, the existing RICE engines will be re-classified as new stationary sources and all RICE will be subject to 40 CFR 63 Subpart ZZZZ and the applicable emissions limit requirements and compliance tests identified in 40 CFR 63 Subpart ZZZZ (40 CFR 63 Subpart A, 40 CFR 63 Subpart ZZZZ, ARM 17.8.342 and ARM 17.8.749).

4. All compliance source tests shall be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

5. The Department may require additional testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. BCEP 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 Section I 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 for calculating operating fees based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. BCEP shall document, by month, the combined hours of operation of the fifteen RICE. By the 25th day of each month, BCEP shall total the combined hours of operation of the fifteen RICE for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitations in Section II.A.4. The information for each of the previous months shall be submitted annually to the Department along with the annual emission inventory (ARM 17.8.749).

3. BCEP shall notify the Department of any construction or improvement project

conducted pursuant to ARM 17.8.745(1), 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(l)(d) (ARM 17.8.745).

4. BCEP shall conduct the necessary recordkeeping and reporting requirements any applicable requirements under 40 CFR 63 Subpart JJJJ and 40 CFR 63 Subpart ZZZZ (40 CFR 60 Subpart JJJJ, 40 CFR 63 Subpart ZZZZ, and ARM 17.8.749).

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

D. Notification

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

1. Actual start-up date of each RICE within 15 working days of the actual start-up of the RICE.

2. BCEP shall provide any required notifications required under 40 CFR 60 Subpart JJJJ and 40 CFR 63 Subpart ZZZZ).

Section III: General Conditions

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

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving BCEP 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 as specified in Section 75-2-401, *et seq*., MCA.

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

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

G. Permit Fees - Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, the continuing validity of this permit is conditional upon the payment by the permittee of an annual operation fee, as required, by that section and rules adopted thereunder by the Board.

Montana Air Quality Permit (MAQP) Analysis
Basin Creek Equity Partners, LLC
MAQP #3211-05

I. Introduction/Process Description

A. Permitted Equipment

Basin Creek Equity Partners, LLC (BCEP), operates a nominal 54.9-megawatt (MW) electrical power generation facility incorporating nine (6.1 MW) four-stroke, lean-burn, natural gas fired reciprocating internal combustion engines (RICE). Under MAQP #3211-05 six new RICE each rated for 6.1 MW were approved for operation at the site. The legal description of the site is Section 18, Township 2 North, Range 7 West, in Silver Bow County, Montana.

B. Process/Source Description

The RICE produces electrical power by engine shaft rotation of an electric generator. The RICE will combust pipeline quality natural gas and incorporate an oxidation catalyst (OxiCat) for the control of carbon monoxide (CO), Volatile Organic Compound (VOC), and Hazardous Air Pollutant (HAP) emissions. Under MAQP #3211-05, selective catalytic reduction (SCR) will be incorporated to the original 9 RICE and to the new six RICE. BCEP will continue to combust pipeline quality natural gas and also will incorporate a liquified natural gas storage at the site to maintain operation during pipeline outages. Further, the RICE will not incorporate add-on controls for sulfur dioxide (SO_2) and particulate matter less than 10 microns (μm) aerodynamic diameter (PM_{10}) emissions. BCEP is required by permit to combust only pipeline quality natural gas which will result in minimal SO_2 and PM_{10} emissions.

Since NO_x emissions from each RICE are less than 100 tons per year (tpy) and BCEP has requested permit conditions limiting potential facility wide NO_x emissions, the facility is a minor source, as defined under the New Source Review Prevention of Significant Deterioration (NSR/PSD) permitting program.

C. Permit History

On November 19, 2002, Basin Creek Power Services, LLC (BCP) was issued final Montana Air Quality Permit **#3211-00**. Under the initial permitting action, BCP proposed the construction and operation of four nominal 23.9-MW simple cycle turbines to produce electrical power for the grid. The plant design scenario included two Pratt and Whitney FT8-1 twin pacs with each twin pac consisting of two simple cycle turbines and a single electric generator capable of combusting natural gas or distillate fuel oil #2. The electric generation system was permitted to operate as a "peaking unit" or "load following unit." Emissions of NO_x from the turbines were required by permit to be controlled with a water injection system that was an integral part of the design of the Pratt and Whitney FT8-1 units. In addition, BCP proposed the installation of a catalyst to control at least 80% of the CO emissions from each twin pack. The equipment permitted in Permit #3211-00 was never installed.

On March 3, 2003, BCP submitted a complete permit application for the replacement of the four previously permitted Pratt and Whitney natural gas fired simple-cycle turbines (95.6 MW combined capacity) with three RICE (48.3 MW combined capacity). Each RICE was equipped with an OxiCat and operated in a dual-fuel mode utilizing pipeline quality natural gas and distillate fuel oil #2. Under the permitting action, BCP requested federally enforceable permit conditions to limit the annual potential NO_x emissions from the facility. Potential NO_x emissions for each RICE were limited to less than 100 tpy to be classified as Low Mass Emitting (LME) units under the Acid Rain Program. The Department of Environmental Quality (Department) limited BCP's emissions by establishing an operational limit for each RICE of 3,850 hours during any rolling 12-month time period and by limiting the fuel combusted in each RICE. The facility-wide potential NO_x emissions were further limited by a combined RICE operation limit of 9,600 hours during any rolling 12-month period. This limit allowed the BCP facility to remain below the NSR/PSD permitting threshold of 250 tpy. On May 8, 2003, Permit **#3211-01** was issued final. Permit #3211-01 replaced Permit #3211-00. The equipment permitted in Permit #3211-01 was never constructed.

On February 24, 2004, BCP submitted a complete permit application for the modification of Montana Air Quality Permit #3211-01. Specifically, the permit action would allow BCP to replace the three previously permitted RICE (48.3 MW combined capacity) with nine RICE (54.9 MW combined capacity).

Under the permit action, BCP requested federally enforceable permit conditions to limit the annual potential NO_x emissions from the facility to a level less than the NSR/PSD permitting threshold of 250 tpy per pollutant. The permit limited the combined RICE operation to 34,600 hours during any rolling 12-month time period and restricts BCP to the use of pipeline quality natural gas. Further, potential NO_x emissions from each RICE are less than 100 tpy. Therefore, the units are classified as LME under the Acid Rain Program (Title IV of the FCAA), thereby eliminating the requirement(s) for compliance with various provisions of the Acid Rain Program. The emission inventory contained in Section IV of the permit analysis demonstrates that the emissions are below the Acid Rain Program LME threshold and below the NSR/PSD permitting threshold.

BCP proposed an OxiCat (see Section III.B of the permit analysis for a discussion of controls), which controls both CO and VOC emissions. However, the uncontrolled CO emissions are greater than 100 tpy, so the Administrative Rules of Montana (ARM), Chapter 17.8, Subchapter 15, Compliance Assurance Monitoring (CAM) rules would apply for emissions of CO from each RICE. The uncontrolled VOC emissions are less than 100 tpy, so the CAM rules would not apply for the VOC emissions from the RICE. Also, because lean-burn technology is integral to the design of the proposed RICE, the Department does not consider lean-burn technology to be a control device as defined in the ARM 17.8.1501(5). Therefore, the uncontrolled NO_x emissions from the RICE are below 100 tpy and are not subject to CAM. Permit **#3211-02** replaced Permit #3211-01.

The Department received a letter dated February 14, 2005, from BCP to change the corporate name on Permit #3211-02 from BCP to Basin Creek. The permit action transferred ownership of Permit #3211-02 from BCP to Basin Creek. Permit #**3211-03** replaced Permit #3211-02.

The Department received a letter dated November 28, 2005, from Basin Creek requesting the reference to the reciprocating internal combustion engines (RICE) be changed from LME units to exempt new units. Basin Creek submitted an acid rain monitoring plan and LME unit certification to the United

States Environmental Protection Agency (EPA). Through correspondence with the USEPA, an understanding was reached that the RICE qualified for a new unit exemption. The permit action changed the reference to the RICE to exempt new units. MAQP #3211-04 replaced MAQP #3211-03.

D. Current Permit Action

On October 8, 2020, the Department received a modification request from BCEP requesting the addition of six new 6.1 MW RICE and to increase the allowable annual hours of operation of the existing nine RICE. Emissions of NOx are minimized by installing selective catalytic reduction (SCR) to both the six new RICE as well as SCR to the existing nine RICE. The new RICE would also be equipped with oxidation-catalyst technology to control CO, VOC and HAP emissions. The proposal also includes addition of a liquified natural gas (LNG) facility to store natural gas during periods of interrupted pipeline supply.

