August 31, 2020

John Rae, General Manager
Potentate Mining, LLC – Sapphire Ranch Mine
PO Box 1110
Philipsburg, MT 59858

Dear Mr. Rae:

Montana Air Quality Permit #5248-00 is deemed final as of August 29, 2020, by the Department of Environmental Quality (Department). This permit is for a sapphire and gold mine. 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
Permitting Services Section Supervisor
Air Quality Bureau
(406) 444-3626

Ed Warner
Lead Engineer – Permitting Services Section
Air Quality Bureau
(406) 444-2467

JM:EW
Enclosures

Montana Department of Environmental Quality
Air, Energy & Mining Division

# Montana Air Quality Permit #5248-00

Potentate Mining, LLC – Sapphire Ranch Mine
P.O. Box 1110
Philipsburg, MT 59858

August 29, 2020

# MONTANA AIR QUALITY PERMIT

Issued To:
Potentate Mining, LLC
Sapphire Ranch Mine
P.O. Box 1110
Philipsburg, MT 59858

Montana Air Quality Permit: 5248-00
Application Received: 04/24/2020
Application Complete: 06/05/2020
Preliminary Determination Issued: 07/15/2020
Department's Decision Issued: 08/13/2020
Permit Final: 08/29/2020

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Potentate Mining, LLC (Potentate), 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. Permitted Equipment

Potentate proposes operation of a placer mine known as the Sapphire Ranch Mine (SRM) for the purpose of recovering sapphires and a minor amount of fine gold. Potentate has operated the SRM for a number of years and is expanding operations to perform open cut mining to excavate the soils containing sapphires and gold that are located above bedrock. Permitted equipment includes aggregate screens, material handling equipment, diesel-fired electric generators, and a diesel-fired light plant. A complete list of the permitted equipment is included in the Permit Analysis.

### B. Plant Location

Potentate's SRM facility boundary includes the Sections 15, 16, the western and northern portion of Section 17 (except for the west half of the west half), the majority of Sections 20 and 21, and the western half of Section 22, in Township 6 North, Range 16 West, in Granite County, Montana. The latitude is 46.274118° and longitude is -113.600290°.

## SECTION II: Conditions and Limitations

### A. Emission Limitations

1. Potentate is authorized to operate one or more diesel-fired generator set(s) and light plants, where the combined maximum rated design capacity of the diesel engine(s) shall not exceed 454 brake-horsepower (bhp) (ARM 17.8.749).

2. Potentate shall operate the engines described in Section II.A.1 with good combustion practices to provide the maximum air pollution control for which they were designed (ARM 17.8.752).

3. The maximum rated throughput capacity of the dry screening plant shall not exceed 150 tons per hour (tph) (ARM 17.8.749).

4. The maximum rated throughput capacity of the wet ore processing screen shall not exceed 55 tph (ARM 17.8.749).

5. Potentate 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).

6. Water and spray bars shall be available on-site at all times and operated as necessary to maintain compliance with the opacity limitations in Section II.A.5 for the screening plants in Sections II.A.3 and II.A.4 (ARM 17.8.752).

7. Potentate shall comply with the following particulate matter emission standards (ARM 17.8.308):

    a. Potentate 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 to less than 20% opacity.

    b. Potentate shall not cause or authorize the production, handling, transportation, or storage of any material unless reasonable precautions are taken to control emissions of airborne particulate matter to less than 20% opacity.

8. Potentate shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.7.a (ARM 17.8.752).

9. Potentate shall treat all material handling transfer points and storage piles with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.7.b (ARM 17.8.752).

10. Potentate shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (ARM 17.8.340 and 40 CFR 60, Subpart IIII).

11. Potentate shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 63, Subpart ZZZZ, National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, for any applicable diesel engine (ARM 17.8.342 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. Potentate 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. Potentate 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 Potentate as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

D. Notification

1. Potentate shall provide the Department with written notification of the actual date of initial start-up of operations postmarked within 15 days of such date (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – Potentate shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (Continuous Emission Monitoring Systems (CEMS)/Continuous Emission Rate Monitoring Systems (CERMS)) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

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

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Potentate 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 Potentate 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
Potentate Mining, LLC – Sapphire Ranch Mine
Montana Air Quality Permit #5248-00

## I. Introduction/Process Description

Potentate Mining, LLC (Potentate) proposes to operate an open cut mining operation known as the Sapphire Ranch Mine (SRM). Potentate's SRM facility boundary includes the Sections 15, 16, the western and northern portion of Section 17 (except for the west half of the west half), the majority of Sections 20 and 21, and the western half of Section 22, in Township 6 North, Range 16 West, in Granite County, Montana. The latitude is 46.274118° and longitude is -113.600290°.

