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BEFORE THE BOARD OF ENVIRONMENTAL QUALITY
STATE OF IDAHO

IN THE MATTER OF AIR QUALITY PERMIT TO CONSTRUCT P-2019.0047 ____________________________ NEZ PERCE TRIBE, IDAHO CONSERVATION LEAGUE, and SAVE THE SOUTH FORK SALMON, Petitioner, v. IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY, Respondent, and PERPETUA RESOURCES IDAHO, INC. Intervenor-Respondent.	Case Docket No. 0101-22-01 OAH Case No. 23-245-01 **EXPERT DECLARATION OF KEVIN LEWIS**

I, Kevin Lewis, hereby declare and affirm as follows:

1. I am currently a Principal Air Quality Engineer at Air Sciences Inc. (Air Sciences). I have prepared this declaration in support of the Permit to Construct (PTC) issued for the Stibnite Gold Project (SGP) on June 17, 2022. Perpetua Resources Idaho, Inc. (Perpetua) received the PTC that was challenged in this proceeding, Case Docket No. 0101-22-01; OAH Case No. 23-245-01.

A. Qualifications and Experience

2. I earned a Bachelor of Science (BS) degree in Chemical Engineering from the University of Wisconsin, Madison, in 1990.

3. From 1990 to 1992, I worked at the Wisconsin Department of Natural Resources, where I wrote air quality permits for toxic pollutants and conducted compliance inspections.

4. In 1993, I joined Air Sciences, became an owner in 1996, and served as President from 2011 to 2021. Air Sciences is a consulting firm specializing in ambient air quality analyses, permitting, and compliance.

5. With over 33 years of experience in air quality, I have conducted air quality analyses for permits across more than 25 states and internationally. At Air Sciences, I focus primarily on air permitting for the gold mining industry. In collaboration with the Nevada Mining Association and the U.S. Environmental Protection Agency (EPA), I compiled, analyzed, and summarized technical data to help develop the National Emissions Standard for Hazardous Air Pollutants (NESHAP): Gold Mine Ore Processing and Production Area Source Category rules under 40 CFR Part 63, Subpart EEEEEEE, which applies to the SGP.

6. During my time at Air Sciences, I developed air quality analyses for hundreds of air permits, renewals, and modifications. I also provided technical support to state agencies throughout the technical review, permit drafting, and public comment phases.

7. I led the modeling and permit development for Perpetua, ensuring compliance with ambient air quality standards while achieving project objectives. This included using reliable emissions data and appropriate modeling techniques to reflect permit conditions.

8. I began working with Perpetua as an air quality consultant in 2017, and I continue to provide consultancy services to this day.

B. Scope of Review

9. I reviewed the in the *Final Order* issued by the Board of Environmental Quality (Board) on May 9, 2024 in the Matter of Air Quality Permit to Construct P-2019.0047 (Final Order), which remanded "this matter back for the development of further evidence regarding ambient air concentrations of arsenic that will be produced by the SGP and whether those levels comply with the Air Rules." Final Order at 23. Based on my review of the Final Order the Board found the following issues to be addressed on remand:

a. DEQ did not act reasonably in using a five-year rolling average for T-RACT that was not properly supported by permit conditions.

b. There was insufficient evidence to support the T-RACT analysis limiting the non-West End pit production limit.

c. DEQ did not act reasonably and in accordance with law when it applied the 16/70 calculation to the ambient arsenic air concentration analysis.

10. I will address items (a), (b) and (c) in this declaration.

C. Documents Reviewed

11. I have reviewed the permitting record in this case, the expert declarations of Theresa Lopez, Norka Paden, and Kevin Schilling, and documents referenced below and attached as an exhibit to this declaration.

D. Summary of Opinions

12. Based on my expertise and multi-state permitting experiences:

a. DEQ properly established a five-year rolling average compliance demonstration in the PTC for ambient arsenic concentrations from the SGP.

b. DEQ sufficiently supported the permitting for the non-West End Pit activities.

c. DEQ correctly applied the provisions of IDAPA[1] 586 to perform an "apples to apples" toxic air pollutant (TAP) risk evaluation using an adjusted arsenic concentration and exposure duration to compare to the T-RACT Acceptable Ambient Concentration for Carcinogens (AACC).

Following rigorous analyses of Perpetua's application, as well as addressing repeated comments from stakeholders, DEQ prepared a thorough and conservative record in support of the PTC.

E. General Permitting and Modeling Context

13. With over thirty years of experience as an air permit consultant, including the development and review of hundreds of permits, I have identified two key objectives in the permitting process:

a. The permittee must submit a thorough and complete permit application.

[1] The Rules for the Control of Air Pollution in Idaho (Air Rules), IDAPA 58.01.01, provide for the control of air pollution in Idaho and govern issuance of air quality permits, including permits to construct. For brevity, citations to the Air Rules are abbreviated "IDAPA," followed by the specific section of IDAPA 58.01.01.

b. The permitting agency must issue a permit that includes operating restrictions and monitoring requirements to ensure compliance with air quality regulations.

14. Integral to these objectives is the creation of accurate emissions data and modeling to support compliance with ambient air quality standards.

15. To obtain a permit in Idaho, an applicant must satisfy for DEQ that the proposal will comply with all applicable state or federal emission standards, will not cause or contribute to a violation of the National Ambient Air Quality Standards, and using the methods provided in IDAPA 210, the emissions of toxic air pollutants will not injure or unreasonably affect human or animal life or vegetation as required by IDAPA 161. IDAPA 202.01, 202.02, 202.03.

16. Compliance with all applicable toxic air pollutant carcinogenic increments demonstrates preconstruction compliance with IDAPA 161 with regards to the pollutants listed in IDAPA 586: the Ambient Air Concentrations for Carcinogenic increments. IDAPA 202.03.

17. Modeling is necessary to meet the requirements of IDAPA 202.02 and 202.03. Specifically, the project proponent must determine the ambient concentrations of relevant toxic air pollutants from the project and compare these concentrations to the AACC.

18. Perpetua and DEQ took a conservative approach throughout the process of demonstrating compliance with IDAPA 202. Specifically, the analyses included arsenic emissions from fugitive dust related to mining activities. This is significant because fugitive dust is the primary source of arsenic emissions from the project. Furthermore, fugitive dust emissions of arsenic are "addressed" by NESHAP Subpart EEEEEEE and therefore would normally be

excluded from the analysis per IDAPA 210.20. *See* Statement of Basis, Permit to Construct No. P-2019.0047 at 28 (Feb. 18, 2021) (Proposed for Public Comment).[2]

19. Modeling of arsenic emissions from the SGP to comply with the Air Rules included fugitive dust from mining activities and involved the following steps: (1) quantifying annual arsenic emissions from all sources while accounting for process scenarios and emission control measures, (2) inputting the emissions data, emission locations, and initial dispersion parameters into the model, and (3) running the model with one year of onsite meteorological data to determine the annual average concentration at specific receptors located at and beyond the ambient air boundary.

20. The results of the modeling performed by Air Sciences and DEQ contain multiple layers of conservatism.

21. First, the model itself is conservative. EPA's evaluation studies for the type of modeling conducted for the SGP showed that the model, specifically AERMOD, over predicts pollutant concentrations by 1.41 to 3.21 times. REC 1834

22. Second, the quantification of arsenic emissions from the SGP was conservative. For haul road dust, the largest source of arsenic emissions, we used the higher of the two published emission factors in the emissions calculations. The emission factor used is five times greater than the lower factor. REC 1834

23. Third, the control and reduction in arsenic emissions from haul road dust was calculated conservatively. We used a control efficiency of 90% for chemical suppressants; the actual range is 90-99%. We also used a control efficiency of 33% for watering dust; the actual range is 75-95%. REC 1834

[2] The 2021 Statement of Basis, along with selected appendices, is attached hereto as Attachment 1.

24. Finally, we conducted fourteen modeling scenarios, each using conservative process and operating assumptions. Each scenario assumed mining activity in a single deposit and hauling to a single location year-round at the maximum permitted production level to maximize predicted arsenic impacts. Actual operation will be more varied in location and rates resulting in significantly lower arsenic impacts.

25. These analyses led to predicted arsenic impacts that are one to two orders of magnitude higher than the actual impacts will be.

26. In my experience, applying multiple layers of conservatism in the permitting review process is standard practice across all air quality permitting agencies, and DEQ's process is no exception. The goal is always to ensure compliance with air quality regulations under all circumstances.

27. DEQ also provided extra opportunities for public involvement. DEQ provided the most robust opportunity for public participation in the SGP permitting process that I've encountered in my 33 years of permitting experience. DEQ afforded commenters unprecedented accommodations that responded to public input. All comments, suggestions, and challenges were thoroughly reviewed. DEQ addressed each comment and, in some instances, conducted additional, more conservative analyses in response to the comments submitted.

F. Opinions

The IDAPA 586 AACC Annual Averaging Period is Not the Compliance Period.

28. As an expert on the relationship between air quality regulations and air quality modeling, I have a comprehensive understanding of the meaning and purpose of IDAPA 586 that reads "The AACC in this section are annual averages."

29. This text led the Board to infer that "the rule specifies compliance on an annual basis." Final Order at 19. This inference incorrectly conflates the AACC *averaging period* specified in IDAPA 586 with the *compliance period* described in IDAPA 006.125.[3]

30. Regulations often differentiate between the averaging period and the compliance period for health-based air contaminant concentration standards, especially when assessing long-term health risks.[4]

31. Treatment of the AACC as requiring compliance on an annual basis introduces an improper compliance period into IDAPA 586 and overlooks the adopted rules defining the methods and EPA scientific principles for determining cancer risk probability.

32. Within the full context of IDAPA 586, "The AACC in this section are annual averages" describes the annual average concentration that will result in a 1-in-1,000,000 excess cancer risk probability assuming constant lifetime exposure (70 years) to that concentration of ambient air emissions.

33. The AACC values listed in IDAPA 586 encompass three components:

a. The ***annual average*** concentration (0.00023 μg/m³ for arsenic) that correlates to

b. The ***1-in-1,000,000*** cancer risk probability as defined by the URF in IDAPA 586 over

c. A ***70-year*** exposure duration or compliance period per IDAPA 006.125.

[3] Definition from Air Rules in effect during the PTC application review: "**Toxic Air Pollutant Carcinogenic Increments**. Those ambient air quality increments based on the probability of developing excess cancers over a seventy (70) year lifetime exposure to one (1) microgram per cubic meter (1 ug/m3) of a given carcinogen and expressed in terms of a screening emission level or an acceptable ambient concentration for a carcinogenic toxic air pollutant. They are listed in Section 586."

[4] For example, the new $PM_{2.5}$ National Ambient Air Quality Standard of 9.0 μg/m³ specifies an averaging period as the "annual arithmetic mean" (or annual average) per 40 CFR 50.20(a), while the compliance period is defined as a three-year average according to 40 CFR Part 50, Appendix N. *See* 89 Fed. Reg. 16202, 16203 (Mar. 6, 2024).

34. Neglecting any of these components when assessing the cancer risk probability, such as the 70-year exposure duration, not only conflicts with the rule, but fundamentally alters the rule itself and ignores the EPA scientific principles underlying the rule.

35. When comparing modeling results to the AACC values listed in IDAPA 586, all three components must align for a correct comparison:

a. The model output must be expressed as an ***annual average*** in µg/m³;

b. The target cancer risk probability must be ***1-in-1,000,000;*** and

c. The exposure duration must occur or be permitted to occur over a ***70-year*** period.

36. The Final Order's statement that "the rule specifies compliance on an annual basis," Final Order at 19, rewrites one of the three essential components of the AACC, namely the exposure duration. Under the Board's interpretation, a project with a 5-year operational permit limit would pose the same risk as a project without a limit. Limiting the exposure duration reduces the cancer risk, as demonstrated by the EPA's risk calculation methods. Declaration of Norka Paden (Paden Decl.) ¶¶ 4, 13.

37. If the project proposal includes a different actual exposure duration that is less than the 70-year lifetime default or the project proposal includes a different target risk (like the 1-in-100,000 T-RACT), then either the model output concentration, the AACC itself, or both must be adjusted according to EPA's methods to ensure all components align.

38. Adjustment for actual project facts is necessary for a correct assessment of cancer risk. Failing to adjust components of the AACC is inconsistent with the rule and contrary to the EPA scientific principles upon which the rule is based.

DEQ Properly Established a Five-Year Rolling Average Compliance Demonstration Period.

39. The IDAPA 586 "annual average" does not represent the compliance period for project emissions; it represents the annual average concentration of emissions that presents a 1-in-1,000,000 (or 1-in-100,000 T-RACT) cancer risk probability assuming constant exposure over a 70-year lifetime.

40. The Final Order stated that "there was no evidence in the record explaining how the five-year rolling average comports with the annual AACC limits." This conclusion conflated the averaging period specified in IDAPA 586 with the notion of a compliance period.

41. The AACC value is defined as a lifetime of exposure, specifically 70 years. This means that cumulative exposure over this 70-year period must not exceed levels that would result in a cancer risk probability of 1-in-1,000,000, or 1-in-100,000 for T-RACT sources.

42. DEQ imposed a daily production limit of 135,000 tons per day (T/day) because production generates arsenic emissions (primarily from fugitive dust emissions). Limiting production proportionally reduces arsenic emissions, concentrations and exposure.

43. DEQ correctly established a compliance demonstration period of 5 years for the 135,000-T/day limit using a 5-year rolling average. The 5-year rolling average represents a more conservative (shorter) timeframe than the exposure duration of 70 years inherent in the AACC. The 5-year rolling average is also a more conservative (shorter) timeframe than the T-RACT AACC exposure duration for the SGP of 16 years.

44. A five-year rolling average production limit in Permit Condition 3.5 is appropriate because "any permit limits must only assure that concentrations in ambient air over the total duration of the project do not cause a potential exposure concentration associated with a 1-in

1,000,000 [AACC] or a 1-in-100,000 [T-RACT] cancer risk." Declaration of Kevin Schilling (Schilling Decl.) ¶ 25.

45. The Board asserted that a "five-year rolling average allows considerable daily and annual increases in exposures which are contrary to limits set forth in the Air Rules." As explained by Theresa Lopez in her Declaration, the T-RACT AACC represents the lifetime probability of cancer risk from a ***cumulative*** dose of arsenic over a specific period of exposure. During the 16-year SGP project life, the ***cumulative*** dose is unaffected by variability in exposures (daily or annual) that may occur over the 5-year averaging period. In addition, Kevin Schilling states, "any daily and annual variability is inconsequential to the exposure concentration and resulting risk." Schilling Decl. ¶ 26.

46. The notion that the Air Rules prohibit daily variability in exposure, and therefore, a daily production limit with a daily compliance demonstration is needed to protect public health, is inaccurate. Limiting daily production activity does not eliminate exposure variability. The modeled output emissions concentration is inherently variable due to a multitude of factors unrelated to production and emissions. For example, for a given day when the wind blows from northeast to southwest, the predicted concentration (and exposure) at the northeast side of the ambient air boundary will be zero, regardless of the production and emissions.

DEQ Sufficiently Justified the Permitting for the Non-West End Pit Activities.

47. The permit imposes a total mining production limit of 788.4 million tons for the life of the project (Permit Condition 3.6). This limit applies to the aggregate amount of mining from all deposits, whether from a single deposit or a combination of deposits, ensuring that the total does not exceed 788.4 million tons over the life of the mine.

48. During permit development, Air Sciences performed 14 different model runs reflecting 14 different operating scenarios to assess arsenic concentrations based on production activity from each of the deposits individually

49. The modeling analysis for arsenic emissions from the Non-West End Pit (non-WEP) deposit scenarios demonstrated that mining activities at the non-WEP deposits result in ambient arsenic concentrations at or below the T-RACT adjusted AACC, even when the full 788.4 million tons of production comes from any one of those deposits. Schilling Decl. ¶¶ 28, 30.

50. The modeling analyses for arsenic emissions from the West End Pit (WEP) deposit scenarios resulted in proportionally higher impacts. This is attributed to the WEP's proximity to the northeastern ambient air boundary and prevailing wind patterns, as illustrated in Figure 1, attached as Exhibit A.

