PRELIMINARY DETERMINATION
ON PERMIT APPLICATION

Date of Mailing: May 11, 2015

Name of Applicant: Otter Creek Coal, LLC

Source: Bituminous Coal and Lignite Surface Mine

Proposed Action: The Department of Environmental Quality (Department) proposes to issue a permit, with conditions, to the above-named applicant. The application was assigned Permit Application Number 5106-00.

Proposed Conditions: See attached.

Public Comment: Any member of the public desiring to comment must submit such comments in writing to the Air Quality Bureau (Bureau) of the Department at the above address. Comments may address the Department's analysis and determination, or the information submitted in the application. In order to be considered, comments on this Preliminary Determination are due by June 10, 2015. Copies of the application and the Department's analysis may be inspected at the Bureau's office in Helena. For more information, you may contact the Department.

Departmental Action: The Department intends to make a decision on the application after expiration of the Public Comment period described above. A copy of the decision may be obtained at the above address. The permit shall become final on the date stated in the Department's Decision on this permit, unless an appeal is filed with the Board of Environmental Review (Board).

Procedures for Appeal: Any person jointly or severally adversely affected by the final action may request a hearing before the Board. Any appeal must be filed by the date stated in the Department's Decision on this permit. The request for a hearing shall contain an affidavit setting forth the grounds for the request. Any hearing will be held under the provisions of the Montana Administrative Procedures Act. Submit requests for a hearing in triplicate to: Chairman, Board of Environmental Review, P.O. Box 200901, Helena, MT 59620.

For the Department,

Julie A. Merkel
Air Permitting Section Supervisor
Air Quality Bureau
(406) 444-3626

Rhonda Payne
Environmental Science Specialist
Air Quality Bureau
(406) 444-5287

JM:RP
Enclosures

MONTANA AIR QUALITY PERMIT

Issued To: Otter Creek Coal, LLC
P.O. Box 7152
Billings, MT 59103

MAQP: #5106-00
Application Complete: 4/2/15
Preliminary Determination Issued: 5/11/15
Department's Decision Issued:
Permit Final:
AFS #: 075-0006

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Otter Creek Coal, LLC (OCC), 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

The OCC surface coal mine includes a centralized coal processing and handling system with coal dumps, crushing, conveying, storage, and train load-outs. Operations also include various auxiliary and associated equipment, including; dragline, trucks, shovels, scrapers, drills, dozers, etc., as applicable. OCC mining operations include but are not limited to the following operational processes:

- Topsoil removal and dumping
- Overburden drilling
- Overburden blasting
- Overburden cast blasting
- Overburden removal by dragline
- Overburden handling by truck/shovel
- Overburden dumping
- Overburden handling by dozer
- Permanent and temporary haul roads
- Graders
- Unpaved access roads
- Coal drilling,
- Coal blasting
- Coal removal
- Coal dumping – truck dump
- Primary crusher
- Secondary crusher
- Conveyors
- Mobile and portable equipment – diesel
- Mobile and portable equipment – gasoline
- Explosives
- Train loadout
- Disturbed acres – pits, peaks, soil stripping

- Disturbed acres (partial) <1yr
- Disturbed acres (partial) <1yr
- Disturbed acres (completed) >2 yr
- Fuel storage tanks

B. Plant Location

OCC has combined coal lease interests at Otter Creek, Powder River County, MT that comprises approximately 17,900 contiguous acres. This area is divided into three tracts (Tract 1, 2 and 3). OCC propose to operate a coal mine in the area that comprises the major portion of Otter Creek Tract 2 located in Sections 3, 4, 9, 10, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, and 26 in Township 4S, Range 45E.

Section II: Conditions and Limitations

A. Emission Limitations

1. Maximum coal production shall be limited to 35 million tons per rolling 12-month time period (ARM 17.8.749).

2. OCC 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 17.8.308).

3. OCC shall not cause to be discharged into the atmosphere from any coal processing and conveying equipment, coal storage system, or coal transfer and loading system processing coal an opacity in excess of the following (ARM 17.8.340 and 40 Code of Federal Regulations (CFR) 60, Subpart Y):

   a. For sources constructed, reconstructed, or modified after April 28, 2008: 10%

   b. The owner or operator must not cause to be discharged into the atmosphere from any mechanical vent on an affected facility gases which contain particulate matter in excess of 0.023 g/dscm (0.010 gr/dscf).

4. OCC shall comply with all applicable standards and limitations, and the reporting, recordkeeping, testing, and notification requirements contained in 40 CFR, Subpart Y, Standards of Performance for Coal Preparation Plants and Processing Plants (ARM 17.8.340 and 40 CFR 60, Subpart Y).

5. OCC 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. OCC 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.6 (ARM 17.8.749).

7. All visible emissions from any Standards of Performance for New Stationary Source (NSPS) – affected crusher shall not exhibit an opacity in excess of the following averaged over 6 consecutive minutes (ARM 17.8.340 and 40 CFR 60, Subpart OOO):

    a. For crushers that commence construction, modification, or reconstruction on or after April 22, 2008: 12% opacity

    b. For crushers that commence construction, modification, or reconstruction after August 31, 1983, but before April 22, 2008: 15% opacity

8. All visible emissions from any other NSPS-affected equipment (such as screens and conveyors) shall not exhibit an opacity in excess of the following averaged over 6 consecutive minutes (ARM 17.8.340 and 40 CFR 60, Subpart OOO):

    a. For equipment that commence construction, modification, or reconstruction on or after April 22, 2008: 7% opacity

    b. For equipment that commence construction, modification, or reconstruction after August 31, 1983, but before April 22, 2008: 10% opacity

10. Water and chemical dust suppressants shall be available on-site at all times and operated as necessary to maintain compliance with the opacity limitations in Sections II.A., II.A.7 and II.A.8 (ARM 17.8.752).

11. OCC shall comply with all applicable standards and limitations, monitoring, reporting, recordkeeping, testing, and notification requirements contained in 40 CFR 60, Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants* (ARM 17.8.340 and 40 CFR 60, Subpart OOO).

12. OCC 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,* 40 CFR 60 Subpart JJJJ, *Standards of Performance for Stationary Spark 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 and Subpart JJJJ; ARM 17.8.342 and 40 CFR 63, Subpart ZZZZ)

13. OCC shall comply with the following limitations and emission control technologies and techniques as described in the application (ARM 17.8.752):

    a. <u>Crushing, Conveyor Transferring, Silo Storage and Railcar loading of Coal</u>
    OCC shall operate a fogging dust suppression system in addition to utilizing enclosures and best operating practices for the operation of the primary and secondary crushers, conveyor transferring, silo storage, and railcar loading of coal.

b. Overburden and Coal Drilling

OCC shall use a drill platform shroud enclosure for the drilling of overburden and coal.

c. Explosives Detonation/Blasting

OCC shall use proper blasting techniques, proper explosive selection, optimized application of explosives, and the utilization of best operating practices to mitigate gaseous and particulate emissions from explosives detonation and blasting. These techniques include optimizing drill hole size and drill hole placement, minimizing retention time between loading blasting holes with emulsion and detonation, proper use of explosives, and utilizing mine plans that ensure blasting is conducted in a manner that prevents overshooting and minimizes the area to be blasted. Additionally, OCC shall use a blasting agent such as ammonium nitrate and fuel oil (ANFO). The fuel oil used in the blasting agent must have a sulfur content of 15 ppm or less.

d. Material Handling and Removal

i. Minimize fall/drop distance on all coal and overburden handling activities;

ii. Adequately maintain open coal storage and minimize equipment activity on stockpiles;

iii. Minimize area of surface damage.

e. Disturbed Acreage Wind Erosion

i. Upon completion of mine activities reclamation of disturbed areas shall begin within one growing season;

ii. Apply temporary vegetative cover on topsoil stockpiles;

iii. Best operating practices shall be maintained and include efficient storing and piling of material, building storage piles to a reasonable height, and orienting stockpiles to reduce erosion caused by prevailing winds;

iv. OCC shall apply water, as necessary, to control emissions from stockpiles due to wind erosion.

f. Permanent Haul Roads

OCC shall utilize magnesium chloride ($MgCl_2$) or similarly effective chemical dust suppressants, water sprays, and vehicle restrictions such as speed limits to minimize fugitive dust emissions.

g. Temporary Haul Roads and Mine Access Roads

OCC shall utilize water sprays and vehicle restrictions such as speed and reasonable precaution requirements prescribed within ARM 17.8.308 to minimize dust emissions.

14. OCC shall maintain a fugitive dust control plan. Elements of the plan shall include, but not be limited to, the conditions established within Section II.A., II.A.3, II.A., II.A.13 and the elements of the Best Available Control Technology (BACT) determination provided within the MAQP analysis (ARM 17.8.308 and ARM 17.8.752).

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. Ambient Monitoring Requirements

1. OCC shall install and operate an ambient air quality monitoring network to measure concentrations of PM_{10} around the project area in accordance Attachment 1 (ARM 17.8.749).

2. OCC shall submit a Quality Assurance Project Plan (QAPP) to the Department as required by the Administrative Rules of Montana (ARM) Title 17, Chapter 8, Subchapter 2. (ARM 17.8.204).

D. Operational Reporting Requirements

1. OCC 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. OCC 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 OCC 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. OCC shall document, by month, the coal production levels. By the 25th day of each month, OCC shall total the coal production levels for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.1. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

SECTION III: General Conditions

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

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

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving OCC 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 OCC may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

ATTACHMENT 1

AMBIENT AIR MONITORING PLAN
OTTER CREEK COAL LLC
Montana Air Quality Permit (MAQP) #5106-00

1. This ambient air-monitoring plan is required by Montana Air Quality Permit (MAQP) # 5106-00, which applies to Otter Creek Coal LLC's (OCC) mining operation located in Sections 3, 4, 9, 10, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, and 26 in Township 4S, Range 45E, in Powder River County, Montana. The Department of Environmental Quality (Department) may modify the requirements of this monitoring plan. All requirements of this plan are considered conditions of the permit.

2. The requirements of this attachment shall take effect when OCC commences construction of the mine.

3. OCC shall install and maintain a minimum of four air monitoring sites in the vicinity of the mine and facilities. The exact locations of the monitoring sites shall be approved by the Department based on the information submitted in the facility's Quality Assurance Project Plan (QAPP), required by the Administrative Rules of Montana (ARM) Title 17, Chapter 8, Subchapter 2. The QAPP shall be prepared to satisfy the applicable requirements of 40 Code of Federal Regulations (CFR) Parts 50, 53, and 58, and any other requirements specified by the Department. At least one monitor site must be in reasonable proximately to the location of highest PM_{10} concentrations as determined by the modeling assessment performed in conjunction with MAQP #5106-00.

4. This Ambient Air Monitoring Plan will be updated to reflect actual monitoring network arrangements upon Department approval of the monitor siting locations and demonstration of conformance to ARM 17.8, Subchapter 2, and 40 CFR Parts 50, 53, and 58, and any other requirements specified by the Department.

5. Within 30 days prior to any changes of the location of the ambient monitors, OCC shall submit a topographic map to the Department identifying UTM coordinates, air monitoring site locations in relation to the facility, and the general area present.

6. The Department will review the air monitoring data and determine if continued monitoring or additional monitoring is warranted. The Department may require continued air monitoring to track long-term impacts of emissions from the facility or require additional ambient air monitoring or analyses if any changes take place in regard to quality and/or quantity of emissions or the area of impact from the emissions.

7. OCC shall monitor the parameters and frequencies as determined by the Department approved QAPP.

   Trace metal analyses of sample filters will not be required at this time; however, the Department may require these analyses in the future.

8. Data recovery for all parameters shall be at least 80 percent computed on a quarterly and annual basis. The Department may require continued monitoring if this condition is not met. (Data Recovery = (Number of data points collected in evaluation period)/(number of scheduled data points in evaluations period)*(100%)).

9. Any ambient air monitoring changes proposed by OCC must be approved in writing by the Department.

10. OCC shall utilize air monitoring and Quality Assurance (QA) procedures that are required in ARM 17.8, Subchapter 2, 40 CFR Parts 50 and 58; and any other requirements specified by the Department.

11. OCC shall submit quarterly data reports within 45 days after the end of the calendar quarter and two hard copies of the annual data report within 90 days after the end of the calendar year.

12. The quarterly data submittals shall consist of a hard copy narrative data summary and a digital submittal of all data points in AIRS batch code format. The electronic data must be submitted to the Research and Monitoring Section as digital text files readable by an office PC with a Windows operating system.

13. The narrative data hard copy summary must be submitted to the Air Compliance Section and shall include:

    a. A hard copy of the individual data points.

    b. The first and second highest 24-hour concentrations for PM_{10}.

    c. The quarterly and monthly wind roses.

    d. A summary of the data completeness.

    e. A summary of the reasons for missing data.

    f. A precision data summary.

    g. A summary of any ambient air standard exceedances.

    h. Q/A-Q/C information such as flow rate verifications, including leak, temperature and barometric pressure checks; verification-calibration results; audit reports; and standards certifications.

14. The annual data report shall consist of a narrative data summary. The narrative data hard copy summary must be submitted to the Air Compliance Section and shall include:

    a. A topographic map of appropriate scale with UTM coordinates and a true north arrow showing the air monitoring site location in relation to the mine site and the general area,

    b. The year's four highest 24-hour concentrations for PM_{10},

    c. The annual wind rose,

    d. A summary of any ambient air standard exceedances, and

    e. An annual summary of data completeness.