### A. Permitted Equipment

MAQP #5248-00 is written in a de minimis-friendly manner so that Potentate may use equipment of varying make/model and capacity, as long as the maximum cumulative capacities do not exceed permit conditions. Equipment in wet ore processing service are not included in the MAQP because the saturated material is not considered to be a source of air emissions. The MAQP application indicated that the following equipment would be operated at the SRM:

| Point Sources (Non-fugitive) | |
|---|---|
| Identification | Description |
| Generator Set Diesel Engines | One up to 20 kilowatts (kW) (27 brake-horsepower (bhp))<br><br>One up to 60 kW (81 bhp)<br><br>One up to 250 kW (335 bhp) |
| Light Plant Diesel Engine | One up to 8 kW (11 bhp) |
| | |
| Fugitive Emission Sources | |
| Identification | Description |
| Screens | Terex Finlay 883 (150 tons per hour (tph) maximum throughput capacity)<br><br>Double deck vibratory screen (55 tph maximum throughput capacity) |
| Rock/Ore Unloading | Unloading of rock/ore unloading and storage pile formation |
| Wind Erosion-Stockpiles | Various material stockpiles throughout the process |
| Haul Roads | Unpaved roadways |

### B. Source Description

Potentate has operated the SRM under a Small Miner Exclusion Statement (SMES), number 46-152 since 2018, and has performed exploration at the mine under Exploration License 00739 since 2014. Potentate is pursuing a full-scale Operating Permit with the Montana Department of Environmental Quality (Department) – Hard Rock Mining Bureau (HRMB) to perform open cut mining to excavate the soils containing sapphires and gold that are located above bedrock. The operation is similar to a typical sand and

gravel operation where the topsoil is stripped, soils are excavated, screened, washed, and the target resource is recovered with the remaining soil returned to the excavation area, regraded, topsoil or coversoil replaced, and reseeded. The main difference is that Potentate would use a system in their wash plant that would gravity concentrate the soils to separate and recover the sapphires and gold. A small volume of the target resource is recovered from the soils compared to a typical sand and gravel operation, so the final reclaimed surface can closely mimic the pre-mining ground surface.

Earth-moving machinery and processing equipment would be employed in the stripping of vegetation and topsoil, excavation of placer soil, and subsequent separation of sapphires and gold. The soils in the mining blocks generally range in thickness from a few feet to up to 15 feet, though some areas have deeper sapphire-bearing zones. Generally, the soil thickness containing economically recoverable concentrations of sapphires and free gold, also referred to as ore, range between six inches and 5 feet. Excavated placer soil may be dry screened to size sort the soil and limit the amount of material hauled to the wash plant. Once at the wash plant, the soils would be washed with water and size sorted.

Mined ore may be stockpiled at the wash plant or the Terex dry screen plant. The Terex dry screen plant screens and sorts the ore without the need for water. The Terex dry screen plant is a track mounted mobile plant that would be operated within the mining block. The Terex moves within the mining block as mining progresses. The Terex would size sort the ore at approximately 55 tons per hour (tph), creating material between ⅛ inch and 1½ inches in diameter. The screened ore is loaded and hauled to the wash plant. The oversize (+ 1½ inches) and undersize (- ⅛ inches) materials are stockpiled temporarily then used for backfill in the reclamation process.

At the wash plant, the screened ore would be fed by a front-end loader or excavator to the plant feeder at a rate of approximately 41.5 tph. The feeder provides a steady loading rate of ore to the double deck vibratory screen, and water is introduced in the feeder to mobilize the ore through the vibratory screen and to the jigs for concentrating the sapphires. The double deck vibratory screen separates the oversized 1-inch and greater material to a stockpile adjacent to the wash plant. Each of the three 42-inch duplex jigs are cleaned out at the end of a wash cycle. The cleanout is sent for sorting and recovery of sapphires. The -⅛-inch material that passes through the jig screens is directed to a Hi-G centrifugal bowl, where the fine gold is concentrated and recovered.

C. Response to Public Comments

| Permit Reference | Comment | Department Response |
|---|---|---|
| | No Comments Received | |

II. Applicable Rules and Regulations

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

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

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

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

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

   Potentate 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 ($NO_2$)
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide (CO)
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone ($O_3$)
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide ($H_2S$)
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter (PM)
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead (Pb)
10. ARM 17.8.223 Ambient Air Quality Standard for Particulate Matter with an Aerodynamic Diameter of Ten Microns or Less ($PM_{10}$)

Potentate 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, Potentate 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 or authorize to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

6. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 Code of Federal Regulations (CFR) Part 60, Standards of Performance for New Stationary Sources (NSPS). Potentate is considered an NSPS affected facility under 40 CFR Part 60 because it meets the definition of an affected facility. The Department has made a determination with respect to 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 LL – Standards of Performance for Metallic Mineral Processing Plants – Potentate would operate screening equipment in an open cut mine and intends to recover gold. A wash plant would concentrate the gold by utilizing density and size sorting methods without crushing, pulverizing, milling, or chemical processes. This method of concentration does not meet the definition of a *metallic mineral processing plant* as defined by this regulation. The resulting concentrate is composed of free gold in the form of gold flakes and black sands, which does not meet the definition of a *metallic mineral concentrate* as

defined by this regulation. Based on this description provided in the application, Subpart LL is not applicable to the SRM.

c. 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are manufactured after April 1, 2006, and are not fire pump engines, and owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005, are subject to this subpart. Based on the information submitted by Potentate, the Godwin DRI Prime pump generator CI ICE meets the definition of an affected unit and is therefore subject to Subpart IIII. Other CI ICE are manufactured prior to the applicability date; however, this permit is written in a de minimis-friendly manner and replacement engines could be subject to this regulation.

8. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. The owner or operator of any existing or new stationary source, as defined and applied in 40 CFR Part 61, shall comply with the standards and provisions of 40 CFR Part 61.

9. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR 63, National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories. Equipment proposed under this action will be subject to the requirements of 40 CFR Part 63 as follows:

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 (RICE). An owner or operator of a stationary reciprocating internal combustion engine (RICE) at a major or area source of HAP emissions is subject to this rule except if the stationary RICE is being tested at a stationary RICE test cell/stand. An area source of HAP emissions is a source that is not a major source. As an area source, the stationary diesel engines operated by Potentate will be subject to this rule.

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. Potentate 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 (tpy) of any pollutant. Potentate has a PTE greater than 25 tpy of particulate matter (PM), $PM_{10}$, and oxides of nitrogen (NOx); 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. Potentate 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. Potentate submitted an affidavit of publication of public notice for the April 23, 2020 issue of the *Philipsburg Mail*, a newspaper of general circulation in Philipsburg in Granite 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 Potentate 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 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 single hazardous air pollutant (HAP), PTE > 25 tpy of any combination of HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tpy of $PM_{10}$ in a serious $PM_{10}$ nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #5248-00 for Potentate, 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 single HAP and less than 25 tpy of combined HAPs.

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

   d. This facility is subject to a current NSPS (40 CFR 60, Subpart IIII).

   e. This facility is subject to the 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 Potentate 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, Potentate may be required to obtain a Title V Operating Permit.

## III. BACT Determination

A BACT determination is required for each new or modified source. Potentate shall install on the new or modified source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by Potentate in permit application #5248-00, providing an analysis of available methods of controlling emissions from the proposed sources. The Department reviewed the analysis and methods presented, as well as previous BACT determinations. The following control options have been selected as constituting BACT. The complete BACT analysis submitted by Potentate is maintained by the Department and is available for review.

### A. Diesel Engine(s) BACT – PM and Gaseous Emissions (Combustion)

The control options required for BACT are consistent with other recently permitted similar sources and are capable of achieving the appropriate emission standards. As such the Department concurs that the control options selected for the proposed diesel engine constitute BACT in this application.

1. Engine Design and Good Combustion Practice

   The use of engine design and good combustion practice was proposed as BACT; in lieu of post manufacture add-on controls. The Department concurs with this proposal and has determined that BACT is good combustion practices to provide the maximum air pollution control for which they were designed. Additionally, these engines will be required to comply with the National Emissions Standards for Hazardous Air Pollutant Sources for Stationary Reciprocating Internal Combustion Engines (40 CFR 63, Subpart ZZZZ), and potentially the Standard of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII) which specify work practice and monitoring standards to ensure engines are maintained and operated in manner consistent with good air pollution control practice for minimizing emissions.

2. Fuel Requirements

   Potentate shall use ultra-low sulfur diesel (ULSD) as fuel to fire the diesel engines proposed under this action for $SO_2$ control. After December 1, 2014, all highway, non-road, locomotive, and marine diesel fuel is required to be ULSD pursuant to the EPA diesel fuel regulations under 40 CFR 80, Subpart I. Compliance with this applicable federal regulation would satisfy BACT.

### B. Material Handling/Storage and Unpaved Roadway BACT – PM Emissions

The SRM will have multiple non-point source fugitive emissions resulting from activities, mainly from loading and unloading of ore and deposition to storage piles, wind erosion of storage piles, general plant areas, and unpaved roadways. Water and chemical dust suppressants are the standard method employed for control of this type of fugitive emissions. Both methods of emissions controls are readily available and commonly used. Chemical dust suppressant alone could be used to control the fugitive emissions; however, as water is more readily available, is less expensive, is equally effective as chemical dust

suppressant, and is more environmentally friendly, water has been identified as BACT for fugitive particulate emissions. In addition, water suppression has been required of recently permitted similar sources. Potentate may use chemical dust suppressant to assist in controlling particulate emissions from the surrounding plant area. Several facility processes incorporate the introduction of water to the materials which is capable of achieving the desired control of particulate emissions from storage or transfer operations.

According to ARM 17.8.308, Potentate is required to take reasonable precautions to limit the fugitive emissions of airborne particulate matter from haul roads, access roads, parking areas, and the general area of operation. Potentate is required to have water available on site (at all times) and to apply the water, as necessary, to maintain compliance with the opacity and reasonable precaution limitations. Potentate may also use chemical dust suppression in order to maintain compliance with fugitive emission limitations in Section II.A of MAQP #5248-00. The Department determined that using water and/or chemical dust suppressant to maintain compliance with the opacity requirements and reasonable precaution limitations constitutes BACT for the fugitive emission sources.