51. To address these elevated arsenic impacts associated with mining at the WEP, DEQ imposed an additional specific production limit for WEP activity. The limit is set at 394.2 million tons over the life of the project (Permit Condition 3.6), which represents 50% of the total mining production limit of 788.4 million tons.

52. Two life-of-mine production limits effectively constrain operations as follows:

a. Total mining from WEP and non-WEP locations cannot exceed 788.4 million tons.

b. Mining at the WEP cannot exceed 394.2 million tons.

c. Mining at non-WEP locations cannot exceed 788.4 million tons minus any mining at the WEP.

53. These restrictions work together as follows: A + B = C, where A represents WEP mining, B represents non-WEP mining, and C represents total mining. There is no need to

establish another limit for non-WEP mining because B can only be the difference between the total (788.4 million) and the volume from the WEP (limited to 394.2 million) as set forth in Permit Condition 3.6. Imposing an additional production limit for non-WEP activity would not offer any further protection of public health or the environment.

DEQ Correctly Applied the Permit Conditions Limiting the Project Life to 16 Years to the Analysis of Compliance with the T-RACT AACC

54. Based on my extensive multi-state permitting experience, DEQ's interpretation and analyses of the cancer risk associated with arsenic from the SGP followed sound permitting practices and scientific methods for TAPs evaluations.

55. In specific, DEQ correctly interpreted that "annual average" referred to in IDAPA 586 is simply the output of the air dispersion model that will result in a **1-in-1,000,000** excess cancer risk probability assuming the emissions impact will occur ***each year for 70 years***. Schilling Decl. ¶ 20.

56. The air dispersion model, specifically EPA's AERMOD, predicts ambient air concentrations as annual averages. For assessing long-term health impacts, such cancer risk probability (the AACC), the annual average output from the model serves as the default long-term averaging period. Defining the AACC as "annual averages" is consistent with the model's output and informs the compliance demonstration. It does not negate the other components of the AACC essential to properly assessing the cancer risk from the project's arsenic emissions.

57. Again, the AACC values in IDAPA 586 encompass three components: (1) the annual average concentration (0.00023 $\mu g/m^3$ for arsenic), (2) a cancer risk probability of 1-in-1,000,000, and (3) a 70-year exposure duration. For a proper comparison of modeling results all three components must align.

58. The annual average output concentration from the model can only be compared directly to AACC values in IDAPA 586 under the following conditions: 1) a target risk of ***1-in-1,000,000*** and 2) an emissions impact duration (or exposure duration) of ***70 years***. If one or both conditions are adjusted, then an adjustment to either the AACC and/or the annual average model output concentration must also be made for an "apple-to-apples" comparison.

59. For example, the annual average concentration for a 5-year project cannot be compared to the listed AACC because the exposure durations differ: five (5) years for the actual project and 70 years for the listed AACC. This example is found in IDAPA 210.15. To adjust for exposure duration, the example found in IDAPA 210.15 prompts the AACC to be multiplied by 10 to adjust for the shorter duration of the project. See Schilling Decl. ¶ 19.

60. DEQ properly applied these principles in the arsenic analysis for the SGP. The listed AACC was adjusted in accordance with IDAPA 210.12 to reflect the permit conditions establishing T-RACT. Per IDAPA 210.12 the AACC was multiplied by 10 to represent a risk of ***1-in-100,000*** for an emissions impact duration of ***70 years***; this is the T-RACT AACC. Then the annual average output concentration from the model was adjusted for the life-of-mine permit condition to reflect a 16-year exposure duration. This is shown mathematically by multiplying the modeled concentration by 16/70. This adjustment represents the equivalent modeled concentration over a 70-year period, known as the Exposure Concentration (EC). Detailed explanations are provided in the declarations of Norka Paden (¶¶ 4, 13) and Kevin Schilling (¶¶ 6.c, 18, 20).

61. With the AACC adjusted to the T-RACT AACC and the modeled annual average concentration adjusted to the EC, DEQ established a scientifically appropriate comparison to

determine acceptable risk. If the EC is less than the T-RACT AACC, as in the case of the SGP, then the risk of the project is less than ***1-in-100,000***.

62. As described in the declarations of Kevin Schilling and Norka Paden, DEQ applied these adjustments properly in their analyses of the SGP arsenic emissions impacts. Not applying these adjustments would be contrary to DEQ's toxic air pollutant rule and contrary to EPA's scientific approach and risk factors used for calculating excess risk probability adopted by the rule.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge, information, and belief.

DATED: August 30, 2024.

Kevin Lewis, Air Sciences Inc.

CERTIFICATE OF SERVICE

I hereby certify that on August 30, 2024, a true and correct copy of the **EXPERT DECLARATION OF KEVIN LEWIS** was served on the following:

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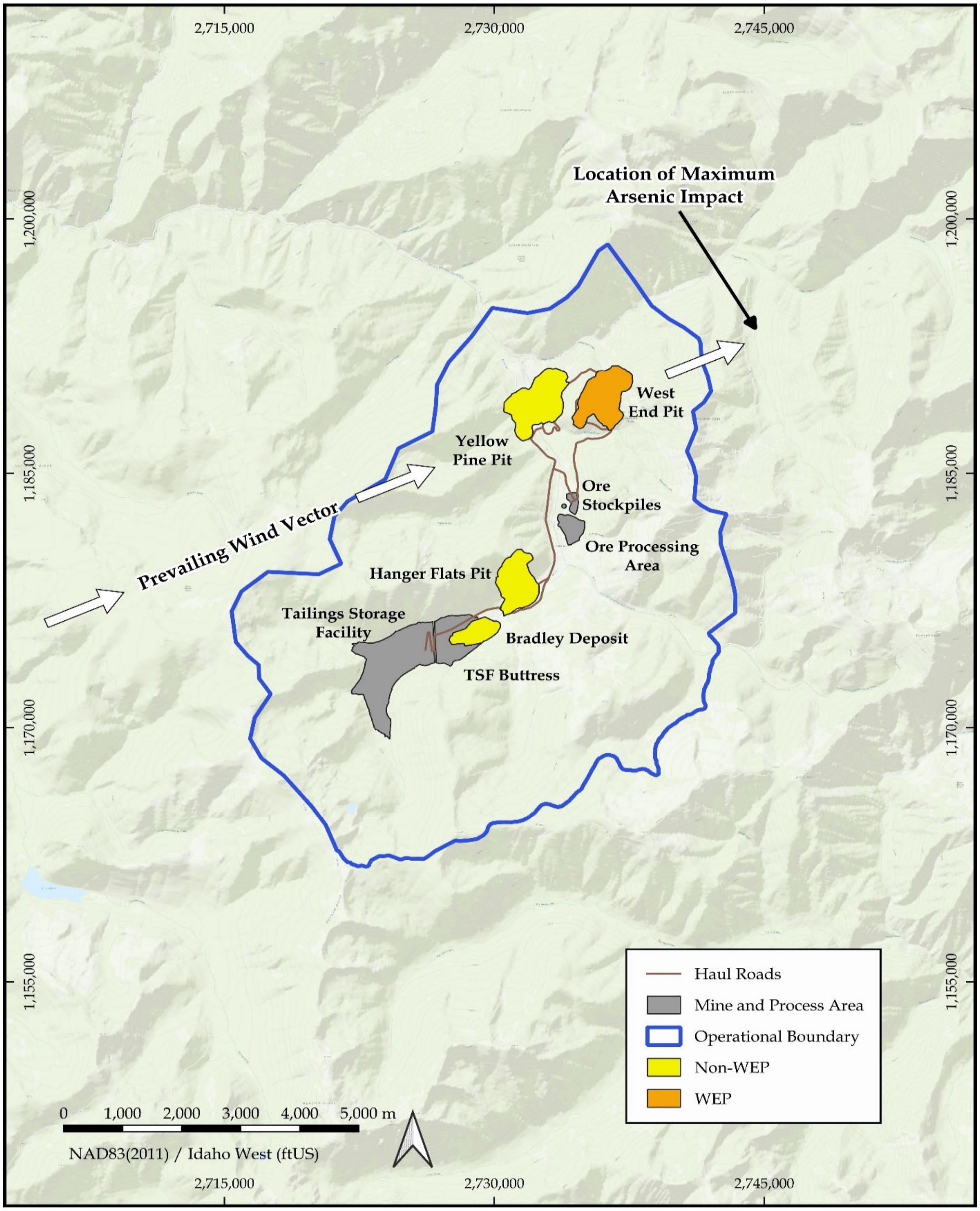
EXHIBIT A
Figure 1. Location of Maximum Arsenic Impacts



Attachment 1

Attachment 1

Statement of Basis

Permit to Construct No. P-2019.0047
Project ID 62288

Midas Gold Idaho, Inc.
Stibnite, Idaho

Facility ID 085-00011

Proposed for Public Comment

February 18, 2021
Morrie Lewis
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ANFO	ammonium nitrate/fuel oil
As	arsenic
ASTM	American Society for Testing and Materials
bkW	brake kilowatt
BT	Bradley Tailings
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
Cd	cadmium
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CIP	Carbon-in-Pulp
CIL	Carbon-in-Leach
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COC	contaminants of concern
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
DR	development rock
DRSF	development rock storage facilities
dscf	dry standard cubic feet
EF	emission factors
EIS	Environmental Impact Statement required by the National Environmental Policy Act
EL	screening emission levels
EPA	United States Environmental Protection Agency
FDCP	Fugitive Dust Control Plan
FDRSF	Fiddle Development Rock Storage Facility
Forest Service	United States Forest Service
GACT	Generally Available Control Technology
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
H_2SO_4	Sulfuric Acid
HAP	hazardous air pollutants
HFDRSF	Hangar Flats Development Rock Storage Facility
HFP	Hangar Flats Pit
Hg	mercury
hp	horsepower
hr/yr	hours per consecutive 12-calendar-month period
HVAC	heating, ventilation, and air conditioning
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers

lb/hr	pounds per hour
lb/qtr	pound per quarter
LMP	lime manufacturing plant
MACT	Maximum Achievable Control Technology
Midas Gold	Midas Gold Idaho, Inc.
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
Ni	nickel
NF	National Forest System road
NMMP	nonmetallic mineral processing
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NSPS	New Source Performance Standards
NSR	New Source Review
O&M	operation and maintenance
O_2	oxygen
PAH	polycyclic aromatic hydrocarbons
Pb	lead
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
POX	pressure oxidation
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
PW	process weight rate
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
SAG	semi-autogenous grinding
Sb	antimony
scf	standard cubic feet
SCL	significant contribution limits
Se	selenium
SGP	Stibnite Gold Project
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
STKP	crusher stockpile
Subsection 210.20	HAP TAP exemption for NSPS and NESHAP sources in IDAPA 58.01.01.210.20
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12-calendar-month period
TAP	toxic air pollutants
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds

WEDRSF	West End Development Rock Storage Facility
WEP	West End pit
YPDRSF	Yellow Pine Development Rock Storage Facility
YPP	Yellow Pine Pit
$\mu g/m^3$	micrograms per cubic meter

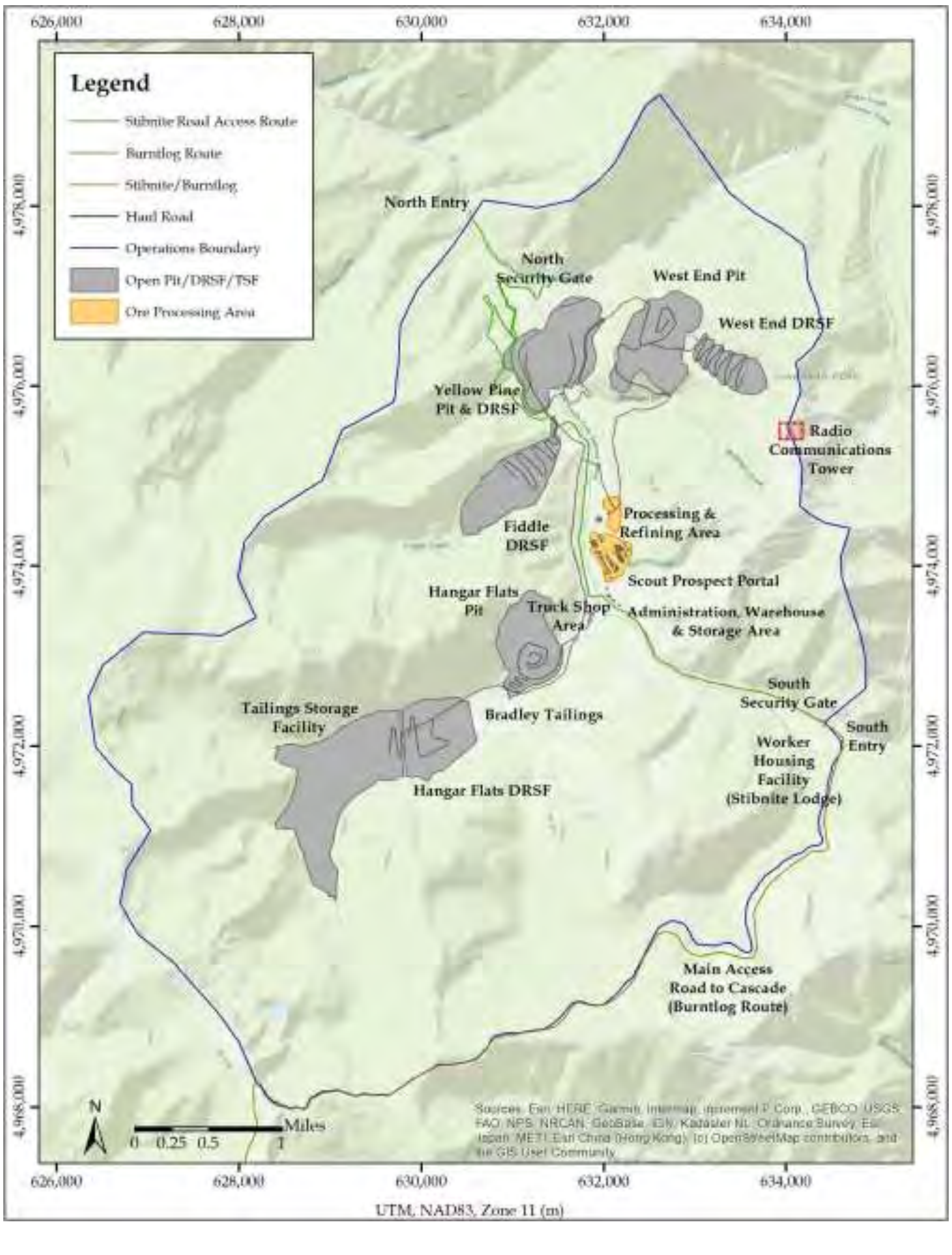
FACILITY INFORMATION

Description

Midas Gold Idaho, Inc. (Midas Gold) proposes to construct and operate the Stibnite Gold Project (SGP), consisting of conventional open-pit mining, ore preparation, and gold extraction operations.

SGP is to be located in Valley County at the intersection Forest Service roads NF-374 and NF-412 (Stibnite Road), approximately 10 miles east of Yellow Pine. The proposed Burntlog Route access road will provide year-round access to the site. The project comprises a combination of public national forest and private lands. The mining operations boundary within which public access will be excluded is defined in Figure 1. This operations boundary also defines the ambient air boundary used in all ambient air quality impact analyses.