15. All records compiled in accordance with this Attachment must be maintained by OCC 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).

16. The Department may audit, or may require OCC to contract with an independent firm to audit, the air monitoring network, the laboratory performing associated analyses, and any data handling procedures at unspecified times.

17. The hard copy reports should be sent to:

    Department of Environmental Quality
    Attention: Air Compliance Section Supervisor
    1520 E. Sixth Ave.
    Helena, MT 59601

18. The electronic data from the quarterly monitoring shall be sent to:

    Department of Environmental Quality
    Attention: Research and Monitoring Section Supervisor
    1520 E. Sixth Ave.
    Helena, MT 59601

Montana Air Quality Permit Analysis
Otter Creek Coal, LLC
MAQP #5106-00

I. Introduction/Process Description

A. Permitted Equipment

OCC operates, but is not limited to, the following equipment:

EU ID	Description	Details
1a	Topsoil removal	Topsoil removal and loading into scraper
1b	Topsoil dumping	Topsoil dumping from scraper to storage pile
2	Overburden Drilling	Drilling of overburden
3a	Overburden Blasting	Blasting of overburden
3b	Overburden Cast Blasting	Cast blasting of overburden
4a	Overburden Removal by Dragline	Dragline handling of overburden
4b	Overburden Handling by Truck/Shovel	Truck/shovel handling of overburden
4c	Overburden dumping	Overburden dumping from truck
4d	Overburden Handling by Dozer	Dozer handling of overburden
5a	Permanent Haul Roads	Moving coal from the bench face to the coal dump; roads vary in silt and moisture content
5b	Temporary Haul Roads	Moving coal from the bench face to the coal dump; roads vary in silt and moisture content
5c	Graders	Grading of permanent, temporary and mine access roads
6	Unpaved Access Roads	Unpaved access roads – light duty vehicles
7	Coal Drilling	Coal drilling
8	Coal Blasting	Coal blasting
9	Coal Removal	Truck loaded by shovel
10	Coal Dumping – Truck Dump	Coal dumping – truck dump
11	Primary Crusher	Coal mining, cleaning, and material handling/crushing
12	Secondary Crusher	Coal mining, cleaning, and material handling/crushing
13	Conveyors	Coal mining, cleaning and material conveyors
15	Explosives	Explosive use for mining operations
16	Train loadout	Bulk coal loaded into railcars

EU ID	Description	Details
17a	Disturbed acres – pits, peaks, soil stripping	Acreage of disturbed acres with pits, peaks, soil stripping
17b	Disturbed acres (partial) <1yr	Acreage of disturbed areas with partial backfilled grade and disturbed within the last year
17c	Disturbed acres (partial) >1yr	Area of disturbed acres with partial backfilled grade greater than 1 years. Also includes areas with less than 2 years of vegetation growth
17d	Disturbed acres (completed) >2 yr	Acreage of disturbed acres that have been completely backfilled and graded. Also includes areas with greater than 2 years of vegetation growth
18	Fuel storage tanks	Gasoline and Diesel Storage Tanks

Note: Except as noted elsewhere in this permit, the information in Table 1 is for informational purposes only. The specific unit descriptions do not restrict the Permittee from replacing an emission unit identified in Table 1. The Permittee shall comply with all applicable provisions of ARM 17.8.745 when installing a replacement emission unit, including any applicable minor or construction permit requirements.

B. Source Description

Otter Creek Coal, LLC (OCC) intends to develop coal reserves at Otter Creek, Powder River County, MT. OCC has combined coal lease interests that comprise approximately 17,900 contiguous acres. This area is divided into three tracts (Tract 1, 2 and 3). OCC submitted an MAQP application to the Montana Department of Environmental Quality (Department) on November 6, 2014 to operate a coal mine in the area that comprises the major portion of Otter Creek Tract 2 located in Sections 3, 4, 9, 10, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, and 26 in Township 4S, Range 45E.

OCC will develop Tract 2 for (approximately) the first 17-19 years and Tract 3 during years 19 - 41. Tract 1 development is proposed from (approximately) year 40 to year 55. The necessary permits, baseline studies and mining and reclamation plans must be developed and approved for OCC to mine Tracts 1 and 3 in the future.

The OCC mine will be operated in keeping with a typical western surface coal mine and extraction facility. Development will begin with construction of an access road from Highway 484 across the Otter Creek valley, then branching to the area to the northeast and southward parallel to Otter Creek. This road, with excavated sediment ponds, will serve as sediment control during initial construction and pit development, and provide access to the primary crusher and dragline erection sites. Simultaneously, a rail loop, live storage silos and train loadout will be constructed west of Highway 484, opposite the mine access road at the terminus of the Tongue River Railroad in Section 9, Township 4S, Range 45E.

Initial development activity will focus on construction of the access roads, rail loop, silos and train loadout, crushing and conveying system, and shops and office facilities. As the transportation and coal handling systems near completion, boxcut development and dragline erection will initiate at mid-pit.

The boxcut will be developed using mobile equipment – trucks and a shovel. When the dragline is operational, it will begin by stripping overburden and casting spoil into the empty boxcut. As mining advances to the east, dragline spoil will be cast into the previous empty cut.

As coal is exposed by overburden stripping, the uncovered coal seam will be drilled and blasted. A shovel or front-end loader will load the broken coal into haul trucks that will deliver the coal to the truck dump via graded haul roads. The truck dump and the primary crusher will be located near the pit. From the truck dump the coal will be dumped into a hopper that will feed the primary crusher which will be located below grade. From the primary crusher the coal will be sent via an enclosed overland conveyor to a secondary crusher. From the secondary crusher the coal will be sent to the silos via an enclosed overland conveyor. Screening will occur in association with both the primary and secondary crushing operations. The primary and secondary crushers, screens and conveyors will run off electric land power and will be controlled by a fogging dust suppression system. The coal will be loaded into railcars from the silos and shipped via rail to market.

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. <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. <u>ARM 17.8.106 Source Testing Protocol</u>. 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).

OCC 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}

OCC 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, OCC shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

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

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

7. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). OCC is considered an NSPS affected facility under 40 CFR Part 60 and is 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 Part 60 Subpart Y – Standards of Performance for Coal Preparations Plants and Processing Plants. Process operations at this facility that meet the definition of affected facilities include any coal processing and conveying equipment, coal storage systems, or coal transfer and loading systems.

   c. 40 CFR Part 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. A CI ICE is considered stationary if it remains or will remain at a location for more than 12 months, or a shorter period of time for and engine located at a seasonal source. Based on the information submitted by OCC, no stationary CI ICE would be present at the mine; however, OCC may be subject to this Subpart depending upon the construction/manufacture date and upon the location, nature and duration of operation of the CI ICE.

d. 40 CFR Part 60 Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). Owners and operators of certain stationary SI ICE that commence construction, modification or reconstruction after June 12, 2006 are subject to this subpart. Based on the information submitted by OCC, no stationary SI ICE would be present at the mine; however, OCC may be subject to this Subpart depending upon the construction/manufacture date and upon the location, nature and duration of operation of SI ICE.

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

   a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAPs Subpart as listed below.

   b. 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants (HAPs) 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. A RICE is considered stationary if it remains or will remain at the permitted location for more than 12 months, or a shorter period of time for an engine located at a seasonal source. Based on the information submitted by OCC, no stationary RICE equipment would be present at the mine; however this subpart would become applicable if OCC operates a RICE that remains in a location for more than 12 months.

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. OCC 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. OCC has a PTE greater than 25 tons per year of particulate matter (PM), particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}), particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), oxides of nitrogen (NO_x), carbon monoxide (CO) and volatile organic compounds (VOCs);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. OCC 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. OCC submitted an affidavit of publication of public notice for the November 7, 2014 issue of the Billings Gazette, a newspaper of general circulation in the City of Billings in Yellowstone County, and in the November 13, 2014 issue of the Powder River Examiner, a newspaper of general circulation in the Town of Broadus in Broadus County, as proof of compliance with the public notice requirements.

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

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The 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 OCC 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 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.

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 (excluding fugitive emissions) is below 250 tons per year of any pollutant.

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

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

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

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

   c. PTE > 70 tons/year of particulate matter with an aerodynamic diameter of 10 microns or less (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 #5106-00 for OCC, the following conclusions were made:

   a. The facility's PTE is less than 100 tons/year for any pollutant, excluding fugitives.

   b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

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

   d. This facility is subject to NSPS 40 CFR 60 Subpart Y.

   e. This facility is not subject to any current NESHAP standards.

   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 conclusions, the Department has determined that OCC will be a minor source of emissions as defined under Title V. Therefore, a Title V operating permit is not required. However, if minor sources subject to NSPS are required to obtain a Title V Operating Permit, OCC will be required to obtain a Title V Operating Permit.

III. BACT Determination

A BACT determination is required for each new or modified source. OCC 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 OCC in permit application #5106-00, providing an analysis of available methods for controlling emissions from the proposed sources. It is difficult to assign emission rates to fugitive pollutants due to the uncontrollable variables inherent in the mining process and the difficulty of measuring emission rates for a compliance demonstration. Therefore, BACT can constitute either add-on control equipment or modifications to process design, work practice, operational standard, or addition of control equipment if imposition of an emissions standard is infeasible.

Sources undergoing BACT analysis with Add-On Control Technology:

Crushing, Conveyor Transferring, Silo Storage, and Railcar Loading of Coal
Overburden and Coal Drilling

Sources undergoing BACT analysis using operational standards, work practices or best operations practices:

Explosives Detonations
Mine Activity – Material Handling and Removal
Disturbed Acreage Wind Erosion
Roadway Fugitive Dust

BACT Analyses for Sources with Add-On Control Technology

The Department reviewed the analysis and methods presented, as well as previous BACT determinations to formulate a BACT conclusion. The following control options have been selected as constituting BACT for each identified emission source:

A. <u>BACT for Particulate (PM, PM10 and PM2.5) Emissions from Crushing, Conveyor Transferring, Silo Storage, and Railcar Loading of Coal</u>

Fragmented coal is hauled from the mine pit to the truck dump and is reduced in size by the mine's primary crusher. Crushed coal is then transferred through a series of conveyors and a secondary crushing unit until properly sized coal is deposited within storage silos. The coal is stored within the silos until it is eventually transferred into railcars for shipment by rail. Potential sources of particulate emissions can occur from the following sources within the coal handling, transferring, and crushing processes:

- Coal Haul Truck Dump
- Primary and Secondary Crushing Units
- Conveyors and Transfers
- Silo Storage and Transfer into the Storage Silo
- Railcar Coal Loading

Analogous control methods are utilized to reduce particulate emissions from all coal processing, transferring, storage, and loading sources. The BACT analysis is subsequently defined for the particulate control of each source.

The following list comprises the available technologies for controlling particulate emissions from coal processing, transferring, storage and loading sources:

Best Operating Practices (BOP)

BOPs include practices such as minimizing drop heights for transfers, adherence to proper loader operation and minimizing turbulence in the process stream. BOPs will be the base case for this analysis.

Enclosure

Enclosure technology employs structures or underground placement to shelter material from wind entrainment. Enclosures can fully or partially surround the source and the control efficiency depends on the level of enclosure.

Passive Enclosure Containment System (PECS)

PECSs are a special class of enclosures designed into transfer and conveyance structures in order to control emissions at material transfer points. They limit the turbulence and impact a material stream experiences as it transfers from one conveyor or process equipment to another. PECSs also limit air pressure differences that would otherwise release particulate containing air from the process. These systems are also referred to as 'passive emissions control systems' or 'dustless transfer chutes'.

No reference to expected control efficiency was found; however, enclosures are often used in conjunction with other higher rated control equipment provide high control efficiencies. Previous Department BACT analysis have required PECS plus a fogging dust suppression for certain coal handling processes and attributed a 99 percent particulate emissions reduction from this arrangement. Enclosures have been deemed technically and economically feasible for the processing, transferring, storage and loading of coal at OCC.

Wet Dust Suppression (Water Sprays)

Wet dust suppression methods apply water to materials in a processing or transfer system generally by spray application. Emissions are prevented through agglomeration. This process combines small dust particles with larger aggregate or with liquid droplets. Water retained by strayed material, or moisture inherent in the material, reduces emission from downstream transfers and storage piles in the same manner. While water sprays are technically feasible for this application, OCC will be located in an area where temperatures vary considerably throughout the year which presents a technical challenge to ensure that freezing does not occur within the system during cold weather.

Fogging Dust Suppression System

Fogging systems work on the same principle as wet dust suppression systems and can be considered a subcategory of that basic technology. Fogging systems create a fine mist of micron-sized water droplets in an area above an emission point in an area above an emission point in a processing or conveyance system. As fine particles are emitted into the fog they impact water droplets that wet the particulate surface. The wetted particles then attract and agglomerate with other wetted particles and settle by

gravity back to the bulk material stream. Ultra-fine atomization of the water droplets serves three primary purposes: 1) It enhances surface wetting of the similarly sized dust particles. 2) It prevents freezing. 3) It minimizes water usage and wetting of the bulk material. Traditional water sprays can obstruct material flow though screens or reduce the effectiveness of crushers due to introduction too much moisture into the material. Due to the relatively low amount of moisture in fogging dust suppression systems, material flows unobstructed within the system. Additionally, fogging dust suppression systems located in upstream facility processes introduce moisture that is retained throughout downstream processes and creates compounding emission control.