C. Screening Plants – PM Emissions

The SRM will have multiple screen plants that would emit particulate matter while processing ore. ARM 17.8.304 and 17.8.308 require that Potentate limit the opacity emissions from these sources to less than 20%. Potentate shall have water spray bars and water available on site (at all times) and apply the water, as necessary, to maintain compliance with the opacity limitations. Potentate may also use chemical dust suppression in order to maintain compliance. The Department determined that using water and/or chemical dust suppressant to maintain compliance with the opacity requirements and reasonable precaution limitations constitutes BACT for the screening plants.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

## IV. Emission Inventory

| Source Description | Facility Source ID | Emissions (TPY) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | PM | PM10 | PM2.5 | NOx | CO | VOC | SO2 |
| **Exploration Trommel (Goldfields Plant)** | | | | | | | | |
| Exploration Loader Transfer | ELT1 | 0.28 | 0.10 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| Trommel (wet screen) transfer to stockpile | TT1 | 0.07 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Terex Finlay 883 Dry Screening Plant** | | 0.00 | 0.00 | 0.00 | | | | |
| Loader Transfer 1 to Terex (screening) | LT1 | 16.43 | 5.72 | 0.85 | 0.00 | 0.00 | 0.00 | 0.00 |
| Terex Conveyor 1 | TC1 | 1.97 | 0.72 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 |
| Terex Conveyor 2 | TC2 | 1.97 | 0.72 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 |
| Terex Conveyor 3 | TC3 | 1.97 | 0.72 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Variable Speed Feed Hopper** | | | | | | | | |
| Loader Transfer 2 to Hopper | LT2 | 1.31 | 0.48 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 |
| Conveyor 1 | C1 | 1.31 | 0.48 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 |
| Conveyor 2 | C2 | 1.31 | 0.48 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Double Deck Vibratory Screen** | | | | | | | | |
| Transfer to Double Deck Vibratory Screen (screening) | DDT1 | 1.51 | 0.52 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Engines** | | | | | | | | |
| Combined 454 horsepower | G1-G4 | 4.37 | 4.37 | 4.37 | 61.58 | 13.27 | 4.99 | 4.07 |
| **Piles** | | | | | | | | |
| Exploration Plant Sample Stockpile | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Exploration Plant Washed Rock Stockpile | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Terex Undersize Stockpile | | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Terex Oversize Stockpile | | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Terex Ore Stockpile | | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Wash Plant Ore Stockpile | | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Wash Plant Oversize Stockpile | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Sand Screw Wash Sand Stockpile | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Haul Roads** | | | | | | | | |
| Combined Vehicle Traffic | | 212.24 | 54.09 | 5.41 | 0.00 | 0.00 | 0.00 | 0.00 |
| **TOTALS** | | **244.83** | **68.47** | **11.29** | **61.58** | **13.27** | **4.99** | **4.07** |

The general equation for emission estimation is:

$$E = A \times EF \times (1-ER/100)$$

where:

E = emissions,
A = activity rate,
EF = emission factor, and
ER = overall emission reduction efficiency, %.

| Source Description | Facility Source ID | Material Process Rate | | Operating Hours | | Emission Factors (lb/ton) | | | | Control Technology | Control Efficiency | Emissions (TPY) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TPH | TPY | hrs/yr (application) | hrs/yr (calc) | PM | PM10 | PM2.5 | Source | | (%) | PM | PM10 | PM2.5 |
| **Exploration Trommel (Goldfields Plant)** | | | | | | | | | | | | | | |
| Exploration Loader Transfer | ELT1 | 21 | 183960 | 1851 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | | | 0.276 | 0.101 | 0.016 |
| Trommel (wet screen) transfer to stockpile | TT1 | 21 | 183960 | 1851 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Water spray | 75 | 0.069 | 0.025 | 0.004 |
| **Terex Finlay 883 Dry Screening Plant** | | | | | | | | | | | | | | |
| Terex Screen (includes transfer) | LT1 | 150 | 1314000 | 2160 | 8760 | 0.025 | 0.0087 | 0.0013 | AP42 Table 11.19.2-2 | | | 16.425 | 5.716 | 0.854 |
| Terex Conveyor 1 | TC1 | 150 | 1314000 | 2160 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | | | 1.971 | 0.723 | 0.112 |
| Terex Conveyor 2 | TC2 | 150 | 1314000 | 2160 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | | | 1.971 | 0.723 | 0.112 |
| Terex Conveyor 3 | TC3 | 150 | 1314000 | 2160 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | | | 1.971 | 0.723 | 0.112 |
| **Variable Speed Feed Hopper** | | | | | | | | | | | | | | |
| Loader Transfer 2 to Hopper | LT2 | 100 | 876000 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | | | 1.314 | 0.482 | 0.074 |
| Conveyor 1 | C1 | 100 | 876000 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | | | 1.314 | 0.482 | 0.074 |
| Conveyor 2 | C2 | 100 | 876000 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | | | 1.314 | 0.482 | 0.074 |
| **Double Deck Vibratory Screen** | | | | | | | | | | | | | | |
| Double Deck Screen (includes transfer) | DDT1 | 55 | 481800 | 5110 | 8760 | 0.025 | 0.0087 | 0.0013 | AP42 Table 11.19.2-2 | Water spray | 75 | 1.506 | 0.524 | 0.078 |
| Gravity Fed Chute 1 | CH1 | 13 | 113880 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| Gravity Fed Chute 2 | CH2 | 34 | 297840 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| Conveyor 3 | C3 | 27 | 236520 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| Conveyor 4 | C4 | 13 | 113880 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| **Duplex Jigs** | | | | | | | | | | | | | | |
| Jig 1 | J1 | 16 | 140160 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| Jig 2 | J2 | 16 | 140160 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| Jig 3 | J3 | 13 | 113880 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| Gravity Fed Chute 3 | CH3 | 21 | 183960 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| **Hy-G Centrifugal Bowl** | | | | | | | | | | | | | | |
| Transfer to Hy-G | HG1 | 3 | 26280 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| Sand Screw | SS1 | 26 | 227760 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| Conveyor 5 (Superior Industries 36X60STKP) | C5 | 35 | 306600 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |

| Source Description | Facility Source ID | Material Process Rate | | Operating Hours | | Emission Factors (lb/ton) | | | | Control Technology | Control Efficiency | Emissions (TPY) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TPH | TPY | hrs/yr (application) | hrs/yr (calc) | PM | PM10 | PM2.5 | Source | | (%) | PM | PM10 | PM2.5 |
| **Cyclones (3)** | | | | | | | | | | | | | | |
| Pump Transfer to cyclones | CY1 | 5 | 43800 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| **Clarifier** | | | | | | | | | | | | | | |
| Pump transfer to clarifier | CL1 | 5 | 43800 | 5110 | 8760 | 0.003 | 0.0011 | 0.00017 | AP42 Table 11.19.2-2 | Wet material | 100 | 0.000 | 0.000 | 0.000 |
| **TOTALS** | | | | | | | | | | | | **28.131** | **9.980** | **1.510** |

| Stockpile Source | Particle Size Multiplier (k) (<2.5 µm) | Particle Size Multiplier (k) (<10 µm) | Particle Size Multiplier (k) (all) | Moisture Content (%)[1] | Average Wind Speed (mph) [2] | PM-2.5 Emission Factor (lb/ton) | PM-10 Emission Factor (lb/ton) | PM <30 (TSP) Emission Factor (lb/ton) | Average Stockpile Weight (tons/year) | Control Factor | PM-2.5 Emissions (tons/year) | PM-10 Emissions (tons/year) | PM Emissions (tons/year) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Exploration Plant Sample Stockpile | 0.053 | 0.35 | 1 | 14 | 5 | 1.1E-05 | 7.3E-05 | 2.1E-04 | 45,990 | 1 | 0.0003 | 0.0017 | 0.0048 |
| Exploration Plant Washed Rock Stockpile[3] | 0.053 | 0.35 | 1 | 50 | 5 | 1.9E-06 | 1.2E-05 | 3.5E-05 | 45,990 | 1 | 0.00004 | 0.0003 | 0.0008 |
| Terex Undersize Stockpile | 0.053 | 0.35 | 1 | 14 | 5 | 1.1E-05 | 7.3E-05 | 2.1E-04 | 120,450 | 1 | 0.0007 | 0.0044 | 0.0126 |
| Terex Oversize Stockpile | 0.053 | 0.35 | 1 | 14 | 5 | 1.1E-05 | 7.3E-05 | 2.1E-04 | 120,450 | 1 | 0.0007 | 0.0044 | 0.0126 |
| Terex Ore Stockpile | 0.053 | 0.35 | 1 | 14 | 5 | 1.1E-05 | 7.3E-05 | 2.1E-04 | 240,900 | 1 | 0.0013 | 0.0088 | 0.0253 |
| Wash Plant Ore Stockpile | 0.053 | 0.35 | 1 | 14 | 5 | 1.1E-05 | 7.3E-05 | 2.1E-04 | 240,900 | 1 | 0.0013 | 0.0088 | 0.0253 |
| Wash Plant Oversize Stockpile | 0.053 | 0.35 | 1 | 50 | 5 | 1.9E-06 | 1.2E-05 | 3.5E-05 | 87,600 | 1 | 0.0001 | 0.0005 | 0.0015 |
| Sand Screw Wash Sand Stockpile[3] | 0.053 | 0.35 | 1 | 50 | 5 | 1.9E-06 | 1.2E-05 | 3.5E-05 | 242,652 | 1 | 0.0002 | 0.0015 | 0.0043 |
| | | | | | | | | | | **TOTAL** | **0.0046** | **0.0306** | **0.0873** |

[1] Moisture contents for equations from Table 13.2.4-1, AP-42 (Aggregate Handling and Storage Piles). Piles that are saturated from the washing and screening process are assumed to have a moisture content of 50%.