Figure 1 PROJECT AREA OF OPERATIONS

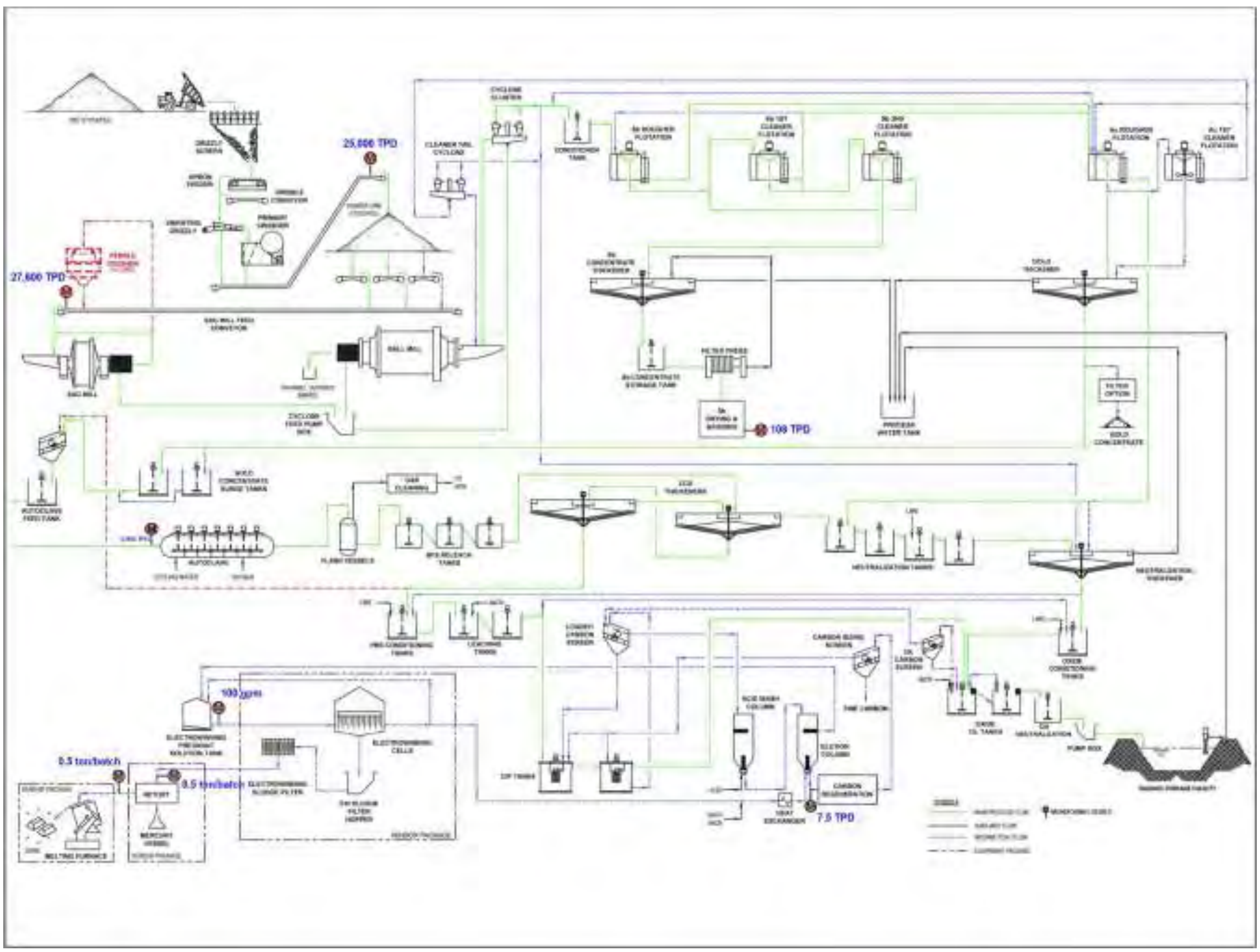


SGP will require the construction of significant infrastructure, including a power transmission line, a primary mine site access road, onsite haul roads, an ore processing facility, onsite workspaces, employee housing and recreation, water storage and distribution facilities, and sewage disposal facilities.

Conventional open-pit mining methods including drilling, blasting, excavating, and hauling will be used to extract ore and waste rock, termed development rock (DR). Hydraulic shovels and front-end loaders will be used to load ore and DR into haul trucks. DR will be used for construction, restoration, and backfilling, or hauled to the dedicated development rock storage facilities (DRSF). Approximately 340 million tons of DR will be handled over the life of the mine.

The SGP will include three years of pre-mining development and construction activities, followed by an operating mine life of approximately 12 years. Mining will occur in three open pits: Yellow Pine Pit (YPP), Hangar Flats pit (HFP), and West End pit (WEP). Although there will be overlap in mine development construction and operations, the general sequence of mining will be the YPP deposit, followed by the HFP and WEP deposits. Legacy tailings from the Meadow Creek valley (Bradley Tailings [BT]) will also be reclaimed and reprocessed during the initial project schedule. Surface exploration drilling will occur within the pits and within the Scout Prospect decline (underground exploration) throughout the mine operation period. Restoration and reclamation of other legacy mining features will occur prior to mining, throughout the life of the mine, and as part of the mine closure.

Figure 2 DIAGRAM OF PROCESS FLOWS



Ore will be hauled to the primary crusher area, where it will be fed directly into the crusher dump pocket or stockpiled. The ore crushing plant will be designed to operate at a maximum rate of 25,000 tons per calendar day (T/day). Approximately 100 million tons of ore will be mined from the three pits over the life of the project. The metal-recovery process from ore will include conventional crushing and grinding, followed by froth-flotation circuits that will generate separate gold-silver and antimony-silver concentrates. The antimony-silver concentrate will be shipped offsite for refining, whereas additional onsite processing of the gold-silver concentrate will include pressure oxidation, carbon-in-leach circuits, and refining processes to recover gold and minor amounts of silver. The finely ground leftover ore material from the mineral-recovery process, termed tailings, will be neutralized, thickened, and transported via a pipeline to the tailings storage facility. A diagram of ore processing and ore concentration and refining process flows is provided in Figure 2.

Permitting History

This is the initial PTC for a new facility, thus there is no permitting history.

Application Scope

This permit is the initial PTC for this facility.

The applicant has proposed to conduct mining operations and to install and operate ore processing, ore concentration and refining, and ancillary equipment:

- Drilling, blasting, excavating, and hauling operations;
- Ore processing operations (OC1–OC13, PS);
- Ore concentration and refining operations (AC, EW, MR, MF, CKD);
- Process heating (ACB, CKB, PV, HS, LKC);
- Lime production operations (LS1–LS12, LSBM, LS-L/U, LK, LCR, LS1-L/U, MillS2-L/U, ACS1–ACS4);
- Aggregate production operations (PCSP1, PCSP2);
- Concrete production operations (CM; CS1–CS2-L/U, CA-L/U);
- Heating, Ventilation, and Air Conditioning heaters (H1M–H2M, HM, HAC, HR, HA, HMO, HTS, HW);
- Emergency generator engines (EDG1–EDG3, EDFP); and
- Fuel storage (TG1–TG2, TD3—TD10).

Application Chronology

August 20, 2019	DEQ received an application and an application fee.
August 29 – September 13, 2019	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
September 19, 2019	DEQ determined that the application was incomplete.
October 4, 2019	DEQ received a preliminary response and supplemental information from the applicant, including a request to delegate authority of responsible official.
October 9, 2019	DEQ approved the request to delegate authority of responsible official.
October 15, 2019	DEQ met with the applicant to review and discuss the preliminary response.
October 22, 2019	DEQ determined that the application remained incomplete while the applicant prepared a response to the remaining items previously identified (9/19/19), and included a summary of recommendations provided at the meeting (10/15/19).
November 8, 2019	DEQ requested additional information from the applicant via email, relating to items previously identified (9/19/19).
November 21, 2019	DEQ received a request from the applicant for extension until November 27, 2019 to respond.
November 27, 2019	DEQ received supplemental information from the applicant, including a revised application with updated emissions inventories and modeling analyses.
December 24, 2019	DEQ determined that the application was incomplete.
January 8, 2020	DEQ received a request from the applicant for extension until February 7, 2020 to respond.
January 31, 2020	DEQ requested additional information from the applicant via email, relating to items previously identified (12/24/19).
February 5, 2020	DEQ received supplemental information from the applicant, including a revised application with updated emissions inventories and modeling analyses.
March 6, 2020	DEQ determined that the application was incomplete.
April 2, 2020	DEQ received a request from the applicant for extension until April 15, 2020 to respond.
April 15, 2020	DEQ received supplemental information from the applicant, including updated modeling analyses.
May 15, 2020	DEQ determined that the application was complete.
June 24, 2020	DEQ received the final application including all updates.
July 6, 2020	DEQ made available the draft permit and statement of basis for peer and regional office review.
July 14, 2020	DEQ made available the draft permit and statement of basis for applicant review.
July 31, 2020	DEQ made available an updated draft statement of basis Appendix B for applicant review.

August 3 and 13, 2020	DEQ received comments from the applicant on the draft permit and statement of basis.
August 20, 2020	DEQ received the permit processing fee.
September 10 – October 12, 2020	DEQ provided a public comment period on the proposed action.
October 12, 2020	DEQ received a request to extend the public comment period.
October 13 – November 11, 2020	DEQ extended the public comment period on the proposed action.
October 27, 2020	DEQ provided an information meeting during the extended public comment period.
November 20, 2020	DEQ requested additional information from the applicant to address substantive public comments received, including missing TAP and HAP emission estimates.
November 25 and December 11, 2020	DEQ extended the response to public comment period until February 22, 2021 to allow additional time for the applicant and DEQ to respond to substantive public comments.
December 17, 2020	DEQ received a response to the request for additional information from the applicant.[1]
December 18 and 21, 2020	DEQ received supplemental information from the applicant, including a response and HAP/TAP addendum to the application,[2] updated HAP and TAP emissions estimates,[3] updated TAP modeling analyses,[4] and supporting references.[5]
January 28, 2021	DEQ received updated modeling files with corrections for formaldehyde and sulfuric acid, and an updated figure showing TAP modeled impacts.
February XX – March XX, 2021	DEQ provided a public comment period on the proposed action as updated to address the HAP and TAP addendum and updates.
February XX, 2020	DEQ provided an information meeting during the public comment period.
DRAFT February 18, 2021	DEQ issued the final permit, statement of basis, and response to public comments.

[1] "Response to DEQ's Request for Information," Midas Gold, December 17, 2020 (2020AAG2130).

[2] "HAP/TAP Addendum," Midas Gold, December 18, 2020. (2020AAG2150)

[3] "20200623-Midas Gold SGP PTC EI - Final-TAPr2.2.xls," Midas Gold, December 21, 2020. (2020AAG2152)

[4] "Modeling Files 2020-12.zip," Midas Gold, December 21, 2020. (2020AAG2154)

[5] "References-20201222T020853Z-001.zip," Midas Gold, December 21, 2020. (2020AAG2153)

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 lists all sources of regulated emissions for informational purposes.

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Source	Control Equipment	Maximum Process Rate
Mining			
	Drilling activities	Reasonable control and Fugitive Dust Control Plan (FDCP)	1,200 holes/day
	Blasting activities	Reasonable control & FDCP	2 blasts/day
	Excavating and hauling activities	Reasonable control & FDCP – Chemical suppression and water sprays Control efficiency: 93.3% for PM/PM_{10} (haul roads)	180,000 T/day
	Rock dumps and storage piles	Reasonable control & FDCP	n/a
PS1–2-L/U	(2) Prill Silos #1-2 Maximum capacity: 100 T (each)	Loading – None Unloading – None	200 T/day and 9,000 T/yr (combined)
Ore Processing			
OC1	Loader Transfer of Ore to Grizzly	Reasonable control & FDCP – Water sprays and moisture carryover	25,000 T/day
OC2	Grizzly to Apron Feeder		
OC3	Conveyor – Apron Feeder to Dribble		
OC4	Conveyor – Apron Feeder to Grizzly		
OC5	Conveyor – Dribble to Grizzly		
OC6	Grizzly to Primary Crusher or Coarse Ore Stockpile Feed		
OC7	Primary Crusher	Reasonable control & FDCP – Water sprays and moisture carryover	
OC8	Conveyor – Coarse Ore Stockpile Feed Transfer to Stockpile		
OC9	Stockpile Transfer to Reclaim Conveyors	Reasonable control & FDCP – Below-grade of storage piles Control efficiency: 80% for PM/PM_{10}	27,600 T/day
OC10	Conveyor – Reclaim Conveyors to SAG Mill Feed Conveyor		
OC11	Conveyor – SAG Mill Feed Transfer to SAG Mill	Reasonable control & FDCP – Enclosure Control efficiency: 80% for PM/PM_{10}	
OC12	Pebble Crusher	Reasonable control & FDCP – Water sprays and moisture carryover	
OC13	Pebble Discharge to SAG Mill Feed		
Ore Concentration and Refining			
CIP Leach 1–4	Carbon-in-Pulp Leach Tanks	Chemical treatment (lime, caustic soda, hydrogen peroxide, copper sulfate, etc.)	125 g/m^3 CN, 10.25 pH, and 1,700 T/yr PAX
CIL 1–6	Carbon-in-Leach Tanks	Chemical treatment	
CIP 1–6	Carbon-in-Pulp Tanks	Chemical treatment	
CN Detox 1–2	Cyanide Detox Tanks	Chemical treatment	25 g/m^3 CN, and 8.5 pH

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Source	Control Equipment	Maximum Process Rate
AC	Autoclave (AC)	Venturi Scrubber (VS1) Vent Gas Cleaning Tower (ST1) Vent Gas Steam Condensation Tower (CT1) Carbon Filter (CA5) Type: sulfur-impregnated activated carbon Form: granulated	6,960 T/day
EW	Electrowinning Cells and Pregnant Solution Tank	Shared Carbon Filter (CA2) Type: sulfur-impregnated activated carbon Form: granulated	100 gpm
MR	Mercury Retort	Condenser Carbon Filter (CA3) Type: sulfur-impregnated activated carbon Form: granulated	1,000 lb/batch and 21 T/yr
MF	Induction Melting Furnace	Baghouse (BH2) Carbon Filter (CA4) Type: sulfur-impregnated activated carbon Form: granulated	
CKD	Carbon Regeneration Kiln (Drum)	Wet Scrubber (WS2) Carbon Filter (CA1) Type: sulfur-impregnated activated carbon Form: granulated	7.2 T/day
	Tailings and Maintenance Pond activities	Chemical treatment, reasonable control & FDCP	1 g/m^3 CN
Process Heating			
ACB	POX Boiler (for AC) Maximum capacity: 17 MMBtu/hr Fuel: propane	None	operation is limited to AC startup only
HS	Strip Circuit Solution Heater Maximum capacity: 5 MMBtu/hr Fuel: propane	None	n/a
CKB	Carbon Regeneration Kiln Burners Maximum capacity: 2.255 MMBtu/hr Fuel: propane	None	(n/a)
PV	Propane Vaporizer Maximum capacity: 0.1 MMBtu/hr Fuel: propane	None	n/a
LKC	PFR Shaft Lime Kiln Combustion Maximum capacity: 22.0 MMBtu/hr Fuel: propane	None	n/a

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Source	Control Equipment	Maximum Process Rate
Lime Production			
LS1	Limestone transfer to Primary Crusher Hopper	None	1,130 T/day
LS2	Primary Crusher Maximum capacity: 1,130 T/day	None	
LS3	Primary Screen	None	
LS4	Secondary Crusher	None	
LS5	Secondary Screen	None	
LS6	Conveyor – Limestone to Ball Mill Feed Bin	None	
LS7	Conveyor – Limestone to Ball Mill Feed	None	
LS8	Conveyor – Ball Mill Feed to Ball Mill	None	
LSBM	Limestone Ball Mill	Baghouse (BH3)	
LS9	Conveyor – Limestone to Kiln Feed Bin	None	267 T/day
LS10	Conveyor – Limestone to Lime Kiln Feed	None	
LS11	Fines Screen	None	
LS12	Conveyor – Kiln Feed to PFR Shaft Lime Kiln	None	
LK	Parallel Flow Regenerative (PFR) Shaft Kiln	Baghouse (BH4)	169 T/day and 52,377 T/yr
LCR	Lime Mill Crusher	Baghouse (BH5)	
LS-L/U	Bucket Elevator – Pebble Lime Silo Loading Pebble Lime Silo discharge to Lime Slaker	Loading – Bin Vent Filter Unloading – Wet Scrubber (WS3)	
LS1-L/U	SAG Mill Lime Silo #1 Maximum capacity: 250 T/day	Loading – Bin Vent Filter Unloading – None	4,000 T/day and 70,000 T/yr (combined)
MillS2-L/U	SAG Mill Lime Silo #2 Maximum capacity: 250 T/day	Loading – Bin Vent Filter Unloading – None	
ACS1	AC Lime Silo #1 Maximum capacity: 1,000 T/day	Loading – Bin Vent Filter Unloading – None	
ACS2	AC Lime Silo #2 Maximum capacity: 1,000 T/day	Loading – Bin Vent Filter Unloading – None	
ACS3	AC Lime Silo #3 Maximum capacity: 1,000 T/day	Loading – Bin Vent Filter Unloading – None	
ACS4	AC Lime Silo #4 Maximum capacity: 500 T/day	Loading – Bin Vent Filter Unloading – None	
Aggregate Production			
PCSP1	Portable Crushing and Screening Plant 1 Crushers, screens, and conveyors	Reasonable control & FDCP – water sprays and moisture carryover	2,000 T/day (aggregate)
PCSP2	Portable Crushing and Screening Plant 2 Crushers, screens, and conveyors	Reasonable control & FDCP – water sprays and moisture carryover	2,000 T/day (aggregate)
Concrete Production			
CM	Central Mixer Loading Maximum capacity: 120 T/hr	Reasonable control & FDCP – Controls may include water sprays, enclosures, hoods, curtains, shrouds, movable and telescoping chutes, and central duct collection systems.	2,480 T/day and 560,000 T/yr (cement + aggregate)
CS1-L/U	Cement/Shotcrete Silo #1 Maximum capacity: 80 T	Loading – Bin Vent Filter Unloading – None	
CS2-L/U	Cement/Shotcrete Silo #2 Maximum capacity: 80 T	Loading – Bin Vent Filter Unloading – None	
CA-L/U	Aggregate Bin Maximum capacity: 2,400 T	Loading – None Unloading – None	

