Montana Department of
ENVIRONMENTAL QUALITY
Brian Schweitzer, Governor
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May 26, 2010

Eric Klepfer
Klepfer Mining Service, LLC
13058 Sherwood Court
Hayden Lake, ID 83835

Dear Mr. Klepfer:

Montana Air Quality Permit #4449-01 is deemed final as of May 26, 2010, by the Department of Environmental Quality (Department). This permit is for an underground exploration project. 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,

Vickie Walsh
Air Permitting Program Supervisor
Air Resources Management Bureau
(406) 444-9741 (406) 444-2467

Ed Warner
Environmental Engineer
Air Resources Management Bureau

VW:EW
Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

Montana Air Quality Permit #4449-01

Timberline Resources Corporation
101 E. Lakeside Avenue
Coeur d'Alene, ID 83814

May 26, 2010

MONTANA AIR QUALITY PERMIT

Issued To:	Timberline Resources Corporation Butte Highlands Project 101 East Lakeside Avenue Coeur d'Alene, Idaho 83814	Montana Air Quality Permit: #4449-01 Application Complete: 4/21/10 Preliminary Determination Issued: 4/22/10 Department's Decision Issued: 5/10/10 Permit Final: 5/26/10 AFS #: 093-0020

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Timberline Resources Corporation (TRC), 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 TRC Butte Highlands Project (BHP) is located on Sections 31 and 32, Township 1 North, Range 7 West, in Silver Bow County, Montana.

B. Current Permit Action

TRC proposes to remove the Caterpillar DM9081 924 horsepower (hp) diesel engine/generator set from the permit and to add a diesel engine/generator set with a maximum design capacity of up to 1,000 hp that has a diesel engine certified to Environmental Protection Agency (EPA) nonroad compression-ignition engine emission standards as specified in Title 40 Code of Federal Regulations (CFR) 89, Subpart B and 40 CFR 1039, Subpart B, as applicable, for all pollutants, for the same model year and maximum engine power. The certification must be a minimum of Tier 2 for the same model year and maximum engine power. TRC also proposes to remove the emergency backup designation from the current emergency backup diesel engine/generator to allow for more operational flexibility with the hours of operation. The current permit action incorporates these proposals, updates the emissions inventory, and corrects some typographical errors in the emissions inventory calculations.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. TRC shall operate and maintain a fabric filter baghouse on the cement storage silo exhaust stack for controlling particulate matter (PM) emissions (ARM 17.8.752).

2. The maximum ore and development rock production shall be limited to 182,500 tons per any 12-month rolling period (ARM 17.8.749).

3. TRC may only operate the following diesel engines (ARM 17.8.749):

   a. One primary diesel engine/generator set with a maximum rated engine design capacity not to exceed 1,000 hp that is compliant with EPA nonroad compression-ignition engine Tier 2 (at minimum) emission standards for all pollutants for the same model year and maximum engine power.

b. One secondary diesel engine/generator set with a maximum rated engine design capacity not to exceed 475 hp that is compliant with EPA nonroad compression-ignition engine Tier 2 (at minimum) emission standards for all pollutants for the same model year and maximum engine power.

c. One diesel engine for an air compressor with a maximum rated engine design capacity not to exceed 275 hp that is compliant with EPA nonroad compression-ignition engine Tier 1 (at minimum) emission standards for all pollutants for the same model year and maximum engine power.

d. One diesel engine for a welder with a maximum rated engine design capacity not to exceed 26 hp that is compliant with EPA nonroad compression-ignition engine Tier 2 (at minimum) emission standards for the same model year and maximum engine power.

4. TRC 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 and ARM 17.8.752).

5. TRC 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).

6. TRC 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.5 (ARM 17.8.749 and ARM 17.8.752).

7. TRC shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 Code of Federal Regulations (CFR) 60, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* and 40 CFR 63, Subpart ZZZZ, *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, for any applicable diesel engine (ARM 17.8.340; 40 CFR 60, Subpart IIII; ARM 17.8.342 and 40 CFR 63, Subpart ZZZZ).

B. Testing Requirements

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

2. The Department of Environmental Quality (Department) may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. TRC 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. TRC 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 flow, stack 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 requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by TRC 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).

4. TRC shall document, by month, the amount of ore and development rock production. By the 25th day of each month, TRC shall total the ore and development rock production for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.2. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

5. TRC shall have available onsite at all times documentation for the diesel engines that verifies their compliance with the applicable EPA nonroad compression-ignition engine emission standards as described in Section II.A.3 (ARM 17.8.749).

D. Notification

TRC shall supply the Department the following notification (ARM 17.8.749).

1. Anticipated date of initial start-up of operations postmarked not more than 60 days nor less than 30 days prior to such date.

2. Actual date of initial start-up of operations postmarked within 15 days of such date (ARM 17.8.340, 40 CFR Part 60).

SECTION III: General Conditions

A. Inspection – TRC shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if TRC fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving TRC of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

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

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

G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by TRC 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).

Montana Air Quality Permit (MAQP) Analysis
Timberline Resources Corporation – Butte Highlands Project
MAQP #4449-01

I. Introduction/Process Description

Timberline Resources Corporation (TRC) operates an underground exploration project. The facility is located in Sections 31 and 32 in Township 1 North, Range 7 West, and is known as the Butte Highlands Project (BHP).

A. Permitted Equipment

The equipment covered by this MAQP consists of:

- Cement storage silo with a baghouse on the silo exhaust
- Shotcrete cement plant
- Cement Rock Fill plant
- A primary diesel-fired generator not to exceed 1,000 horsepower (hp)
- A secondary diesel-fired generator not to exceed 475 hp
- A diesel-fired engine for an air compressor not to exceed 275 hp
- A diesel-fired engine for a welder not to exceed 26 hp.

B. Source Description

The TRC BHP is an underground exploration project consisting of drifting, ore recovery for bulk sampling, and development rock removal and storage. Emissions-generating activities at the BHP include wet drilling and blasting using an emulsion blasting agent underground to liberate 10,000 tons of gold ore and 150,000 tons of development rock. These materials will be loaded and transported to the surface. On the surface, the raw ore will be stored in a temporary stockpile for loading with a front-end-loader to haul trucks for transport off-site. Development rock will be unloaded to a permanent development rock stockpile, and the active area of that pile would be subject to wind erosion.

The emissions associated with the underground activities will initially be vented to the outside atmosphere via the primary portal. Once the development advances under the BHP patented claims, a ventilation raise will be developed to the surface. The majority of the mine air, including the air emissions from the underground activities, will exhaust out of the ventilation raise.