E. Response to Public Comments (None Received)

F. Response to American Chemet Comments (None Received)

G. 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 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 subchapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emissions 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 RICE, the Department determined that initial testing for NO_x and CO is necessary to demonstrate compliance with applicable emission limits. Furthermore, based on the emissions from the RICE and the current Department testing schedule guidance, the Department determined that additional testing every 2 years 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).

BCEP 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 online or 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 in 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 that a public nuisance is created.

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

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM10

BCEP 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 an 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 precaution be taken to control emissions of airborne particulate. (2) Under this rule, BCEP 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 17.8.340 Standard of Performance for New Stationary Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). BCEP's RICE original nine units are not considered NSPS affected facilities under 40 CFR Part 60 because the units do not meet the definition of an affected unit under any subpart contained in 40 CFR 60. The six new RICE will be subject to NSPS Subpart JJJJ.

4. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This rule incorporates, by reference, 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP). Since HAP emissions from the BCEP power generation facility will now exceed 10 tons per year for any individual HAP and more than 25 tons per year for all HAPs combined, the BCEP facility will be subject to the provisions of 40 CFR Part 61.

5. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR Part 63, NESHAP for Source Categories. Since HAP emissions from the BCEP power generation facility will now exceed 10 tons per year for any individual HAP and more than 25 tons per year for all HAPs combined, the BCEP facility will be subject to the provisions of 40 CFR Part 63.

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. BCEP the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department; and 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 pro-rate the required fee amount.

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

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit modification to construct, alter or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. BCEP has a PTE greater than 25 tons per year of NO_x, CO, and 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 are not subject to 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. BCEP submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. BCEP submitted an affidavit of publication of public notice for the October 11, 2020, issue of the Montana Standard a newspaper of general circulation in the City of Butte in Silver Bow County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The BACT analysis is described 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 BCEP 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 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. 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.

   The BCEP facility is not a listed source and the facility's permitted potential emissions are less than 250 tons per year for any pollutant.

G. ARM 17.8, Subchapter 12 - Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:

   a. PTE > 100 tons/year of any pollutant;

b. PTE > 10 tons/year of any one HAP, or 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 PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. 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 #3211-05 for BCEP, the following conclusions were made:

   a. The facility's PTE is greater than 100 tons/year for NO_x CO, and VOCs.

   b. The facility's PTE is greater than 25 tons/year of all HAPs.

   c. This facility is not located in a serious PM_{10} nonattainment area. BCEP is not a major source for PM_{10} and the requirements contained in ARM 17.8.901, *et seq*. do not apply to the BCEP facility. Further, previous modeling analysis showed that PM_{10} impacts from the BCEP facility comply with the Butte/Silver Bow State Implementation Plan.

   d. This facility is subject to NSPS Subpart JJJJ for the new six RICE.

   e. This facility is subject to NESHAP standard 40 CFR 63 Subpart ZZZZ, once the six new engines become operational.

   f. This facility is a Title IV affected source. BCEP qualifies for a new unit exemption (40 CFR 72.7(b)(1)).

   g. This facility is not an EPA designated Title V source.

   Based on the above information, the BCEP facility is a major source, and a Title V Operating Permit is required.

III. BACT Determination

A BACT determination is required for each new or altered source. BCEP shall install on a new or altered source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized. BCEP provided a BACT analysis for the six new RICE engines and also provided the equivalent of a BACT analysis for the existing nine RICE engines which are very similar in operation, which were not modified under this action but which were provided with selective catalytic control for NOx reduction.

RICE BACT Analysis

NOx - BACT

Oxides of nitrogen (NO_x) are primarily formed in combustion processes in three ways: thermal NOx, prompt NOx, and fuel NOx. Thermal NO_x is formed by the combination of elemental nitrogen with oxygen in the combustion air within the high-temperature environment of the combustor. Prompt NOx is formed by reactions of nitrogen with hydrogen radicals from the fuel. Fuel NO_x is formed by the oxidation of nitrogen contained in the fuel. Natural gas contains negligible amounts of fuel-bound nitrogen and hydrocarbon radicals, although some molecular nitrogen is present. It is assumed that NO_x emissions from the engines primarily originate as thermal NO_x. The rate of formation of thermal NOx is a function of residence time and free oxygen and increases exponentially with peak flame temperature. NOx control techniques are aimed at controlling one or more of these variables during combustion. Controlling the air-to-fuel ratio can also reduce the amount of NOx.

Step 1 – Identify All Available NOx Control Technologies

Methods to control NOx from RICE include both intrinsic emissions control as well as add- on control. The intrinsic emissions control for NOx includes good combustion practices/proper operation, also referred to as lean-burn combustion. Add-on controls for NOx emissions control from RICE include Non-Selective Catalytic Reduction (NSCR) and Selective Catalytic Reduction (SCR). A brief analysis of these controls is shown below.

Lean-burn engines are designed to operate with excess oxygen, which means a lean fuel mixture. The proposed project includes CAT lean-burn, four-stroke engines. In the lean- burn combustion process, natural gas and air are premixed in a low fuel/air ratio before being fed into the cylinders. The lean-burn process efficiently reduces NOx emissions due to a lower combustion temperature. The CAT RICE are also equipped with turbo chargers which increase the volume of air in the combustion chamber. Lean-burn engines with no add-on controls have inherently low NOx emissions.

Other control methods utilize add-on equipment to remove NOx from the exhaust gas stream after its formation. The most common control techniques involve the injection of urea or ammonia into the gas stream to reduce the NOx to molecular nitrogen and water. Urea/ammonia is either injected into the engine combustion chamber (in the case of NSCR) or injected with the use of a catalyst (SCR).

Step 2 – Eliminate Technically Infeasible Options

Lean Burn Combustion

The existing and proposed RICE are designed as lean-burn, four-stroke engines. Lean burn engines may operate up to the lean flame extinction limit, with exhaust oxygen levels of 12 percent or greater. The air-to-fuel ratios of lean-burn engines range from 20:1 to 50:1 and are typically higher than 24:1. The CAT lean-burn engines can also be characterized as "clean-burn" engines. Engines operating at high air-to-fuel ratios (greater than 30:1) may require combustion modification to promote stable combustion with high excess air. The RICE are designed with a turbocharger which is used to force more air into the combustion chamber. Lean-burn combustion is technically feasible for application to the RICE.

Non-Selective Catalytic Reduction (NSCR)

NSCR is an add-on/post-combustion technology that is used on rich-burn engines. NSCR uses the residual hydrocarbons and CO in the rich-burn engine exhaust as a reducing agent for NOx. In an NSCR, hydrocarbons and CO are oxidized by oxygen (O_2) and NOx.

The excess hydrocarbons, CO, and NOx pass over a catalyst (usually a noble metal such as platinum, rhodium, or palladium) that reduces NOx to dinitrogen (N_2). The NSCR technique is effectively limited to engines with normal exhaust oxygen levels of 4 percent or less. This includes four-stroke rich-burn naturally-aspirated engines and some four- stroke rich-burn turbo-charged engines. Engines operating with NSCR require tight air- to-fuel control to maintain high reduction effectiveness without high hydrocarbon emissions. To achieve effective NOx reduction performance, the engine may need to be run with a richer fuel adjustment than normal. This exhaust excess oxygen level would probably be closer to 1 percent.

NSCR is not a feasible emissions control for the existing or proposed lean-burn engines at the BCEP facility. Lean-burn engines could not be equipped with NSCR control because of the reduced exhaust temperatures. In addition, lean burn engines operate with an oxygen level at approximately 10%, much higher than an NSCR can operate. NSCR is not considered to be technically feasible for application to the lean-burn RICE and is eliminated from further consideration.

Selective Catalytic Reduction (SCR)

SCR is an add-on/post-combustion technology that has been shown to be effective in reducing NOx in exhaust from RICE. An SCR system consists of a urea or ammonia storage, feed, and injection system, and a catalyst and catalyst housing. SCR systems selectively reduce NOx emissions by injecting urea or ammonia into the exhaust gas stream upstream of the catalyst. NOx, ammonia (NH_3), and O_2 react on the surface of the catalyst to form N_2 and water (H_2O). For the SCR system to operate properly, the exhaust gas must be within a particular temperature range (typically between 450°F and 850°F). The temperature range is dictated by the catalyst (typically made from noble metals, base metal oxides such as vanadium and titanium, and zeolite-based material). Exhaust gas temperatures greater than the upper limit (850°F) will pass the NOx and NH_3 unreacted through the catalyst prior to the reaction.