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Source	Control Equipment	Maximum Process Rate
Heating, Ventilation, and Air Conditioning (HVAC)			
H1M	Mine Air Heater #1 Maximum capacity: 4 MMBtu/hr Fuel: propane	None	n/a
H2M	Mine Air Heater #2 Maximum capacity: 4 MMBtu/hr Fuel: propane	None	n/a
HM	(4) Mill HVAC Heaters #1-4 Maximum capacity: 1.0 MMBtu/hr (each) Fuel: propane	None	n/a
HAC	Autoclave HVAC Heater Maximum capacity: 0.25 MMBtu/hr Fuel: propane	None	n/a
HR	Refinery HVAC Heater Maximum capacity: 0.25 MMBtu/hr Fuel: propane	None	n/a
HA	Admin HVAC Heater Maximum capacity: 0.25 MMBtu/hr Fuel: propane	None	n/a
HMO	(2) Mine Ops. HVAC Heaters Maximum capacity: 0.25 MMBtu/hr (each) Fuel: propane	None	n/a
HTS	(2) Truck Shop HVAC Heaters Maximum capacity: 1.0 MMBtu/hr (each) Fuel: propane	None	n/a
HW	(3) Warehouse HVAC Heaters Maximum capacity: 1.0 MMBtu/hr (each) Fuel: propane	None	n/a

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Source	Control Equipment	Maximum Process Rate
Emergency Power Generation and Fire Suppression			
EDG1	Camp Emergency Generator Date of construction: 2007 or later Maximum capacity: 1,000 bkW Maximum operation: 100 hr/yr (non-emergency) Fuel: ultra-low sulfur diesel (ULSD) Displacement: <10 L/cyl	EPA Tier 2 technologies	1 hr/day and 100 hr/yr
EDG2	Plant Emergency Generator #1 Date of construction: 2007 or later Maximum capacity: 1,000 bkW Maximum operation: 100 hr/yr (non-emergency) Fuel: ULSD Displacement: <10 L/cyl	EPA Tier 2 technologies	1 hr/day and 100 hr/yr
EDG3	Plant Emergency Generator #2 Date of construction: 2007 or later Maximum capacity: 1,000 bkW Maximum operation: 100 hr/yr (non-emergency) Fuel: ULSD Displacement: <10 L/cyl	EPA Tier 2 technologies	1 hr/day and 100 hr/yr
EDFP	Mill Fire Pump Date of construction: 2009 or later Maximum capacity: 200 bkW Maximum operation: 100 hr/yr (non-emergency) Fuel: ULSD Displacement: <10 L/cyl	None	1 hr/day and 100 hr/yr
Fuel Storage			
TG1–TG2	Mine Site Gasoline Tanks (#1 through #2) Maximum capacity: 5,000 gal each	Lids or other appropriate closure with gasketed seal and submerged filling	<100,000 gal/mo
TD3–TD10	Mine Site Diesel Tanks (#3 through #10)	Lids or other appropriate closure	n/a

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit (PTE) as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions did not count in determining the PTE of a facility or stationary source.

Using this definition of PTE, an emissions inventory was developed for the SGP (see Appendix A). Emissions estimates of criteria pollutant and hazardous air pollutant (HAP) PTE were based on project-specific activity rates (e.g., continuous operation with the exception of the POX Boiler and emergency generator engines, design production rates, material haul rates, blasting agent usage rates, reagent usage rates, etc.), process design (e.g., open-pit mining, process concentration and pH, parallel flow regenerative lime production, central mix concrete production, haul fleet, etc.), emission abatement techniques (e.g., dust suppressant, chemical treatment, carbon filter, baghouse, bin vent filtration, wet scrubber, venturi scrubber, vent gas cleaning tower, and vent gas steam condensation tower control equipment), material characteristics (e.g., moisture content, road silt content, haul route distances, etc.), site conditions (onsite meteorological data, precipitation, etc.), and emission factors based on AP-42,[6] representative source test emissions data, and representative emission limits. Estimated emissions from the autoclave and the carbon regeneration kiln relied on emissions data from representative source test emissions data, scaled to the proposed equipment capacity. Estimated emissions from fuel storage tanks relied on TANKS[7] emission estimation software and projected annual gasoline and ULSD usage rates. Estimated emissions from the emergency generator engines relied on the use of certified engine emission factors.

Uncontrolled PTE

Using the definition of PTE, uncontrolled PTE is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled PTE is used to determine if a facility is a "synthetic minor" source of emissions. Synthetic minor sources are facilities that have an uncontrolled PTE for regulated air pollutants or HAP above an applicable major source threshold without permit limits.

For Midas Gold, uncontrolled PTE was based upon a worst-case for operation of the facility of continuous operation at proposed maximum material throughput and fuel input rates (Table 1), without consideration of control equipment. For batch operations, the number of operations necessary to achieve the proposed daily throughput rates was assumed in estimating emissions (MR, MF). Silo loading and unloading operations were assumed to occur at most once per day (LS1-L/U, MillS2-L/U, LS-L/U, PS-L/U, ACS1–ACS4-L/U, CS1–CS2-L/U, CA-L/U). Fuel storage was based on estimated facility-wide fuel usage rates (TG1, TG2 and TD3—TD10). For the purposes of maintenance and testing, emergency power generation operations were assumed to occur 1 hour per day and 100 hours per year (EDG1–EDG3, EDFP). With the exception of the POX Boiler in which operation is limited to AC startup only, continuous operation at maximum fuel input rates was assumed for all process heating and HVAC equipment.

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6 Compilation of Air Pollutant Emission Factors, AP-42, Volume I, Fifth Edition (AP-42), Section 1.3 –Fuel Oil Combustion, 1.4 –Natural Gas Combustion, 1.5 – LPG Combustion, 3.2 – Natural Gas-Fired Reciprocating Engines, 3.3 – Gasoline and Diesel Industrial Engines, 3.4 – Large Stationary Diesel and All Stationary Dual-Fuel Engines, 8.3 – Ammonium Nitrate, 11.9 – Western Surface Coal Mining, 11.12 – Concrete Batching, 11.17 – Lime Manufacturing, 11.19 – Construction and Aggregate Processing, 13.2 – Fugitive Dust Sources, and 13.3 – Explosives Detonation, Office of Air Quality Planning and Standards Office of Air and Radiation (OAQPS), EPA, updated as of August 2011.

7 TANKS Storage Tank Emissions Calculation Software Version 4.09D, OAQPS, EPA, released October 5, 2006.

The following table presents the uncontrolled PTE for regulated air pollutants as submitted by the applicant and verified by DEQ staff. Refer to Appendix A for a summary of the calculations and the assumptions used to determine emissions for each source, and the Facility Classification section for a review of facility classification based on uncontrolled and controlled PTE.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR CRITERIA AIR POLLUTANTS

Source	PM	PM_{10}	$PM_{2.5}$	CO	NO_x	VOC	SO_2
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
OC1	13.69	5.02	0.78				
OC2	13.69	5.02	0.78				
OC3	13.69	5.02	0.78				
OC4	13.69	5.02	0.78				
OC5	13.69	5.02	0.78				
OC6	13.69	5.02	0.78				
OC7	24.64	10.95	1.64				
OC8	13.69	5.02	0.78				
OC9	15.11	5.54	0.86				
OC10	15.11	5.54	0.86				
OC11	15.11	5.54	0.86				
OC12	27.20	12.09	1.81				
OC13	15.11	5.54	0.86				
PS-L	0.07	0.03	0.004				
PS-U	0.07	0.03	0.004				
AC	74.10	74.10	74.10				2.86
MF	1.77	1.77	1.77				
CKD (EW, MR)	6.13	6.13	6.13	0.53	0.05	0.48	
LS1	0.48	0.17	0.03				
LS2	0.86	0.38	0.06				
LS3	3.97	1.38	0.21				
LS4	0.86	0.38	0.06				
LS5	3.97	1.38	0.21				
LS6	0.48	0.17	0.03				
LSBM	64.22	53.89	19.23				
LS7	0.48	0.17	0.03				
LS8	0.48	0.17	0.03				
LS9	0.12	0.05	0.007				
LS10	0.12	0.05	0.007				
LS11	1.03	0.36	0.05				
LS12	0.12	0.05	0.007				
LS-L	0.23	0.23	0.23				
LS-U	0.02	0.02	0.02				
LK	34.05	34.05	34.05	11.78	6.29		0.03
LCR	10.58	8.88	3.17				
LS1-L	1.60	1.03	0.16				
LS1-U	0.01	0.006	0.001				
MillS2-L	1.60	1.03	0.16				
MillS2-U	0.01	0.006	0.001				
ACS1-L	6.39	4.11	0.62				
ACS1-U	0.04	0.02	0.004				
ACS2-L	6.39	4.11	0.62				
ACS2-U	0.04	0.02	0.004				
ACS3-L	6.39	4.11	0.62				
ACS3-U	0.04	0.02	0.004				
ACS4-L	3.19	2.06	0.31				
ACS4-U	0.02	0.01	0.002				
PCSP1	27.67	10.11	1.54				
PCSP2	27.67	10.11	1.54				
CM	17.16	4.68	0.71				
CS1-L	21.90	14.10	2.14				
CS1-U	0.14	0.08	0.01				
CS2-L	21.90	14.10	2.14				

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR CRITERIA AIR POLLUTANTS

Source	PM	PM_{10}	$PM_{2.5}$	CO	NO_x	VOC	SO_2
	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
CS2-U	0.14	0.08	0.01				
CA-L	1.73	0.83	0.13				
CA-U	1.73	0.83	0.13				
ACB	0.002	0.002	0.002	0.02	0.04	0.002	0.004
CKB	0.08	0.08	0.08	0.81	1.40	0.09	0.17
PV	0.003	0.003	0.003	0.04	0.06	0.004	0.008
HS	0.17	0.17	0.17	1.80	3.11	0.19	0.38
LKC	0.63	0.63	0.63	6.72	11.65	0.72	1.42
H1M	0.13	0.13	0.13	1.44	2.49	0.15	0.30
H2M	0.13	0.13	0.13	1.44	2.49	0.15	0.30
HM	0.13	0.13	0.13	1.44	2.49	0.15	0.30
HAC	0.008	0.008	0.008	0.09	0.16	0.01	0.02
HR	0.008	0.008	0.008	0.09	0.16	0.01	0.02
HA	0.008	0.008	0.008	0.09	0.16	0.01	0.02
HMO	0.02	0.02	0.02	0.18	0.31	0.02	0.04
HTS	0.07	0.07	0.07	0.72	1.24	0.08	0.15
HW	0.10	0.10	0.10	1.08	1.87	0.11	0.23
EDG1	0.02	0.02	0.02	0.39	0.71	0.14	0.001
EDG2	0.02	0.02	0.02	0.39	0.71	0.14	0.001
EDG3	0.02	0.02	0.02	0.39	0.71	0.14	0.001
EDFP	0.004	0.004	0.004	0.08	0.09	0.09	0.0001
TG1–TG2						1.91	
TD3—TD10						0.06	
Total	**560**	**337**	**164**	**29.47**	**36.16**	**4.68**	**6.27**

Although not explicitly calculated, it was confirmed by Midas Gold in the response to a request for additional information[1] that the uncontrolled HAP PTE for SGP is estimated to exceed 25 tons per year (T/yr) without application of the specified control equipment (Table 1). Arsenic HAP PTE from haul roads at a controlled emission rate of 0.464 pounds per hour (lb/hr) and accounting for 93.3% control efficiency exceeds 20 T/yr, supporting that uncontrolled HAP PTE exceeds 10 T/yr of single HAP and 25 T/yr of total HAP.

Pre-Project PTE

Pre-project PTE is used to establish the change in emissions at a facility as a result of this project. Because this is a new facility, pre-project emissions are set to zero for all criteria pollutants.

Post-Project PTE

Post-project PTE is used in determining the change in emissions at a facility and in determining the facility's classification as a result of this project. Post-project PTE includes all permit limits resulting from this project.

In addition to assuming continuous operation of the facility at the proposed material throughput and fuel input rates, post-project emissions estimates account for the use of dust suppressant, chemical treatment, carbon filter, baghouse, bin vent filtration, wet scrubber, venturi scrubber, vent gas cleaning tower, and vent gas steam condensation tower control equipment.

A variety of factors impact emissions from unpaved roadways, and it was recognized that accurate determination of site-specific parameters characterizing road conditions and vehicle traffic was critical to estimating particulate matter emissions and ambient air impacts. Midas Gold provided site-specific information to support parameters such as silt content, mean vehicle weight, and dust suppressant control efficiencies, and provided an analysis evaluating the conservatism of the resulting emission factor (AP-42).[8] To ensure operation consistent with these parameters and to reasonably control fugitive emissions, compliance with requirements identified in the FDCP is

[8] Appendix A – Model Parameter / Assumption / Data Level of Conservatism IDEQ Forms to the Stibnite Gold Project Permit to Construct Application, Midas Gold, revised June 23, 2020 (2020AAG1078).

required by the permit. Further discussion of the sensitivity of predicted air quality impacts is provided in the Ambient Air Quality Impact Analyses section.

The following table presents the post-project PTE for criteria pollutants from all emissions units at the facility as determined by DEQ staff. Because this is a new facility, the post-project PTE is equivalent to the facility-wide PTE. Refer to Appendix A for a summary of the calculations and the assumptions used to determine emissions from each source, and the Facility Classification section for a review of facility classifications based on uncontrolled and controlled PTE.