During mine development, there will be a need for the use of cement for various underground activities. A cement rock fill (CRF) plant and a shotcrete plant will supply CRF and shotcrete to underground operations, and will require concrete, aggregate (sand for shotcrete plant, development rock for CRF plant), and water. A silo will be located at the site to store bulk cement to be used either in the CRF plant and/or shotcrete plant. The cement silo will be equipped with a baghouse to reduce emissions during cement loading and unloading activities. The silo, CRF plant, and shotcrete plant will be located near the mine portal. Sand and aggregate will be loaded into hoppers using a front-end-loader. The end products will be transported underground via truck.

A diesel-fired generator set with a maximum rated engine design capacity not to exceed 1,000 hp will supply power to the site. Other diesel-fired combustion equipment will include a secondary generator (up to 475 hp), an air compressor (up to 275 hp), and a welder (up to 26 hp). All of the diesel engines must be compliant with Environmental Protection Agency (EPA) Nonroad Compression Ignition Engine emissions standards.

Two diesel fuel storage tanks will be present at the site, one 8,000 gallon (diesel) and one 6,000 gallon (bio-diesel).

The exploration project may persist up to 2 years. It is estimated that the ore transport process of hauling bulk samples to the surface and off-site will occur within a 1-2 month period.

C. Permit History

On July 22, 2009, the Department of Environmental Quality (Department) received a complete application from TRC. The application was for an underground exploration project consisting of drifting, ore recovery for bulk sampling, and development rock removal and storage. On October 6, 2009, TRC was issued **MAQP #4449-00** for the underground exploration project known as BHP.

E. Current Permit Action

On February 22, 2010, the Department received a letter from TRC indicating that they were unable to obtain the Caterpillar DM9081 diesel engine/generator set that was to be the facility's primary generator. TRC proposed to use a different diesel engine/generator set in place of the Caterpillar DM9081. MAQP #4449-00 was written using emission factors specific to the Caterpillar DM9081 engine and therefore required the use of a Caterpillar DM9081 engine for a primary generator set. The Department replied on March 29, 2010, that the use of the replacement diesel engine/generator would violate the conditions of MAQP #4449-00 because it was not the specific diesel engine/generator described in the MAQP and the potential emissions from the proposed diesel engine/generator were greater than the de minimis threshold. Replacing the Caterpillar DM9081 generator set with the proposed engine would require a permit modification. The Department received the permit modification request and application fee from TRC on April 7, 2010, and the Affidavit of Public Notice on April 21. 2010. The current permit action removes the Caterpillar DM9081 engine from the permit, changes the primary engine/generator language to be more de minimis-friendly, updates the Emissions Inventory with the new primary generator set, removes the emergency backup designation from the secondary diesel engine/generator to allow for more operational flexibility with hours of operation, and corrects some typographical errors in the Emissions Inventory from MAQP #4449-00. **MAQP #4449-01** replaces MAQP #4449-00.

II. Applicable Rules and Regulations

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

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

1. <u>ARM 17.8.101 Definitions</u>. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. <u>ARM 17.8.105 Testing Requirements</u>. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   TRC 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}

TRC 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, TRC 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.

8. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 Code of Federal Regulations (CFR) Part 60, Standards of Performance for New Stationary Sources (NSPS). TRC may be considered an NSPS affected facility under 40 CFR Part 60 and subject to the requirements of the following subparts.

   a. 40 CFR 60, Subpart A – General Provisions apply 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 Internal Combustion Engines. This subpart may apply to the proposed diesel engines because they may have been manufactured after July 11, 2005.

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, may be required to 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 a National Emission Standard for Hazardous Air Pollutants (NESHAP) Subpart as listed below:

   b. 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. As an area source, the diesel engines will be subject to this rule. However, although diesel engines are an affected source, per 40 CFR 63.6590(b)(3) they do not have any requirements unless they are new or reconstructed after June 12, 2006. Therefore, any diesel engine operated by TRC that is new or reconstructed after June 12, 2006, may be subject to the area source provisions of this Subpart.

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. TRC submitted 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. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

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

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

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

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. TRC has a PTE greater than 25 tons per year of particulate matter (PM), oxides of nitrogen (NO_x), and carbon monoxide (CO); therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. TRC 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. TRC submitted an affidavit of publication of public notice for the April 6, 2010, issue of the *Montana Standard*, a newspaper of general circulation in the Town 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 Best Available Control Technology (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 TRC of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

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

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

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

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

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

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

a. PTE > 100 TPY of any pollutant;

b. PTE > 10 TPY of any one hazardous air pollutant (HAP), PTE > 25 TPY of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

c. PTE > 70 TPY of particulate matter with an aerodynamic diameter of 10 microns or less (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 #4449-01 for TRC, the following conclusions were made:

a. The facility's PTE is less than 100 TPY for any pollutant.

b. The facility's PTE is 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. This facility may be subject to a current NSPS (40 CFR 60, Subpart IIII).

e. This facility may be subject to area source provisions of a current NESHAP (40 CFR 63, Subpart ZZZZ).

f. This source is not a Title IV affected source, or a solid waste combustion unit.

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

Based on these facts, the Department determined that TRC will be a minor source of emissions as defined under Title V. However, if minor sources subject to NSPS are required to obtain a Title V Operating Permit, TRC may be required to obtain a Title V Operating Permit.

III. BACT Determination

A BACT determination is required for each new or modified source. TRC 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.

Diesel Engine BACT Analysis

The control options required for the diesel engines are consistent with other recently permitted similar sources and are capable of achieving the appropriate emission standards. NO_x emissions were analyzed, as NO_x is the primary pollutant emitted from this type of source. The following options were examined during the NO_x BACT analysis for the diesel engines:

1. Combustion modifications, such as injection timing retard, preignition chamber combustion, air-to-fuel ratio adjustment. This type of control technology helps reduce NO_x formation in the combustion zone.

2. Selective Catalytic Reduction (SCR), which is a post-combustion gas treatment technique that uses a catalyst to reduce NO and NO_2 to molecular nitrogen, water and oxygen (O_2). Ammonia (NH_3) is commonly used as the reducing agent.

3. Non-selective Catalytic Reduction (NSCR) uses a three-way catalyst to promote the decomposition of NO_x to nitrogen and water. Exhaust carbon monoxide and hydrocarbons are simultaneously oxidized to carbon dioxide (CO_2) and water in this process. NSCR is applicable only to engines with exhaust O_2 concentrations below approximately 1% (such as rich-burn natural gas-fired engines); and

4. Proper design and operation can reduce NO_x by controlling the combustion temperature, residence time, and available O_2. Normal combustion practices involve maximizing the heating efficiency of the fuel in an effort to minimize fuel usage. Increasing the efficiency of fuel combustion also minimizes NO_x formation.