Similar systems utilizing fogging controls and enclosures are currently in use at other coal mines in the region. Fogging dust suppression systems have been deemed technically and economically feasible for controlling particulate emissions from proposed coal processing, transferring, storage and loading sources. The control technology will reduce particulate emissions within the system through direct application to the material and through moisture retained in the material from fogging upstream in the process.

Foam Dust Suppression System (FDSS)

FDSSs are a specialized type of wet dust suppression system that incorporates a chemical foaming agent and surfactant. Relatively small amounts of chemical and water are mixed in a controlled ratio and then atomized with compressed air to create a large column of stiff foam. The foam is then mixed into the bulk material stream where it wets fine particles and facilitates agglomeration that prevents escape to the atmosphere. It is therefore more like an intrinsic pollution-prevention control than an add-on control like a baghouse. Once added, particulate emissions are prevented rather than removed. The Department has deemed FDSS technically and economically feasible for controlling particulate emissions from proposed coal processing, transferring, storage and loading sources.

Electrostatic Precipitators (ESP)

An ESP uses electrical forces to move entrained particles onto a collection surface. To remove dust cake from the collection surface, the collection surface is periodically 'rapped' by a variety of means to dislocate the particulate, which drops down into a hopper. Particulate laden air must be able to be collected and ducted to the ESP.

ESPs are substantially larger than other viable control options. Additionally, in the EPA Air Pollution Cost Manual, it states 'ESPs are not typically viewed as cost effective control devices for smaller sources' (U.S. EPA, 2002, pp.4-15) and 'ESPs are usually not suited for use on processes which are highly variable, since frequent changes in operating conditions are likely to degrade ESP performance' (U.S. EPA, 1998). Finally, the Department is not aware of any similar sources using an ESP to control particulates. Therefore, the Department has determined that ESPs can be eliminated from further consideration for the control of particulates from crushing, conveyor transferring, silo storage, and railcar loading of coal.

Wet Particulate Scrubber

Wet scrubbers typically use water to impact, intercept, or diffuse a particulate in a waste gas stream. Particulate matter is accelerated and impacted onto a solid surface or into a liquid droplet through devices such as a venturi and spray chamber. Wet slurry material is typically stored in an on-site waste impoundment.

The benefit of wet particulate scrubbers is their ability to perform in conditions of varied temperature and moisture. They can collect flammable and explosive dusts safety, absorb gaseous pollutants and collect mists. In contrast, wet particulate scrubbers require the disposal of a significant amount of water which contains the collected particulate. The contaminated water requires further treatment in a settling pond or sewage system and the disposal process lowers the particulate collection efficiency while increasing operational costs. Additionally, wet scrubbers work best when controlling sources that emit emissions such as hot, saturated gases. OCC will be located in an area where temperatures vary considerably throughout the year and efforts would need to be made to ensure freezing within the scrubber during the winter months does not occur.

Due to these considerations, the Department has determined that wet particulate scrubber control can be eliminated from further consideration for the control of particulates from crushing, conveyor transferring, silo storage, and railcar loading of coal.

Fabric Filter Dust Collector (Baghouse)

Baghouses direct particulate-laden exhaust through lightly woven or felted fabric which traps particulate by sieving or other mechanisms. Collection efficiency pressure drop simultaneously increases as a particulate layer collect on the filter. Filters are intermittently cleaned by shaking the bag, pulsing air through the bag, or temporarily reversing the airflow direction.

Under ideal circumstances, baghouses can reduce particulate emissions by 99.9 percent and are generally deemed technically and economically feasible for many proposed material transfers and conveyors. However, baghouse control of coal and coke handling processes must be specifically designed and selected due to safety concerns. High concentrations of fine coal dust can be explosive and environments where sparking can occur (such as inside baghouses) pose a significant safety hazard. Baghouses and coal are known to create environments that lead to potential dust explosions. Although baghouses are technically feasible for the control of particulates from crushing, conveyor transferring, silo storage, and railcar loading of coal, the safety concerns associated with the operation of baghouses in the process pose enough risk that the Department has determined they can be eliminated from further consideration.

The following information summarized in the table below was submitted by OCC as part of their BACT demonstration in MAQP 5106-00. It summarizes the remaining available control alternatives according to their respective control effectiveness:

Technology	**Control Efficiency**	**Ranking**
Fogging Dust Suppression System	95 to 99%	1
Foam Dust Suppressant	95 to 99%	1
Passive Enclosure Containment System (PECS)	95 to 99%	1
Wet Dust Suppression (Water Spray)	≥50%	3
Enclosure	50 to 90% (varies with degree of enclosure)	4
Best Operating Practices (BOPs)	Base case	--

Fogging dust suppression systems, foam dust suppressant and PECS all have control efficiencies varying from 95 to 99%. As mentioned above, fogging dust suppression systems are currently in use at other coal mines near the proposed OCC mine site. OCC has proposed to use fogging dust suppression systems combined with enclosures and best operating practices to achieve the desired control efficiencies from crushing, conveyor transferring, silo storage and railcar loading of coal. Since OCC has selected a control technology with the highest ranking control efficiency, no further analysis is required.

<u>BACT Determination – control of particulates from crushing, conveyor transferring, silo storage, and railcar loading of coal:</u>

Based on the above analysis and information, the Department concurs with OCC that the use of a fogging dust suppression system in addition to utilizing enclosures and best operating practices constitutes BACT for the operation of crushing, conveyor transferring, silo storage, and railcar loading of coal.

B. <u>BACT for Particulate (PM, PM10 and PM2.5) Emissions from Overburden and Coal Drilling</u>

Once topsoil is removed at the OCC mine, overburden and coal layers are drilled to provide area for explosives to be placed for future blasting. Add-on control technology is potentially available for drilling operations.

The following list comprises the available technologies for controlling particulate emissions from overburden and coal drilling:

No Add-on Control
This is the base case for proposed new sources.

Enclosure – Drill Platform Shroud
Enclosure technology employs structural placement to shelter material from wind entrainment and to prevent suspended material from escaping the drilling area. Enclosures can either fully or partially surround the source. Most drilling platforms provide partial enclosure through the use of a drill platform shroud or a skirt made of flexible material that hangs from the underside of the drill platform and surrounds the drill hole. The shroud enclosure contains the particulate dust that becomes lofted during drilling.

Wet Dust Suppression Systems
Wet drilling systems pump water into the bailing air from a water tank mounted on the drill. Water droplets in the bailing air trap dust particles as they travel up the annular space of the drilled hole, thus controlling dust as the air bails particulate from the hole. Emissions are reduced through agglomerate formation by combining small dust particles with larger aggregate or with liquid droplets.

Wet dust suppression systems are generally capable of controlling particulate emissions from mine drilling, however due to the fact that the OCC mine will operate in a relatively cold climate, wet dust suppression would be problematic during freezing weather. Serious drawbacks within the system occur when ambient temperatures drop below freezing because the system relies on water to control particulate emissions. Additional and potentially extreme operational and engineering efforts would be required to prevent freezing with the system throughout the winter months. Due to climatic issues, the Department has determined that wet dust suppression systems can be eliminated from further consideration for the control of particulates from overburden and coal drilling.

Dry Dust Collection Systems
Dry dust collection systems typically include the operation of a drill platform shroud, a drill stem seal and a dust collector. The shroud provides an enclosure around the area where the drill stem enters the ground and the enclosure is ducted to a dust collector. The dust collector fan creates a negative pressure inside the enclosure that captures dust as it exits the hole during drilling. The dust is removed in the collector and clean air is exhausted through the fan.

An advantage of the dry dust collection system is that it does not require the use of any expendable material such as water or chemical surfactant. As a result, the control technology can be operated at any outside temperature since there is no risk that water within the system will freeze. However, dry dust collection systems are expensive to install and maintain. The control system must be properly maintained to ensure maximum performance. Additionally, the system requires electrical power that is likely to be provided by a diesel generator to run the fan and dust collection system. This would result in more emitting points at OCC.

Most importantly is the safety hazard associated with the collection of dry coal dust. The dry collection system creates an environment susceptible to potential coal dust explosions. The dry dust collection systems are located on the drilling platform in close proximity to the drilling operator and can therefore place the operator in direct danger from potential explosions or fires. Due to these safety issues, the Department has determined that dry dust collection systems can be eliminated from further consideration for the control of particulates from overburden and coal drilling.

The following information summarized in the table below was submitted by OCC as part of their BACT demonstration in MAQP 5106-00. It summarizes the remaining available control alternatives according to their respective control effectiveness:

Technology	Control Efficiency	Ranking
Enclosure – Drill Platform Shroud	Up to 90% (varies with degree of shroud seal)	1
Best Operating Practices (BOPs)	Base case	2

Drill platform shroud enclosures provide an effective solution for controlling particulates generated from the drilling of overburden and coal and are not associated with the safety hazards present in using dry dust collection systems. The level of control efficiency depends on the level of enclosure, therefore the shroud height or the distance between the ground and the bottom of the shroud should be kept as low as possible in order to achieve maximum control efficiency.

BACT Determination – control of particulates from overburden and coal drilling:

Based on the above analysis and information, the Department concurs with OCC that the use of a drill platform shroud enclosure constitutes BACT for the drilling of overburden and coal.

BACT Analyses for Sources Using Operational Standards, Work Practices, or Best Operating Practices

The following sections analyze BACT for OCC point and fugitive sources through the assessment of operational standards, work practices, and use of best operating practices (BOPs). The Department reviewed the analysis and methods presented, as well as previous BACT determinations to formulate a BACT conclusion. The following control options have been selected as constituting BACT for each identified emission source:

A. BACT for Gaseous and Particulate Emissions from Explosives Detonation/Blasting

Explosives will be used for the blasting of overburden and coal within the OCC mine and will result in the release of gaseous and particulate emissions.

Explosives

OCC will use emulsion and a mixture of ammonium nitrate and fuel oil (ANFO) for the blasting of overburden and coal. ANFO is a reliable explosive that is relatively easy to use, highly stable until detonation and low cost. In contrast, ammonium nitrate is water soluble and adsorbed water interferes with the explosive function of ANFO. Therefore, emulsion may be preferred in wet mining areas since it is more water resistant than ANFO. OCC will use a combination of 70% ANFO and 30% emulsion for blasting processes. Add-on controls do not exist for explosives detonation. OCC will employ various operational controls for mine blasting operations. Additionally, the fuel oil used in the blasting agent will meet ultra-low sulfur specifications (15 ppm).

Blasting Techniques
Various blasting techniques will be utilized at OCC and will depend on the material and preferred movement of debris and flyrock. Gaseous emissions will result from the detonation of the chemical compounds within the explosives. Particulate emissions will result from the blasting and loosening of compacted coal and overburden material. Although blasting generates a large amount of dust, the operation occurs infrequently enough that it is not considered to be a significant contributor of particulate emissions. Best operational practices and blasting techniques will be utilized for reducing gaseous and particulate emissions from the blasting of both overburden material and coal.

Overburden Blasting
After topsoil has been removed from an excavation area, overburden is drilled and blasted in order to loosen the material for future handling and removal.

Conventional overburden blasting and overburden cast blasting will occur at the OCC mine. Conventional overburden blasting minimizes the travel of debris from blasts in order to facilitate organized removal by truck and shovel as well as to aid in reducing suspended particulate emissions. This method employs sequential detonation and will be designed to minimize flyrock. Overburden cast blasting is designed to blast the overburden material into a previously excavated and mined area. Cast blasting also utilizes sequential detonation and blasts will be designed to direct the overburden into adjacent vacant pit areas while minimizing flyrock.

Coal Blasting
Once the overburden is blasted and removed, coal extraction can take place through further blasting and coal removal techniques.

Detonations within the coal layer will be designed to minimize the travel of debris from blasts in order to reduce suspended particulate emissions and to facilitate organized removal by truck and shovel. This method will employ sequential detonation and will be designed to minimize flyrock. Coal blasting methods will also ensure that blasting holes are drilled to a diameter that allows for proper fragmentation during blasting.

Proposed Operational Controls
The use of common BOPs is the industry standard method for minimizing blasting emissions. OCC will use the following blasting BOPs:

- Optimize drill-hole size. Optimizing drill-hole size will result in effective blasting and reduce the number of blasts needed to achieve the desired effect.
- Optimize drill hole placement and utilization of sequential detonation. Optimizing drill hole placement will ensure that all material is successfully detonated and additional explosives are not needed in order to achieve complete fragmentation.
- Optimize usage of explosive. Proper usage of explosive prevents the detonation of unnecessary explosive and resulting excess emissions.
- Mine planning will result in blasting that is conducted in a manner that prevents overshooting and minimizes the area to be blasted.
- Minimized retention time between loading blasting holes with emulsion and detonation will increase the efficiency of the explosive.

OCC provided estimated potential to emit calculations in the application for MAQP 5106-00 that will result from blasting and describe the basis for those estimations. However, it is difficult to assign emission rates using these values due to the uncontrollable variables inherent in the blasting process and the difficulty of measuring emission rates for a compliance demonstration. Therefore, BACT for reducing blasting emissions is better expressed as a work practice condition to use proper blasting techniques, proper explosive selection, optimized application of explosives, and the utilization of best operating practices.