Table 3 POST-PROJECT POTENTIAL TO EMIT FOR CRITERIA AIR POLLUTANTS

Source	PM	PM_{10}	$PM_{2.5}$	CO	NO_x	VOC	SO_2
	T/yr (a)a)	T/yr (a)	T/yr (a)	T/yr (a)	T/yr (a)	T/yr (a)	T/yr (a)
POINT SOURCE EMISSIONS							
OC1	0.64	0.21	0.06				
OC2	0.64	0.21	0.06				
OC3	0.64	0.21	0.06				
OC4	0.64	0.21	0.06				
OC5	0.64	0.21	0.06				
OC6	0.64	0.21	0.06				
OC7	5.48	2.46	0.46				
OC8	0.64	0.21	0.06				
OC9	3.02	1.11	0.17				
OC10	3.02	1.11	0.17				
OC11	3.02	1.11	0.17				
OC12	6.04	2.72	0.50				
OC13	0.71	0.23	0.07				
PS-L	0.07	0.03	0.004				
PS-U	0.07	0.03	0.004				
AC	22.23	22.23	22.23				2.86
EW	0.31	0.31	0.31				
MR	0.006	0.006	0.006				
MF	0.89	0.89	0.89				
CKD	1.84	1.84	1.84	0.53	0.05	0.48	
LS1	0.48	0.18	0.03				
LS2	0.86	0.38	0.06				
LS3	3.97	1.38	0.21				
LS4	0.86	0.38	0.06				
LS5	3.97	1.38	0.21				
LS6	0.48	0.18	0.03				
LSBM	6.42	5.39	1.92				
LS7	0.48	0.18	0.03				
LS8	0.48	0.18	0.03				
LS9	0.12	0.05	0.01				
LS10	0.12	0.05	0.01				
LS11	1.03	0.36	0.06				
LS12	0.12	0.05	0.01				
LS-L	0.02	0.02	0.02				
LS-U	0.002	0.002	0.002				
LK	3.40	3.40	3.40	11.79	6.29		0.03
LCR	1.06	0.89	0.32				
LS1-L	0.002	0.001	0.0001				
LS1-U	0.01	0.006	0.001				
MillS2-L	0.002	0.001	0.0001				
MillS2-U	0.01	0.006	0.001				
ACS1-L	0.009	0.003	0.0004				
ACS1-U	0.04	0.02	0.004				
ACS2-L	0.009	0.003	0.0004				
ACS2-U	0.04	0.02	0.004				
ACS3-L	0.009	0.003	0.0004				
ACS3-U	0.04	0.02	0.004				
ACS4-L	0.004	0.001	0.0002				

Table 3 POST-PROJECT POTENTIAL TO EMIT FOR CRITERIA AIR POLLUTANTS

Source	PM	PM_{10}	$PM_{2.5}$	CO	NO_x	VOC	SO_2
	T/yr [(a)a]	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]
ACS4-U	0.02	0.01	0.002				
PCSP1	2.74	1.02	0.13				
PCSP2	2.74	1.02	0.13				
CM	0.55	0.17	0.02				
CS1-L	0.03	0.01	0.002				
CS1-U	0.14	0.08	0.01				
CS2-L	0.03	0.01	0.002				
CS2-U	0.14	0.08	0.01				
CA-L	1.73	0.83	0.13				
CA-U	1.73	0.83	0.13				
ACB	0.002	0.002	0.002	0.02	0.04	0.002	0.004
CKB	0.08	0.08	0.08	0.81	1.40	0.09	0.17
PV	0.003	0.003	0.003	0.04	0.06	0.004	0.008
HS	0.17	0.17	0.17	1.80	3.11	0.19	0.38
LKC	0.63	0.63	0.63	6.72	11.65	0.72	1.42
H1M	0.13	0.13	0.13	1.44	2.49	0.15	0.30
H2M	0.13	0.13	0.13	1.44	2.49	0.15	0.30
HM	0.13	0.13	0.13	1.44	2.49	0.15	0.30
HAC	0.008	0.008	0.008	0.09	0.16	0.01	0.02
HR	0.008	0.008	0.008	0.09	0.16	0.01	0.02
HA	0.008	0.008	0.008	0.09	0.16	0.01	0.02
HMO	0.02	0.02	0.02	0.18	0.31	0.02	0.04
HTS	0.07	0.07	0.07	0.72	1.24	0.08	0.15
HW	0.10	0.10	0.10	1.08	1.87	0.12	0.23
EDG1	0.02	0.02	0.02	0.39	0.71	0.14	0.001
EDG2	0.02	0.02	0.02	0.39	0.71	0.14	0.001
EDG3	0.02	0.02	0.02	0.39	0.71	0.14	0.001
EDFP	0.004	0.004	0.004	0.08	0.09	0.09	0.0001
TG1–TG2						1.91	
TD3—TD10						0.06	
Post-Project PTE [(c)]	**86.6**	**55.7**	**35.8**	**29.5**	**36.2**	**4.7**	**6.3**
FUGITIVE EMISSIONS							
Blasting activities	117.35	61.02	3.52	635.83	17.08		0.03
Drilling activities	284.70	148.04	8.54				
Hauling	2901.27	712.95	71.29				
Material load / unload (L/UL) [(b)]	15.00	7.10	1.07				
Dozing	103.56	19.78	10.87				
Grading	36.80	11.04	1.14				
Water Truck Travel	109.27	26.85	2.69				
Access Roads	6.95	1.72	0.17				
Wind Erosion [(b)]	5.72	2.86	0.43				
Surface Exploration	1.12	0.39	0.06				
Underground Exploration	0.002	0.001	0.0001				
Fugitive Total [(b)]	**3,569**	**986**	**100**	**636**	**17.1**		**0.03**

a) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating scenarios and annual limits.

b) Estimated emissions from the "W3" scenario resulted in the most emissions across most activities, with the exception of material load/unload and wind erosion activities, which occurred in the Y1, H1, W1, and B1 scenarios. Totals reported are for the "W3" scenario.

c) In the response to a request for additional information, Midas Gold confirmed that antimony process dryer and bagging operation emission sources (Sb1 and Sb2) initially proposed would be replaced by a dewatering/packaging circuit. As a result, these emission sources have been removed from the permit and post-project PTE.

Fourteen operational scenarios were evaluated by the applicant and verified by DEQ in order to estimate maximum hourly, daily, and annual potential emissions from sources. These scenarios encompassed all feasible origin and destination location combinations for locating ore and development rock. A summary of these scenarios is provided in Table 4. Although drilling, blasting, excavating, and hauling activities are not expected to be confined to a single scenario in practice, emissions in each scenario were conservatively estimated at the maximum daily proposed processing rate (180,000 of ore and rock) to allow for maximum operational flexibility, and to evaluate potential air quality impacts. Scenarios having the greatest potential emissions (i.e., the top seven) were those with the longest origin-to-destination distances, which resulted in increased emissions evident in onsite hauling and material loading and unloading activities. Consequently, the W3 scenario having the maximum origin-to-destination distance (16,415 daily vehicle miles traveled) is representative of maximum potential emissions.

Table 4 OPERATING SCENARIOS

Scenario	Origin [(a)]	Destination [(a)]
Y1	YPP	STKP
Y2	YPP	FDRSF
Y3	YPP	HFDRSF
H1	HFP	STKP
H2	HFP	FDRSF
H3	HFP	HFDRSF
H4	HFP	YPDRSF
W1	WEP	STKP
W2	WEP	FDRSF
W3	WEP	HFDRSF
W4	WEP	YPDRSF
W5	WEP	WEDRSF
B1	BT	STKP
B2	BT	HFDRSF

a) Where ore and rock origin and destination locations as depicted in Figure 1 are abbreviated as follows:
YPP = Yellow Pine Pit, HFP = Hangar Flats pit, WEP = West End pit, BT = Bradley Tailings, STKP = Primary Crusher Stockpile, FDRSF = Fiddle DRSF, HFDRSF = Hangar Flats DRSF, YPDRSF = Yellow Pine DRSF, WEDRSF = West End DRSF, and DRSF = development rock storage facilities.

There are numerous sources of fugitive dust emissions at the facility, including drilling and blasting activities, crushing and ore handling equipment, ore and rock storage piles, and unpaved roadways. Calculated at maximum daily processing rates, emissions from these sources would tend to be conservatively estimated. But it is also recognized that uncertainties exist in some of the emission factors used, and that predicted modeled impacts may be sensitive to emissions from such sources. In particular, it may prove challenging to consistently and continuously achieve the targeted level of fugitive dust control for emissions from traffic on unpaved roadways, with over 55 miles of haul truck routes within the mining operations boundary, a fleet of 32 haul trucks weighing between 37 and 357 tons, and a targeted dust control efficiency of 93.3% accomplished by application of both dust suppressant and water controls. Based on this, and the scale of operations, a detailed Fugitive Dust Control Plan (FDCP) was required (Permit Conditions 2.6). It is noted that Midas Gold projected actual annual production at approximately 42.7 million T/yr, or 65% of the permitted annual production limit of 65.7 million T/yr (Permit Condition 3.5), and that as a result actual emissions are expected to be lower than presented.

Change in PTE

The change in facility-wide PTE is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants, which for a new source is equivalent to the facility-wide and post-project PTE.

Table 5 CHANGES IN PTE FOR REGULATED AIR POLLUTANTS

Source	PM	PM_{10}	$PM_{2.5}$	CO	NO_x	VOC	SO_2
	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]	T/yr [(a)]
Pre-Project PTE	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Post-Project PTE	86.6	55.7	35.8	29.5	36.2	4.7	6.3
Changes in Potential to Emit	**86.6**	**55.7**	**35.8**	**29.5**	**36.2**	**4.70**	**6.30**

a) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating scenarios and annual limits.

Controlled Hazardous and Toxic Air Pollutant Emissions

A summary of the estimated PTE for hazardous air pollutants (HAP) and emissions increases (PTE) for non-carcinogenic and carcinogenic toxic air pollutants (TAP) and for potential is provided in the following table (Table 6). This table and the Ambient Air Quality Impact Analyses were updated to include new and updated TAP emission estimates from additional emission sources identified in public comments and in a response and HAP/TAP addendum to the application provided by Midas Gold.[2,3]

All permitted fugitive and point emission sources were evaluated in the new HAP and TAP emission estimates. In Table 6 below, HAP and TAP PTE emissions estimates are for the highest emissions year Scenario “W3” referenced from Table B1-W3 of Appendix B to the HAP/TAP addendum and ‘TblB1’ worksheet in the supporting spreadsheet. Process and production activities include ore processing; ore concentration and refining; process heating; aggregate production; concrete production; heating, ventilation, and air conditioning (HVAC); emergency power generation and fire suppression; and fuel storage. Mining and leaching activities include drilling, blasting, excavating, hauling, prill silos, rock dumps and storage piles, and tailings. Metal HAP and TAP emissions from process materials were based on metal concentration profiles from onsite core samples of ore and limestone materials, including 98 samples of SGP limestone[9] and over 55,000 samples of SGP ore.[10,11] As a conservative assumption, the limestone profile was also used for emissions from aggregate materials. Mercury emissions from the LK were estimated by assuming all mercury in the limestone feed is volatilized and emitted. For each non-mercury metal HAP and TAP, emissions from the LK were calculated as PM emissions multiplied by the median metal concentration measured. Elemental analysis of core samples was complemented with an evaluation of whether each result represented a regulated HAP and/or TAP substance (element or compound) in Table 2 of the HAP/TAP addendum.[2]

TAP also classified as HAP emitted from sources addressed by New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) were not required to be evaluated for compliance with TAP increments in accordance with IDAPA 58.01.01.210.20 (Subsection 210.20). Guidance and clarification of Subsection 210.20 source exemptions were included in the Subsection 210.20 (IDAPA 58.01.01.210.20) section and in the response to public comments document that is part of the final permit package for this permitting action. Some of the screening levels for non-carcinogenic and carcinogenic TAP were exceeded as a result of this project and required modeling. Modeling was required for aluminum, barium, calcium carbonate, calcium oxide, iron, sulfuric acid, thallium, and vanadium because the 24-hour average non-carcinogenic screening emission levels (EL) in IDAPA 58.01.01.585 were exceeded. Modeling was required for arsenic, cadmium, formaldehyde, and nickel because the annual average carcinogenic EL in IDAPA 58.01.01.586 were exceeded. Refer to the Ambient Air Quality Impact Analyses section and Appendix B for additional discussion.

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9 “M3-PN170045 Stibnite Gold Feasibility Study RE: M3-MGI-029E Lime Kiln Analysis Memo” and MGI-17-431-FullGeochem - MB.xlsx, M3 Engineering & Technology, June 14, 2018. (ref. M3 2018; 2020AAG2153)

10 “Geochemistry Statistics” email R. McCluskey to E. Memon, Stibnite Gold Project, Air Sciences, September 26, 2017. (ref. Midas Gold 2017c; 2020AAG205)

11 “Re: Te-2” and 2020-12-09_Fe and Se data.xlsx, Stibnite Gold Project, December 9, 2020. 1,500 of these samples were tested for selenium. (ref. Midas Gold 2020; 2020AAG2153)

Table 6 POTENTIAL TO EMIT FOR HAZARDOUS & TOXIC AIR POLLUTANTS (HAP/TAP) [a]

HAP/TAP	Mining and Leaching Emissions		Processing and Production Emissions		Facility-Wide Total Emissions		Adjusted TAP Emissions	Screening Emission Level
	lb/hr [b]	T/yr [c]	lb/hr [b]	T/yr [c]	lb/hr [b]	T/yr [c]	lb/hr [b,d]	lb/hr [d]
1,3-Butadiene [e]	0	0	8.4E-07	3.7E-06	8.4E-07	3.7E-06	0	2.4E-05
2-Methylnaphthalene [e,f]	0	0	1.1E-06	4.6E-06	1.1E-06	4.6E-06	0	9.1E-05
3-Methylcholanthrene [e]	0	0	7.8E-08	3.4E-07	7.8E-08	3.4E-07	3.2E-08	2.5E-06
7,12-Dimethylbenz(a)anthracene [e,f]	0	0	7.6E-07	3.0E-06	7.6E-07	3.0E-06	0	9.1E-05
Acenaphthene [e,f]	0	0	5.7E-06	7.1E-06	5.7E-06	7.1E-06	0	9.1E-05
Acenaphthylene [e,f]	0	0	1.1E-05	1.4E-05	1.1E-05	1.4E-05	0	9.1E-05
Acetaldehyde [e]	0	0	2.5E-05	1.1E-04	2.5E-05	1.1E-04	0	3.0E-03
Acrolein	0	0	1.6E-05	2.0E-05	1.6E-05	2.0E-05	0	0.017
Anthracene [e,f]	0	0	1.7E-06	2.4E-06	1.7E-06	2.4E-06	0	9.1E-05
Antimony	0.019	0.082	5.7E-04	2.5E-03	0.019	0.085	0	0.033
Arsenic [e]	0.544	2.381	4.5E-03	0.020	0.548	2.400	**5.7E-06**	1.5E-06
Benzene [e]	0	0	7.4E-03	0.032	7.4E-03	0.032	3.8E-05	8.0E-04
Benzo(a)pyrene [e,f]	0	0	1.4E-07	6.1E-07	2.0E-06	8.8E-06	2.0E-07	2.0E-06
Benz(a)anthracene [e,f]	0	0	3.1E-07	1.4E-06				
Benzo(b)fluoranthene [e,f]	0	0	4.4E-07	1.9E-06				
Benzo(k)fluoranthene [e,f]	0	0	1.5E-07	6.6E-07				
Chrysene [e,f]	0	0	5.8E-07	2.5E-06				
Dibenz(a,h)anthracene [e,f]	0	0	1.8E-07	7.7E-07				
Indeno(1,2,3-cd)pyrene [e,f]	0	0	2.2E-07	9.6E-07				
Benzo(g,h,i)perylene [e,f]	0	0	7.5E-07	1.1E-06	7.5E-07	1.1E-06	0	9.1E-05
Beryllium [e]	2.6E-03	0.011	4.3E-04	1.9E-03	3.0E-03	0.013	2.3E-07	2.8E-05
Biphenyl	0	0	4.4E-05	1.9E-04	4.4E-05	1.9E-04	0	0.1
Cadmium [e]	4.1E-04	1.8E-03	4.6E-04	2.0E-03	8.7E-04	3.8E-03	**2.0E-05**	3.7E-06
Carbon disulfide	0.014	0.063	0	0	0.014	0.063	0	2
Chromium	7.3E-03	0.032	6.8E-04	2.8E-03	8.0E-03	0.035	2.7E-05	0.033
Chromium (VI) [e]	0	0	3.4E-07	1.5E-06	3.4E-07	1.5E-06	3.4E-07	5.6E-07
Cobalt	3.3E-03	0.014	4.7E-04	2.0E-03	3.7E-03	0.016	1.5E-06	3.3E-03
Cyanide	0.453	1.983	1.2E-03	5.3E-03	0.454	1.988	0	0.333
Dichlorobenzene	0	0	5.7E-05	2.3E-04	5.7E-05	2.3E-04	2.1E-05	20 [j]
Fluoranthene [e,f]	0	0	5.5E-06	7.0E-06	5.5E-06	7.0E-06	0	9.1E-05
Fluorene [e,f]	0	0	1.7E-05	2.1E-05	1.7E-05	2.1E-05	0	9.1E-05
Formaldehyde [e]	0	0	3.3E-03	0.015	3.3E-03	0.015	**1.3E-03**	5.1E-04
Hexane	0	0	0.117	0.480	0.117	0.48	0.032	12
Hydrogen Chloride	0	0	0.986	3.666	0.986	**3.666**	0	0.05
Lead	6.5E-03	0.029	4.8E-04	2.1E-03	7.0E-03	0.031	0	
Manganese	0.244	1.067	4.6E-03	0.017	0.248	1.085	3.6E-05	0.067
Mercury [g]	1.3E-03	5.7E-03	7.1E-04	2.9E-03	*< 0.028*	*< 0.122*	*0.041 lb/yr*	*25 lb/yr*
Naphthalene	0	0	2.1E-03	8.8E-03	2.1E-03	8.8E-03	1.1E-05	3.33
Nickel [e]	1.6E-03	7.1E-03	5.5E-04	2.4E-03	2.2E-03	9.5E-03	**4.0E-05**	2.7E-05
Phenanthrene [e,f]	0	0	5.1E-05	6.3E-05	5.1E-05	6.3E-05	0	9.1E-05
Phenol	0	0	2.4E-04	1.1E-03	2.4E-04	1.1E-03	0	1.27
Phosphorus	0.53	2.32	5.6E-03	0.023	0.535	2.343	8.2E-06	7.0E-03
Pyrene [e,f]	0	0	5.0E-06	6.6E-06	5.0E-06	6.6E-06	0	9.1E-05
Selenium	3.3E-04	1.4E-03	4.1E-04	1.8E-03	7.4E-04	3.2E-03	4.3E-07	0.013
Toluene	0	0	0.032	0.139	0.032	0.139	6.1E-05	25
Xylene	0	0	0.032	0.138	0.032	0.138	0	29
Total HAP [h]	1.83	8.00	1.20	4.57	3.05	12.68	0.03	