Technical Feasibility

NSCR is only applicable to rich-burn engines and diesel-fueled engines can not be operated as rich-burn. Consequently, NSCR is technically infeasible for the diesel engines. An SCR unit requires that the combustion unit operate on a continuous basis for optimal NO_x control. SCR is technically feasible for the primary generator because it is expected to operate continuously.

Environmental Feasibility

The primary environmental concern from any of the proposed options is the on-site storage and usage of urea for an SCR system. Although this type of system is in operation at many facilities, it is an additional environmental liability.

Economic Feasibility

Due to the relatively short 2-year duration of the exploratory project, the cost of implementing and maintaining an SCR system represents an adverse economic impact that is disproportionately high relative to control costs required of similar facilities. It is therefore eliminated from consideration as BACT for this application.

TRC proposes proper engine design and combustion with no add-on controls to meet the EPA nonroad compression-ignition emission standards and good operating practices as BACT. The proposed NO_x BACT conforms with previous BACT determinations made by the Department for diesel-fired engines.

The Department determined that additional controls for particulate matter (PM), PM_{10}, PM with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), volatile organic compounds (VOC), CO, and oxides of sulfur (SO_x) are technically or economically infeasible. Therefore, the Department determined that proper operation and maintenance with no additional controls for PM, PM_{10}, $PM_{2.5}$, VOC, CO, and SO_x would constitute BACT for the diesel engine/generator.

IV. Emission Inventory

Non-Fugitive Sources	**TPY**						
Emission Source	**PM**	**PM_{10}**	**$PM_{2.5}$***	**NO_x**	**CO**	**VOC**	**SO_2**
Cement Silo loading	0.14	0.14	0.14				
Shotcrete Plant Cement Feed Auger to Mix Tank	1.09	0.27	0.05				
CRF Plant Cement Feed Auger to Mix Hopper	10.42	2.57	0.51				
Diesel Generator - Primary up to 1000 hp (EPA Tier 2)	1.45	1.45	1.45	43.45	25.11	11.01	8.98
Diesel Generator - Secondary 475 hp (EPA Tier 2)	0.69	0.69	0.69	20.64	11.93	5.23	4.27
Diesel Engine - Compressor 275 hp (EPA Tier 1)	1.06	1.06	1.06	18.32	22.57	2.66	2.47
Diesel Engine - Welder 26 hp (EPA Tier 2)	0.08	0.08	0.08	1.31	0.93	0.10	0.23
Total Emissions	**14.93**	**6.25**	**3.98**	**83.72**	**60.53**	**19.56**	**15.95**

NOTES:

PM Particulate matter
PM_{10} PM with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$ PM with an aerodynamic diameter of 2.5 microns or less
* $PM_{2.5}$ estimations are for filterable fractions only
NO_x Oxides of nitrogen
CO Carbon monoxide
VOC Volatile organic compounds
SO_2 Sulfur dioxide

Fugitive Sources	**TPY**						
Emission Source	**PM**	**PM_{10}**	**$PM_{2.5}$***	**NO_x**	**CO**	**VOC**	**SO_2**
Ore Unloading	0.11	0.05	0.01				
Development Rock Unloading	0.11	0.05	0.01				
Ore Haul Truck Loading	0.11	0.05	0.01				
Ore Haul Truck Travel	7.92	2.21	0.22				
Unloading Sand to Storage Area	0.03	0.01	0.00				
Shotcrete Plant Sand Transfer to Mixing Pit w/FEL	0.03	0.01	0.00				
CRF Plant Aggregate Hopper loading w/ FEL	1.89	0.90	0.18				
FEL travel	34.68	9.66	0.97				
Shotcrete truck transport to underground	0.57	0.16	0.02				
CRF Plant truck transport to underground	9.36	2.61	0.26				
8,000 gallon diesel tank						0.00	
6,000 gallon diesel tank						0.00	
Development Rock Stockpile Wind Erosion	5.59	1.68	0.25				
Total Emissions	**60.39**	**17.40**	**1.92**	**0.00**	**0.00**	**0.00**	**0.00**

NOTES:

* $PM_{2.5}$ estimations are for filterable fractions only

Underground Mine Sources	**TPY**						
Emission Source	**PM**	**PM_{10}**	**$PM_{2.5}$***	**NO_x**	**CO**	**VOC**	**SO_2**
Wet Drilling	0.01	0.01	0.01				
Blasting	0.02	0.01	0.00	0.05	2.46		
Underground Ore Loading	0.02	0.01	0.00				
Underground Development Rock Loading	0.02	0.01	0.00				
Total Emissions	**0.08**	**0.04**	**0.01**	**0.05**	**2.46**	**0.00**	**0.00**

NOTES:

* $PM_{2.5}$ estimations are for filterable fractions only

Facility-Wide Emissions	TPY						
	PM	**PM_{10}**	**$PM_{2.5}$***	**NO_x**	**CO**	**VOC**	**SO_2**
Total Emissions	**75.40**	**23.69**	**5.92**	**83.77**	**63.00**	**19.56**	**15.95**

NOTES:
* $PM_{2.5}$ estimations are for filterable fractions only

CALCULATIONS

Non-fugitive Sources

Cement Silo
Flow Capacity = 375 cubic feet per minute (cfm) (Vendor information)
Maximum Hours of Operation = 8,760 hrs/yr

Total PM Emissions:
Emission Factor = 0.01 gr/dscf (Vendor information)
Calculation:
(375 cfm) * (8760 hrs/yr) * (0.01 gr/dscf) * (lb/7000 gr) * (ton/2000 lb) * (60 min/hr) = 0.14 TPY

Total PM_{10} Emissions:
Emission Factor = 0.01 gr/dscf (Vendor information)
Calculation:
(375 cfm) * (8760 hrs/yr) * (0.01 gr/dscf) * (lb/7000 gr) * (ton/2000 lb) * (60 min/hr) = 0.14 TPY

Total $PM_{2.5}$ Emissions:
Emission Factor = 0.01 gr/dscf (Vendor information, assume $PM_{2.5}$ = PM_{10})
Calculation:
(375 cfm) * (8760 hrs/yr) * (0.01 gr/dscf) * (lb/7000 gr) * (ton/2000 lb) * (60 min/hr) = 0.14 TPY

Shotcrete Plant Cement Feed Auger to Mix Tank
Maximum Process Rate = 0.92 ton/hr (Company Information based on max daily short-term throughput)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Transfers = 1 transfer (Company Information)

Total PM Emissions:
Emission Factor = 0.544 lb/ton (AP 42, Table 11.12-2, 6/06)
Control Efficiency = 50% (Water Spray)
Calculation: (0.92 ton/hr) * (8760 hrs/yr) * (0.544 lb/ton) * (ton/2000 lb) * (1 transfer) * (1 - 50/100) = 1.09 TPY