BACT Determination – control of gaseous and particulate emissions from explosives detonation/blasting:

Based on the above analysis and information, the Department concurs with OCC that the use of work practice conditions including the use proper blasting techniques, proper explosive selection, optimized application of explosives, and the utilization of best operating practices as well as using ANFO that meets ultra-low sulfur specifications constitutes BACT for control of gaseous and particulate emissions from explosives detonation/blasting.

B. BACT for Particulate Emissions from Mine Activity- Material Handling and Removal

Material removal comprises three steps: topsoil removal, overburden and coal. BACT determinations for these mine activities are the equivalent for all material types.

Topsoil is removed first and is either replaced in a reclaimed area for immediate re-vegetative growth or stored in a pile for further reclamation. Scrapers load the topsoil during the removal and dumping processes and haul the topsoil to its predetermined location. After the topsoil is removed, overburden is drilled and blasted and material is handled and removed with dozers, trucks, shovels and draglines. Once the overburden is removed, the coal extraction can take place through further blasting and coal removal techniques.

BACT Determination – control of particulate emissions from material handling and removal:

BACT for road grading, material handling and removal processes can be accomplished by the use of BOPs such that these sources are in compliance with visible and particulate emissions standards of ARM.17.8.304 and ARM 17.8.308. BOPs are to be utilized in order to reduce particulate emission for all road grading, material removal, hauling and dumping processes of topsoil, overburden and coal. BOPs generally include minimizing material handling steps through careful mine planning and using processes that minimize fall distance on all material handling activities.

C. BACT for Particulate Emissions from Disturbed Acreage Wind Erosion

Mine reclamation will occur throughout the life of the mine and will consist of spoil grading, topsoil placement and re-vegetation methods. Topsoil and overburden that has been removed from a new section of the mine is moved and 1) used to refill an already excavated and mined section, or 2) stored for future reclamation use. Thus, the topsoil and overburden are strategically moved throughout the mine.

Disturbed Acreage (within a year of reuse) – Pits, Peaks, Graded Spoil and Topsoil Placement OCC will follow traditional mine reclamation processes by reclaiming sections of the mine with topsoil and overburden in accordance with a scheduled and strategized mining plan. This is designed to optimize material hauling and transferring and will serve to limit disturbed areas subject to wind erosion.

Moreover, undisturbed piles will form a crust which will act as a natural barrier and reduces the influence of wind erosion on storage stockpiles. In order to ensure control efficiency, storage piles and graded areas will remain undisturbed until the area is ready for final reclamation activities. Best operating practices include efficient storing and piling of material to allow proper crusting, piling of material to a reasonable height, and orienting stockpiles to minimize area cross-sectional to prevailing winds. Additionally, OCC will add water, as necessary, to control emissions from wind erosion.

Disturbed Acreage (beyond a year of reuse) – Areas Top soiled and Seeded for Vegetation Growth Once overburden and topsoil are relocated for final reclamation use, the overburden piles are smoothed and contoured, topsoil is placed on the graded areas, and the land is prepared for re-vegetation by furrowing, mulching and other methods. The soil is prepared and seeded to accomplish re-vegetation and final reclamation of mined areas. Fugitive particulate control efficiency will increase as more vegetation returns to the area over time and eventually eliminate particulate emissions from the reclaimed land.

The Department has typically considered these types of control methods as BACT for fugitive dust sources in Montana. Guidance provided by the Department indicates that re-vegetation to rehabilitated land with one to two years of vegetative growth provides a 90% control efficiency of fugitive particulate emissions and 100% control efficiency for reclaimed land that has greater than two years of vegetative growth.

<u>BACT Determination – control of particulate emissions from disturbed acreage wind removal:</u>

BACT for controlling particulate emissions from disturbed acreage wind removal can be accomplished by utilizing established land reclamation and re-vegetative growth to control fugitive emissions in order to maintain compliance with ARM.17.8.304 and ARM 17.8.308. BOPs including efficient storing and piling of material, building storage piles to a reasonable height, and orienting stockpiles to reduce erosion caused by prevailing winds also constitutes BACT for the control of particulate emissions from disturbed acreage wind removal.

D. BACT for Fugitive Particulate Emissions from Roadways

Particulate emissions from fugitive road dust will result from vehicle and equipment travel on roadways within the OCC mine site. Roadways at OCC have been categorized into permanent haul roads, temporary haul roads and mine access roads for purposes of calculating emissions and determining BACT. Each road type serves a unique purpose at the mine and requires varying degrees of control due to usage, permanence and environmental access. However, all three categories can be addressed with the same unpaved road dust control techniques.

OCC shall develop a fugitive dust control plan that will be used for maintaining compliance with ARM 17.8.308. Elements of the plan shall include, but not be limited to, the conditions established in MAQP 5106-00 Sections II.A.1 through II.A.7 .

The following table provided by OCC in the application for MAQP 5106-00 summarizes the control technologies for roadway fugitive emissions:

Technology	Description
No Add-on Control	This is the base case for proposed roadways.
Vehicle Restrictions	Restrict vehicle speed to reduce fugitive dust and increase distance between vehicles.
Surface Improvement	Improve roadway surfaces by paving with asphaltic concrete or other additives.
Surface treatment	Wet suppression or surface treatment with chemical dust suppressants

Permanent Haul Roads
Permanent haul roads will primarily be used at the OCC mine to move coal from the bench face to the coal dump. These roads vary in both silt and moisture content and produce a varying degree of fugitive road dust emissions.

Initially, surface improvement using asphaltic concrete appears to be the most desirable roadway fugitive dust control system. It offers a high coefficient of road adhesion and creates a surface that reduces dust problems. However, using this road composition has seasonal disadvantages in climates with snow or freezing rain. Asphaltic treatments create a smooth surface that offers little resistance to the development of ice or snow causing the roadway to become extremely slick. This could constitute a serious threat to operational safety in mining areas where rapid and frequent freeze conditions prevail.

The Design of Surface Haulage Roads Manual further states that "the high cost of asphaltic road surface severely restricts its feasibility on roads of short life. In most cases, a 4 inch layer of road surface may be accepted as the minimum requirement road depth due to the extreme weight of vehicles constantly traveling haul road surfaces. The cost of constructing a 4 in thick layer ranges from $46 to $57 per square yard for labor, equipment, and material. Using the higher figure for a 5 mile road 30 feet wide would necessitate an expenditure of $444,000 for paving alone." Additionally, a sufficient sub-base and base course must be established proper to placing the asphalt. The necessary base course is an additional expense to be considered in total construction cost.

The Design of Surface Haulage Roads Manual continues to state that it would be impractical to use a permanent surface improvement control such as asphaltic concrete in areas where haul roads are subject to relocation or must accommodate heavy tracked vehicles. Major traffic on haul roads will consist of heavy machinery and certain roadways will be relocated throughout the life of the mine. For these reasons, the Department has determined surface improvement using asphaltic concrete can be eliminated from further consideration.

The utilization of magnesium chloride ($MgCl_2$) or other similarly effective chemical dust suppressants combined with water as a surface treatment offers high control efficiencies for particulates from roadway usage. Chemical dust suppressants control emissions by changing the physical characteristics of the existing road surface material. After several applications, the chemical dust suppressant will form a hardened surface that binds particulate together. A road treated with $MgCl_2$ will resemble a non-uniformly flat, paved road. Water sprays will increase the moisture content of roadway material and help to conglomerate particles, therefore reducing the likelihood that they will become suspended.

Enforced vehicle restrictions, such as limitations on vehicle speeds, will also help OCC to maintain compliance with ARM 17.8.304 and ARM 17.8 308.

Temporary Haul Roads

Temporary haul roads will be used in conjunction with permanent haul roads at OCC to move coal from the bench face to the coal dump. These roads serve the same purpose as the permanent haul roads but will frequently change location throughout the life of the mine. Temporary haul roads also vary in both silt and moisture content and can produce a varying degree of fugitive road dust emissions.

The use of $MgCl_2$ on temporary haul roads is not a practical approach as changing the physical characteristics of the roadway surface is undesirable on a temporary road. The treatment will potentially inhibit future mining activities or the placement of future haul road locations. Water sprays are a better solution to increase the moisture content of roadway material in order to conglomerate particles and reduce fugitive particulate emissions.

Vehicle restrictions, enforced as necessary, will also control fugitive emission from temporary haul road travel.

Mine Access Roads

Mine access roads will be used at OCC for connection to the mining area and various industrial sites. These roads will primarily have a gravel surface and will experience very minimal usage by heavy machinery.

$MgCl_2$ will not be used at OCC for control of particulate emissions from mine access roads due to the location of these roads within the mine site. Mine access roads connect the main processing area of OCC to the mining and truck dumping sections by traversing Otter Creek. The risk for leaching chlorides into the local drainage basin is an undesirable negative environmental impact associated with the use $MgCl_2$. The risk is not present in regard to $MgCl_2$ use on permanent haul roads because of their shielded location within the

mine site. Additionally, mine access roads will not experience heavy use and will experience far less overall usage than the permanent and temporary haul roads so the structural support provided by applying $MgCl_2$ would be unnecessary.

The use of water sprays and vehicle restrictions will act to control fugitive emissions from mine access road travels. These measures, as well as available reasonable precautions, will maintain compliance with ARM.17.8.304 and ARM.17.8.308.

<u>BACT Determination – control of fugitive particulate emissions from roadways:</u>
BACT for controlling fugitive particulate emissions from permanent roadways can be accomplished by utilizing $MgCl_2$ or similarly effective chemical dust suppressants, water sprays, and vehicle restrictions. Water sprays, vehicle restrictions such as speed and reasonable precaution requirements prescribed within ARM 17.8.308 constitutes BACT for temporary haul roads and mine access roads.

III. Emission Inventory

Emission sources and their impacts on ambient air quality will change throughout the life of the mine. The main variables affecting emissions calculations for the sources at the mine are varying depths of coal, amount of overburden and varying haul road lengths. The emissions inventory reflects emissions calculated at the requested production rate of 35 million tons per year. In order to determine the maximum air quality impacts, OCC identified operational phases when mining activities have the potential to achieve 35 million tons of coal and are near the mine property boundary where ambient air impacts are the greatest. Thirty-five million tons per year of coal are expected to be produced in year 7 through three-quarters of year 8. Likewise, 35 million tons of coal is expected to be produced in years 16, 17 and through three-quarters of year 18.

The emitting sources from these two time periods were calculated and combined to represent a single, maximum emissions year for purposes of estimating project potential to emit and to model maximum ambient air quality impacts. Of these two time periods, the highest emission rates for all criteria pollutants occur during the years 16, 17 and 75% of 18.

Projected Annual Production

Inventory Year	Coal Removal (tons/y)
1	11,647,705
2	18,480,509
3	20,590,779
4	19,760,767
5	19,271,318
6	19,251,439
7	19,771,219
8	19,908,103
9	19,533,544
10	18,841,637
11	17,797,082
12	17,553,709
13	17,331,472
14	17,106,879

15	15,355,564
16	16,392,949
17	13,296,930
18	6,969,715
19*	4,556,081

*Split production between Tracts 2 and 3

Mine Production Rates to Achieve 35 Million TPY

Group	Production 1st Year	Production 2nd Year	Production 3rd Year	Fraction of Final Year to Achieve 35 million tons/year Mined Coal
Years 7 and 8	19,771,219	19,908,103	NA	76.50%
Years 16, 17, and 18	16,392,949	13,296,930	6,969,715	76.19%

The following table summarizes the maximum potential fugitive emission rates resulting from a facility-wide production rate of 35 million tons/year:

Inventory Year	PM Fugitive (tpy)	PM10 Fugitive (tpy)	PM2.5 Fugitive (tpy)	NOx Fugitive (tpy)	SO2 Fugitive (tpy)	CO Fugitive (tpy)	VOCs Fugitive (tpy)	CO2 Fugitive (tpy)	HAPS Fugitive (tpy)
Max. Coal Production - 35 Million Tons - Years 7 and 8	6,630.0	1,733.7	188.1	932.3	2.9	2,229.7	123.5	834,203.4	1.0
Max. Coal Production - 35 Million Tons - Years 16, 17, and 18:	8,421.6	2,237.5	241.2	1,035.4	4.0	2,565.7	164.0	836,199.3	1.0
1	1,602.0	462.6	53.9	249.7	1.4	474.2	57.8	278,442.0	0.33
2	2,380.5	656.8	75.2	405.6	1.6	831.1	68.0	440,607.8	0.53