Table 6 **POTENTIAL TO EMIT FOR HAZARDOUS & TOXIC AIR POLLUTANTS (HAP/TAP)** [(a)]

HAP/TAP	Mining and Leaching Emissions		Processing and Production Emissions		Facility-Wide Total Emissions		Adjusted TAP Emissions	Screening Emission Level
	lb/hr [(b)]	T/yr [(c)]	lb/hr [(b)]	T/yr [(c)]	lb/hr [(b)]	T/yr [(c)]	lb/hr [(b,d)]	lb/hr [(d)]
Aluminum [(i)]	57.855	253	0.648	2.577	58.504	256	**58.504**	0.667
Barium [(i)]	0.652	2.855	6.8E-03	0.028	0.659	2.883	**0.659**	0.033
Calcium Carbonate [(i)]	11.408	49.967	2.244	8.125	13.652	58.092	**13.652**	0.667
Calcium Oxide [(i)]	0	0	0.696	0.952	0.696	0.952	**0.696**	0.133
Copper [(i)]	4.1E-03	0.018	5.3E-04	2.2E-03	4.6E-03	0.020	0.0046	0.067
Cyclohexane [(i)]	0	0	1.0E-03	4.6E-03	1.0E-03	4.6E-03	0.0010	70
Hydrogen Sulfide [(i)]	0	0	0.900	3.942	0.900	3.942	0.900	0.933
Iron [(i)]	14.831	64.958	0.213	0.812	15.043	65.770	**15.043**	0.067
Molybdenum [(i)]	8.1E-04	3.6E-03	4.7E-04	2.0E-03	1.3E-03	5.6E-03	0.0013	0.333
Pentane [(i)]	0	0	0.123	0.495	0.123	0.495	0.123	118
Silver [(i)]	4.1E-04	1.8E-03	4.1E-04	1.8E-03	8.2E-4	3.6E-03	0.00082	7.0E-03
Sulfuric Acid [(i)]	0	0	2.030	8.891	2.030	8.891	**2.030**	0.067
Thallium [(i)]	8.1E-03	0.036	5.2E-04	2.2E-03	8.7E-03	0.038	**0.0087**	0.007
Uranium [(i)]	8.1E-03	0.036	5.2E-04	2.2E-03	8.7E-03	0.038	0.0087	0.013
Vanadium [(i)]	0.023	0.100	8.4E-04	3.5E-03	0.024	0.103	**0.024**	0.003
Trimethyl Benzene [(i)]	0	0	0.011	0.048	0.011	0.048	0.011	8.2
Tungsten [(i)]	8.1E-03	0.036	5.2E-04	2.2E-03	8.7E-03	0.038	0.0087	0.333
Zinc [(i)]	0.029	0.125	2.2E-03	8.8E-03	0.031	0.134	0.031	0.667

a) HAP and TAP PTE emissions estimates are for the highest emissions year Scenario W3, referenced from Table B1-W3 of Appendix B to the HAP/TAP addendum and 'TblB1' worksheet in the supporting spreadsheet. Process and production activities include ore processing; ore concentration and refining; process heating; aggregate production; concrete production; heating, ventilation, and air conditioning (HVAC); emergency power generation and fire suppression; and fuel storage. Mining and leaching activities include drilling, blasting, excavating, hauling, prill silos, rock dumps and storage piles, and tailings.
b) Controlled average emissions rates in pounds per hour (lb/hr). Emissions rates for non-carcinogens are daily averages, based on the proposed daily operating scenarios and limits. Emissions rates for carcinogens are annual averages, based on the proposed annual operating scenarios and limits.
c) Controlled average emissions rates in tons per year (T/yr) are annual averages, based on the proposed annual operating scenarios and annual limits.
d) Adjusted TAP emissions and screening emission levels (EL) as specified in IDAPA 58.01.01.585-586 for purposes of TAP preconstruction compliance demonstrations. For TAP, adjusted emissions do not include sources addressed by NSPS and NESHAP in accordance with IDAPA 58.01.01.210.20Table 8.
e) Carcinogenic TAP as identified in IDAPA 58.01.01.586.
f) Polycyclic aromatic hydrocarbon (PAH). The group of seven PAH with a single EL are regulated as polycyclic organic matter (POM) equivalent in potency to benzo(a)pyrene as specified in IDAPA 58.01.01.586.
g) Adjusted mercury emissions (which are not TAP) are reported in pounds per year (lb/yr) and do not include fugitive sources and sources addressed by NESHAP 40 CFR 63 for comparison to the Mercury Emission Standard threshold of 25 lb/yr. Facility-wide mercury PTE emission rates were calculated as annual average based on federally-enforceable NESHAP Subpart EEEEEEE limits, and exceed values referenced from Table B1-W3 of Appendix B to the HAP/TAP addendum and 'TblB1' worksheet in the supporting spreadsheet (which account for the proposed mercury control devices for refinery process sources AC, EW, MR, MF, CKD).
h) Total hazardous air pollutant (HAP) emissions from all permitted sources and activities (combined). The maximum potential emissions of any single HAP is hydrogen chloride.
i) Toxic air pollutant that is not also a hazardous air pollutant (i.e., non-HAP TAP) and is not included in HAP totals.
j) Dichlorobenzene is regulated as both the ortho- and para- isomers (o-dichlorobenzene and 1,4-dichlorobenzene). For the purposes of TAP compliance, the lowest EL (and therefore most conservative) is listed.

HAP and TAP particulate metals are indirectly regulated via facility-wide fugitive dust requirements for particulate matter (PM) (Permit Conditions 2.1–2.8, 3.9, 5.9), material throughput and operational limits (Permit Conditions 3.3–3.8, 4.7–4.12, 5.4–5.8, 6.2), PM emission limits (Permit Conditions 4.3, 5.3), control device requirements (Permit Conditions 3.10, 4.13–4.17, 5.9–5.15), and associated testing, monitoring, recordkeeping, and reporting requirements. Because usage of process reagents were not correlated to material throughput rates and not otherwise inherently limited, HAP emissions limits and usage limits were established for potassium amyl xanthate (PAX) and sodium cyanide (Permit Conditions 4.4–4.6). Cyanide emissions were sensitive to leachant concentration and basicity, and monitoring of these parameters was established (Permit Condition 4.5) to ensure compliance with the emission limit. Monitoring of these limits and process parameters also ensure compliance with the major threshold for each individual HAP of 10 tons per year (T/yr).

Ambient Air Quality Impact Analyses

The applicant has demonstrated preconstruction compliance to DEQ's satisfaction that emissions from this facility will not cause nor significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated preconstruction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix B.

As presented in the modeling memorandum in Appendix B, the estimated emission rates of PM_{10}, $PM_{2.5}$, SO_2, CO, NO_x, and certain TAP from this project exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline.[12] The facility-wide emission rate of lead (Pb) was determined to be below the "below regulatory concern" (BRC) threshold level of less than 10% of the "significant" emission rate defined in IDAPA 58.01.01.006 (i.e., less than 0.06 T/yr) and therefore modeling was not required.[12] Refer to the Emissions Inventories section for additional information concerning the emissions inventories.

New and updated TAP increment compliance demonstrations[4] were provided after evaluation of fugitive particulate TAP emissions from emission sources (Table 6) as identified in public comments and in a response and HAP/TAP addendum to the application provided by Midas Gold.[2] For non-HAP TAP, all sources were evaluated for TAP compliance by comparison of facility-wide emissions to applicable screening emission levels (EL). After exclusion of sources addressed by NSPS and NESHAP (Table 8), applicable concrete production and HVAC emission sources were evaluated for HAP TAP compliance by comparison of adjusted emissions to applicable EL. Refer to the Emissions Inventories section for estimates of HAP and TAP emissions (as summarized in Table 6) and to the Subsection 210.20 (IDAPA 58.01.01.210.20) section for relevant guidance and discussion of sources addressed by NSPS and NESHAP. With the exception of 12 TAP, estimated emission increases of non-carcinogenic and carcinogenic TAP demonstrated preconstruction compliance with TAP standards in accordance with IDAPA 58.01.01.210.07 using controlled average emission rates. Modeling analyses conducted in the development of TAP rules supports that if controlled average emission rates do not exceed applicable screening emission levels (EL) in IDAPA 58.01.01.585–586, controlled ambient concentrations are expected to be below the applicable acceptable ambient concentration (AAC/AACC).

Estimated emission increases of aluminum, arsenic, barium, cadmium, calcium carbonate, calcium oxide, formaldehyde, iron, nickel, sulfuric acid, thallium, and vanadium (12 TAP) demonstrated preconstruction compliance with TAP standards in accordance with IDAPA 58.01.01.210.08 for controlled ambient concentrations. Modeling analyses demonstrated preconstruction compliance with the acceptable ambient concentrations for these TAP (AAC/AACC) in IDAPA 58.01.01.585–586. Emission limits (Permit Condition 4.3), operational and material throughput limits (Permit Conditions 3.3–3.8, 4.5–4.12, and 5.4–5.8), fugitive dust control requirements (Permit Conditions 2.1–2.8), and control equipment requirements (Permit Conditions 2.6, 3.9–3.11, 4.13–4.17, and 5.9–5.15) limit these TAP emissions in accordance with IDAPA 58.01.01.210.08.c, limit Pb to BRC, and limit PM, PM_{10} ,and $PM_{2.5}$ to below the emission rates relied upon in the NAAQS evaluation of ambient air impacts in the modeling analyses.

Arsenic represented the single greatest HAP TAP emission; adjusted arsenic HAP TAP emissions at 5.7E-06 pounds per hour (lb/hr) did not exceed 2% of the applicable EL. Iron (Fe) represented the greatest single non-HAP TAP emission at over 15 lb/hr, which did not exceed 15% of the applicable EL. Any uncertainties in metal TAP emission estimates are not expected to affect compliance with TAP provisions.

It was recognized that accurately defining the mining operations boundary and controlling public access within that boundary was critical to estimating ambient air impacts. To ensure operation consistent with the defined mining operations boundary, site-specific access control measures will be employed. Midas Gold has committed

[12] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013, criteria pollutant BRC thresholds as provided in IDAPA 58.01.01.221.01, and DEQ guidance pertaining to BRC (2014ACF3).

to identifying and complying with these site-specific access control measures in an Access Management Plan (AMP, as required by Permit Condition 2.7).[13] Refer to Appendix E for a description and discussion of the mining operations boundary and control measures that may be included in this plan.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (refer to Appendix B). Refer to the Emissions Inventories section and Appendix A for additional information concerning development of the emissions inventories.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Valley County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAP (hazardous air pollutants) only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAP (Total HAP) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAP emissions are > 10 T/yr or if the aggregate of all uncontrolled HAP (Total HAP) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAP.

SM = Use if a synthetic minor (uncontrolled HAP emissions are > 10 T/yr or if the aggregate of all uncontrolled HAP (Total HAP) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAP.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

[13] Attachment 2 – Stibnite Road Access Management Plan to the Stibnite Gold Project Permit to Construct Application, Midas Gold, revised June 23, 2020 (2020AAG1078).

Table 7 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	560	86.6	**100**	SM80
PM_{10}	337	55.7	**100**	SM
$PM_{2.5}$	164	35.8	**100**	SM
SO_2	6.27	6.3	**100**	B
NO_x	36.16	36.2	**100**	B
CO	29.47	29.5	**100**	B
VOC	4.68	4.7	**100**	B
HAP (single)	>20	3.666	**10**	SM
Total HAP	>25	12.68	**25**	SM

Based on the uncontrolled PTE summarized in Table 2 and controlled PTE summarized above and in Table 3, Table 6, and Appendix A, the permittee will be a "synthetic minor" source of PM, PM_{10}, $PM_{2.5}$, and HAP emissions for new source review and Title V (Tier I) permitting purposes. The uncontrolled PTE for the remaining criteria pollutants (SO_2, NO_x, CO, VOC) confirm Midas Gold will be a natural minor source for these emissions.

Permit to Construct (IDAPA 58.01.01.201)

The permittee has requested that a PTC be issued to the facility for the proposed new emission sources. Therefore, a permit to construct is required in accordance with IDAPA 58.01.01.201. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 .... Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct (IDAPA 58.01.01.201) section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Subsection 210.20 (IDAPA 58.01.01.210.20)

IDAPA 58.01.01.210.20...................................... NSPS and NESHAP Sources

No demonstration of compliance with the TAP provisions is required to obtain a PTC or to demonstrate PTC exemption criteria for a new source or for modification of an existing source if the TAP is also a listed HAP from:

The equipment or activity covered by a NSPS or NESHAP; or

The source category of equipment or activity addressed by a NSPS or NESHAP even if the equipment or activity is not subject to compliance requirements under the federal rule.

Emission sources covered or addressed by NSPS or NESHAP are identified in the following table, and guidance on interpretation of "addressed" is provided in Appendix F. Each emission source and activity listed in the table is addressed by the corresponding NSPS and NESHAP. For the sources identified, emissions of TAP that are also HAP (HAP TAP) were excluded from TAP compliance demonstrations (i.e., excluded from comparison to TAP EL and from modeling to demonstrate compliance with TAP AAC/AACC, as discussed in the Ambient Air Quality Impact Analyses).