Total PM_{10} Emissions:
Emission Factor = 0.134 lb/ton (AP 42, Table 11.12-2, 6/06)
Control Efficiency = 50% (Water Spray)
Calculation: (0.92 ton/hr) * (8760 hrs/yr) * (0.134 lb/ton) * (ton/2000 lb) * (1 transfer) * (1 - 50/100) = 0.27 TPY

Total $PM_{2.5}$ Emissions:
Emission Factor = 0.0268 lb/ton (assume $PM_{2.5}$ = 20% * PM_{10}, AP 42, Table 11.12-2, 6/06)
Control Efficiency = 50% (Water Spray)
Calculation: (0.92 ton/hr) * (8760 hrs/yr) * (0.0268 lb/ton) * (ton/2000 lb) * (1 transfer) * (1 - 50/100) = 0.05 TPY
CRF Plant Cement Feed Auger to Mix Hopper

Maximum Process Rate = 4.38 ton/hr (Company Information based on max daily short-term throughput)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Transfers = 1 transfer (Company Information)

Total PM Emissions:
Emission Factor = 0.544 lb/ton (0.544 uncontrolled, AP 42, Table 11.12-2, 6/06)
Calculation: (4.38 ton/hr) * (8760 hrs/yr) * (0.544 lb/ton) * (ton/2000 lb) * (1 transfer) = 10.42 TPY

Total PM_{10} Emissions:
Emission Factor = 0.134 lb/ton (0.134 uncontrolled, AP 42, Table 11.12-2, 6/06)
Control Efficiency = 0% (Uncontrolled)
Calculation: (4.38 ton/hr) * (8760 hrs/yr) * (0.134 lb/ton) * (ton/2000 lb) * (1 transfer) = 2.57 TPY

Total $PM_{2.5}$ Emissions:
Emission Factor = 0.0268 lb/ton (assume $PM_{2.5}$ = 20% * PM_{10}, AP 42, Table 11.12-2, 6/06)
Calculation: (4.38 ton/hr) * (8760 hrs/yr) * (0.0268 lb/ton) * (ton/2000 lb) * (1 transfer) = 0.51 TPY

Diesel Generator – Primary 1,000 hp Tier 2 Compliant
Operational Capacity of Engine = 1,000 hp
Hours of Operation = 8,760.00 hours

PM Emissions:
PM Emissions = 1.45 TPY (Assume PM = PM_{10})

PM_{10} Emissions:
Emission Factor = 3.31E-04 lbs/hp-hr (EPA Tier 2 emission standards)
Calculation: (8,760 hours) * (1,000 hp) * (3.31E-04 lbs/hp-hr) * (ton/2000 lb) = 1.45 TPY

NO_x Emissions:
Emission Factor = 9.92E-03 lbs/hp-hr (EPA Tier 2 emission standards)
Calculation: (8,760 hours) * (1,000 hp) * (9.92E-03 lbs/hp-hr) * (ton/2000 lb) = 43.45 TPY

CO Emissions:
Emission Factor = 5.73E-03 lbs/hp-hr (EPA Tier 2 emission standards)
Calculation: (8,760 hours) * (1,000 hp) * (5.73E-03 lbs/hp-hr) * (ton/2000 lb) = 25.11 TPY

VOC Emissions:
Emission Factor = 2.51E-03 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)
Calculation: (8,760 hours) * (1000 bhp) * (2.51E-03 lbs/hp-hr) * (ton/2000 lb) = 11.01 TPY

SO_x Emissions:
Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (8,760 hours) * (1,000 hp) * (0.00205 lbs/hp-hr) * (ton/2000 lb) = 8.98 TPY

Diesel Generator – Secondary 475 hp Tier 2 Compliant
Operational Capacity of Engine = 475 hp
Hours of Operation = 8,760 hours

PM Emissions:
PM Emissions = 0.69 TPY (Assume PM = PM_{10})

PM_{10} Emissions:
Emission Factor = 3.31E-04 lbs/hp-hr (EPA Tier 2 emissions standards)
Calculation: (8,760 hours) * (475 hp) * (3.31E-04 lbs/hp-hr) * (ton/2000 lb) = 0.69 TPY

NO_x Emissions:
Emission Factor = 9.92E-03 lbs/hp-hr (EPA Tier 2 emissions standards)
Calculation: (8,760 hours) * (475 hp) * (9.92E-03 lbs/hp-hr) * (ton/2000 lb) = 20.64 TPY

CO Emissions:
Emission Factor = 5.73E-03 lbs/hp-hr (EPA Tier 2 emissions standards)
Calculation: (8,760 hours) * (475 hp) * (5.73E-03 lbs/hp-hr) * (ton/2000 lb) = 11.93 TPY

VOC Emissions:
Emission Factor = 2.51E-03 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, assume TOC = VOC, Exhaust & Crankcase, 10/96)
Calculation: (8,760 hours) * (475 hp) * (2.51E-03 lbs/hp-hr) * (ton/2000 lb) = 5.23 TPY

SO_x Emissions:
Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (8,760 hours) * (475 hp) * (0.00205 lbs/hp-hr) * (ton/2000 lb) = 4.27 TPY

Diesel Engine – 275 hp air compressor Tier 1 Compliant
Operational Capacity of Engine = 275 hp
Hours of Operation = 8,760.00 hours

PM Emissions:
PM Emissions = 1.06 TPY (Assume PM = PM_{10})

PM_{10} Emissions:
Emission Factor = 8.82E-04 lbs/hp-hr (EPA Tier 1 emissions standards)
Calculation: (8,760 hours) * (275 hp) * (8.82E-04 lbs/hp-hr) * (ton/2000 lb) = 1.06 TPY

NO_x Emissions:
Emission Factor = 1.52E-02 lbs/hp-hr (EPA Tier 1 emissions standards)
Calculation: (8,760 hours) * (275 hp) * (1.52E-02 lbs/hp-hr) * (ton/2000 lb) = 18.32 TPY

CO Emissions:
Emission Factor = 1.87E-02 lbs/hp-hr (EPA Tier 1 emissions standards)
Calculation: (8,760 hours) * (275 hp) * (1.87E-02 lbs/hp-hr) * (ton/2000 lb) = 22.57 TPY

VOC Emissions:
Emission Factor = 2.20E-03 lbs/hp-hr (EPA Tier 1 emissions standards)
Calculation: (8,760 hours) * (275 hp) * (2.20E-03 lbs/hp-hr) * (ton/2000 lb) = 2.66 TPY

SO_x Emissions:
Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (8,760 hours) * (275 hp) * (0.00205 lbs/hp-hr) * (ton/2000 lb) = 2.47 TPY

Diesel Engine – 26 hp welder Tier 2 Compliant
Operational Capacity of Engine = 26 hp
Hours of Operation = 8,760.00 hours