[2] Average wind speed from MesoWest. 2019. University of Utah. Department of Atmospheric Sciences. Available from: http://mesowest.utah.edu/. Also summarized in Montana Department of Environmental Quality - Hard Rock Mining Bureau Operating Permit #00200

[3] The stockpile is saturated from being washed and screened in the wash plant.

| Mobile Equipment List | Model | Average Vehicle Weight (lbs) | Vehicle Weight (tons) | Silt Content (%)[1] | PM-2.5 Emission Factor (lb/VMT) | PM-10 Emission Factor (lb/VMT) | PM-30 (TSP) | VMT/year | Dust Control Efficiency (50%)[3] | PM-2.5 Emissions (tons/year) | PM-10 Emissions (tons/year) | PM-30 (TSP) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRP Can-Am 4-Wheeler | 400 | 607 | 0.30 | 4.8 | 0.02 | 0.23 | 0.92 | 1,345 | 0.5 | 0.01 | 0.08 | 0.31 |
| Cat Backhoe | 420E | 15,474 | 7.74 | 4.8 | 0.10 | 1.01 | 3.95 | 8,760 | 0.5 | 0.22 | 2.21 | 8.65 |
| Cat Dozer | D8K | 70,504 | 35.25 | 4.8 | 0.20 | 1.99 | 7.82 | 4,380 | 0.5 | 0.22 | 2.18 | 8.56 |
| Cat Dozer | D8H | 50,000 | 25.00 | 4.8 | 0.17 | 1.71 | 6.70 | 4,380 | 0.5 | 0.19 | 1.87 | 7.34 |
| Cat Front End Loader | 950M | 42,357 | 21.18 | 4.8 | 0.16 | 1.58 | 6.22 | 4,380 | 0.5 | 0.17 | 1.74 | 6.81 |
| Cat Skid Steer | 226B | 5,822 | 2.91 | 4.8 | 0.06 | 0.65 | 2.55 | 5,256 | 0.5 | 0.09 | 0.85 | 3.34 |
| Cat Excavator | 329FL | 63,002 | 31.50 | 4.8 | 0.19 | 1.89 | 7.43 | 2,190 | 0.5 | 0.10 | 1.04 | 4.07 |
| Cat Excavator | 325C | 60,406 | 30.20 | 4.8 | 0.19 | 1.86 | 7.29 | 2,190 | 0.5 | 0.10 | 1.02 | 3.99 |
| Ford Fuel Truck | L9000 | 68,000 | 34.00 | 4.8 | 0.20 | 1.96 | 7.69 | 949 | 0.5 | 0.05 | 0.47 | 1.83 |
| John Deere Excavator | 690D-LC | 39,730 | 19.87 | 4.8 | 0.15 | 1.54 | 6.04 | 2,190 | 0.5 | 0.08 | 0.84 | 3.31 |
| Volvo ATH 6x6 Articulated Haul Truck | A35C | 91,933 | 45.97 | 4.8 | 0.22 | 2.25 | 8.81 | 37,233 | 0.5 | 2.09 | 20.90 | 82.02 |
| Volvo ATH 6x6 Articulated Haul Truck | A35C | 91,933 | 45.97 | 4.8 | 0.22 | 2.25 | 8.81 | 37,233 | 0.5 | 2.09 | 20.90 | 82.02 |
| | | | | | | | | | **TOTAL** | **5.41** | **54.09** | **212.24** |

| **Constants for Equations[2]** | **PM-2.5** | **PM-10** | **PM-30** |
|---|---|---|---|
| k (lb/VMT) | 0.15 | 1.5 | 4.9 |
| a | 0.9 | 0.9 | 0.7 |
| b | 0.45 | 0.45 | 0.45 |

VMT = Vehicle Miles Traveled

[1] Silt content of Sand and Gravel Processing from Table 13.2.2-1 Typical Silt Content Values of Surface Material on Industrial Unpaved Roads, AP-42

[2] Constants for equations from Table 13.2.2-2 Constants for equation 1a and 1b, AP-42

(Unpaved Roads)

[3] Assumes 25% control efficiency for watering roads and 75% control efficiency for applying magnesium chloride for an average control efficiency of 50%

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\,(s/12)^a (W/3)^b \qquad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\,(s/12)^a (S/30)^d}{(M/0.5)^c} - C \qquad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
*C* = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

**Diesel Engine(s): 454 hp**

Note: Emissions are based on the combined power output of the engine (453.5 hp).