SCR represents state-of-the-art controls for lean-burn four-stroke engine NOx removal. Because SCRs are commercially available and have been used on engines of this size and type, SCR is technically feasible for application to the RICE.

Step 3 – Rank Control Technologies by NOx Control Effectiveness

The table below lists the NOx control technologies and emission rates for the technically feasible NOx control options. Technically feasible control alternatives that remain are SCR and good combustion practices/no additional control. The designed NOx removal efficiency for SCR ranges from 80% to 90% depending on NOx inlet concentration and source parameters. An NOx control efficiency of 80% over the currently permitted emission rate is assumed for SCR. The emission rates are expressed in terms of lb/hr and grams per horsepower-hour (g/hp-hr). Ranking the control technologies in this manner provides a comparison to levels in EPA's RACT/BACT/LEAR Clearinghouse (RBLC).

Table: Ranked NOx Control Technology Effectiveness

Control Technology	NOx Reduction (% control)	NOx Emission Rate (lb/hr)	NOx Emission Rate (g/hp-hr)(1)
SCR(2)	80%	3.84	0.16
Lean-Burn Combustion	Baseline	14.4	0.80

(1)Based on gross electrical output.
(2)The manufacturer stated 85% control, but 80% control is used to provide more conservative emissions estimates and modeling results.

Step 4 – Evaluate Most Effective NOx Controls and Document Results

The next step in the top down BACT analysis is to review each of the technically feasible control options for environmental, energy, and economic impacts. First, all technically feasible controls will be discussed for environmental and energy impacts. Next, if the top control is not chosen, an economic analysis to determine capital and annual control costs in terms of cost-effectiveness (i.e., dollars per ton of pollutant removed) of each control system would be conducted. Because BCEP has selected the top control (SCR), additional analyses are not needed.

Step 5 – Select NOx BACT

Based on the information and analysis above, NOx BACT for the CAT RICE is lean-burn combustion and the addition of SCR. BCEP is proposing an NOx BACT emission limit of 3.84 lb/hr for full load operation, based on vendor supplied emissions data using site- specific ambient data and an area-specific natural gas composition. The lb/hr limit (in that form) is necessary to allow for load fluctuations that are intrinsic to the operation of a peaking unit. This rate is equivalent to 0.21 g/hp-hr at full load operation (based on gross electrical output).

CO-BACT

CO emissions are a product of incomplete combustion. CO results when there is insufficient residence time at high temperature to complete the final step in hydrocarbon oxidation. In RICE, CO emissions may indicate early quenching of combustion gases on cylinder walls or valve surfaces. CO emissions from engines are a function of oxygen availability (excess air), flame temperature, residence time at flame temperature, combustion zone design, and turbulence. Control of CO is normally accomplished by providing adequate fuel residence time and a high temperature in the combustion zone to ensure complete combustion. As previously mentioned, lean-burn engines typically have higher CO emissions and lower NOx emissions due to the air-to fuel ratios at which they operate.

Step 1 – Identify All Available CO Control Technologies

Methods to control CO from RICE include both intrinsic emissions control as well as add- on control. The intrinsic emissions control for CO includes good combustion practices/ proper operation (i.e., controlling the combustion process to suppress CO formation and monitoring that process though the air-to-fuel ratio). Add-on control for CO emissions control from RICE involves the use of catalytic oxidation. A brief analysis of these controls is shown below.

Step 2 - Eliminate Technically Infeasible Options

Good Combustion Practices/Control

"Good combustion practices/control" include operational and engine design elements to control the amount and distribution of excess air in the flue gas to ensure that there is enough oxygen present for complete combustion (controlling the air-to-fuel ratio). Good combustion practices are technically feasible for controlling CO emissions from the RICE.

Catalytic Oxidation

Oxidation catalysts are a post-combustion technology that does not rely on the introduction of additional chemicals for a reaction to occur. The oxidation of CO to CO_2 utilizes excess air present in the engine exhaust; the activation energy required for the reaction to proceed is lowered in the presence of a catalyst. Products of combustion are introduced into a catalytic bed, with the optimum temperature range for these systems being between 700°F and 1,100°F. At higher temperatures, catalyst sintering may occur, potentially causing permanent damage to the catalyst. The addition of a catalyst bed onto the engine exhaust can create a pressure drop, resulting in back pressure to the engine. This has the effect of reducing the efficiency of the engine and power generating capabilities.

Catalytic oxidation is a technically feasible CO control technology for RICE.

Step 3 – Rank Control Technologies by CO Control Effectiveness

Catalytic oxidizer units are expected to have CO control efficiencies ranging from 70% to 90%. Control of CO emissions is directly proportional to the control of VOC emissions. This BACT analysis will consider a catalytic system with 80% control efficiency, as provided by Caterpillar. Effectiveness values for combustion control are less concrete but are generally less than 80%. The table lists the control technologies and expected control efficiencies.

Table : Ranked CO Control Technology Effectiveness

Control Technology	Incremental CO Reduction (% control)	CO Emission Rate (lb/hr)	CO Emission Rate (g/bhp-hr)*
Catalytic Oxidation, existing RICE	~80%	5.10	0.283
Catalytic Oxidation, new RICE	~88%	3.00	0.166
Good Combustion Practices/Control (baseline)	Baseline	25.3	1.4

*Based on gross electrical output.

Step 4 – Evaluate Most Effective CO Controls and Document Results

Because BCEP has selected the top control (catalytic oxidation) in addition to good combustion practices/control, the following information is presented for informational purposes only.

Catalytic Oxidation Energy Impacts

The addition of a catalyst bed onto the engine exhaust for the oxidation catalyst will create additional pressure drop, resulting in increased back pressure to the engine. This has the effect of reducing the efficiency of the engine and the power generating capabilities (parasitic load). These effects are considered minor compared to the reduction in CO (and VOC; see further discussion below) emissions from the use of an oxidation catalyst.

Catalytic Oxidation Environmental Impacts

The oxidation catalyst oxidizes CO to CO_2 which is released to the atmosphere and is now a regulated constituent of the atmosphere (for major source actions in which another pollutant has triggered major source review and for which CO_2 is considered a regulated air pollutant). In addition, as with all controls that utilize catalysts for removal of pollutants, the catalyst must be disposed of after it is spent. The catalyst may be considered hazardous waste and require special treatment or disposal and, even if it is not hazardous, it will add minor waste volume to landfills. The health and environmental benefits of reducing CO emissions outweigh these other environmental impacts.

Catalytic Oxidation Economic Impacts

As catalytic oxidation is being chosen and is the top control technology listed, no further economic discussion is necessary.

Good Combustion Practices/Control – Energy, Environmental, and Economic Impacts

Combustion controls are an intrinsic control designed to reduce pollution and increase efficiency of the engines. There are no energy, environmental, or economic impacts from this process. There is no "add-on" equipment associated with this control technology, and there is no capital cost associated with this control.

Step 5 – Select CO BACT

Based on the information and analysis above, CO BACT for the CAT RICE is good combustion control and the addition of an oxidation catalyst. BCEP is proposing a CO BACT emission limitation of 3.0 lb/hr for full load operation for the six new units, based on vendor guarantees using site-specific ambient data and an area-specific natural gas composition. The previous CO limit for the existing nine RICE will remain based on an earlier determination that oxidation catalyst is BACT and the old RICE are not under-going a modification as part of this permitting action.

VOC- BACT

Like CO, VOC emissions are a product of incomplete combustion. VOC emissions occur when some gas remains unburned or is only partially burned during the combustion process. With natural gas, some organics are unreacted trace constituents of the gas, while others may be products of the heavier hydrocarbon constituents. Partially burned hydrocarbons result from inadequate air-to-fuel mixing before or during combustion or inefficient air-to-fuel ratios in the cylinder during combustion due to maladjustment of the engine fuel system. Lean-burn engines typically have higher VOC emissions than rich- burn engines due to the respective air-to-fuel ratios at which they operate.

The BACT analysis follows the same format as the BACT analysis as for CO, and also concludes that oxidation-catalyst is the BACT for VOC emissions control for the RICE. BCEP is proposing oxidation-catalyst controls on the new engines and will continue its use on the existing engines.