PM Emissions:
PM Emissions = 0.08 TPY (Assume PM = PM_{10})

PM_{10} Emissions:
Emission Factor = 6.61E-04 lbs/hp-hr (EPA Tier 2 emissions standards)
Calculation: (8,760 hours) * (26 hp) * (6.61E-04 lbs/hp-hr) * (ton/2000 lb) = 0.08 TPY

NO_x Emissions:
Emission Factor = 1.15E-02 lbs/hp-hr (EPA Tier 2 emissions standards)
Calculation: (8,760 hours) * (26 hp) * (1.15E-02 lbs/hp-hr) * (ton/2000 lb) = 1.31 TPY

CO Emissions:
Emission Factor = 8.16E-03 lbs/hp-hr (EPA Tier 2 emissions standards)
Calculation: (8,760 hours) * (26 hp) * (8.16E-03 lbs/hp-hr) * (ton/2000 lb) = 0.93 TPY

VOC Emissions:
Emission Factor = 8.82E-04 lbs/hp-hr (EPA Tier 2 emissions standards)
Calculation: (8,760 hours) * (26 hp) * (8.82E-04 lbs/hp-hr) * (ton/2000 lb) = 0.10 TPY

SO_x Emissions:
Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (8,760 hours) * (26 hp) * (0.00205 lbs/hp-hr) * (ton/2000 lb) = 0.23 TPY

Fugitive Sources

Ore Unloading
Maximum Process Rate = 21 ton/hr (Maximum plant process rate)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Piles = 1 pile

PM Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00119 lb/ton
Where: k = particle size multiplier = 0.74 (Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00119 lb/ton) * (ton/2000 lb) * (1 piles) = 0.11 TPY

PM_{10} Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00056 lb/ton
Where: k = particle size multiplier = 0.35 (Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00056 lb/ton) * (ton/2000 lb) * (1 piles) = 0.05 TPY

$PM_{2.5}$ Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00009 lb/ton
Where: k = particle size multiplier = 0.053 (Value for PM < 2.5 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00009 lb/ton) * (ton/2000 lb) * (1 piles) = 0.01 TPY

Development Rock Unloading
Maximum Process Rate = 21 ton/hr (Maximum plant process rate)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Piles = 1 pile

PM Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00119 lb/ton
Where: k = particle size multiplier = 0.74 (Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00119 lb/ton) * (ton/2000 lb) * (1 piles) = 0.11 TPY

PM_{10} Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00056 lb/ton
Where: k = particle size multiplier = 0.35 (Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00056 lb/ton) * (ton/2000 lb) * (1 piles) = 0.05 TPY

$PM_{2.5}$ Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00009 lb/ton
Where: k = particle size multiplier = 0.053 (Value for PM < 2.5 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00009 lb/ton) * (ton/2000 lb) * (1 piles) = 0.01 TPY

Ore Haul Truck Loading
Maximum Process Rate = 21 ton/hr (Maximum plant process rate)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Piles = 1 pile

PM Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00119 lb/ton
Where: k = particle size multiplier = 0.74 (Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00119 lb/ton) * (ton/2000 lb) * (1 piles) = 0.11 TPY

PM_{10} Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00056 lb/ton
Where: k = particle size multiplier = 0.35 (Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00056 lb/ton) * (ton/2000 lb) * (1 piles) = 0.05 TPY

$PM_{2.5}$ Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00009 lb/ton
Where: k = particle size multiplier = 0.053 (Value for PM < 2.5 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 6.2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00009 lb/ton) * (ton/2000 lb) * (1 piles) = 0.01 TPY

Ore Haul Truck Travel
Vehicle Miles Traveled (VMT) per Day = 8 VMT/day (Company info)
VMT per hour = (7.95 VMT/day) * (day/24 hrs) = 0.33 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 = 10.92 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 = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 37 tons (Company info)
a = constant = 0.7 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.33 VMT/hr) * (10.92 lb/VMT) * (ton/2000 lb) * (1-50/100) = 7.92 TPY

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 = 3.04 lb/VMT
Where: k = constant = 1.5 lbs/VMT (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 37 tons (Company info)
a = constant = 0.9 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.33 VMT/hr) * (3.04 lb/VMT) * (ton/2000 lb) * (1-50/100) = 2.21 TPY

$PM_{2.5}$ 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 = 0.30 lb/VMT
Where: k = constant = 0.15 lbs/VMT (Value for $PM_{2.5}$, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 37 tons (Company info)
a = constant = 0.9 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.33 VMT/hr) * (0.30 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.22 TPY

Unloading Sand to Storage Area
Maximum Process Rate = 3.13 ton/hr (Company Information based on max daily short-term throughput)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Transfers = 1 transfer (Company Information)

Total PM Emissions:
Emission Factor = 0.0021 lb/ton (0.0021 uncontrolled, AP 42, Table 11.12-2, 6/06)
Calculation: (3 ton/hr) * (8760 hrs/yr) * (0.0021 lb/ton) * (ton/2000 lb) * (1 transfer) = 0.03 TPY

Total PM_{10} Emissions:
Emission Factor = 0.00099 lb/ton (0.00099 uncontrolled, AP 42, Table 11.12-2, 6/06)
Control Efficiency = 0% (Uncontrolled)
Calculation: (3 ton/hr) * (8760 hrs/yr) * (0.00099 lb/ton) * (ton/2000 lb) * (1 transfer) = 0.01 TPY

Total $PM_{2.5}$ Emissions:
Emission Factor = 0.000198 lb/ton (assume $PM_{2.5}$ = 20% * PM_{10}, AP 42, Table 11.12-2, 6/06)
Calculation: (3 ton/hr) * (8760 hrs/yr) * (0.000198 lb/ton) * (ton/2000 lb) * (0.02874375 TPY) = 0.00 TPY

Shotcrete Plant Sand Transfer to Mixing Pit with Front End Loader
Maximum Process Rate = 3.13 ton/hr (Company Information based on max daily short-term throughput)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Transfers = 1 transfer (Company Information)

Total PM Emissions:
Emission Factor = 0.0021 lb/ton (0.0021 uncontrolled, AP 42, Table 11.12-2, 6/06)
Calculation: (3 ton/hr) * (8760 hrs/yr) * (0.0021 lb/ton) * (ton/2000 lb) * (1 transfer) = 0.03 TPY

Total PM_{10} Emissions:
Emission Factor = 0.00099 lb/ton (0.00099 uncontrolled, AP 42, Table 11.12-2, 6/06)
Calculation: (3 ton/hr) * (8760 hrs/yr) * (0.00099 lb/ton) * (ton/2000 lb) * (1 transfer) = 0.01 TPY