Operational Capacity of Engines = 454 hp (combined engine hp rating)

Hours of Operation = 8,760 hours (unrestricted hours)

**Total $PM/PM_{10}/PM_{2.5}$ Emissions:**

Emission Factor = 0.0022 lbs/hp-hr (All PM < 1 mm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,760 hours) * (454 hp) * (0.0022 lbs/hp-hr) * (ton/2000 lb) = 4.37 ton/yr

**NOx Emissions:**

Emission Factor = 0.031 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,760 hours) * (454 hp) * (0.031 lbs/hp-hr) * (ton/2000 lb) = 61.58 ton/yr

**CO Emissions:**

Emission Factor = 0.00668 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,760 hours) * (454 hp) * (0.00668 lbs/hp-hr) * (ton/2000 lb) = 13.27 ton/yr

**VOC Emissions:**

Emission Factor = 0.0025141 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)

Calculation: (8,760 hours) * (454 hp) * (0.0025141 lbs/hp-hr) * (ton/2000 lb) = 4.99 ton/yr

**SOx Emissions:**

Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,760 hours) * (454 hp) * (0.00205 lbs/hp-hr) * (ton/2000 lb) = 4.07 ton/yr

V. Existing Air Quality

The SRM is located in Section 16, Township 6 North, Range 16 West, in Granite County, Montana. The air quality of this area is classified as unclassifiable/attainment for National Ambient Air Quality Standards (NAAQS) pollutants, including particulate matter species ($PM_{10}/PM_{2.5}$).

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 #5248-00.

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 | |
|---|---|---|
| ✓ | | 1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights? |
| | ✓ | 2. Does the action result in either a permanent or indefinite physical occupation of private property? |
| | ✓ | 3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property) |
| | ✓ | 4. Does the action deprive the owner of all economically viable uses of the property? |
| | ✓ | 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? |
| | ✓ | 6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action) |
| | ✓ | 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? |
| | ✓ | 7a. Is the impact of government action direct, peculiar, and significant? |
| | ✓ | 7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded? |
| | ✓ | 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? |
| | ✓ | 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.

Permit Analysis Prepared by: Ed Warner
Date: July 8, 2020

**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:*
Potentate Mining, LLC
Sapphire Ranch Mine
P.O. Box 1110
Philipsburg, MT 59858

*Montana Air Quality Permit number (MAQP):* 5248-00

*EA Draft:* 07/15/2020
*EA Final:* 08/13/2020
*Permit Final:* 08/29/2020

1. *Legal Description of Site:* The facility boundary includes the Sections 15, 16, the western and northern portion of Section 17 (except for the west half of the west half), the majority of Sections 20 and 21, and the western half of Section 22, in Township 6 North, Range 16 West, in Granite County, Montana. The latitude is 46.274118° and longitude is -113.600290°.

2. *Description of Project:* Potentate Mining, LLC (Potentate) proposes operation of a placer mine known as the Sapphire Ranch Mine (SRM) for the purpose of recovering sapphires and a minor amount of fine gold. Potentate has operated the SRM for a number of years and is expanding operations to perform open cut mining to excavate the soils containing sapphires and gold that are located above bedrock. Permitted equipment includes aggregate screens, material handling equipment, diesel-fired electric generators, and a diesel-fired light plant.

3. *Objectives of Project:* To recover sapphires and gold.

4. *Alternatives Considered:* In addition to the proposed action, the Department of Environmental Quality (Department) – Air Quality Bureau also considered the "no-action" alternative. The no-action alternative would mean that Potentate would not receive the necessary MAQP for operating the air emission sources associated with the planned expansion to full scale mining at SRM. However, Potentate has complied with the requirements for obtaining an MAQP. Therefore, the "no-action" alternative was eliminated from further consideration. Other alternatives considered were discussed in the BACT analysis, Section III, in the permit analysis.

5. *A Listing of Mitigation, Stipulations, and Other Controls:* A list of enforceable conditions, including a BACT analysis, would be included in MAQP #5248-00.

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. *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. The project would be located on private land owned by Potentate. The current land use is a mine site. 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 #5248-00.

B. *Water Quality, Quantity and Distribution*

The proposed project would have a minor effect on water quality, quantity, and distribution. Water would be required in the wash plant processes for extracting the sapphires and gold from the ore, as well as for control of fugitive particulate matter emissions from material handling, screening, storage piles, and haul roads. Potentate is applying for and Industrial Stormwater Permit with the Department – Water Quality Bureau under the Montana Pollutant Discharge Elimination System (MPDES). Potentate is preparing an Industrial Stormwater Pollution and Prevention Plan (SWPPP) which would outline outfalls for the SRM and proposed discharges into surface waters.

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

Air emissions from this project would have a minor effect on the geology and soil quality, stability, and moisture of the surrounding area. The project would be entirely located on private land owned by Potentate. The proposed operation is similar to a typical sand and gravel operation where the topsoil is stripped, soils are excavated, screened, washed, and the target resource is recovered with the remaining soil returned to the excavation area, regraded, topsoil or coversoil replaced, and reseeded. The main difference is that Potentate would use a system in their wash plant that would gravity concentrate the soils to separate and recover the sapphires and gold. A small volume of the target resource is recovered from the soils compared to a typical sand and gravel operation, so the final reclaimed surface can closely mimic the pre-mining ground surface. The air quality permit associated with this project would contain limitations and conditions to minimize the effect of the emissions to off-site aspects.

D. *Vegetation Cover, Quantity, and Quality*

The project would likely have a minor effect 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 #5248-00.

E. *Aesthetics*

The equipment would be visible and generate noise while in operation. Due to the remote location of the SRM site, the aesthetic impact would be minor.