BCEP installed the existing nine CAT RICE in 2005, and the Title V permit contains a VOC emission limit based on the manufacturer's guaranteed emission rate. Initial compliance testing for the engines demonstrated compliance with the permitted limit using the test method required in the permit. The current permitted emission limit for VOC is 2.60 lb/hr/RICE and the required test method in the permit is EPA Reference Method 18.

At the time of the initial permitting, NSPS Subpart JJJJ was not in effect – it went into effect in January 2008. NSPS Subpart JJJJ does not apply to the existing RICE because they were ordered by the owner in 2005. NSPS Subpart JJJJ will apply to the proposed RICE because they are non-emergency engines with a maximum engine power of 8,180 hp and construction will commence after July 1, 2007.

The applicable NSPS Subpart JJJJ Table I limit for the new RICE will be 0.7 g/hp-hr (excluding formaldehyde).

Review of recent BACT determinations shows that oxidation-catalyst is still the preferred VOC emissions control technology. However, the permitted emission rates for BACT determinations shown on EPA's RBLC are much higher than the current VOC limits in the BCEP permit. Recent RBLC BACT determinations for non-emergency 4SLB RICE of comparable size are shown in the following table:

Table: Recent RBLC VOC BACT Determinations for 4SLB RICE

Permit Date	Company & Facility Name	VOC Emission Limit	Comments
05/22/2019	Michigan State University 16,500 hp (each) VOC 11.0 lb/hr (each)	0.30 g/bhp-hr	BACT-PSD
03/31/2016	Mid-Kansas Electric. CAT with SCR and oxidation-catalyst 13,410 hp (each) VOC 5.82 lb/hr (each)	0.20 g/bhp-hr	BACT-PSD
03/31/2014	Markwest Liberty, compressor station CAT with oxidation-	0.25 g/bhp-hr	BACT-PSD

	catalyst		

BCEP is proposing that the permit limit for VOC emissions from the new and existing RICE be set at 4.60 lb/hr which is equivalent to 0.25 g/bhp-hr. of this application.

SO_2- BACT

SO_2 emissions from natural gas combustion are directly attributed to fuel sulfur content: either sulfates from fuel sulfur or mercaptans used as odorants. No additional sulfur originates from the process. Units firing fuels with very low sulfur content (such as pipeline quality natural gas) exhibit correspondingly low SO_2 emissions. The proposed SO_2 BACT conforms to previous BACT determinations made by MDEQ for natural gas combustion units.

$PM/PM_{10}/PM_{2.5}$ - BACT

$PM/PM_{10}/PM_{2.5}$ emissions from natural gas combustion sources consist of several components: a) inert contaminants in natural gas; b) sulfates from fuel sulfur or mercaptans used as odorants, c) dust drawn in from the ambient air, and d) particulate of carbon and hydrocarbons resulting from incomplete combustion. Units firing fuels with low ash content (such as pipeline quality natural gas) and high combustion efficiency exhibit correspondingly low particulate emissions.

Because of their extremely low particulate concentrations and resulting large costs per ton of particulate matter removed, post-combustion controls, such as electrostatic precipitators (ESPs) or baghouses, have not been applied to commercial gas-fired engines. In addition, no vendors of the RICE to be used for the BCEP peaking project have identified any similar engines that have particulate control devices. The RBLC search (made up of major source actions) includes only no additional control, use of pipeline quality natural gas, and good combustion practices. The use of add-on particulate control such as ESPs or baghouses is both technically infeasible and does not represent available control technology.

The use of pipeline quality natural gas and good combustion control will limit steady-state $PM/PM_{10}/PM_{2.5}$ emissions to 0.63 lb/hr, based on the guarantee from CAT, the RICE vendor. The BACT emission limitation for $PM/PM_{10}/PM_{2.5}$ emissions from the RICE is proposed as 0.63 lb/hr based on a one-hour average. This limitation includes both filterable and condensable $PM/PM_{10}/PM_{2.5}$ emissions.

IV. Emission Inventory

Pollutant	RICE Emissions at 96,000 Total Hours (tpy)	Building Heater and Pre-heater Emissions (tpy)	LNG Source Emissions (tpy)	Facility-Wide Emissions (tpy)
NO_X (as NO_2)	184.37	3.407	8.503	196.28
SO_X (as SO_2)	4.80	0.020	0.051	4.87
CO	204.48	2.862	7.142	214.48
VOC (as CH_4)	220.80	0.187	0.159	221.15
$PM_{2.5}$	33.12	0.194	0.485	33.80
PM/PM_{10}	33.12	0.259	0.646	34.03

Formaldehyde	23.39	0.00256	neg.	23.40
Total HAPs	38.44	0.064	neg.	38.51

RICE Emission Inventory

INTERNAL COMBUSTION ENGINES - CRITERIA POLLUTANTS

Engine Type: 4 stroke lean burn spark ignition
Model: Caterpillar G16CM34 PER ENGINE Electrical Power Output: 6100 kW
Engine Power Output: 8180 bhp
Engine Heat Rate 5642 Btu/BHP-hr
Heat Input per engine: 46.2 MMBtu/hr
Natural Gas Heating Value 1020 Btu/scf
Max Gas Flow per Engine 45,247 scf/hr
Number of Engines Existing 9 existing engines
Number of Engines Proposed 6 proposed new engines
Hours per Year per Engine 6,400 hrs/yr/engine
Total Hours of Operation 96,000 hrs/yr
Total Heat Input per Year 4,430,550 MMBtu/yr (for HAPS Calculations)

CRITERIA POLLUTANTS			
PM10/PM2.5 (uncontrolled):	Emission Factor		Reference/Notes
Emission Factor:	0.038	g/bhp-hr	CAT data, for 100% load
	0.63	lb/hr, per engine	Current Permit Information
Emissions:	0.69	lb/hr, per engine	CAT data, for 100% load
	2.21	tpy, per engine	Assume PM2.5 and PM10 are equal for the engines
	33.12	tpy, all engines	
	0.015	lb/MMBtu	Calculated
Sulfur Dioxide (based on H2S in fuel):			
Emission Factor:	0.0022	lb/mmBtu	Calculated from lb/hr. >AP-42 Table 3.2-2 factor
Emissions:	0.10	lb/hr, per engine	From Vendor
	0.320	tpy, per engine	
	4.80	tpy, all engines	
Nitrogen Oxides (NOx)			
Existing Engines Permit Limit:	14.40	lb/hr per engine	Permit Condition
Existing Engines:	46.08	tpy, per engine	

Regulatory Limit:	1.0	g/bhp-hr	NSPS Subpart JJJJ, After 2010, natural gas
Uncontrolled Emission Rate:	1.065	g/bhp-hr	CAT 16CM34G Emission Rate, 1.43 g/kW-hr
SCR Assumed Control Efficiency:	80%	NOx removal	SCR Control Efficiency, based on BACT.
SCR Controlled Emission Rate:	0.213	g/bhp-hr	Vendor gives 85% control.
Emissions:	3.841	lb/hr, per engine	Controlled with SCR
	12.29	tpy, per engine	
	184.37	tpy, all engines	
Carbon Monoxide (CO), Existing Engines			
Emission Factor:	0.28	g/bhp-hr	CAT Info, after Oxy Cat. Load Dependent
Emissions:	5.10	lb/hr, per engine	Permit Limit, existing engines
	16.32	tpy, per engine	Existing engines
	146.88	tpy, all existing engines	
Carbon Monoxide (CO), New Engines			
Emission Factor:	0.17	g/bhp-hr	CAT Info, after Oxy Cat., calculated
Emissions:	3.0	lb/hr, per engine	Vendor Information
	9.60	tpy, per engine	Existing engines
	57.60	tpy, all proposed engines	
TOTAL CO	204.48	TPY, ALL ENGINES	
Volatile Organic Compounds (VOC)			
Emission Factor:	0.14	g/bhp-hr	CAT Info, after Oxy Cat. NMHC. Load Dependent
Emissions:	2.60	lb/hr, per engine	Current Permit Limit
	8.320	tpy, per engine	
	124.80	tpy, 6 engines	
Emission Factor, proposed	0.25	g/bhp-hr	BACT limit.
Emissions:	4.60	lb/hr, per engine	Vendor Information, proposed limit for all engines.
	14.720	tpy, per engine	
	220.80	tpy, all engines	
Formaldehyde			

Controlled Emission Factor:	5.28E-02	lb/mmBtu	AP-42 Table 3.2-2, rated A, consisted with current permit
	80%	% control	From oxidation catalyst
	1.06E-02	lb/mmBtu	Controlled
Emissions:	0.487	lb/hr, per engine	
	1.560	tpy, per engine	
	23.39	tpy, all engines	

V. Ambient Air Quality Impacts

The modeling submitted in support of Permit Application #3211-05 showed compliance with the ambient standards, PSD increments, and Butte/Silver Bow State Implementation Plan.