Total $PM_{2.5}$ Emissions:
Emission Factor = 0.000198 lb/ton (assume $PM_{2.5}$ = 20% * PM_{10}, AP 42, Table 11.12-2, 6/06)
Calculation: (3 ton/hr) * (8760 hrs/yr) * (0.000198 lb/ton) * (ton/2000 lb) * (0.02874375 TPY) = 0.00 TPY

CRF Plant Aggregate Hopper Loading with Front End Loader
Maximum Process Rate = 62.50 ton/hr (Company Information based on max daily short-term throughput)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Transfers = 1 transfer (Company Information)

Total PM Emissions:
Emission Factor = 0.0069 lb/ton (0.0069 uncontrolled, AP 42, Table 11.12-2, 6/06)
Calculation: (63 ton/hr) * (8760 hrs/yr) * (0.0069 lb/ton) * (ton/2000 lb) * (1 transfer) = 1.89 TPY

Total PM_{10} Emissions:
Emission Factor = 0.0033 lb/ton (0.0033 uncontrolled, AP 42, Table 11.12-2, 6/06)
Calculation: (63 ton/hr) * (8760 hrs/yr) * (0.0033 lb/ton) * (ton/2000 lb) * (1 transfer) = 0.90 TPY

Total $PM_{2.5}$ Emissions:
Emission Factor = 0.00066 lb/ton (assume $PM_{2.5}$ = 20% * PM_{10}, AP 42, Table 11.12-2, 6/06)
Calculation: (63 ton/hr) * (8760 hrs/yr) * (0.00066 lb/ton) * (ton/2000 lb) * (1.888875 TPY) = 0.18 TPY

Front End Loader Travel
Vehicle Miles Traveled (VMT) per Day = 39 VMT/day (Company info)
VMT per hour = (39.45 VMT/day) * (day/24 hrs) = 1.64 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 = 9.63 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 = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 28 tons (Company info)
a = constant = 0.7 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (1.64 VMT/hr) * (9.63 lb/VMT) * (ton/2000 lb) * (1-50/100) = 34.68 TPY

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 = 2.68 lb/VMT
Where: k = constant = 1.5 lbs/VMT (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 28 tons (Company info)
a = constant = 0.9 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (1.64 VMT/hr) * (2.68 lb/VMT) * (ton/2000 lb) * (1-50/100) = 9.66 TPY

$PM_{2.5}$ 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 = 0.27 lb/VMT
Where: k = constant = 0.15 lbs/VMT (Value for $PM_{2.5}$, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 28 tons (Company info)
a = constant = 0.9 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (1.64 VMT/hr) * (0.27 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.97 TPY

Shotcrete Truck Transport to Underground
Vehicle Miles Traveled (VMT) per Day = 1 VMT/day (Company info)
VMT per hour = (0.582 VMT/day) * (day/24 hrs) = 0.02 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 = 10.65 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 = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 35 tons (Company info)
a = constant = 0.7 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.02 VMT/hr) * (10.65 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.57 TPY

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 = 2.97 lb/VMT
Where: k = constant = 1.5 lbs/VMT (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 35 tons (Company info)
a = constant = 0.9 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.02 VMT/hr) * (2.97 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.16 TPY

$PM_{2.5}$ 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 = 0.30 lb/VMT
Where: k = constant = 0.15 lbs/VMT (Value for $PM_{2.5}$, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 35 tons (Company info)
a = constant = 0.9 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.02 VMT/hr) * (0.30 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.02 TPY

CRF Plant Truck Transport to Underground
Vehicle Miles Traveled (VMT) per Day = 10 VMT/day (Company info)
VMT per hour = (9.63 VMT/day) * (day/24 hrs) = 0.40 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 = 10.65 lb/VMT
Where: k = constant = 4.9 lbs/VMT (Value for PM_{30}/TSP, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 35 tons (Company info)
a = constant = 0.7 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.40 VMT/hr) * (10.65 lb/VMT) * (ton/2000 lb) * (1-50/100) = 9.36 TPY

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 = 2.97 lb/VMT
Where: k = constant = 1.5 lbs/VMT (Value for PM_{10}, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 35 tons (Company info)
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) * (0.40 VMT/hr) * (2.97 lb/VMT) * (ton/2000 lb) * (1-50/100) = 2.61 TPY

$PM_{2.5}$ 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 = 0.30 lb/VMT
Where: k = constant = 0.15 lbs/VMT (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.5 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 35 tons (Company info)
a = constant = 0.9 (Value for $PM_{2.5}$, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for $PM_{2.5}$, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.40 VMT/hr) * (0.30 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.26 TPY

Diesel Storage Tanks
TANKS 4.0.9d Report
Distillate fuel oil No. 2

8,000 gallon tank
Total Emissions = 4.69 lbs/yr = 0.0023 TPY

6,000 gallon tank
Total Emissions = 3.53 lbs/yr = 0.0018 TPY

Development Rock Stockpile Wind Erosion
Exposed Area = 29 acres (Company Information)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Piles = 1 pile(s) (Company Information)

Total PM Emissions:
Emission Factor = 0.38 tons/acre-yr (TSP, AP 42, Table 11.9-4, 7/98)
Control Efficiency = 50% (Water spray)
Calculation: (29 acres) * (0.38 tons/acre-yr) * (1 - 50/100) = 5.59 TPY

Total PM_{10} Emissions:
Emission Factor = 0.114 tons/acre-yr (Company Information, assume PM_{10} = 30% total PM)
Control Efficiency = 50% (Water spray)
Calculation: (29 acres) * (0.114 tons/acre-yr) * (1 - 50/100) = 1.68 TPY

Total $PM_{2.5}$ Emissions:
Emission Factor = 0.0171 tons/acre-yr (Company Information, assume $PM_{2.5}$ = 15% PM10)
Control Efficiency = 50% (Water spray)
Calculation: (29 acres) * (0.0171 tons/acre-yr) * (1 - 50/100) = 0.25 TPY

Underground Mine Sources

Wet Drilling
Production Rate = 20.83 ton/hr (Company Information based on max daily short-term throughput)
Maximum Hours of Operation = 8,760 hrs/yr

PM Emissions:
Emission Factor = 0.00008 lb/ton (no AP-42 PM data, assume PM=PM_{10})
Calculation: (8760 hrs/yr) * (20.83 ton/hr) * (0.00008 lb/ton) * (ton/2000 lb) = 0.01 TPY

PM_{10} Emissions:
Emission Factor = 0.00008 lb/ton (Wet Drilling, AP-42, Table 11.19.2-2, 8/04)
Calculation: (8760 hrs/yr) * (20.83 ton/hr) * (0.00008 lb/ton) * (ton/2000 lb) = 0.01 TPY

$PM_{2.5}$ Emissions:
Emission Factor = 0.00008 lb/ton (no AP-42 $PM_{2.5}$ data, assume $PM_{2.5}$ = PM_{10})
Calculation: (8760 hrs/yr) * (20.83 ton/hr) * (0.00008 lb/ton) * (ton/2000 lb) = 0.01 TPY