F. *Air Quality*

The area surrounding the proposed project is unclassifiable/attainment for the National Ambient Air Quality Standards (NAAQS) for all criteria air pollutants. Emissions of air pollutants would occur as a result of the project. MAQP #5248-00 would contain conditions limiting opacity and require, as necessary, the use of water and/or chemical dust suppressants to control dust from vehicle traffic and process equipment. The air quality impacts from the proposed project would be minor.

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

In an effort to identify any unique endangered, fragile, or limited environmental resources in the area, the Department contacted the Montana Natural Heritage Program, Natural Resource Information System (NRIS). In this case, the area was defined by the sections, township, and range of the proposed location with an additional 1-mile buffer zone. The following table summarizes identified occurrences of species of concern within the search radius.

| Birds | Fish | Mammals | Plants |
|---|---|---|---|
| Clark's Nutcracker | Westslope Cutthroat Trout | Wolverine | Missoula Phlox |
| Cassin's Finch | Bull Trout | Townsend's Big-eared Bat | Whitebark Pine |
| Evening Grosbeak | | Fisher | Austin's Knotweed |
| Brown Creeper | | | Keeled Bladderpod |
| Northern Goshawk | | | Dense-leaf Draba |
| Veery | | | Candystick |
| Pileated Woodpecker | | | |
| Pacific Wren | | | |
| Golden Eagle | | | |
| Great Blue Heron | | | |
| Long-billed Curlew | | | |

The Department determined that any effects on the local populations would be expected to be minor, as the application indicated that the locale that has had mining and logging activity occurring there for over 100 years.

H. *Sage Grouse Executive Order*

The Department recognizes that the site location is not within a Greater Sage Grouse General Habitat Area as defined by Executive Order No. 12-2015.

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

No upgrades to utilities are planned to meet the power demands of the proposed project. The generators would be used to provide electrical power to the wash plant activities because existing power is not of sufficient voltage to operate that equipment. The generators would require diesel fuel. Water would be required for operation and dust control. The project would result in air pollutant emissions; however, the Department

believes that impacts would be minor due to dispersion characteristics of pollutants and conditions placed in MAQP #5248-00. Overall, these increases on demands of water, air, and energy would have no more than a minor impact.

J. *Historical and Archaeological Sites*

According to correspondence from the Montana State Historic Preservation Office (SHPO), there is low likelihood of adverse disturbance to any known archaeological or historic site, given previous industrial disturbance within the area. Therefore, it is unlikely that the current permit action would impact any known historic or archaeological site. Should structures need to be altered or if cultural materials be inadvertently discovered during this project, SHPO requests that they be contacted and the site investigated.

K. *Cumulative and Secondary Impacts*

Overall, the cumulative and secondary impacts from this project on the physical and biological environment in the immediate area would likely be minor. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #5248-00. 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. The application states that actual operations would be occur in one or two 12-hour shifts daily between May and November, weather permitting, and that mining activities would not take place during winter months.

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

A. *Social Structures and Mores*

This project would have no expected impacts to social structures and mores. The project would occur on land owned by Potentate and the project activities would be consistent with the mining activities that currently occur there.

B. *Cultural Uniqueness and Diversity*

This project would have no expected impacts to cultural uniqueness and diversity. The project would occur on land owned by Potentate and the project activities would be consistent with the mining activities that currently occur there.

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

This project would have a minor impact on local and state tax base and revenue due to the taxes generated from the purchase of supplies and the mine payroll.

D. *Agricultural or Industrial Production*

This project would not have an impact on agricultural production as the current land use is already a mine site. Industrial production would experience a minor impact as Potentate seeks to transition the existing exploration at the mine to full-scale open cut mining.

E. *Human Health*

The proposed project would result in minor contributions to air pollution from the proposed project. However, MAQP #5248-00 would incorporate conditions including, but not limited to, the BACT requirements discussed in Section III of the permit analysis, to ensure that the operations would maintain compliance with all applicable rules and standards. These rules and standards are designed to be protective of human health. Any impact to human health from the proposed project 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 would occur and the site would be located on private property. The project 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 equipment.

G. *Quantity and Distribution of Employment*

The SRM currently employs 10-12 people and is anticipated to employ approximately 24 full time employees. This is a minor impact on quantity and distribution of employment.

H. *Distribution of Population*

The project could have a minor impact on distribution of population as Potentate hires additional 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 expected to be minor.

J. *Industrial and Commercial Activity*

Operation of the project would result in a minor increase in the industrial activity in the area. However, the Department believes the impacts would be minor because of the relatively small size of the project.

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.

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. As previously stated, the proposed project would result in a slight increase in employment and industrial activity in the area. The Department believes that Potentate would be expected to operate in compliance with all applicable rules and regulations as outlined in MAQP #5248-00.

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 open cut mining operation for recovery of sapphires and gold. MAQP #5248-00 includes conditions and limitations to ensure the facility will operate in compliance with all applicable 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 Sage Grouse Conservation Program

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

EA prepared by: Ed Warner
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