Inventory Year	PM Fugitive (tpy)	PM10 Fugitive (tpy)	PM2.5 Fugitive (tpy)	NOx Fugitive (tpy)	SO2 Fugitive (tpy)	CO Fugitive (tpy)	VOCs Fugitive (tpy)	CO2 Fugitive (tpy)	HAPS Fugitive (tpy)
3	2,808.0	707.8	79.1	499.6	1.6	1,121.8	71.1	490,691.8	0.59
4	3,108.4	796.2	87.7	500.8	1.6	1,158.1	69.9	470,992.8	0.57
5	3,310.0	857.1	93.6	497.2	1.6	1,162.1	69.1	459,376.4	0.55
6	3,441.4	889.4	96.9	504.5	1.6	1,191.6	69.1	458,904.6	0.55
7	3,677.4	958.9	104.2	524.8	1.6	1,252.0	69.9	471,240.8	0.57
8	3,859.8	1,012.9	109.7	532.7	1.6	1,278.1	70.1	474,489.5	0.57
9	3,979.4	1,046.7	113.1	535.5	1.6	1,303.4	69.5	465,600.0	0.56
10	4,060.4	1,071.1	115.4	532.2	1.6	1,316.2	68.5	449,178.6	0.54
11	3,983.5	1,050.5	113.0	510.0	1.6	1,268.3	66.9	424,387.8	0.51
12	3,953.5	1,036.9	111.5	516.4	1.6	1,302.6	66.6	418,611.7	0.50
13	4,079.5	1,076.1	115.4	519.9	1.6	1,324.9	66.3	413,337.3	0.50
14	4,097.2	1,076.5	115.4	511.3	1.6	1,299.2	65.9	408,006.9	0.49
15	3,723.8	980.7	105.2	455.9	1.5	1,147.2	63.3	366,442.2	0.44
16	3,908.8	1,025.4	109.9	493.9	1.6	1,257.8	64.9	391,062.9	0.47
17	2,963.6	785.2	85.0	382.2	1.5	934.4	60.3	317,583.7	0.38
18	2,033.3	560.4	60.7	209.0	1.3	490.4	50.9	167,417.2	0.20
19	1,796.2	484.9	52.5	146.2	1.2	333.8	47.4	110,133.4	0.13

The following table summarizes the maximum potential point source emission rates resulting from a facility-wide production rate of 35 million tons/year:

Inventory Year	PM Point (tpy)	PM10 Point (tpy)	PM2.5 Point (tpy)	NOx Point (tpy)	SO2 Point (tpy)	CO Point (tpy)	VOCs Point (tpy)	CO2 Point (tpy)	HAPS Point (tpy)
1	7.7	2.4	0.3	0.0	0.0	0.0	0.0	0.0	0.00
2	11.7	3.8	0.4	0.0	0.0	0.0	0.0	0.0	0.00
3	13.2	4.2	0.5	0.0	0.0	0.0	0.0	0.0	0.00
4	12.7	4.1	0.5	0.0	0.0	0.0	0.0	0.0	0.00
5	12.5	4.0	0.4	0.0	0.0	0.0	0.0	0.0	0.00
6	12.5	4.0	0.4	0.0	0.0	0.0	0.0	0.0	0.00
7	13.0	4.1	0.5	0.0	0.0	0.0	0.0	0.0	0.00
8	13.1	4.1	0.5	0.0	0.0	0.0	0.0	0.0	0.00
9	13.0	4.1	0.5	0.0	0.0	0.0	0.0	0.0	0.00
10	12.6	3.9	0.4	0.0	0.0	0.0	0.0	0.0	0.00
11	12.0	3.7	0.4	0.0	0.0	0.0	0.0	0.0	0.00
12	11.9	3.7	0.4	0.0	0.0	0.0	0.0	0.0	0.00

Inventory Year	PM Point (tpy)	PM10 Point (tpy)	PM2.5 Point (tpy)	NOx Point (tpy)	SO2 Point (tpy)	CO Point (tpy)	VOCs Point (tpy)	CO2 Point (tpy)	HAPS Point (tpy)
13	11.8	3.6	0.4	0.0	0.0	0.0	0.0	0.0	0.00
14	11.6	3.6	0.4	0.0	0.0	0.0	0.0	0.0	0.00
15	10.4	3.2	0.4	0.0	0.0	0.0	0.0	0.0	0.00
16	11.1	3.4	0.4	0.0	0.0	0.0	0.0	0.0	0.00
17	8.9	2.8	0.3	0.0	0.0	0.0	0.0	0.0	0.00
18	4.6	1.4	0.2	0.0	0.0	0.0	0.0	0.0	0.00
19	3.1	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.00

The following tables list the emissions calculations for activities at the mine and represent maximum emissions at 35 million tpy. The general equation for emission calculations is:

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

where:

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

Activity Description	PM								
	PM Emission Factor			Controlled PM Emission Factor			Activity Rate		PM Emissions
	PM	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Topsoil Removal	0.0580	lb/ton of topsoil handled	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4 for TSP)	-	0.06	lb/ton of topsoil handled	3,230,911.00	ton/year	93.70
Topsoil Dumping	0.0020	lb/ton of topsoil handled	AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) as recommended in AP-42 on page 11.9.4 Western Surface Coal Mining (10/98)	-	0.00	lb/ton of topsoil handled	3,230,911.00	ton/year	3.24
Overburden Drilling	1.3000	lb/hole	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4 for TSP)	0.90	0.13	lb/hole	31,170.55	holes/year	2.03
Overburden Blasting - Truck/Shovel	205.7571	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP)	-	205.76	lb/blast	387.93	blasts/year	39.91
Overburden Blasting - Cast Blasting	1,252.1981	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP)	-	1,252.20	lb/blast	76.36	blasts/year	47.81
Overburden Removal by Dragline	5.6416	lb/100 cy	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP)	-	5.64	lb/100 cy	593,916.90	100 cubic yards/year	1,675.34
Overburden Handling by Truck/Shovel	0.0012	lb/ton overburden handled	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	-	0.00	lb/ton overburden handled	64,655,272.61	ton/yr	40.06
Overburden Dumping	0.0012	lb/ton of overburden handled	AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) as recommended in AP-42 on page 11.9.4 Western Surface Coal Mining (10/98)	-	0.00	lb/ton of overburden handled	68,544,161.50	ton/yr	42.47
Overburden Handling by Dozer	3.9407	lb/hr	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP)	-	3.94	lb/hr	16,571.31	hr/yr	32.65

Activity Description	PM								
	PM Emission Factor			Controlled PM Emission Factor			Activity Rate		PM Emissions
	PM	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Permanent Haul Roads - Travel	15.7300	lb/VMT	MDEQ memo 4/25/1994 for silt content and AP-42 13.2.2 Unpaved Roads 11/2006 as recommended by AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for vehicle traffic)	0.80	3.15	lb/VMT	2,373,037.07	miles/year - years 16, 17, and portion of 18.	3,732.79
Temporary Haul Roads - Travel	15.7300	lb/VMT	MDEQ memo 4/25/1994 for silt content and AP-42 13.2.2 Unpaved Roads 11/2006 as recommended by AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for vehicle traffic)	0.75	3.93	lb/VMT	302,608.22	miles/year	595.00
Grading	5.3700	lb/VMT	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP)	-	5.37	lb/VMT	171,778.20	VMT/yr	461.22
Access Roads - Unpaved	2.9460	lb/VMT	AP-42 Section 13.2, (12/03) Unpaved Roads	0.75	0.74	lb/VMT	2,803,291.14	miles/year	1,032.31
Coal Drilling	0.2200	lb/hole	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4 for TSP)	0.90	0.02	lb/hole	15,290.52	holes/year	0.17
Coal Blasting	156.5248	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP)	-	156.52	lb/blast	275.23	blasts/year	21.54
Coal Removal	0.0012	lb/ton	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	-	0.00	lb/ton	35,000,000.00	tons/year	21.69
Coal Dumping - Truck Dump	0.0012	lb/ton	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	0.98	0.00	lb/ton	35,000,000.00	tons/year	0.54
Primary Crusher	0.0200	lb/ton	WebFIRE SCC 30501010 Coal Mining, Cleaning, and Material Handling: Crushing	0.98	0.00	lb/ton	35,000,000.00	tons/year	8.75

Activity Description	PM								
	PM Emission Factor			Controlled PM Emission Factor			Activity Rate		PM Emissions
	PM	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Secondary Crusher	0.0200	lb/ton	WebFIRE SCC 30501010 Coal Mining, Cleaning, and Material Handling: Crushing	0.98	0.00	lb/ton	35,000,000.00	tons/year	8.75
Conveyers	0.0012	lbs/ton/drop	AP-42 13.2.4 Aggregate Handling and Storage Piles Equation (1) as recommended in AP-42 11.9 Western Surface Coal Mining (10/98) page 11.9-4.	0.98	0.00	lbs/ton/drop	35000000* 6	tons/year* drops	3.25
Portable/Mobile Equipment - Diesel Engines	0.0032	lb/gallons	Tier 4 Standards - Worst case for all engines except gensets > 900 kW	-	0.00	lb/gallons	8,000,000.00	gal/year, estimated	12.94
Portable/Mobile Equipment - Gasoline Engines	13.0000	lb/1000 gallons	AP-42 Section 3.3 (10/96) Table 3.3-1 (Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines)	-	13.00	lb/1000 gallons	552.38	1000 gal/yr	3.59
Train Loadout	0.0012	lb/ton	AP-42 13.2.4 Aggregate Handling and Storage Piles Equation (1) as recommended in AP-42 11.9 Western Surface Coal Mining (10/98) page 11.9-4.	0.98	0.00	lb/ton	35,000,000.00	tons/year	0.54
Disturbed Acres - Pits, Peaks, Soil Stripping	760.0000	lb/acre/year	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4)	0.30	532.00	lb/acre/year	485.49	acres	129.14
Disturbed Acres - Partial, (<1 Yr)	760.0000	lb/acre/year	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4)	0.30	532.00	lb/acre/year	421.74	acres	112.18
Disturbed Acres - Partial, (>1 Yr)	760.0000	lb/acre/year	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4)	0.90	76.00	lb/acre/year	460.85	acres	17.51
Disturbed Acres - Complete, (>2 Yr)	760.0000	lb/acre/year	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4)	0.90	76.00	lb/acre/year	513.13	acres	19.50

	PM10								
Activity Description	PM_{10} Emission Factor			Controlled PM_{10} Emission Factor			Activity Rate		PM_{10} Emissions
	PM_{10}	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Topsoil Removal	0.029	lb/ton of topsoil handled	Assumes PM10/PM ratio = 0.5	-	0.03	lb/ton of topsoil handled	3230911	ton/year	46.85
Topsoil Dumping	0.001	lb/ton of topsoil handled	AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) as recommended in AP-42 on page 11.9.4 Western Surface Coal Mining (10/98)	-	0.00	lb/ton of topsoil handled	3230911	ton/year	1.53
Overburden Drilling	0.160	lb/hole	FIRE - This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003.	0.90	0.02	lb/hole	31171	holes/year	0.25
Overburden Blasting - Truck/Shovel	106.994	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP and PM10/TSP ratio of 0.52)	-	106.99	lb/blast	388	blasts/year	20.75
Overburden Blasting - Cast Blasting	651.143	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP and PM10/TSP ratio of 0.52)	-	651.14	lb/blast	76	blasts/year	24.86
Overburden Removal by Dragline	1.021	lb/100 cy	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for PM15 and PM10/PM15 ratio of 0.75)	-	1.02	lb/100 cy	593917	100 cubic yards/year	303.06
Overburden Handling by Truck/Shovel	0.001	lb/ton overburden handled	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	-	0.00	lb/ton overburden handled	64655273	ton/yr	18.95

Activity Description	PM10								
	PM_{10} Emission Factor			Controlled PM_{10} Emission Factor			Activity Rate		PM_{10} Emissions
	PM_{10}	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Overburden Dumping	0.001	lb/ton of overburden handled	AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) as recommended in AP-42 on page 11.9.4 Western Surface Coal Mining (10/98)	-	0.00	lb/ton of overburden handled	68544162	ton/yr	20.09
Overburden Handling by Dozer	0.753	lb/hr	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for PM15 and PM10/PM15 ratio of 0.75)	-	0.75	lb/hr	16571	hr/yr	6.24
Permanent Haul Roads - Travel	4.190	lb/VMT	MDEQ memo 4/25/1994 for silt content and AP-42 13.2.2 Unpaved Roads 11/2006 as recommended by AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for vehicle traffic)	0.80	0.84	lb/VMT	2373037	miles/year - years 16, 17, and portion of 18.	994.30
Temporary Haul Roads - Travel	4.190	lb/VMT	MDEQ memo 4/25/1994 for silt content and AP-42 13.2.2 Unpaved Roads 11/2006 as recommended by AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for vehicle traffic)	0.75	1.05	lb/VMT	302608	miles/year	158.49
Grading	1.540	lb/VMT	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for PM15 and PM10/PM15 ratio of 0.6)	-	1.54	lb/VMT	171778	VMT/yr	132.27
Access Roads - Unpaved	0.800	lb/VMT	AP-42 Section 13.2, (12/03) Unpaved Roads	0.75	0.20	lb/VMT	2803291	miles/year	280.33
Coal Drilling	0.028	lb/hole	per WebFIRE (3/1990) for SCC 30501034. This factor was present in AIRS Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants, March 1990, EPA 450/4-90-003.	0.90	0.00	lb/hole	15291	holes/year	0.02