Blasting
Maximum Process Rate = 2 blasts/day (Application information)
Area blasted = 240 sq. ft. (Application information)
Maximum Daily Explosive Usage = 1 tons/day (Application information)

PM Emissions:
Emission Factor = 0.000014 * (240 sq. ft.)^1.5 = 0.0521 lb/blast (AP-42, Table 11.9-1,7/98)
Calculation: (2 blasts/day) * (0.05 lb/blast) * (365 days/year) * (ton/2000 lb) = 0.0190 TPY

PM_{10} Emissions:
Emission Factor = 0.000014 * (240 sq. ft.)^1.5 * 0.52 = 0.026 lb/blast (AP-42, Table 11.9-1,7/98)
Calculation: (2 blasts/day) * (0.03 lb/blast) * (365 days/year) * (ton/2000 lb) = 0.0099 TPY

$PM_{2.5}$ Emissions:
Based on AP-42
Emission Factor = 0.000014 * (240 sq. ft.)^1.5 * 0.03 = 0.0015 lb/blast (AP-42, Table 11.9-1,7/98)
Calculation: (2 blasts/day) * (0.0016 lb/blast) * (365 days/year) * (ton/2000 lb) = 0.0006 TPY

CO Emissions:
Emission Factor = 27 lb/ton (Dyno Nobel North America information)
Calculation: (0.5 tons/day) * (27 lb/ton) * (365 days/year) * (ton/2000 lb) = 2.46375 TPY

NO_x Emissions:
Emission Factor = 0.5 lb/ton (Dyno Nobel North America information)
Calculation: (0.5 tons/day) * (0.5 lb/ton) * (365 days/year) * (ton/2000 lb) = 0.045625 TPY

Underground Ore Loading
Maximum Process Rate = 21 ton/hr (Maximum plant process rate)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Piles = 1 piles

PM Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00027 lb/ton
Where: k = particle size multiplier = 0.74 (Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00027 lb/ton) * (ton/2000 lb) * (1 piles) = 0.02 TPY

PM_{10} Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00013 lb/ton
Where: k = particle size multiplier = 0.35 (Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00013 lb/ton) * (ton/2000 lb) * (1 piles) = 0.01 TPY

$PM_{2.5}$ Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00002 lb/ton
Where: k = particle size multiplier = 0.053 (Value for PM < 2.5 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00002 lb/ton) * (ton/2000 lb) * (1 piles) = 0.00 TPY

Underground Development Rock Loading
Maximum Process Rate = 21 ton/hr (Maximum plant process rate)
Maximum Hours of Operation = 8,760 hrs/yr
Number of Piles = 1 piles

PM Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00027 lb/ton
Where: k = particle size multiplier = 0.74 (Value for PM < 30 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00027 lb/ton) * (ton/2000 lb) * (1 piles) = 0.02 TPY

PM_{10} Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00013 lb/ton
Where: k = particle size multiplier = 0.35 (Value for PM < 10 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00013 lb/ton) * (ton/2000 lb) * (1 piles) = 0.01 TPY

$PM_{2.5}$ Emissions:
Predictive equation for emission factor provided per AP 42, Sec. 13.2.4.3, 11/06.
Emission Factor = k (0.0032) * (U/5)^1.3 * (M / 2)^-1.4 = 0.00002 lb/ton
Where: k = particle size multiplier = 0.053 (Value for PM < 2.5 microns per AP 42, Sec. 13.2.4.3, 11/06)
U = mean wind speed = 2 mph (Provided by company for average Butte windspeed)
M = material moisture content = 4% (Provided by company)
Calculation: (21 ton/hr) * (8760 hrs/yr) * (0.00002 lb/ton) * (ton/2000 lb) * (1 piles) = 0.00 TPY

V. Existing Air Quality

The existing air quality of the proposed project location is considered in attainment for all regulated air pollutants. Within Silver Bow County is the Butte PM_{10} nonattainment area; however, the proposed project in not located within the boundaries of this designated area.

VI. Ambient Air Impact Analysis

In the view of the Department, the amount of controlled emissions generated by this project will not cause concentrations of any regulated pollutant in the ambient air that exceed any set ambient standard. Any potential impacts will be minimized by the conditions and limitations established in MAQP #4449-01.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

YES	NO	
X		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	X	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	X	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	X	4. Does the action deprive the owner of all economically viable uses of the property?
	X	5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		5b. Is the government requirement roughly proportional to the impact of the proposed use of the property?
	X	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)

YES	NO	
	X	7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally?
	X	7a. Is the impact of government action direct, peculiar, and significant?
	X	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	X	7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?
	X	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

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

VIII. Environmental Assessment

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

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Timberline Resources Corporation

Montana Air Quality Permit Number: 4449-01

Preliminary Determination Issued: April 22, 2010
Department Decision Issued: May 10, 2010
Permit Final: May 26, 2010

1. *Legal Description of Site*: The TRC BHP will be located in Sections 31 and 32, Township 1 North, Range 7 West, in Silver Bow County.

2. *Description of Project*: The TRC BHP is an underground exploration project consisting of drifting, ore recovery for bulk sampling, and development rock removal and storage. The objective of this project is to operate a diesel engine/generator to supply electricity to the facility.

3. *Objectives of Project*: The objective of the BHP is for TRC to update the equipment inventory of their existing MAQP to include a primary diesel engine/generator up to 1,000 hp. TRC had been permitted to use a specific model of generator engine that they were unable to obtain; therefore, their MAQP needed to be modified to allow for a different engine/generator. The permit modification will change the equipment inventory to more de minimis-friendly language that will allow TRC to operate any make or model engine that does not exceed 1,000 hp but is certified to EPA nonroad compression-ignition engine standards. The emergency backup generator has also been redesignated as a secondary generator which allows for more annual hours of operation for that unit.

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 air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because TRC demonstrated compliance with all applicable rules and regulations as required for permit issuance. 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 #4449-01.

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.

7. *The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution				X		Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites			X			Yes
J	Cumulative and Secondary Impacts			X			Yes

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

This permitting action would have a minor effect on terrestrial and aquatic life and habitats in the project area from pollutant deposition. The engine/generator would be located on private land owned by TRC. The current land use is agricultural. The Department has determined that any impacts from emissions or deposition of pollutants would be minor due to dispersion characteristics of the pollutants, the atmosphere, and the conditions that would be placed in MAQP #4449-01.

B. Water Quality, Quantity and Distribution

Adding the engine/generator to this facility would not cause an increase in water consumption. There would be no additional impacts to water resources and therefore, no surface and groundwater quality impacts would be expected.