Table 8 NSPS and NESHAP Sources

NESHAP / NSPS	Source Category Subject & Addressed	Sources
NESHAP Subpart ZZZZ [(a)] NSPS Subpart IIII	Any industry using a stationary internal combustion engine	*Emergency Power Generation* EDG1, EDG2, EDG3, EDFP
NESHAP Subpart AAAAA [(a)] NSPS Subpart HH	Any lime manufacturing plant	*Lime Production* LK, LKC, LS1–LS12, LSBM, LS-L/U, LCR, LS1-L/U, MillS2-L/U, and ACS1-4-L/U
NESHAP Subpart DDDDD [(a)] NESHAP Subpart JJJJJ [(a)] NSPS Subpart Dc etc.	Any facility using a boiler or process heater (indirect fire)	*Process Heating* ACB, CKB, PV, HS [(b)]
NESHAP Subpart CCCCCC [(a)]	Any gasoline dispensing facility Includes any operation that transfers and stores gasoline	*Gasoline Fuel Storage and Dispensing* TG1–TG2
NESHAP Subpart EEEEEEE [(a)]	Gold ore mining Includes an establishment engaged in developing the mine site, mining, and/or beneficiating ores valued chiefly for their gold content, or in transformation of gold into bullion or doré bar in combination with mining activities	*Mining* drilling, blasting, excavating, hauling, prill silos, rock dumps and storage piles, tailings *Ore Processing* OC1–OC13 [(b)] *Ore Concentration and Refining* CIP Leach 1–4, CIL 1–6, CIP 1–6, CN Detox 1–2, AC, EW, MR, MF, CKD *Process Heating* ACB, CKB, PV, HS [(b)]
NSPS Subpart LL	Any metallic mineral plant Includes any combination of equipment that extracts aluminum, copper, gold, iron, lead, molybdenum, silver, titanium, tungsten, uranium, zinc, and zirconium	*Ore Processing* OC1–OC13 [(b)]
NSPS Subpart OOO	Any nonmetallic mineral plant Includes plants processing crushed and broken stone, crushed and broken limestone, lime plants, sand and gravel, clay, etc.	*Aggregate Production* PCSP1, PCSP2 *Concrete Production* CA-L/U *Lime Production* LK, LKC, LS1–LS12, LSBM, LS-L/U, LCR, LS1-L/U, MillS2-L/U, and ACS1-4-L/U [(b)]
Source category that may not be subject to and may not be addressed by NSPS or NESHAP		*Concrete Production* CM, CS1-L/U, CS2-L/U *Heating, Ventilation, and Air Conditioning* H1M–H2M, HM, HAC, HR, HA, HMO, HTS, HW

a) NESHAP in 40 CFR 63.
b) Ore Processing emission sources are addressed by both the gold ore mining and metallic mineral plant source categories, Process Heating emission sources are addressed by both the gold ore mining and boiler/process heater source categories, and Lime Production emission sources are addressed by both the lime production and nonmetallic mineral processing plant source categories.

After exclusion of sources addressed by NSPS and/or NESHAP, concrete production (central mixer, cement/shotcrete silos, aggregate bin) and heating, ventilation, and air conditioning (HVAC) units comprise the remaining sources that are applicable to compliance with TAP provisions. Emissions of each TAP from these sources (non-NESHAP-addressed) were estimated and compared to the applicable screening emission level (as summarized in Table 6).

Mercury Emission Standard (IDAPA 58.01.01.215)

IDAPA 58.01.01.215... Mercury Emission Standard for New or Modified Sources

No owner or operator may commence construction or modification of a stationary source or facility that results in an increase in annual potential emissions of mercury of 25 pounds or more unless the owner or operator has obtained a PTC under Sections 200–228 of the Rules. The PTC application shall include an MBACT analysis for the new or modified source or sources for review and approval by DEQ. A determination of applicability under Section 215 shall be based upon the best available information.

Fugitive emissions shall not be included in a determination of applicability under Section 215.

New or modified stationary sources within a source category subject to 40 CFR 63 are exempt from the requirements of Section 215.

IDAPA 58.01.01.215 sets requirements for mercury emissions. For this standard, fugitive emissions and sources in a source category subject to 40 CFR 63 are exempt. As identified in Table 8, emission sources within a source category subject to NESHAP 40 CFR 63, including Subpart ZZZZ, Subpart AAAAA, Subpart CCCCCC, and Subpart EEEEEEE were therefore exempt from this standard. Although non-applicable to area sources of HAP such as Midas Gold, as a source category lime manufacturing plants are subject to NESHAP 40 CFR 63, Subpart AAAAA and associated sources (identified in Table 8) therefore exempt from this standard. Fugitive emissions from drilling, blasting, excavating, roadways (hauling), dozing, grading, storage piles, tailings and other fugitive and mobile emission sources were also exempt from this standard. Refer to the MACT/GACT Applicability (40 CFR 63) section for regulatory applicability analysis. No mercury emissions are expected from fuel storage, emergency power generation, and fire suppression sources.

After exclusion of sources within a source category subject to an area source NESHAP (40 CFR 63), aggregate production (crushers, screens, and conveyors), concrete production (aggregate bin), and heating, ventilation, and air conditioning (HVAC) units comprise the remaining sources that are applicable to the Mercury Emission Standard. Mercury emissions from these sources (non-fugitive and non-NESHAP-addressed) were estimated at less than 0.041 pounds per year (lb/yr), below the level at which MBACT review is required. Mercury emissions from propane combustion in HVAC sources are uncontrolled. Mercury emissions from materials processed in aggregate production and concrete production are controlled via water sprays and moisture carryover. As such controls are required for the portable crushing and screening plant, central mixer, and cement/shotcrete silos (Permit Conditions 2.1–2.8, 5.9, 5.10, and 5.15).

For the autoclave, electrowinning cells and pregnant solution tank, mercury retort, and induction melting furnace refinery sources (AC, EW, MR, MF) with enforceable NESHAP Subpart EEEEEEE mercury emission limits, potential emissions estimates (PTE) calculated consistent with these limits were included in the facility-wide mercury emission totals in Table 6. These values were substituted in lieu of the controlled emission estimates referenced from Table B1-W3 of Appendix B to the HAP/TAP addendum and 'TblB1' worksheet in the supporting spreadsheet. Although the mercury emissions from these sources are ultimately not included in the adjusted mercury emission totals for the purposes of the Mercury Emission Standard, these were used for the purposes of estimating HAP PTE consistent with enforceable limits.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701 .... Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 establishes PM emission limits for equipment that commenced operation on or after October 1, 1979.

For equipment commencing operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following equations:

IDAPA 58.01.01.701.01.a: If PW is < 9,250 lb/hr; $E = 0.045 (PW)^{0.60}$

IDAPA 58.01.01.701.01.b: If PW is ≥ 9,250 lb/hr; $E = 1.10 (PW)^{0.25}$

For the new ore processing, ore concentration and refining, lime production, aggregate production, and concrete production equipment sources (Table 1) emissions (E) were calculated at the proposed maximum throughput rates (Table 1), and estimated emissions from all sources demonstrated compliance with this requirement. Compliance with operational and material throughput limits (Permit Conditions 3.3–3.8, 4.5–4.12, and 5.4–5.8) and control equipment requirements (Permit Conditions 2.6, 3.9–3.11, 4.13–4.17, and 5.9–5.15) assure compliance with this standard, resulting in much lower emission rates.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 .... Requirement to Obtain Tier I Operating Permit

Any source subject to 40 CFR 63, Subpart EEEEEEE is a Tier I source as defined in IDAPA 58.01.01.006.122.c. In accordance with IDAPA 58.01.01.313.01.b., the permittee must submit a complete application to DEQ for an initial Tier I operating permit within 12 months of becoming a Tier I source.

Midas Gold has committed to applying for a Tier I permit. Detailed federal regulatory applicability were provided in the PTC application, and specific federally-applicable requirements will be incorporated into the Tier I. Refer to the NSPS Applicability (40 CFR 60), NESHAP Applicability (40 CFR 61), and MACT/GACT Applicability (40 CFR 63) sections below for additional information regarding applicable requirements.

Post-project facility-wide emissions from this facility do not have a PTE greater than 100 tons per year for criteria pollutants or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories section of this analysis. Although not a major facility as defined in IDAPA 58.01.01.008.10, any source subject to 40 CFR 63, Subpart EEEEEEE is a Tier I source as defined in IDAPA 58.01.01.006.122.c. In accordance with IDAPA 58.01.01.313.01.b., the permittee must submit a complete application to DEQ for an initial Tier I operating permit within 12 months of becoming a Tier I source. Refer to the NESHAP Applicability (40 CFR 61) section for additional discussion of Subpart EEEEEEE applicability.

Permit Condition 2.24 incorporates the requirement to obtain a Tier I permit in accordance with IDAPA 58.01.01.313.01.b.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 .... Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source which would constitute a major stationary source by itself as defined in 40 CFR 52. PSD requirements were therefore not applicable to this permitting action in accordance with 40 CFR 52.21(a)(2).

The facility includes a lime manufacturing plant (LMP) that uses a Parallel Flow Regenerative Shaft Kiln (LK, LKC) to produce lime product from limestone by calcination, which is a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a). For each criteria pollutant, LMP emissions do not exceed 100 T/yr and facility-wide emissions do not exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The permittee has affected facilities subject to New Source Performance Standards (NSPS). The POX Boiler (ACB) meets the definition of process heater rather than steam generating unit, and the use of a rotary lime kiln has not been proposed in the production of lime; therefore Subpart Dc and Subpart HH are not applicable. Initial regulatory applicability analyses and determinations are provided below; detailed analyses and explicit incorporation of applicable requirements is left to the required Tier I permit action as discussed in the Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70) section.

- Standards of Performance for New Stationary Sources (NSPS) 40 CFR 60, Subpart A – General Provisions. DEQ is delegated this Subpart.

- NSPS 40 CFR 60, Subpart LL – Standards of Performance for Metallic Mineral Processing Plants. DEQ is delegated this Subpart. Each crusher, conveyor belt transfer point, and truck unloading station is an affected facility.
- NSPS 40 CFR 60, Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants. DEQ is delegated this Subpart. Each crusher, grinding mill, screening operation, belt conveyor, and storage bin is an affected facility.
- NSPS 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. DEQ is delegated this Subpart. Each emergency generator engine and fire pump is an affected facility.

Emission sources regulated by Subpart LL, Subpart OOO, and Subpart IIII are identified in the incorporation of federal requirements condition (Permit Condition 2.22)

40 CFR 60, Subpart A .... General Provisions

§60.1 .... Applicability

(a) Except as provided in subparts B and C, the provisions of this part apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of any standard (or, if earlier, the date of publication of any proposed standard) applicable to that facility.

(b) Any new or revised standard of performance promulgated pursuant to section 111(b) of the Act shall apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of such new or revised standard (or, if earlier, the date of publication of any proposed standard) applicable to that facility.

Because the permittee will own or operate NSPS affected facilities, which have been proposed to commence construction after the date of publication of the relevant applicable NSPS standards (as listed above), general provisions in Subpart A are applicable.

40 CFR 60, Subpart A is incorporated by reference into Permit Condition 2.22, and specific applicable requirements will be incorporated into the Tier I operating permit.

40 CFR 60, Subpart Dc .... Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

§60.40c .... Applicability and delegation of authority.

(a) Except as provided in paragraphs (d), (e), (f), and (g) of this section, the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/h)) or less, but greater than or equal to 2.9 MW (10 MMBtu/h).

§60.41c .... Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Clean Air Act and in subpart A of this part.

…

Heat input *means heat derived from combustion of fuel in a steam generating unit and does not include the heat derived from preheated combustion air, recirculated flue gases, or exhaust gases from other sources (such as stationary gas turbines, internal combustion engines, and kilns).*

Heat transfer medium *means any material that is used to transfer heat from one point to another point.*

…

Process heater *means a device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst.*

…

Steam generating unit *means a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in this subpart.*

Although the Pressure Oxidation Boiler (POX Boiler) is between 10 and 100 MMBtu/hr in design heat input capacity (17 MMBtu/hr) and is proposed for construction after June 9, 1989, it meets the definition of process heater rather than steam generating unit, and therefore is not applicable to this subpart. The POX Boiler (ACB) is a device used to directly heat ore material via steam injection into the autoclave, to promote chemical oxidation reactions in which the heated ore participates as a reactant. DEQ is delegated this Subpart.

40 CFR 60, Subpart HH .... Standards of Performance for Lime Manufacturing Plants

§60.340 .... Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to each rotary lime kiln used in the manufacture of lime.

(b) The provisions of this subpart are not applicable to facilities used in the manufacture of lime at kraft pulp mills.

(c) Any facility under paragraph (a) of this section that commences construction or modification after May 3, 1977, is subject to the requirements of this subpart.

§60.341 .... Definitions.

As used in this subpart, all terms not defined herein shall have the same meaning given them in the Act and in the General Provisions.

(a) Lime manufacturing plant *means any plant which uses a rotary lime kiln to produce lime product from limestone by calcination.*

(b) Lime product *means the product of the calcination process including, but not limited to, calcitic lime, dolomitic lime, and dead-burned dolomite.*

(c) Positive-pressure fabric filter *means a fabric filter with the fans on the upstream side of the filter bags.*

(d) Rotary lime kiln *means a unit with an inclined rotating drum that is used to produce a lime product from limestone by calcination.*

(e) Stone feed *means limestone feedstock and mill scale or other iron oxide additives that become part of the product.*

The use of a rotary lime kiln has not been proposed in the production of lime, and therefore the requirements of Subpart HH are not applicable. DEQ is delegated this Subpart.

40 CFR 60, Subpart LL .... Standards of Performance for Metallic Mineral Processing Plants

§60.380 .... Applicability and designation of affected facility.

(a) The provisions of this subpart are applicable to the following affected facilities in metallic mineral processing plants: Each crusher and screen in open-pit mines; each crusher, screen, bucket elevator, conveyor belt transfer point, thermal dryer, product packaging station, storage bin, enclosed storage area, truck loading station, truck unloading station, railcar loading station, and railcar unloading station at the mill or concentrator with the following exceptions. All facilities located in underground mines are exempted from the provisions of this subpart. At uranium ore processing plants, all facilities subsequent to and including the beneficiation of uranium ore are exempted from the provisions of this subpart.

(b) An affected facility under paragraph (a) of this section that commences construction or modification after August 24, 1982, is subject to the requirements of this part.

Because the permittee will own or operate a metallic mineral processing plant with a crusher at an open-pit mine; with crushers, conveyor belt transfer points, and truck unloading stations at the mill or concentrator; and because these are proposed to commence construction after August 24, 1982, requirements in Subpart LL are applicable.

40 CFR 60, Subpart LL is incorporated by reference into Permit Condition 2.22, and specific applicable requirements will be incorporated into the Tier I operating permit.

40 CFR 60, Subpart OOO .... Standards of Performance for Nonmetallic Mineral Processing Plants

§60.670 .... Applicability and designation of affected facility.

(a)(1) Except as provided in paragraphs (a)(2), (b), (c), and (d) of this section, the provisions of this subpart are applicable to the following affected facilities in fixed or portable nonmetallic mineral processing plants: each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck or railcar loading station. Also, crushers and grinding mills at hot mix asphalt facilities that reduce the size of nonmetallic minerals embedded in recycled asphalt pavement and subsequent affected facilities up to, but not including, the first storage silo or bin are subject to the provisions of this subpart.

(2) The provisions of this subpart do not apply to the following operations: All facilities located in underground mines; plants without crushers or grinding mills above ground; and wet material processing operations (as defined in §60.671).

(b) An affected facility that is subject to the provisions of subparts F or I of this part or that follows in the plant process any facility subject to the provisions of subparts F or I of this part is not subject to the provisions of this subpart.

(c) Facilities at the following plants are not subject to the provisions of this subpart:

(1) Fixed sand and gravel plants and crushed stone plants with capacities, as defined in §60.671, of 23 megagrams per hour (25 tons per hour) or less;

(2) Portable sand and gravel plants and crushed stone plants with capacities, as defined in §60.671, of 136 megagrams per hour (150 tons per hour) or less; and

(3) Common clay plants and pumice plants with capacities, as defined in §60.671, of 9 megagrams per hour (10 tons per hour) or less.

(d)(1) When an existing facility is replaced by a piece of equipment of equal or smaller size, as defined in §60.671, having the same function as the existing facility, and there is no increase in the amount of emissions, the new facility is exempt from the provisions of §§60.672, 60.674, and 60.675 except as provided for in paragraph (d)(3) of this section.

(2) An owner or operator complying with paragraph (d)(1) of this section shall submit the information required in §60.676(a).

(3) An owner or operator replacing all existing facilities in a production line with new facilities does not qualify for the exemption described in paragraph (d)(1) of this section and must comply with the provisions of §§60.672, 60.674 and 60.675.

(e) An affected facility under paragraph (a) of this section that commences construction, modification, or reconstruction after August 31, 1983, is subject to the requirements of this part.

(f) Table 1 of this subpart specifies the provisions of subpart A of this part 60 that do not apply to owners and operators of affected facilities subject to this subpart or that apply with certain exceptions.

Because the project contains crushers, grinding mills, screening operations, belt conveyors, and storage bins in a fixed or portable nonmetallic mineral processing plant, which are proposed to commence construction after August 31, 1983, requirements in Subpart OOO are applicable. The portable crushing and screening plants (PCSP1, PCSP2) will be rated at below 150 tons per hour (T/hr), and are therefore not subject to the provisions of Subpart OOO.