Activity Description	PM10								
	PM_{10} Emission Factor			Controlled PM_{10} Emission Factor			Activity Rate		PM_{10} Emissions
	PM_{10}	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Coal Blasting	81.393	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP and PM10/TSP ratio of 0.52)	-	81.39	lb/blast	275	blasts/year	11.20
Coal Removal	0.001	lb/ton	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	-	0.00	lb/ton	35000000	tons/year	10.26
Coal Dumping - Truck Dump	0.001	lb/ton	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	0.98	0.00	lb/ton	35000000	tons/year	0.26
Primary Crusher	0.006	lb/ton	WebFIRE SCC 30501010 Coal Mining, Cleaning, and Material Handling: Crushing	0.98	0.00	lb/ton	35000000	tons/year	2.63
Secondary Crusher	0.006	lb/ton	WebFIRE SCC 30501010 Coal Mining, Cleaning, and Material Handling: Crushing	0.98	0.00	lb/ton	35000000	tons/year	2.63
Conveyers	0.001	lbs/ton/drop	AP-42 13.2.4 Aggregate Handling and Storage Piles Equation (1) as recommended in AP-42 11.9 Western Surface Coal Mining (10/98) page 11.9-4.	0.98	0.00	lbs/ton/drop	35000000* 6	tons/year* drops	1.54
Portable/Mobile Equipment - Diesel Engines	0.003	lb/gallons	Tier 4 Standards - Worst case for all engines except gensets > 900 kW	-	0.00	lb/gallons	8000000	gal/year, estimated	12.94
Portable/Mobile Equipment - Gasoline Engines	13.000	lb/1000 gallons	AP-42 Section 3.3 (10/96) Table 3.3-1 (Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines)	-	13.00	lb/1000 gallons	552	1000 gal/yr	3.59

Activity Description	PM10								
	PM_{10} Emission Factor			Controlled PM_{10} Emission Factor			Activity Rate		PM_{10} Emissions
	PM_{10}	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Train Loadout	0.001	lb/ton	AP-42 13.2.4 Aggregate Handling and Storage Piles Equation (1) as recommended in AP-42 11.9 Western Surface Coal Mining (10/98) page 11.9-4.	0.98	0.00	lb/ton	35000000	tons/year	0.26
Disturbed Acres - Pits, Peaks, Soil Stripping	380.000	lb/acre/year	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4)	0.30	266.00	lb/acre/year	485	acres	64.57
Disturbed Acres - Partial, (<1 Yr)	380.000	lb/acre/year	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4)	0.30	266.00	lb/acre/year	422	acres	56.09
Disturbed Acres - Partial, (>1 Yr)	380.000	lb/acre/year	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4)	0.90	38.00	lb/acre/year	461	acres	8.76
Disturbed Acres - Complete, (>2 Yr)	380.000	lb/acre/year	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-4)	0.90	38.00	lb/acre/year	513	acres	9.75

Activity Description	PM2.5								
	$PM_{2.5}$ Emission Factor			Controlled $PM_{2.5}$ Emission Factor			Activity Rate		$PM_{2.5}$ Emissions
	$PM_{2.5}$	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Topsoil Removal	0.0029	lb/ton of topsoil handled	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10 for Construction	-	0.00	lb/ton of topsoil handled	3,230,911.00	ton/year	4.68
Topsoil Dumping	0.0001	lb/ton of topsoil handled	AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) as recommended in AP-42 on page 11.9.4 Western Surface Coal Mining (10/98)	-	0.00	lb/ton of topsoil handled	3,230,911.00	ton/year	0.23

	PM2.5								
Activity Description	$PM_{2.5}$ Emission Factor			Controlled $PM_{2.5}$ Emission Factor			Activity Rate		$PM_{2.5}$ Emissions
	$PM_{2.5}$	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Overburden Drilling	0.0160	lb/hole	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10 for Construction	0.90	0.00	lb/hole	31,170.55	holes/year	0.02
Overburden Blasting - Truck/Shovel	6.1727	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP and PM10/TSP ratio of 0.03)	-	6.17	lb/blast	387.93	blasts/year	1.20
Overburden Blasting - Cast Blasting	37.5659	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP and PM10/TSP ratio of 0.03)	-	37.57	lb/blast	76.36	blasts/year	1.43
Overburden Removal by Dragline	0.0959	lb/100 cy	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for PM2.5/TSP ratio of 0.017)	-	0.10	lb/100 cy	593,916.90	100 cubic yards/year	28.48
Overburden Handling by Truck/Shovel	0.0001	lb/ton overburden handled	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	-	0.00	lb/ton overburden handled	64,655,272.61	ton/yr	2.87
Overburden Dumping	0.0001	lb/ton of overburden handled	AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) as recommended in AP-42 on page 11.9.4 Western Surface Coal Mining (10/98)	-	0.00	lb/ton of overburden handled	68,544,161.50	ton/yr	3.04
Overburden Handling by Dozer	0.4138	lb/hr	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for PM2.5/TSP ratio of 0.105)	-	0.41	lb/hr	16,571.31	hr/yr	3.43
Permanent Haul Roads - Travel	0.4200	lb/VMT	MDEQ memo 4/25/1994 for silt content and AP-42 13.2.2 Unpaved Roads 11/2006 as recommended by AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for vehicle traffic)	0.80	0.08	lb/VMT	2,373,037.07	miles/year - years 16, 17, and portion of 18.	99.67

Activity Description	PM2.5								
	$PM_{2.5}$ Emission Factor			Controlled $PM_{2.5}$ Emission Factor			Activity Rate		$PM_{2.5}$ Emissions
	$PM_{2.5}$	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Temporary Haul Roads - Travel	0.4200	lb/VMT	MDEQ memo 4/25/1994 for silt content and AP-42 13.2.2 Unpaved Roads 11/2006 as recommended by AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for vehicle traffic)	0.75	0.11	lb/VMT	302,608.22	miles/year	15.89
Grading	0.1700	lb/VMT	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for PM2.5/TSP ratio of 0.031)	-	0.17	lb/VMT	171,778.20	VMT/yr	14.60
Access Roads - Unpaved	0.0800	lb/VMT	AP-42 Section 13.2, (12/03) Unpaved Roads	0.75	0.02	lb/VMT	2,803,291.14	miles/year	28.03
Coal Drilling	0.0028	lb/hole	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10	0.90	0.00	lb/hole	15,290.52	holes/year	0.00
Coal Blasting	4.6957	lb/blast	AP-42 11.9 Western Surface Coal Mining (7/98) (Table 11.9-1 for TSP and PM2.5/TSP ratio of 0.03)	-	4.70	lb/blast	275.23	blasts/year	0.65
Coal Removal	0.0001	lb/ton	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	-	0.00	lb/ton	35,000,000.00	tons/year	1.55
Coal Dumping - Truck Dump	0.0001	lb/ton	AP-42 11.9 Western Surface Coal Mining (7/98) and AP-42 13.2.4 Aggregate Handling and Storage Piles (11/06) Equation (1)	0.98	0.00	lb/ton	35,000,000.00	tons/year	0.04
Primary Crusher	0.0006	lb/ton	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10	0.98	0.00	lb/ton	35,000,000.00	tons/year	0.26

Activity Description	PM2.5								
	$PM_{2.5}$ Emission Factor			Controlled $PM_{2.5}$ Emission Factor			Activity Rate		$PM_{2.5}$ Emissions
	$PM_{2.5}$	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Secondary Crusher	0.0006	lb/ton	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10	0.98	0.00	lb/ton	35,000,000.00	tons/year	0.26
Conveyers	0.0001	lbs/ton/drop	AP-42 13.2.4 Aggregate Handling and Storage Piles Equation (1) as recommended in AP-42 11.9 Western Surface Coal Mining (10/98) page 11.9-4.	0.98	0.00	lbs/ton/drop	35000000* 6	tons/year* drops	0.23
Portable/Mobile Equipment - Diesel Engines	0.0032	lb/gallons	Tier 4 Standards - Worst case for all engines except gensets > 900 kW	-	0.00	lb/gallons	8,000,000.00	gal/year, estimated	12.94
Portable/Mobile Equipment - Gasoline Engines	13.0000	lb/1000 gallons	AP-42 Section 3.3 (10/96) Table 3.3-1 (Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines)	-	13.00	lb/1000 gallons	552.38	1000 gal/yr	3.59
Train Loadout	0.0001	lb/ton	AP-42 13.2.4 Aggregate Handling and Storage Piles Equation (1) as recommended in AP-42 11.9 Western Surface Coal Mining (10/98) page 11.9-4.	0.98	0.00	lb/ton	35,000,000.00	tons/year	0.04
Disturbed Acres - Pits, Peaks, Soil Stripping	38.0000	lb/acre/year	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10	0.30	26.60	lb/acre/year	485.49	acres	6.46
Disturbed Acres - Partial, (<1 Yr)	38.0000	lb/acre/year	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10	0.30	26.60	lb/acre/year	421.74	acres	5.61
Disturbed Acres - Partial, (>1 Yr)	38.0000	lb/acre/year	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10	0.90	3.80	lb/acre/year	460.85	acres	0.88

	PM2.5								
Activity Description	$PM_{2.5}$ Emission Factor			Controlled $PM_{2.5}$ Emission Factor			Activity Rate		$PM_{2.5}$ Emissions
	$PM_{2.5}$	Units	Emission Factor Reference	Control Efficiency	Rate	Units			[tons]
Disturbed Acres - Complete, (>2 Yr)	38.0000	lb/acre/year	See Link Below - Examination of the Multiplier Used to Estimate PM2.5 Fugitive Dust Emissions from PM10	0.90	3.80	lb/acre/year	513.13	acres	0.97

Fugitive Emissions from Explosive use for Mining Operations:

Pollutant	Emission Factor	Units	Source	Total (tpy)	Uncontrolled Emissions Annual (tpy)	Control Method (Practice or Equipment)	Control Efficiency (percent)	Controlled Emissions Annual (tpy)	lb/hr
NO_2	17	lb/ton	AP-42 Section 13.3, (2/80) Table 13.3-1 (Emission Factors for Detonation of Explosives - ANFO)	528.13	None	Best Operating Practices	0.00%	528.13	120.58
CO	67	lb/ton	AP-42 Section 13.3, (2/80) Table 13.3-1 (Emission Factors for Detonation of Explosives - ANFO)	2081.44	None	Best Operating Practices	0.00%	2081.44	475.21
SO_2	0.0048	lb/ton	Based on Ultra Low Sulfur Content of Fuel Oil in ANFO	0.15	None	Best Operating Practices	0.00%	0.15	0.03

Tank Emissions from Fuel Storage Tanks:

Tank	Contents	Maximum Annual Fuel Throughput (gal)	Notes
250,000 gal Vertical Tank	Diesel	8,000,000 total for the facility	Calculations assumed that the entire annual fuel throughput was stored and dispensed in this single tank as a conservative estimate.
10,000 gal Horizontal Tank	Diesel	8,000,000 total for the facility	Calculations assumed that the entire annual fuel throughput was stored and dispensed in this single tank as a conservative estimate.
15,000 gal Gasoline Tank	Gasoline	552,377	Calculations assumed that the entire annual fuel throughput was stored and dispensed in this single tank.
5,000 gallon Oil	Oil	5,000	Calculations assumed that the entire fuel throughput was stored and dispensed in this single tank as a conservative estimate.
1,000 gallon Oil	Oil	1,000	Calculations assumed that the entire fuel throughput was stored and dispensed in this single tank as a conservative estimate.

Tank ID	Pollutant	Emission Factor Basis	Emission Factor[1]	Units	Source	Uncontrolled Emissions Annual (tpy)	Control Method (Practice or Equipment)	Control Efficiency[1] (percent)	Controlled Emissions Annual (tpy)
250,000 gal Vertical Tank	VOCs	EPA TANKS 4.09d	137.08	lb/year	EPA TANKS 4.09d	0.069	Good Operating Practices	0%	0.069
10,000 gal Horizontal Tank	VOCs	EPA TANKS 4.09d	108.58	lb/year	EPA TANKS 4.09d	0.054	Good Operating Practices	0%	0.054
15,000 gal Gasoline Tank	VOCs	EPA TANKS 4.09d	1954.18	lb/year	EPA TANKS 4.09d	0.977	Good Operating Practices	0%	0.977
5,000 gallon Oil	VOCs	EPA TANKS 4.09d	204.72	lb/year	EPA TANKS 4.09d	0.102	Good Operating Practices	0%	0.102
1,000 gallon Oil	VOCs	EPA TANKS 4.09d	50.32	lb/year	EPA TANKS 4.09d	0.025	Good Operating Practices	0%	0.025

IV. Existing Air Quality

The Otter Creek Coal mine is located in areas designated as unclassifiable/attainment for all National Ambient Air Quality Standards (NAAQS) pollutants and attainment for all Montana Ambient Air Quality Standards (MAAQS) pollutants. In April, 2011, Otter Creek Coal established an ambient air monitoring site to measure particulate matter with an aerodynamic diameter of 2.5 microns(micrometers) or less ($PM_{2.5}$), and particulate matter having an aerodynamic diameter of 10 microns (micrometers) or less (PM_{10}), in the Otter Creek area. These two monitors were selected for the reporting of $PM_{2.5}$ and PM_{10} regional air quality at the Otter Creek Mine site. On-site monitoring for PM_{10} and $PM_{2.5}$ has been ongoing since April 2011.

A summary of the $PM_{2.5}$ and PM_{10} data collected on-site through April 2012 is provided in the table below. The table gives the 24-hour $PM_{2.5}$ and PM_{10} concentrations measured (referenced to local temperature and pressure), together with the first and second -highest 24-hour PM2.5 and PM10 concentrations and average $PM_{2.5}$ and PM_{10} concentrations for the first year of the monitoring site operation.