C. Geology and Soil Quality, Stability and Moisture

The project would have a minor affect on the geology and soil quality, stability, and moisture from pollutant deposition. Only minor amounts of pollution would be generated from the diesel engine/generator. The project would be entirely located on patented private land owned by TRC.

D. Vegetation Cover, Quantity, and Quality

The project would have a minor affect on the local vegetation. The impacts from emissions or deposition of pollutants would be minor due to dispersion characteristics of the pollutants, the atmosphere, and the conditions that would be placed in MAQP #4449-01.

E. Aesthetics

The project would have a minor affect on the local aesthetics. The engine/generator would be visible and would create additional noise. Noise from the generator may be audible to passersby from the Fish Creek road and the Highlands road, but there are no houses close enough that would be a disturbance. The proposed engine/generator is similar in aesthetic impact to other engines that have been permitted for this source.

F. Air Quality

The Department determined that the facility would remain a minor source of emissions as defined under the Title V Operating Permit Program because the source's PTE would be less than the major source threshold level of 100 tons per year for any regulated pollutant. The area surrounding the facility is unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) for all criteria air pollutants. The site location is not within the Butte PM_{10} nonattainment area. The Department believes that concentrations of the criteria pollutants in the area are at or near background levels and well below any NAAQS levels. Emissions of air pollutants would occur as a result of the current permit action. MAQP #4449-01 contains conditions requiring the diesel engine/generator to be compliant with EPA nonroad compression-ignition engine emission standards. If the facility operates in compliance with all applicable permit requirements, then the effects would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

The addition of the diesel engine/generator would impact the unique endangered, fragile, or limited environmental resources because emissions of PM_{10}, NO_x, CO, VOC, and SO_x could increase in the area. However, the Department believes that any impacts would be minor due to the relatively small amount of the above listed pollutants emitted, dispersion characteristics of the pollutants and the atmosphere, and conditions placed in MAQP #4449-01, including, but not limited to, BACT requirements discussed in Section V of the permit analysis for this permit.

The Montana Natural Heritage Program (MNHP) identified occurrences of 12 plant and animal species of concern within the vicinity of the proposed project location. The Canada lynx is a threatened species of concern identified by the MNHP with the remaining species of concern being classified as sensitive or without classification. Sensitive animal species of concern are the Brewer's Sparrow, Westslope Cutthroat Trout, Gray Wolf, and Wolverine. Sensitive plant species of concern are the Sapphire Rockcress, Small-flowered Pennycress, Lemhi Beardtongue, and Hall's Rush. Unclassified animals are the Grasshopper Sparrow and Black Rosy-Finch. The unclassified plant is the Slender Fleabane.

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

The operation of the diesel engine/generator would have a minor impact on the environmental resources of water, air, and energy. Line power is available near the site; however, this line does not have sufficient power to support all the exploration activities. Operation of the diesel engine/generator would create air emissions; however, the Department believes that any impacts would be minor due to the relatively small amount of pollutants emitted.

I. Historical and Archaeological Sites

The Department contacted the Montana Historical Society, State Historical Preservation Office (SHPO) in an effort to identify any historical and archaeological sites that may be present in the area of operation. Search results concluded that there are several previously recorded sites near

the designated project area. The proposed site is in the area of the historic Highland Mine; however, few if any of the original structures remain and the proposed diesel engine/generator would be located near the other surface equipment associated with the BHP.

J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological environment in the immediate area would be minor due to the abundant mining activity that has occurred there in the past century. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #4449-01. From an air quality perspective, the potential emissions expected from operating the facility at its maximum throughput on a continuous basis would not violate ambient air quality standards. Therefore, the MAQP is written to reflect the expected emissions from operating continuously at the maximum rate. TRC may be restricted on annual throughput by other government jurisdictions which would limit ore production to a level less than described in the MAQP.

8. *The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue			X			Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities			X			Yes
G	Quantity and Distribution of Employment				X		Yes
H	Distribution of Population				X		Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity				X		Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

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

A. Social Structures and Mores

The addition of the diesel engine/generator would cause no disruption to the local social structures and mores. The property on which the project will occur is private land owned by TRC. While the proposed location is near several historic mine sites, few if any of the original structures remain and the addition of the diesel engine/generator would not change the footprint of the surface activities.

B. Cultural Uniqueness and Diversity

The Department believes that the addition of the diesel engine/generator will have no impact to the cultural uniqueness and diversity of the surrounding area because the project would be located on private land and the addition of the diesel engine/generator would not change the activities taking place with the surface operations.

C. Local and State Tax Base and Tax Revenue

The project would have a minor effect on the local and state tax base and revenue due to the taxes generated from the purchase of supplies and the mine payroll (see Section G – Quantity and Distribution of Employment).

D. Agricultural or Industrial Production

The addition of the diesel engine/generator would not result in any impact to the agricultural or industrial production because it would not change the operations taking place there.

E. Human Health

There would be minor effects on human health due to the slight increase in emissions of air pollutants. However, MAQP #4449-01 incorporates conditions to ensure that the facility would be operated in compliance with all applicable rules and standards. These rules and standards are designed to be protective of human health. In addition, the project would occur in a remote area with limited population; therefore, effects on human health would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The project would not have an impact to the access to recreational and wilderness activities because no road closures will occur and the site would be located on private property. The diesel engine/generator would have a minor impact on the quality of recreational and wilderness activities due to the slight increase in emissions of air pollutants and the noise generated by the engine.

G. Quantity and Distribution of Employment

The addition of the diesel engine/generator would not have an impact on the quantity and distribution of employment because operation of the equipment will not require any new employees.

H. Distribution of Population

The addition of the diesel engine/generator would not have an impact on the distribution of population because operation of the equipment will not require any new employees.

I. Demands for Government Services

Government services would be required for acquiring the appropriate permits from government agencies. In addition, the permitted source of emissions would be subject to periodic inspections by government personnel. Demands for government services would be minor.

J. Industrial and Commercial Activity

The engine/generator would be considered a relatively small industrial source. No additional industrial or commercial activity would be expected as a result of the proposed operation.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans or goals. The state standards would protect the proposed site and the environment surrounding the site. The proposed project location is outside of the Butte PM_{10} nonattainment area and no effects to the nonattainment area are expected from this project.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from this project would result in minor impacts to the economic and social environment in the immediate area. The proposed permit would not result in an increase in employment in the area, and a slight increase in industrial process in the area. The Department believes that TRC would be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #4449-01.

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

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action is for the construction and operation of an underground exploration project. MAQP #4449-01 includes conditions and limitations to ensure the facility will operate in compliance with all applicable air quality rules and regulations. In addition, there are no significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program, Montana Department of Environmental Quality – Hard Rock Program.

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program, Montana Department of Environmental Quality – Hard Rock Program.

EA prepared by: Ed Warner
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