Bison Engineering (Bison) conducted air quality modeling for the proposed project as part of the Basin Creek Equity Partners (BCEP), LLC Power Plant Modifications air quality permit application. This ambient air impact analysis was conducted, pursuant to the requirements of ARM 17.8.749, to demonstrate that the proposed modification would not cause or contribute to a violation of any state or federal ambient air quality standard. The proposed project is not categorized as a major Prevention of Significant Deterioration (PSD) modification.

The "Power Plant Modifications" proposed emission PTEs are above the modeling thresholds listed in Montana's Modeling Draft Guideline for PM_{10}, $PM_{2.5}$, NO_2, and CO, and warrant further analyses. Emission increases were first modeled to determine if any model receptors exceeded the Class II Significant Impact Levels (SILs), presented in Table VI-1. For those pollutant and averaging times that exceed the applicable SILs, BCEP demonstrated compliance with NAAQS, MAAQS, and PSD Increments, also presented in Table VI-1. For this project, PM_{10} 24-hour, $PM_{2.5}$ annual, $PM_{2.5}$ 24-hour, NO_2 1-hour and NO_2 annual Class II SILs were exceeded, which then warranted NAAQS, MAAQS and Class II Increment analyses for applicable pollutant/time periods. Additionally, a Class I SIL analysis was performed to ensure that the project would not adversely affect the nearby Anaconda-Pintler Wilderness Area.

Table VI-1 Applicable standards

Pollutant	Averaging Period	Class I SIL (μg/m^3)	Class II SIL (μg/m^3)	Primary NAAQS (μg/m^3)	MAAQS (μg/m^3)	Class I Increment (μg/m^3)	Class II Increment (μg/m^3)
PM_{10}	24-hour	0.3	5	150	150	8	30
	Annual	0.2	1	-	50	4	17
$PM_{2.5}$	24-hour	0.27	1.2	35	-	2	9
	Annual	0.051	0.2	12	-	1	4
NO_2	1-hour	-	7.5	188	564	-	-
	Annual	0.1	1	100	94	2.5	25
CO	1-hour	-	2,000	40,000	26,000	-	-
	8-hour	-	500	10,000	10,000	-	-

The SIL, Increment, and MAAQS/NAAQS compliance demonstrations were conducted using the latest available version of EPA-approved American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) and associated preprocessors. Specifically:

- AERMOD version 19191: Air dispersion model.
- AERMET version 19191: processes NWS meteorological data for input to AERMOD.
- AERMINUTE version 15272: processes 1-minute NWS wind data to generate hourly average winds for input to AERMET.
- AERSURFACE version 13016: processes 1992 National Land Cover Data surface characteristics for input to AERMET.
- AERMAP version 18081: Processes National Elevation Data from the USGS to determine elevation of sources and receptors for input into AERMOD.
- BPIPPRM version 04274: characterizes building downwash for input to AERMOD.
- Oris Solution's BEEST Graphical User Interface, Version 12.01.

Regulatory default options were used for all model runs. Rural dispersion coefficients were applied, as all of Montana currently meets this criterion. All buildings at the site were evaluated for building downwash on each modeled point source, using BPIPPRM.

Five years of metrological data (2013, 2015-2018) ready for use in AERMOD was constructed using representative surface and upper air data. Surface air data was obtained from the closest National Weather Service (NWS) station, which is located approximately 2.5 miles to the northeast of the project site, at the Bert Mooney Airport (KBTM – WBAN 24135). This NWS station also provided the automated surface observing system (ASOS) one-minute data used with AERMINUTE. The Great Falls Upper Air station (WBAN 24143) was used for upper air data. The ADJ_U* option was employed in AERMET to account for stable, low wind speeds.

A series of nested receptor grids were used in the model to calculate the ambient air impacts around the project location. Discrete receptors were placed at 24 m spacing along the site's ambient air boundary, 100 m spacing from the site's ambient air boundary to 1 km from the site, 250 m spacing from 1 km to 3 km from the site, 500 m spacing from 3 km to 10 km from the site, and 1000 m spacing from 10 km to 50 km, totaling 12,420 receptor locations. Significantly impacted receptors (receptors with modeled concentrations equal to or greater than their respective Class II SILs) were used for the NAAQS/MAAQS and applicable Increment analyses. For the Class I Impact analyses, an additional receptor grid was created to represent the entirety of the Anaconda-Pintler Wilderness Area.

The source and building elevations at the site were based on the existing graded elevation. Receptor elevations and regional inventory source elevations were determined using the terrain preprocessor AERMAP and elevation data based on 1/3 arc-second (approximately 10 m resolution) National Elevation Dataset (NED) from the United States Geological Survey (USGS).

Background monitors were selected from Montana's Air Quality Monitoring Network Plan (May 2019), based on the closest and most representative sites with available data. The following applicable $PM_{2.5}$, PM_{10}, and NO_2 monitoring sites were identified for use for background concentrations. For PM_{10} (24-hour) and $PM_{2.5}$ (annual), design values calculated from Butte's permanent monitor at Greeley School (30-093-0005) were used. A Butte $PM_{2.5}$ study from two winters (2012-2013 and 2013-2014) was refenced as justification for an alternative background concentration for the 24-hour $PM_{2.5}$ concentration. The Greeley School is representative of the worst concentrations, with the design value primarily influenced by wintertime concentrations. The study employed temporary monitors (Met One E-BAMs) around the Butte community which verified this concentration gradient centered around the Greeley School monitor. Due to the location of BCEP, a more representative site from the study located at the Airport was used, employing the maximum 24-hour concentration from the two winters, which was 14.2 $\mu g/m^3$ on 12/07/2013. For NO_2, design values were calculated from the Broadus site (30-075-0001), which showed a comparable NO_2 design values at other monitors around the state. When applicable, the background concentrations were calculated both including and excluding exceptional events to illustrate the impacts of wildfires on the background levels and are displayed in Table VI-2.

Table VI-2 Background concentrations

<table>
<tr><th>Pollutant</th><th>Averaging Time</th><th>Background Conc. (µg/m³)(1)</th><th>Basis</th><th>Site</th><th>Background Conc. (µg/m³)(2)</th></tr>
<tr><td rowspan="2">PM2.5</td><td>24-hour</td><td>14.2</td><td>Maximum 24-hour avg.</td><td>Airport site, Butte saturation study (2012-2014)</td><td>-</td></tr>
<tr><td>Annual</td><td>6.9</td><td>3-year Annual avg.</td><td rowspan="2">Butte – Greeley School (30-093-0005) (years: 2016-2018)</td><td>8.7</td></tr>
<tr><td>PM10</td><td>24-hour</td><td>52</td><td>Avg. of yearly 2nd max 24-hour value</td><td>76</td></tr>
<tr><td rowspan="2">NO2</td><td>1-hour</td><td>19.1 (10 ppb)</td><td>Avg 98% of daily 1-hour max</td><td rowspan="2">Broadus (30-075-0001) (years: 2016-2018)</td><td>-</td></tr>
<tr><td>Annual</td><td>1.8 (0.94 ppb)</td><td>3-year Annual avg.</td><td>-</td></tr>
</table>

(1)Data excludes all exceptional event data in the calculations.
(2)Data includes all exceptional event data in the calculations.

Data with exceptional events removed was used for all purposes in this analysis. The background concentrations are added to the modeled concentrations in the NAAQS/MAAQS analyses.

For the NO_2 modeling analyses, Tier 2 (Ambient Ratio Method, ARM2) was employed in AERMOD, with the EPA default minimum and maximum ambient ratios of 0.5 and 0.9, respectively (ratio of NO_2/NO_x).

Source parameters were provided by BCEP, all but four existing heaters were modeled as “point” sources in AERMOD and their descriptions are displayed in Table VI-3.