Summary of Collected Particulate Data
(April 2011 – April 2012)

	PM10 (µg/m3)	PM2.5 (µg/m3)
24-hr NAAQ Standard	150	35
Maximum*	79	55
Maximum**	62	15
2nd High**	45	13
Low*	1	1
Average*	9	4
Standard Deviation*	10.9	5.5
Number of Valid Samples Taken*	123	114

* Includes samples taken on August 25, 2011 with wildfire in area.
** Does not include samples taken on August 25, 2011 with wildfire in area.

VI. Ambient Air Impact Analysis

OCC submitted an air quality impact analysis in the application for MAQP 5106-00. The analysis was developed by Bison Engineering, Inc. (Bison) on behalf of OCC.

The proposed mine will be in an area currently designated as "Unclassifiable/Attainment" for all air quality criteria pollutants (40 CFR 81.327). The closest nonattainment areas (NAA) are the 1-hour and 24-hour sulfur dioxide (SO_2) NAA in Billings and Laurel, respectively, and are located approximately 175 km (108 mi) and 197 km (122 mi) northwest of the mine. A carbon monoxide (CO) maintenance area also exists in the Billings area. The closest Class I area is the Northern Cheyenne Indian Reservation, a nonfederal Class I area, about 10.9 km (6.8 mi) west of the proposed Tract 2 mine.

General Air Quality Modeling Methodology

The air dispersion modeling demonstration was conducted in two phases to determine compliance with the National and Montana Ambient Air Quality Standards (NAAQS/MAAQS, respectively): a significant impact analysis and full cumulative impact analysis. In the first phase, only the OCC proposed emission sources were modeled and the results were compared to the corresponding Significant Impact Levels (SILs). If the modeled concentration is less than or equal to the relevant SIL, then the project emissions will not cause or contribute to a NAAQS/MAAQS violation and no further modeling is necessary. If the model concentration exceeds the SIL, then a full impact analysis must be conducted. This analysis includes nearby emission sources (within 50 km) and relevant background concentrations. Background concentrations account for any sources not explicitly included in the modeling demonstration. There are no permitted sources within 50 km of Tract 2 so the full impact analysis did not contain this data. Both short-term (less than annual) and annual SILs and NAAQS/MAAQS exist, depending on the ambient air pollutant and therefore, were addressed.

Ambient Air Impact Analysis Emissions Inventory

Primary emissions from the mine will be fugitive particulate emissions. Fugitive emissions do not count toward PSD applicability and therefore a PSD modeling analysis was not conducted. However, these emissions were modeled to determine compliance with the federal and state ambient air quality standards. Mobile exhaust emissions are also not controlled by the air permitting regulations; these emissions are regulated by other air quality programs such as State Implementation Plans and Transportation Conformity so the associated emissions were not included in the modeling demonstration. Portable/mobile gasoline and diesel engines were also not included in the modeling demonstration since these units are considered mobile equipment and not subject to the Montana air permitting program regulations (ARM 17.8.744(1)(b)).

The following ambient air pollutants were evaluated by air dispersion modeling since the corresponding emission rates were above the thresholds the Department relies upon for minor sources to trigger modeling as noted in the parentheses: CO (100 tpy), NOx (40 tpy), $PM_{2.5}$ (10 tpy), and PM_{10} (15 tpy).

There were four individual sources modeled as volume sources: primary crusher, secondary crusher, train loadout, and one conveyor transfer point. The emissions from the coal dumping by the dump trucks were combined with the primary crusher emissions. There were two coal production scenarios modeled as open pit sources, which contained fugitive particulate emissions: topsoil and overburden handling activities (drilling, blasting, removal, and dumping), coal handling (drilling, blasting, and removal), vehicles traveling on temporary roads, and windblown dust on disturbed acreage. The water truck emissions for dust suppression were distributed among the haul, access, and temporary roads emissions based on the lengths of each type of road whereas the 75% of the grader emissions were combined with the haul roads and the remaining 25% to the access roads; access road emissions will be caused by employee and contractor vehicle traffic. The haul roads for moving the coal from the open pits to the primary crusher were divided into four sections: north, south, central, and main; the number of road segments varied depending on the scenario since more roads will be traveled during Years 16 – 18 since the associated open pits will be further east from the primary crusher.

For the Years 7 - 8, the corresponding modeled numbers of haul road segments were as follows: north (141), south (96), central (65), and main (all, 81). For the Years 16 – 18, all haul roads will be traveled: north (247), south (172), central (133), and main (81). All of the access roads (375) will be traveled, regardless of the scenario. Each modeled haul and access road segment length were 17 meters (m) (56 feet, ft) long and 30 meters (m) (100 ft) wide. Table 1 lists the modeled particulate emissions for both production scenarios.

Table 1. Modeled OCC PM_{10} and $PM_{2.5}$ Annual Emissions.

Source	2007 – 2008		2016 – 2018	
	PM_{10} (tpy)[1]	$PM_{2.5}$ (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Individual Modeled Volume Sources				
Primary Crusher	2.89	0.30	2.89	0.30
Secondary Crusher	2.63	0.26	2.63	0.26
Conveyor Transfer	1.54	0.23	1.54	0.23
Rail Loadout	0.26	0.04	0.26	0.04
Series of Modeled Volume Sources				
Haul Road (with Grading and Water Truck)	764.47	77.37	1,263.46	127.87
Access Road (with Grading and Water Truck)	113.63	11.63	113.63	11.63
Open Pits				
Open Pits (North and South)	762.91	76.29	792.59	82.33
Total	1,648.33	166.12	2,177.00	222.66

[1] tpy = tons per year.

Explosive emissions were included in the modeling demonstration as NOx and CO emissions; the NOx emissions were assumed to be equivalent to NO_2 (nitrogen dioxide). Explosives also emit sulfur oxides (SOx) but even assuming all SOx emissions were equivalent to sulfur dioxide (SO_2), these emissions were below 40 tpy threshold requiring air dispersion modeling. Table 2 lists the modeled CO and NOx emissions for both production scenarios.

Table 2. Modeled OCC CO and NOx Annual Emissions.

Source	2007 – 2008		2016 – 2018	
	CO (tpy)[1]	NOx (tpy)	CO (tpy)[1]	NOx (tpy)
Open Pit				
Explosives	1,758.48	446.11	2,081.38	528.21
Total	1,758.48	446.11	2,081.38	528.21

[1] tpy = tons per year.

The locations of the emission sources were defined by a georectified mine map plan that was imported into an AERMOD graphic user interface (GUI) software. Using the same technique with visual coordination, the open pit mine locations, angles, and easterly and northerly lengths were determined.

Source Characterization: Crushers - The primary and secondary crusher initial horizontal dimensions were based on the total size of the truck dump/crusher areas shown on the mine map. The crusher initial vertical release heights were based on the height of the crushers with the release heights set near ground-level, the worse-case dispersion of these sources.

Conveyor Transfer – This source modeled initial horizontal and vertical dimensions were based on professional judgment and the assumed structure height of the conveyor transfer system, respectively.

Train Loadout with Two Silos – The dimensions were based on professional judgment with the release height set at the top of the silos.
Haul/Access Roads – These series of adjacent volume sources were modeled with the initial horizontal dimensions set equal to the road width with the release heights of the average heights of the haul truck and access vehicles.

Open Pits – The volumes of the open pits were calculated based on the maximum depth of the pit according to the mine plan at the bottom of the coal seam and the area of the pits according to the mine plan. The release heights were selected as one-third of the total depth of the pit which accounted for the top soil, overburden, and coal seam depths. Based on the mine plan, the average coal seam depth was 908 m (2,980 ft). The modeled source parameters for the Years 7 – 8 and Years 16 – 18 scenarios are listed in Tables 3 and 4, respectively.

Table 3. OCC Years 7 – 8 Modeled Source Parameters.

Volume Sources							
Model ID	Source Description	UTM NAD83 Zone 13 (mE)[1]	UTM NAD83 Zone 13 (mN)[2]	Base Elevation (m)[3]	Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)
PCRSHR	Primary Crusher	409680.8	5038161.9	963	0.30	15.20	15.20
2NDCRSHR	Secondary Crusher	407209.7	5039132.8	951	0.30	6.10	6.10
CON	Conveyor Transfer	408745.0	5039102.0	951	6.00	6.10	3.00
RAILLD	Rail Loading	406867.9	5039474.6	951	2.50	4.60	2.00
MSR 0001-0081	Main Haul Roads	Varied	Varied	963	5.52	16.97	5.13
NMR 0001-0141	North Haul Roads	Varied	Varied	963	5.52	16.97	5.13
CSR 0001-0065	Center Haul Roads	Varied	Varied	963	5.52	16.97	5.13
SSR 0001-0096	South Haul Roads	Varied	Varied	963	5.52	16.97	5.13
ARD 0001-0375	Access Roads	Varied	Varied	922 - 984	2.06	16.97	1.91

Open Pits									
Model ID	Source Description	UTM NAD83 Zone 13 (mE)	UTM NAD83 Zone 13 (mN)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Pit Volume (m^3)[4]	Angle from North (degrees)
N_7_8	North Years 7-8 35MMtpy Open Pit Emissions	410544.4	5037304.1	908	27	225	2690	.49173 E+08	3.2
S_7_8	South Years 7-8 35MM tpy Open Pit Emissions	410701.2	5034358.7	908	27	244	2931	.58238 E+08	3.2

[1] UTM NAD83 Zone 13 mE = Universal Transverse Mercator North American Datum 1983, Zone 13, meters Easting.
[2] UTM NAD83 Zone 13 mN = Universal Transverse Mercator North American Datum 1983, Zone 13, meters Northing.
[3] m = meters.
[4] m^3 = cubic meters.

Table 4. OCC Years 16 – 18 Modeled Source Parameters.

Volume Sources							
Model ID	Source Description	UTM NAD83 Zone 13 (mE)[1]	UTM NAD83 Zone 13 (mN)[2]	Base Elevation (m)[3]	Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)
PCRSHR	Primary Crusher	409680.8	5038161.9	963	0.30	15.20	15.20
2NDCRSHR	Secondary Crusher	407209.7	5039132.8	951	0.30	6.10	6.10
CON	Conveyor Transfer	408745.0	5039102.0	951	6.00	6.10	3.00
RAILLD	Rail Loading	406867.9	5039474.6	951	2.50	4.60	2.00
MSR 0001-0081	Main Haul Roads	Varied	Varied	963	5.52	16.97	5.13
NMR 0001-0247	North Haul Roads	Varied	Varied	963	5.52	16.97	5.13
CSR 0001-0133	Center Haul Roads	Varied	Varied	963	5.52	16.97	5.13
SSR 0001-0172	South Haul Roads	Varied	Varied	963	5.52	16.97	5.13
ARD 0001-0375	Access Roads	Varied	Varied	922 - 984	2.06	16.97	1.91

Open Pits									
Model ID	Source Description	UTM NAD83 Zone 13 (mE)	UTM NAD83 Zone 13 (mN)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Pit Volume (m^3)[4]	Angle from North (degrees)
N_16_18	North Years 16-18 35MMtpy Open Pit Emissions	411861.2	5037969.0	908	21	728	1952	.86278E+08	3.2

Volume Sources									
Model ID	Source Description	UTM NAD83 Zone 13 (mE)[1]	UTM NAD83 Zone 13 (mN)[2]	Base Elevation (m)[3]	Release Height (m)	Horizontal Dimension (m)		Vertical Dimension (m)	
S_16_18	South Years 16-18 35MM tpy Open Pit Emissions	412068.9	5034545.1	908	21	237	1315	.40470E+08	-8.0

[1] UTM NAD83 Zone 13 mE = Universal Transverse Mercator North American Datum 1983, Zone 13, meters Easting.
[2] UTM NAD83 Zone 13 mN = Universal Transverse Mercator North American Datum 1983, Zone 13, meters Northing.
[3] m = meters.
[4] m^3 = cubic meters.

Ambient Air Impact Analysis

Review of Modeling Inputs: Modeling was conducted according to the Appendix W, 40 CFR 51, Guideline on Air Quality Models, U.S. Environmental Protection Agency (USEPA), November 9, 2005 (http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf).

AERMOD Dispersion Modeling and Associated Programs: The air dispersion modeling demonstration was conducted using latest versions of AERMOD and auxiliary support programs; specifically, the following models were applied:

• AERMOD version 14134: primary air dispersion model.
• AERMET version 14134: processes the hourly surface and upper air meteorological (met) data for input into AERMOD.
• AERMAP version 11103: processes the terrain data and determines the elevations of the receptors for AERMOD input; receptors are locations where AERMOD calculates the pollutant concentrations.
• AERSURFACE version 13016: extracts land use data to calculate the surface characteristics surrounding the surface met site(s) for AERMET.

No buildings or tanks were included in the modeled so BPIPPRM version 04274 was not applied which characterizes building downwash effects for AERMOD and determines good engineering practice (GEP). Stack GEP is the maximum stack height that allows the plume emissions to escape the cavity region created on the downwind side of a building complex. Credit cannot be taken for stack heights exceeding GEP as a dispersion technique.

The AERMOD air dispersion modeling was conducted using the following USEPA default options:

- Stack-tip downwash
- Accounts for elevated terrain effects
- Use calms processing routine
- Use missing data processing routine
- No exponential decay

No gas or particle deposition was applied or wet or dry depletion. For the NO_2 modeling, the ozone limiting method (OLM) was applied for the conversion of NO_x to NO_2, which included only the explosive emissions in the open pits. The applied source NO_2/NO_x ratio was 0.5 with an equilibrium ratio of 0.9; both of these values are USEPA defaults. An hourly or annual

ozone concentration is required for the application of OLM; in this case, the 2010 - 2012 background concentration data from the Birney, MT, monitoring site (USEPA Air Quality System site ID 30-087-0001) was selected. The Birney monitoring location is about 29.8 km (18.5 mi) southwest of the proposed mine. The corresponding annual value was 0.0293 parts per million which converted to 57.4 μg/m3.

Urban/Rural Status: This classification accounts for the dispersive nature of the "convective-like" boundary layer that forms during nighttime conditions from urban heat island effects. All of Montana is classified as rural so the rural dispersion coefficients were selected.

Land Use: The surrounding surface characteristics around the surface met site(s) are required input for AERMET. The most important parameter is the surface roughness length which determines the magnitude of the mechanical turbulence and stability of the boundary layer where air quality dispersion occurs. A land cover file is required for input into AERSURFACE; the National Land Cover Data 1992 (NLCD92) file was obtained for AERMAP input from the following website: http://www.mrlc.gov/nlcd1992.php. AERSURFACE only supports NLCD92 at this time.

Mine Boundary Determination: A georectified mine map plan was imported into an AERMOD GUI, and the mine boundary and the Otter Creek Road were determined through visual coordination within the GUI.

Elevation Data: National Elevation Dataset (NED) files were downloaded from the Multi-Resolution Land Characteristics (MRLC) consortium website (http://www.mrlc.gov/). The data were in Northern American Datum 1983 (NAD83), Zone 13, the projected coordinate system of this modeling demonstration. The dataset were created in 1/3 arc-second (about 10 m) horizontal resolution in Geographic Tagged Image File Format (GeoTIFF). Multiple Cartesian receptors grids were developed using these files:

- 100 meter (m) spacings from the mine boundary to about 1 km
- 250 m spacing from 1 to 3 km
- 500 m spacing from 3 to 5 km
- 1 km spacing from 5 to about 15.5 km

Receptors were also placed at 100 m spacings along the modeled mine boundary and Otter Creek Road. A total of 15,749 receptors were used for the significant impact analysis. Through the significant impact analysis, only the receptors that defined the mine boundary and Otter Creek Road were determined to be significant; therefore, only these receptors (589) were used for the NAAQS/MAAQS analyses.

Meteorology (Met): Surface met data from March 2011 through January 2014 were collected from a 20 m (65 ft) tower on-site at the proposed mine. The following met data were collected with the measuring heights in parentheses: wind speed and wind direction (20 m), ambient temperatures (2 and 19 m), solar radiation (2 m), relative humidity (2 m) and barometric pressure (1.4 m). Total collection efficiencies were nearly 100 percent and quality checked according to USEPA protocols. The on-site met tower latitude and longitude were 45.507N, -106.159W with an elevation of 947 m (3,107 ft). Any on-site missing surface met data (wind speed, wind direction, and temperature) were substituted by the Billings Logan International Airport National Weather Service (NWS) data for the same collection period. This site location was 45.807N latitude, -108.542W longitude with a 1,088 m (3,570 ft) elevation and it is located

about 188 km (117 mi) northwest of the proposed mine. This surface met site was also the source of the cloud cover data. The NWS Integrated Surface Hourly (ISH) surface met files were obtained from the following website: ftp://ftp.ncdc.noaa.gov/pub/data/noaa. The upper air met data for the same time period were obtained from the Great Falls International Airport (47.45N latitude and - 111.38W longitude) which is about 485 km (301 mi) northwest of the proposed mine; the corresponding data files were obtained from the following website: http://ersl.noaa.gov/raobs/. Bison conducted an extensive analysis of various datasets, both surface and upper air, before selecting the fore-mentioned data.

The latest AERMET version incorporates a new model option which was applied: surface fraction velocity adjustment (ADJ_U*). Although it is considered an AERMET beta option, it addresses the model performance during stable, low wind speed conditions that generally leads to high modeled concentrations. The Department allowed the application of this beta option since the USEPA has conducted significant model evaluations using this option. The minimum threshold wind speed of 0.5 meters per second (m/s) was also used, the recommended USEPA default.

SIL Modeling Results: The highest modeled concentration was selected for comparison to the relevant significant impact level (SIL); no background concentrations were added to the modeled concentrations. Tables 5 and 6 lists the results of the SIL analysis for Years 7 – 8, and Years 16 – 17, respectively.

Table 5. OCC AERMOD Years 7 – 8 SIL Modeling Results.

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)[1]	SIL[2] ($\mu g/m^3$)	Significant? (Yes/No)
CO	1-Hour	2,195.16	2,000	Yes
	8-Hour	378.14	500	No
PM_{10}	24-Hour	123.30	5	Yes
	Annual	27.53	1	Yes
$PM_{2.5}$[3]	24-Hour	10.26	1.2	Yes
	Annual	2.80	0.3	Yes
NO_2	1-Hour	285.87	7.52	Yes
	Annual	3.92	1	Yes

[1] $\mu g/m^3$ = micrograms per cubic meter.
[2] SIL = Significant Impact Level.
[3] The DC Circuit Court vacated and remanded $PM_{2.5}$ Significant Impact Levels (SILs) on January 22, 2013 in the 40 CFR 51.166 Prevention of significant deterioration of air quality but not in the 40 CFR 51.166 Permit requirements; however, state air quality agencies may apply these levels with discretion.

The Years 7 - 8 explosive CO emissions caused an exceedance of the 1-hour CO SIL so a full impact analysis should have been performed. However, there are no other CO sources for inclusion in the area and the 1-hour CO NAAQS/MAAQS allows for one exceedance per year so the second highest modeled concentration should be examined, not the highest as in the SIL analysis. In this case, the second highest 1-hour modeled CO concentration for Years 7 - 8 was 1,339.14 $\mu g/m^3$; when compared to the 1-hour CO NAAQS/MAAQS concentrations of 40,000 and 26,450 $\mu g/m^3$, respectively, the modeled concentration was 3 and 5% of the federal and state standards. To obtain a background concentration, the CO data from around the state were reviewed for the last three years of valid data (2011 – 2013) and not directly impacted from vehicular emissions. The Lewis and Clark County monitoring site (USEPA Air Quality System site ID 30-49-0004) was identified as an option. During this period, the highest 1-hour CO

concentration was 0.6 parts per million at this site which converts to about 690 μg/m^3. Adding this concentration to the modeled one, the resulting concentration is about 2,029 μg/m^3 so the federal and state ambient standards are clearly protected.

Table 6. OCC AERMOD Years 16 – 18 SIL Modeling Results.

Pollutant	Averaging Period	Modeled Concentration (μg/m^3)[1]	SIL[2] (μg/m^3)	Significant (Yes/No)
CO	1-Hour	1963.04	2,000	No
	8-Hour	310.22	500	No
PM_{10}	24-Hour	110.50	5	Yes
	Annual	29.51	1	Yes
$PM_{2.5}$[3]	24-Hour	10.44	1.2	Yes
	Annual	2.99	0.3	Yes
NO_2	1-Hour	267.76	7.52	Yes
	Annual	4.94	1	Yes

[1] μg/m^3 = micrograms per cubic meter.
[2] SIL = Significant Impact Level.
[3] The DC Circuit Court vacated and remanded $PM_{2.5}$ Significant Impact Levels (SILs) on January 22, 2013 in the 40 CFR 51.166 Prevention of significant deterioration of air quality but not in the 40 CFR 51.166 Permit requirements; however, state air quality agencies may apply these levels with discretion.

For both mine production scenarios, PM_{10}, $PM_{2.5}$ and NO_2 exceeded their respective SIL, regardless of the averaging period so a full cumulative impact analysis was required.

Background Concentrations: Background concentrations for each averaging period and pollutant were required for the NAAQS/MAAQS analyses; these values were added to the modeled results to account for other emission sources not explicitly included in the modeling analyses.

Both on-site PM_{10} and $PM_{2.5}$ data were collected from 4/27/2011 - 5/31/13. From this period, Bison reviewed two 12-month periods: 6/2011 - 5/2012 and 6/2012 - 5/2013. During these periods, several wildfire events occurred which caused elevated particulate concentrations documented by the monitoring operator, the Department, and/or aerial photographs. Wildfire events can be excluded from regulatory purposes so the impacted data were eliminated from the dataset to develop the background concentrations (http://www.epa.gov/ttn/analysis/exevents.htm). The calculated 24-hour PM_{10} was the average of the second high concentrations for each period (25.5 μg/m^3); the corresponding NAAQS is 150 μg/m^3 which cannot be exceeded more than once per calendar year, averaged over a three year period. The annual average PM_{10} background concentration was 8.4 μg/m^3. The 24-hour $PM_{2.5}$ NAAQS is 35 μg/m^3 based on the 98th percentile averaged over three years (http://www.epa.gov/ttn/scram/). The average of the 98th percentile PM_{10} during the two periods not influenced by wildfire was 8.0 μg/m^3 and the annual average was 3.4 μg/m^3.

For the background NO_2 concentrations, the same ambient monitoring station near Birney, MT, used for the ozone background concentration also collected NO_2 concentrations. Using the same years, 2010 – 2012, the 1-hour and annual NO_2 concentrations were 15.04 and 4 μg/m^3, respectively.

NAAQS/MAAQS Modeling Results: The modeled concentrations for the Years 2016 - 2018 scenario were higher than for the Years 2007 – 2008, but for completeness purposes, the results

for both modeled scenarios are listed in the following tables. For the 24-hour PM_{10} modeled concentration, the high-second-high (H2H) concentration was selected since one exceedance is allowed per year whereas the highest (H1H) was selected for the annual averaging for both PM_{10}, $PM_{2.5}$. and NO_x. The 98th percentile or high-eighth-high (H8H) should be selected for the 24-hour $PM_{2.5}$ and 1-hour NO_2 concentrations according to USEPA guidance (http://www.epa.gov/scram001/guidance/guide/Guidance_for_PM25_Permit_Modeling.pdf, and http://www.epa.gov/region07/air/nsr/nsrmemos/appwno2_2.pdf, respectively). However, the Consultant selected the highest modeled 24-hour $PM_{2.5}$ concentrations for comparison to the NAAQS/MAAQS, which was a very conservative approach.

Table 7. OCC Years 7 – 8 NAAQS/MAAQS Modeling Results.

Pollutant	Averaging Period	Selected Modeled Concentration (µg/m³)[1]	Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS[2] (µg/m³)	Percent of Standard (%)	MAAQS[3] (µg/m³)	Percent of Standard (%)
PM_{10}	24-Hour	(H2H)	96.48	25.5	121.98	150	81	150	81
	Annual	(H1H)	27.53	8.4	35.93	NA[4]	NA	50[4]	72
$PM_{2.5}$	24-Hour	(H1H)	10.26	8	18.26	35	52	35	52
	Annual	(H1H)	2.80	3.4	6.20	12	52	12	52
NO_2	1-Hour	(H8H)	139.65	15.04	154.69	188	82	564	27
	Annual	(H1H)	3.92	4	7.92	100	8	94	8

[1] µg/m³ = micrograms per cubic meter.
[2] NAAQS = National Ambient Air Quality Standards.
[3] MAAQS = Montana Ambient Air Quality Standards.
[4] NA = Not Applicable; the annual PM_{10} NAAAQS has been revoked by the USEPA but an annual PM_{10} MAAQS still exists.

Table 8. OCC Years 16 – 18 NAAQS/MAAQS Modeling Results.

Pollutant	Averaging Period	Selected Modeled Concentration (µg/m³)[1]	Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Total Concentration (µg/m³)	NAAQS[2] (µg/m³)	Percent of Standard (%)	MAAQS[3] (µg/m³)	Percent of Standard (%)
PM_{10}	24-Hour	(H2H)	99.16	25.5	124.66	150	83	150	83
	Annual	(H1H)	29.51	8.4	37.91	NA[4]	NA	50[4]	76
$PM_{2.5}$	24-Hour	(H1H)	10.44	8	18.44	35	53	35	53
	Annual	(H1H)	2.99	3.4	6.39	12	53	12	53
NO_2	1-Hour	(H8H)	165.03	15.04	180.07	188	96	564	32
	Annual	(H1H)	4.94	4	8.94	100	9	94	10

[1] µg/m³ = micrograms per cubic meter.
[2] NAAQS = National Ambient Air Quality Standards.
[3] MAAQS = Montana Ambient Air Quality Standards.
[4] NA = Not Applicable; the annual PM_{10} NAAAQS has been revoked by the USEPA but an annual PM_{10} MAAQS still exists

The Department determined, based on the air dispersion modeling, that the impacts from this permitting action will be minor. The Department believes it will not cause or contribute to a violation of any ambient air quality standard. However, the highest PM_{10} modeled impacts predicted OCC would consume 83% (124.6 µg/m³) of the 24-hour ambient standard (150µg/m³). Based on this information and using the Department Ambient Monitoring Requirements Guidance Statement, the Department will require ambient monitoring for the mine operations.

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. Montana Environmental Policy Act (MEPA) Compliance

The Department, in conjunction with the Montana Department of Natural Resources (DNRC) is conducting a formal Environmental Impact Statement (EIS) on this project to satisfy MEPA requirements.

MAQP Analysis Prepared By: R. Payne
Date: March 29, 2015