Table VI-3 Onsite Source Descriptions

Source ID	Source Description	Source Category	Source Type
STACK1	Existing RICE	Existing Source	POINT
STACK2	Existing RICE	Existing Source	POINT
STACK3	Existing RICE	Existing Source	POINT
STACK4	Existing RICE	Existing Source	POINT
STACK5	Existing RICE	Existing Source	POINT
STACK6	Existing RICE	Existing Source	POINT
STACK7	Existing RICE	Existing Source	POINT
STACK8	Existing RICE	Existing Source	POINT
STACK9	Existing RICE	Existing Source	POINT
STACK10	Proposed RICE	New Source	POINT
STACK11	Proposed RICE	New Source	POINT
STACK12	Proposed RICE	New Source	POINT
STACK13	Proposed RICE	New Source	POINT
STACK14	Proposed RICE	New Source	POINT
STACK15	Proposed RICE	New Source	POINT
H1W	Existing Heater	Existing Source	POINTHOR
H2W	Existing Heater	Existing Source	POINTCAP
H3W	Existing Heater	Existing Source	POINTHOR
H4W	Existing Heater	Existing Source	POINTCAP
H5W	Proposed Heater	New Source	POINT
H6W	Proposed Heater	New Source	POINT
H7W	Proposed Heater	New Source	POINT
H1E	Existing Heater	Existing Source	POINT
H2E	Existing Heater	Existing Source	POINT
H3E	Existing Heater	Existing Source	POINT
H4E	Existing Heater	Existing Source	POINT
H5E	Proposed Heater	New Source	POINT
H6E	Proposed Heater	New Source	POINT
H7E	Proposed Heater	New Source	POINT
S1W	Existing Heater	Existing Source	POINT
S1E	Existing Heater	Existing Source	POINT

Class II SIL Air Quality Analysis

Modeling was performed to identify receptors at which the proposed permit changes create a modeled impact higher than the respective SIL concentration for each pollutant and averaging period. For this analysis, only emissions increases from the proposed RICE engines and heaters were modeled, and offsets from emissions decreases were not considered. RICE and pre-heater emissions were combined, as the emissions exit the same stack. The new sources were modeled at their hourly peak potential emissions for short term averaging periods, and their annual emissions for the annual averaging periods, based on 6,400 hours per year per engine and 1,000 hours per year per heater. These emission rates are displayed in Table VI-4. The receptors which exceeded the SIL for each pollutant and averaging period were retained for further analyses.

Table VI-4 SIL Modeled Emissions Increases

Source ID	PM_{10} 24-hour (lb/hr)	PM_{10} Annual (tpy)	$PM_{2.5}$ 24-hour (lb/hr)	$PM_{2.5}$ Annual (tpy)	NO_2 1-hour (lb/hr)	NO_2 Annual (tpy)	CO 1 & 8-hour (lb/hr)
STACK10	0.710	2.220	0.700	2.210	4.090	12.410	3.210
STACK11	0.710	2.220	0.700	2.210	4.090	12.410	3.210
STACK12	0.710	2.220	0.700	2.210	4.090	12.410	3.210
STACK13	0.710	2.220	0.700	2.210	4.090	12.410	3.210
STACK14	0.710	2.220	0.700	2.210	4.090	12.410	3.210
STACK15	0.710	2.220	0.700	2.210	4.090	12.410	3.210
H5W	0.0150	0.0075	0.0110	0.0056	0.1960	0.0980	0.1650
H6W	0.0150	0.0075	0.0110	0.0056	0.1960	0.0980	0.1650
H7W	0.0150	0.0075	0.0110	0.0056	0.1960	0.0980	0.1650
H5E	0.0150	0.0075	0.0110	0.0056	0.1960	0.0980	0.1650
H6E	0.0150	0.0075	0.0110	0.0056	0.1960	0.0980	0.1650
H7E	0.0150	0.0075	0.0110	0.0056	0.1960	0.0980	0.1650
Total:		**13.365**		**13.294**		**75.048**	

Modeled PM_{10}, $PM_{2.5}$, NO_2, and CO Class II SIL results are presented in Table VI-5. $PM_{2.5}$ and impacts exceeded the 24-hour and Annual SILs, PM_{10} impacts exceed the 24-hour SIL, and NO_2 1-hour and Annual SILs were exceeded, therefore applicable NAAQS, MAAQS, and Class II Increment analyses were performed. For the pollutants and averaging periods exceeding the SIL, the radius of impact was determined, which was the furthest distance of the modeled SIL-exceeded receptor from the source.

Table VI-5 Class II Significant Impact Analysis Results

Pollutant	Avg. Period	Model Conc. (µg/m³)	SIL (µg/m³)	Exceed SIL?	Radius of Impact (km)
PM_{10}	24-hour(1)	8.21	5.0	Yes	0.20
	Annual(2)	0.84	1.0	No	-
$PM_{2.5}$	24-hour(3)	7.08	1.2	Yes	3.56
	Annual(4)	0.66	0.2	Yes	1.99
NO_2	1-hour(5)	124	7.5	Yes	32.0
	Annual(2)	5.00	1.0	Yes	1.79
CO	1-hour(6)	152	2,000	No	-
	8-hour(7)	61.6	500	No	-

(1)The receptor with the maximum 24-hour concentration in the 5-year period.
(2)The receptor with the maximum annual concentration in the 5-year period.
(3)The receptor with the maximum 5-year average 24-hour concentration.
(4)The receptor with the maximum 5-year average annual concentration.
(5)The receptor with the maximum 5-year average of the maximum daily 1-hour concentration.
(6)The receptor with the maximum 1-hour concentration in the 5-year period.

(7)The receptor with the maximum 8-hour concentration in the 5-year period.

NAAQS/MAAQS Air Quality Analysis

For NAAQS and Increment analyses, all onsite RICE engines and heaters were modeled at their peak emissions, which are displayed in Table VI-4. Offsite/competing source emissions were also included in these analyses. Nearby facilities were included from BCEP's original permit application, along with newer and modified applicable permitted sources. The identified facilities are displayed in Table VI-6.

Table VI-6 Competing Source Facility List

Facility Name	Distance from BCEP (km)	Previously Modeled Facility
Sun Mountain Lumber	53	No
Montana Resources	9.2	Yes
NorthWestern Energy – Dave Gates	33.5	No
Renewable Energy Corporation – Advanced Silicon	13.2	Yes
Butte Highlands Joint Venture, LLC	15.4	No
U.S. Minerals Slag Screening Facility	36.5	No
FX Solutions - Slag Pile Feed Stock - Main Processing Plant	- 36.6 34	- No No

For the NAAQS/MAAQS analyses, the nearby sources were modeled at PTE emissions, based on permit limits and/or emission inventory analyses in their respective Montana Air Quality Permits. These are detailed in the current permit application and supporting materials. All offsite sources, descriptions, and AERMOD source types are shown in Table VI-7 below.

Table VI-7 Offsite Source Descriptions

Source ID	Source Description	Source Type
BH_AREA	Butte Highlands Joint Venture - Non-fugitive sources and underground emissions	AREA
BH_CMPR	Butte Highlands Joint Venture Compressor	POINT
BH_CRSR	Butte Highlands Joint Venture Crusher	POINT
BH_GEN1	Butte Highlands Joint Venture 1502 hp Generator	POINT
BH_GEN2	Butte Highlands Joint Venture 1475 hp Generator	POINT
BH_SCRN	Butte Highlands Joint Venture Screen	POINT
FMSPILE2	FX Solutions Main Site Surge Pile 2	AREACIRC
FX_BH	FX Solutions Main Site - Material Transfer Baghouse	POINT
FX_DRYER	FX Solutions Main Site - Rotary Dryer	POINT
FX_FM	FX Solutions Main Site - Furnace Modules	POINT
FX_GEN	FX Solutions Slag Site - Diesel Generator	POINT

FX_SLAG	FX Solutions Slag Site - Fugitive Emissions	AREA
FXCRSHR	FX Main Site - Vertical Shaft Impactor/Crusher	VOLUME
FXMAIN1	Skirted Radial Stacker to Surge Pile 2	VOLUME
FXMAIN10	Conveyor 6 to Screen 3	VOLUME
FXMAIN11	Screen 3 to Conveyor 7	VOLUME
FXMAIN12	Overhead Hopper 1	VOLUME
FXMAIN13	Overhead Hopper 2	VOLUME
FXMAIN14	Overhead Hopper 3	VOLUME
FXMAIN15	Overhead Hopper 4	VOLUME
FXMAIN16	Overhead Hopper 5	VOLUME
FXMAIN17	Overhead Hopper 6	VOLUME
FXMAIN18	Overhead Hopper 7	VOLUME
FXMAIN19	Overhead Hopper 8	VOLUME
FXMAIN2	Surge Pile 2 to Front end loader	VOLUME
FXMAIN20	Overhead Hopper 9	VOLUME
FXMAIN21	Overhead Hopper 10	VOLUME
FXMAIN22	Rail Loading 1	VOLUME
FXMAIN23	Rail Loading 2	VOLUME
FXMAIN24	Rail Loading 3	VOLUME
FXMAIN25	Rail Loading 4	VOLUME
FXMAIN26	Rail Loading 5	VOLUME
FXMAIN27	Rail Loading 6	VOLUME
FXMAIN28	Truck Loading 1	VOLUME
FXMAIN29	Truck Loading 2	VOLUME
FXMAIN3	Front end loader to Hopper 2	VOLUME
FXMAIN30	Truck Loading 3	VOLUME
FXMAIN31	Truck Loading 4	VOLUME
FXMAIN4A	Enclosed Sources - Material Drying and Sizing Building 1	VOLUME
FXMAIN4B	Enclosed Sources - Material Drying and Sizing Building 2	VOLUME
FXMAIN5	Enclosed Sources - Processing Plant	VOLUME
FXMAIN6	Aggregate Load Bin 3 to Screen 2	VOLUME
FXMAIN7	Atomizer to Conveyor 5	VOLUME
FXMAIN8	Conveyor 5 to Hopper 4	VOLUME
FXMAIN9	Hopper 4 to Conveyor 6	VOLUME
FXSCRN2	FX Main Site - Screen 2	VOLUME
FXSCRN3	FX Main Site - Screen 3	VOLUME
FXSPILE	Slag Site Surge Pile 1	AREACIRC
MR_HR10F	Montana Resource Haul Roads	VOLUME
MR_HR11F	Montana Resource Haul Roads	VOLUME
MR_HR12F	Montana Resource Haul Roads	VOLUME

MR_HR13F	Montana Resource Haul Roads	VOLUME
MR_HR14F	Montana Resource Haul Roads	VOLUME
MR_HR15F	Montana Resource Haul Roads	VOLUME
MR_HR16F	Montana Resource Haul Roads	VOLUME
MR_HR17F	Montana Resource Haul Roads	VOLUME
MR_HR18F	Montana Resource Haul Roads	VOLUME
MR_HR19F	Montana Resource Haul Roads	VOLUME
MR_HR1F	Montana Resource Haul Roads	VOLUME
MR_HR2F	Montana Resource Haul Roads	VOLUME
MR_HR3F	Montana Resource Haul Roads	VOLUME
MR_HR4F	Montana Resource Haul Roads	VOLUME
MR_HR5F	Montana Resource Haul Roads	VOLUME
MR_HR6F	Montana Resource Haul Roads	VOLUME
MR_HR7F	Montana Resource Haul Roads	VOLUME
MR_HR8F	Montana Resource Haul Roads	VOLUME
MR_HR9F	Montana Resource Haul Roads	VOLUME
MRBLAST_1HR	Montana Resources Blasting	AREA
MRBLAST_ANN	Montana Resources	AREA
MRSP1F	Montana Resources	AREA
MRSP2F	Montana Resources	AREA
MRSP3F	Montana Resources	AREA
MRSP4F	Montana Resources	AREA
MRV11F	Montana Resource Crusher additional minor sources	VOLUME
MRV12F	Montana Resource Ore Dump	VOLUME
NWE_EG	NWE Dave Gates - Emergency Generator	POINT
NWE_FP	NWE Dave Gates - Fire Pump	POINT
NWE_T1	NWE Dave Gates - Combustion Turbine 1	POINT
NWE_T2	NWE Dave Gates - Combustion Turbine 2	POINT
NWE_T3	NWE Dave Gates - Combustion Turbine 3	POINT
AM_BLRS	REC: <10 MMBtu/hr Boilers	POINT
BOILERS	REC: >10 MMBtu/hr Boilers	POINT
CLSH4SCB	REC: Chlorosilane Scrubber	POINT
CTWR1	REC: Cooling Tower	POINT
CTWR2	REC: Cooling Tower	POINT
CTWR3	REC: Cooling Tower	POINT
CTWR4	REC: Cooling Tower	POINT
H2VENT	REC: Hydrogen Vent Stack	POINT
HOTOIL#1	REC: Hot Oil Heater	POINT
HOTOIL#2	REC: Hot Oil Heater	POINT
HOTOIL#3	REC: Hot Oil Heater	POINT
HOTOIL#4	REC: Hot Oil Heater	POINT

LIME	REC: Lime Storage System	POINT
RATMV1 - RATMV58	REC: Reactor Atmosphere/Analyzer Vents (58 sources)	POINT
SH4SCRB	REC: Silane Scrubber	POINT
SI_HPPR1	REC: Silicon Feed Hopper	POINT
SI_HPPR2	REC: Silicon Lock Hopper	POINT
SI_STRGA	REC: Silicon Storage Bins	POINT
SI_STRGB	REC: Silicon Storage Bins	POINT
SM_AREA	Sun Mountain Lumber Dry Kiln and Fugitive Source Emissions	AREA
SM_BLR1	Sun Mountain Hurst Hog Fuel Boiler	POINT
SM_BLR2	Sun Mountain Cleaver-Brooks NG-Fired Boiler	POINT
SM_C1	Sun Mountain Lumber Material Transfer Cyclone - Jointer	POINT
SM_C2	Sun Mountain Lumber Material Transfer Cyclone - Hog Blower	POINT
SM_C3	Sun Mountain Lumber Material Transfer Cyclone - Shaving Bin	POINT
US_GEN	US Minerals 385 hp Diesel Generator	POINT
US_RD	US Minerals 0.50 MMBtu/hr rotary dryer	POINT
USM_FUG	US Minerals Fugitive Emissions	AREAPOLY
USM_PROC	US Minerals Process Fugitive Sources	AREA

The NO_2 1-hr analysis was performed two ways, to account for the effects of modeled Montana Resources (MR) blasting within the mine's property boundary. The analysis "including MR", includes MR sources, but excludes those receptors within MR's property boundary and would not be considered ambient air. The other analysis, "excluding MR", includes the entire receptor grid determined from the SIL analysis, but excludes the MR sources. These analyses ensure that BCEP does not cause or contribute to a violation of the NO_2 1-hour NAAQS.

The results of the NAAQS analysis are shown in Table VI-8, which show that the modeled emissions comply with both $PM_{2.5}$, PM_{10}, and NO_2 NAAQS standards.

Table VI-8 NAAQS Analysis Results

Pollutant	Avg. Period	Model Design Value (µg/m³)	Monitor Design Value (µg/m³)	Total Conc. (µg/m³)	Primary NAAQS (µg/m³)	% of NAAQS
PM10	24-hour(1)	21.3	52	73.3	150	49%
$PM_{2.5}$	24-hour(2)	14.5	14.2	28.7	35	82%
	Annual(3)	2.6	6.9	9.5	12	79%
NO_2	1-hour(4) (including MR)	141.3	19.1	160.4	188	85%
	1-hour(4) (excluding MR)	141.3	19.1	160.4	188	85%
	Annual(3)	16.2	1.8	18.0	100	18%

[(1)]The receptor with the 6th-highest 24-hr concentration over 5 years.
[(2)]The receptor with the 8th-highest 24-hr concentration per year, averaged over 5 years.
[(3)]The receptor with the maximum annual concentration averaged over 5 years.
[(4)]The receptor with the 8th-highest daily 1-hr max concentration averaged over 5 years.

A demonstration of compliance with applicable MAAQS (ARM 17.8 Subchapter 2), displayed in Table V1-1, was performed for the 1-hour and Annual NO_2 standard, due to the modeled exceedance of the NO_2 SILs. Compliance with the PM_{10} 24-hour MAAQS was demonstrated above, because the form of the standard is the same as the NAAQS. Since the form of the NO_2 1-hour MAAQS is not to be exceeded more than once per year, it was assessed as the highest-second-high from the 1-hour daily max concentrations to demonstrate that the project will not cause or contribute to an exceedance of the 1-hour NO_2 MAAQS. The results of the NO_2 Annual analysis above was also compared to the NO_2 Annual MAAQS. The results are displayed in Table VI-9.

Table VI-9 NO_2 MAAQS Analysis Results

Pollutant	Avg. Period	Model Design Value (μg/m^3)	Monitor Design Value (μg/m^3)	Total Conc. (μg/m^3)	Primary MAAQS (μg/m^3)	% of MAAQS
NO_2	1-hour[(1)] (including MR)	303.9	19.1	323	564	57%
	1-hour[(1)] (excluding MR)	141.7	19.1	160.8	564	29%
	Annual[(2)]	16.2	1.8	18.0	94	19%

[(1)]The receptor with the second highest daily maximum 1-hour concentration averaged over 5 years.
[(2)]The receptor with the maximum annual concentration averaged over 5 years.

Class II Increment Air Quality Analysis

BCEP is not a PSD-major facility, but at the Department's request BCEP provided a Class II PSD Increment evaluation, due to the minor-source baseline dates being triggered in the area for PM_{10} and NO_2. The analysis was performed for all pollutants and averaging periods exceeding the Class II SIL. The same offsite sources were evaluated from the NAAQS/MAAQS analysis. In this analysis, the reported two-year average emissions (2018-2019) were used and PTE emissions were used at facilities where actual emissions data was not available. Facilities that were in operation prior to the baseline date and have not modified their facility in a way that increased emissions were not included in the modeling analysis because their source contributions are considered part of the baseline. New facilities or sources that have increased emissions since the baseline date were included in the analyses. The results are displayed in Table VI-10.

Table VI-10 Class II Increment Analysis Results

Pollutant	Avg. Period	Model Conc. (μg/m^3)	Class II PSD Increment (μg/m^3)	% of Increment
PM_{10}	24-hour[(1)]	21.8	30	73%

$PM_{2.5}$	24-hour(1)	7.0	9	78%
	Annual(2)	2.7	4	68%
NO_2	Annual(2)	16.1	25	64%

(1)The receptor with the maximum second highest 24-hour concentration in the 5-year period.
(2)The receptor with the maximum annual concentration in the 5-year period.

Class I SIL Air Quality Analysis

At the Department's request, a Class I evaluation was done of the Anaconda-Pintler Wilderness Area. Project-related emissions (Table VI-4) were modeled at a set of receptors placed in the Class I Area. The results are displayed in Table VI-11 below and show that the project will not cause an exceedance of the Class I SIL at the Anaconda-Pintler Wilderness Area.

Table VI-11 Class I Significant Impact Analysis Results

Pollutant	Avg. Period	Model Conc. (μg/m^3)	Class I SIL (μg/m^3)
PM_{10}	24-hour(1)	0.029	0.3
	Annual(2)	0.00058	0.2
$PM_{2.5}$	24-hour(1)	0.028	0.27
	Annual(2)	0.00058	0.05
NO_2	Annual(2)	0.0033	0.1

(1)The receptor with the maximum 24-hour concentration in the 5-year period.
(2)The receptor with the maximum annual concentration in the 5-year period.

The Department determined that the project-related PM_{10}, $PM_{2.5}$, and NO_2 increases (with offsite facility emissions) will not cause or contribute to a violation of a federal or state ambient air quality standard. This decision was based on the air dispersion modeling with qualitative/quantitative analyses. The full modeling analysis submitted with the MAQP application is on file with the Department.

VI. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

Analysis Prepared By: Craig Henrikson
Date: March 2, 2021

DEPARTMENT OF ENVIRONMENTAL QUALITY
Air, Energy & Mining Division
Air Quality Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Basin Creek Equity Partners, LLC

Montana Air Quality Permit Number: #3211-05

Draft EA Issued: 03/30/2021
Final EA Issued: 04/15/2021
Permit Final: 05/01/2021

1. *Legal Description of Site:* The BCP electric power plant is located in the Butte Industrial Park area in Butte, Montana. The legal description of the site would be Section 18, Township 2 North, Range 7 West, in Silver Bow County. Overall, the BCP property area consists of approximately 20 acres with the power plant facility covering approximately 10 acres.

2. *Description of Project:* BCEP operates a nominal 54.9-megawatt (MW) electrical power generation facility incorporating nine (6.1 MW per engine) four-stroke lean-burn (4SLB) natural gas-fired reciprocating internal combustion engines (RICE). BCEP is proposing installation of additional electrical generating capacity at the facility to help meet customer load requirements. With this permit application, BCEP seeks approval to construct, operate and maintain an additional six natural gas RICE and to make upgrades to the existing nine RICE. The addition of the engines at the BCEP facility would provide an additional 36.6 MW of peaking capacity at the facility. The proposal also includes addition of a liquified natural gas (LNG) facility to store natural gas during periods of interrupted pipeline supply.

3. *Objective of Project:* Add additional electrical generating capacity at the facility to help meet customer load requirements and also providing for more annual operating hours from the existing nine RICE.

4. *Alternatives Considered:* In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the expanded power generation project. However, the Department of Environmental Quality (Department) does not consider the "no-action" alternative to be appropriate because BCEP demonstrated compliance with all applicable rules and regulations as required for permit issuance. Additionally, the new BACT analysis provided demonstration that new limits for the existing engines are appropriate by adding SCR for NOx control. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls:* A list of enforceable conditions, including a BACT analysis, would be included in MAQP #3211-05.

6. *Regulatory Effects on Private Property:* The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. *Terrestrial and Aquatic Life and Habitats*

The proposed additional electrical generation project would not be expected to have any impacts on terrestrial and aquatic life and habitats.

B. *Water Quality, Quantity, and Distribution*

The proposed additional electrical generation project would not be expected to have any impacts on water quality, quantity, and distribution.

C. *Geology and Soil Quality, Stability, and Moisture*

The proposed additional electrical generation project would not be expected to have any impacts on the geology and soil quality, stability, and moisture.

D. *Vegetation Cover, Quantity, and Quality*

The proposed additional electrical generation project would not be expected to have any impacts on vegetation cover, quantity, and quality.

E. *Aesthetics*

The proposed additional electrical generation project would not be expected to have any impacts on aesthetics as the site is already currently an industrial facility.

F. *Air Quality*

The proposed additional electrical generation project would be expected to have only minor impacts on air quality due to the emission increases.

G. *Unique Endangered, Fragile, or Limited Environmental Resources*

The proposed additional electrical generation project would not be expected to have any impacts on unique endangered, fragile or any limited environmental resources.

H. *Demands on Environmental Resource of Water, Air, and Energy*

The proposed additional electrical generation project would be expected to have only minor impacts on the demands on environmental resources of water, air or energy.

I. *Historical and Archaeological Sites*

The proposed additional electrical generation project would not be expected to have any impacts on historical and archaeological sites.

J. *Cumulative and Secondary Impacts*

The proposed additional electrical generation project would not be expected to have any cumulative and secondary impacts. All other conditions previously approved under MAQP #3211-05 will remain in place. However, future changes associated with this facility would have to apply for and receive the appropriate permits in addition to this MAQP prior to operation. The permits would address the environmental impacts associated with the operations at the site.

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. *Social Structures and Mores*

The proposed additional electrical generation project will have no impacts on the social structures and mores.

B. *Cultural Uniqueness and Diversity*

The proposed additional electrical generation project will have no impacts on the cultural uniqueness and diversity.

C. *Local and State Tax Base and Tax Revenue*

The proposed additional electrical generation project would be expected to have only minor impacts on the local and state tax base and tax revenue.

D. *Agricultural or Industrial Production*

The proposed additional electrical generation project would be expected to have only minor impacts on the agricultural or industrial production.

E. *Human Health*

The proposed additional electrical generation project would be expected to have no impacts on human health.

F. *Access to and Quality of Recreational and Wilderness Activities*

The proposed additional electrical generation project will have no impacts on the access to and quality of recreational and wilderness activities.

G. *Quantity and Distribution of Employment*

The proposed additional electrical generation project would be expected to have only minor impacts on the distribution of employment.

H. *Distribution of Population*

The proposed additional electrical generation project will have no impacts on the distribution of population.

I. *Demands of Government Services*

The proposed additional electrical generation project will have no impacts on the demands of government services other than any permitting required to construct the project.

J. *Industrial and Commercial Activity*

The proposed additional electrical generation project would be expected to have only minor impacts on the industrial and commercial activity.

K. *Locally Adopted Environmental Plans and Goals*

The proposed additional electrical generation project will have no impacts on any locally adopted environmental plans and goals.

L. *Cumulative and Secondary Impacts*

The proposed additional electrical generation project will have no cumulative and secondary impacts.

Recommendation: No Environmental Impact Statement (EIS) is required.

<u>If an EIS is not required, explain why the EA is an appropriate level of analysis</u>: The current permitting action is for the addition of six new RICE but the primary purpose of the facility remains unchanged.

<u>Individuals or groups contributing to this EA</u>: Department of Environmental Quality – Air Quality Bureau

EA prepared by: Craig Henrikson
Date: March 12, 2021