40 CFR 60, Subpart OOO is incorporated by reference into Permit Condition 2.22, and specific applicable requirements will be incorporated into the Tier I operating permit.

40 CFR 60, Subpart IIII...................................... Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

§60.4200.. Am I subject to this subpart?

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) and other persons as specified in paragraphs (a)(1) through (4) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(1) Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is:

(i) 2007 or later, for engines that are not fire pump engines;

(ii) The model year listed in Table 3 to this subpart or later model year, for fire pump engines.

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

(3) Owners and operators of any stationary CI ICE that are modified or reconstructed after July 11, 2005 and any person that modifies or reconstructs any stationary CI ICE after July 11, 2005.

(4) The provisions of §60.4208 of this subpart are applicable to all owners and operators of stationary CI ICE that commence construction after July 11, 2005.

(b) The provisions of this subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.

(c) If you are an owner or operator of an area source subject to this subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart applicable to area sources.

(d) Stationary CI ICE may be eligible for exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C (or the exemptions described in 40 CFR part 89, subpart J and 40 CFR part 94, subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.

(e) Owners and operators of facilities with CI ICE that are acting as temporary replacement units and that are located at a stationary source for less than 1 year and that have been properly certified as meeting the standards that would be applicable to such engine under the appropriate nonroad engine provisions, are not required to meet any other provisions under this subpart with regard to such engines.

Because the permittee will own or operate compression ignition (CI) internal combustion engines (ICE) which are proposed to commence construction after July 11, 2005 and which will be ordered after April 1, 2006 for the emergency generator engines, and which will be ordered after July 1, 2006 for the fire pump engine, requirements in Subpart IIII are applicable. The permittee has not requested or qualified for exemption pursuant to §60.4200(b), (d), or (e).

40 CFR 60, Subpart IIII is incorporated by reference into Permit Condition 2.22, and specific applicable requirements will be incorporated into the Tier I operating permit.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT/GACT Applicability (40 CFR 63)

The permittee has proposed to operate as a minor source of hazardous air pollutant (HAP) emissions, and has affected facilities subject to the following National Emission Standards for Hazardous Air Pollutants (NESHAP). The lime manufacturing plant is proposed at an area source of HAP, and therefore is not applicable to Subpart AAAAA. The process boiler is at an area source of Applicability determinations and regulatory analyses are provided below.

- National Emission Standards for Hazardous Air Pollutants for Source Categories (NESHAP) 40 CFR 63, Subpart A – General Provisions. DEQ is delegated this Subpart for Tier I sources.
- NESHAP 40 CFR 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE). DEQ is delegated this Subpart. The emergency generator and fire pump engines (EDG1, EDG2, EDG3, and EDFP) are affected sources.
- NESHAP 40 CFR 63, Subpart CCCCCC – National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities. DEQ is delegated this Subpart for Tier I sources. The gasoline fuel storage tanks (TG1, TG2) are affected sources.
- NESHAP 40 CFR 63, Subpart EEEEEEE – National Emission Standards for Hazardous Air Pollutants: Gold Mine Ore Processing and Production Area Source Category. DEQ is delegated this Subpart for Tier I sources. The collection of ore pretreatment processes and the carbon process with mercury retort are affected sources. Ore pretreatment processes include the autoclave (AC). Carbon processes with mercury retort include the electrowinning cells and pregnant solution tank (EW), the mercury retort (MR), induction melting furnace (MF), and the carbon regeneration kiln (CKD).

Emission sources regulated by Subpart EEEEEEE, Subpart CCCCCC, and Subpart ZZZZ are identified in the incorporation of federal requirements condition (Permit Condition 2.22)

40 CFR 63, Subpart A .... General Provisions

§63.1 .... Applicability.

(a) General. *(1) Terms used throughout this part are defined in §63.2 or in the Clean Air Act (Act) as amended in 1990, except that individual subparts of this part may include specific definitions in addition to or that supersede definitions in §63.2.*

(2) This part contains national emission standards for hazardous air pollutants (NESHAP) established pursuant to section 112 of the Act as amended November 15, 1990. These standards regulate specific categories of stationary sources that emit (or have the potential to emit) one or more hazardous air pollutants listed in this part pursuant to section 112(b) of the Act. This section explains the applicability of such standards to sources affected by them. The standards in this part are independent of NESHAP contained in 40 CFR part 61. The NESHAP in part 61 promulgated by signature of the Administrator before November 15, 1990 (i.e., the date of enactment of the Clean Air Act Amendments of 1990) remain in effect until they are amended, if appropriate, and added to this part.

(3) No emission standard or other requirement established under this part shall be interpreted, construed, or applied to diminish or replace the requirements of a more stringent emission limitation or other applicable requirement established by the Administrator pursuant to other authority of the Act (section 111, part C or D or any other authority of this Act), or a standard issued under State authority. The Administrator may specify in a specific standard under this part that facilities subject to other provisions under the Act need only comply with the provisions of that standard.

(4)(i) Each relevant standard in this part 63 must identify explicitly whether each provision in this subpart A is or is not included in such relevant standard.

(ii) If a relevant part 63 standard incorporates the requirements of 40 CFR part 60, part 61 or other part 63 standards, the relevant part 63 standard must identify explicitly the applicability of each corresponding part 60, part 61, or other part 63 subpart A (General) provision.

(iii) The General Provisions in this subpart A do not apply to regulations developed pursuant to section 112(r) of the amended Act, unless otherwise specified in those regulations.

…

(b) Initial applicability determination for this part. *(1) The provisions of this part apply to the owner or operator of any stationary source that—*

(i) Emits or has the potential to emit any hazardous air pollutant listed in or pursuant to section 112(b) of the Act; and

(ii) Is subject to any standard, limitation, prohibition, or other federally enforceable requirement established pursuant to this part.

(2) [Reserved]

(3) An owner or operator of a stationary source who is in the relevant source category and who determines that the source is not subject to a relevant standard or other requirement established under this part must keep a record as specified in §63.10(b)(3).

Because the permittee will own or operate stationary sources that emit HAP which are subject to standards, limitations, prohibitions, or other federally-enforceable requirements established pursuant to NESHAP, provisions in Subpart A are applicable.

40 CFR 63, Subpart A is incorporated by reference into Permit Condition 2.22, and specific applicable requirements will be incorporated into the Tier I operating permit.

40 CFR 63, Subpart ZZZZ.................................. National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

§63.6580... What is the purpose of subpart ZZZZ?

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

§63.6585... Am I subject to this subpart?

You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

(c) An area source of HAP emissions is a source that is not a major source.

(d) If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable.

(e) If you are an owner or operator of a stationary RICE used for national security purposes, you may be eligible to request an exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C.

(f) The emergency stationary RICE listed in paragraphs (f)(1) through (3) of this section are not subject to this subpart. The stationary RICE must meet the definition of an emergency stationary RICE in §63.6675, which includes operating according to the provisions specified in §63.6640(f).

(1) Existing residential emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

(2) Existing commercial emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

(3) Existing institutional emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

Because the permittee will own or operate stationary RICE at an area source of HAP which are subject to standards, limitations, prohibitions, or other federally-enforceable requirements established pursuant to NESHAP, requirements in Subpart ZZZZ are applicable.

40 CFR 63, Subpart ZZZZ is incorporated by reference into Permit Condition 2.22, and specific applicable requirements will be incorporated into the Tier I operating permit.

40 CFR 63, Subpart AAAAA .... National Emission Standards for Hazardous Air Pollutants for Lime Manufacturing Plants

§63.7080 .... What is the purpose of this subpart?

This subpart establishes national emission standards for hazardous air pollutants (NESHAP) for lime manufacturing plants. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations.

§63.7081 .... Am I subject to this subpart?

(a) You are subject to this subpart if you own or operate a lime manufacturing plant (LMP) that is a major source, or that is located at, or is part of, a major source of hazardous air pollutant (HAP) emissions, unless the LMP is located at a kraft pulp mill, soda pulp mill, sulfite pulp mill, beet sugar manufacturing plant, or only processes sludge containing calcium carbonate from water softening processes.

(1) An LMP is an establishment engaged in the manufacture of lime product (calcium oxide, calcium oxide with magnesium oxide, or dead burned dolomite) by calcination of limestone, dolomite, shells or other calcareous substances.

(2) A major source of HAP is a plant site that emits or has the potential to emit any single HAP at a rate of 9.07 megagrams (10 tons) or more per year or any combination of HAP at a rate of 22.68 megagrams (25 tons) or more per year from all emission sources at the plant site.

(b) [Reserved]

§63.7143 .... What definitions apply to this subpart?

Terms used in this subpart are defined in the Clean Air Act, in §63.2, and in this section as follows:

...

Lime manufacturing plant (LMP) *means any plant which uses a lime kiln to produce lime product from limestone or other calcareous material by calcination.*

Lime product *means the product of the lime kiln calcination process including, calcitic lime, dolomitic lime, and dead-burned dolomite.*

Limestone *means the material comprised primarily of calcium carbonate (referred to sometimes as calcitic or high calcium limestone), magnesium carbonate, and/or the double carbonate of both calcium and magnesium (referred to sometimes as dolomitic limestone or dolomite).*

...

The lime manufacturing plant is proposed at an area source of HAP, and therefore is not subject to this Subpart.

40 CFR 60, Subpart CCCCCC............................ National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities

§63.11110... What is the purpose of this subpart?

This subpart establishes national emission limitations and management practices for hazardous air pollutants (HAP) emitted from the loading of gasoline storage tanks at gasoline dispensing facilities (GDF). This subpart also establishes requirements to demonstrate compliance with the emission limitations and management practices.

§63.11111... Am I subject to the requirements in this subpart?

(a) The affected source to which this subpart applies is each GDF that is located at an area source. The affected source includes each gasoline cargo tank during the delivery of product to a GDF and also includes each storage tank.

(b) If your GDF has a monthly throughput of less than 10,000 gallons of gasoline, you must comply with the requirements in §63.11116.

(c) If your GDF has a monthly throughput of 10,000 gallons of gasoline or more, you must comply with the requirements in §63.11117.

(d) If your GDF has a monthly throughput of 100,000 gallons of gasoline or more, you must comply with the requirements in §63.11118.

(e) An affected source shall, upon request by the Administrator, demonstrate that their monthly throughput is less than the 10,000-gallon or the 100,000-gallon threshold level, as applicable. For new or reconstructed affected sources, as specified in §63.11112(b) and (c), recordkeeping to document monthly throughput must begin upon startup of the affected source. For existing sources, as specified in §63.11112(d), recordkeeping to document monthly throughput must begin on January 10, 2008. For existing sources that are subject to this subpart only because they load gasoline into fuel tanks other than those in motor vehicles, as defined in §63.11132, recordkeeping to document monthly throughput must begin on January 24, 2011. Records required under this paragraph shall be kept for a period of 5 years.

(f) If you are an owner or operator of affected sources, as defined in paragraph (a) of this section, you are not required to obtain a permit under 40 CFR part 70 or 40 CFR part 71 as a result of being subject to this subpart. However, you must still apply for and obtain a permit under 40 CFR part 70 or 40 CFR part 71 if you meet one or more of the applicability criteria found in 40 CFR 70.3(a) and (b) or 40 CFR 71.3(a) and (b).

(g) The loading of aviation gasoline into storage tanks at airports, and the subsequent transfer of aviation gasoline within the airport, is not subject to this subpart.

(h) Monthly throughput is the total volume of gasoline loaded into, or dispensed from, all the gasoline storage tanks located at a single affected GDF. If an area source has two or more GDF at separate locations within the area source, each GDF is treated as a separate affected source.

(i) If your affected source's throughput ever exceeds an applicable throughput threshold, the affected source will remain subject to the requirements for sources above the threshold, even if the affected source throughput later falls below the applicable throughput threshold.

(j) The dispensing of gasoline from a fixed gasoline storage tank at a GDF into a portable gasoline tank for the on-site delivery and subsequent dispensing of the gasoline into the fuel tank of a motor vehicle or other gasoline-fueled engine or equipment used within the area source is only subject to §63.11116 of this subpart.

(k) For any affected source subject to the provisions of this subpart and another Federal rule, you may elect to comply only with the more stringent provisions of the applicable subparts. You must consider all provisions of the rules, including monitoring, recordkeeping, and reporting. You must identify the affected source and provisions with which you will comply in your Notification of Compliance Status required under §63.11124. You also must demonstrate in your Notification of Compliance Status that each provision with which you will comply is at least as stringent as the otherwise applicable requirements in this subpart. You are responsible for making accurate determinations concerning the more stringent provisions, and noncompliance with this rule is not excused if it is later determined that your determination was in error, and, as a result, you are violating this subpart. Compliance with this rule is your responsibility and the Notification of Compliance Status does not alter or affect that responsibility.

§63.11132 .... What definitions apply to this subpart?

As used in this subpart, all terms not defined herein shall have the meaning given them in the Clean Air Act (CAA), or in subparts A and BBBBBB of this part. For purposes of this subpart, definitions in this section supersede definitions in other parts or subparts.

Dual-point vapor balance system *means a type of vapor balance system in which the storage tank is equipped with an entry port for a gasoline fill pipe and a separate exit port for a vapor connection.*

Gasoline *means any petroleum distillate or petroleum distillate/alcohol blend having a Reid vapor pressure of 27.6 kilopascals or greater, which is used as a fuel for internal combustion engines.*

Gasoline cargo tank *means a delivery tank truck or railcar which is loading or unloading gasoline, or which has loaded or unloaded gasoline on the immediately previous load.*

Gasoline dispensing facility (GDF) *means any stationary facility which dispenses gasoline into the fuel tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine, including a nonroad vehicle or nonroad engine used solely for competition. These facilities include, but are not limited to, facilities that dispense gasoline into on- and off-road, street, or highway motor vehicles, lawn equipment, boats, test engines, landscaping equipment, generators, pumps, and other gasoline-fueled engines and equipment.*

Monthly throughput *means the total volume of gasoline that is loaded into, or dispensed from, all gasoline storage tanks at each GDF during a month. Monthly throughput is calculated by summing the volume of gasoline loaded into, or dispensed from, all gasoline storage tanks at each GDF during the current day, plus the total volume of gasoline loaded into, or dispensed from, all gasoline storage tanks at each GDF during the previous 364 days, and then dividing that sum by 12.*

Motor vehicle *means any self-propelled vehicle designed for transporting persons or property on a street or highway.*

Nonroad engine *means an internal combustion engine (including the fuel system) that is not used in a motor vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under section 7411 of this title or section 7521 of this title.*

Nonroad vehicle *means a vehicle that is powered by a nonroad engine, and that is not a motor vehicle or a vehicle used solely for competition.*

Submerged filling *means, for the purposes of this subpart, the filling of a gasoline storage tank through a submerged fill pipe whose discharge is no more than the applicable distance specified in §63.11117(b) from the bottom of the tank. Bottom filling of gasoline storage tanks is included in this definition.*

Vapor balance system *means a combination of pipes and hoses that create a closed system between the vapor spaces of an unloading gasoline cargo tank and a receiving storage tank such that vapors displaced from the storage tank are transferred to the gasoline cargo tank being unloaded.*

Vapor-tight *means equipment that allows no loss of vapors. Compliance with vapor-tight requirements can be determined by checking to ensure that the concentration at a potential leak source is not equal to or greater than 100 percent of the Lower Explosive Limit when measured with a combustible gas detector, calibrated with propane, at a distance of 1 inch from the source.*

Vapor-tight gasoline cargo tank *means a gasoline cargo tank which has demonstrated within the 12 preceding months that it meets the annual certification test requirements in §63.11092(f) of this part.*

Because the permittee will own or operate a gasoline dispensing facility (GDF) at an area source of HAP, requirements in Subpart CCCCCC are applicable. Because the permittee has committed to loading and dispensing of less than 100,000 gallons of gasoline per month (gal/mo), the requirements of 40 CFR 63.11117 will become applicable in accordance with 40 CFR 63.11111(b) and (c). Gasoline loading and dispensing is limited by Permit Condition 2.18 to avoid requirements applicable to GDF exceeding 100,000 gal/mo, and requires recordkeeping in accordance with 40 CFR 63.11111(e).

40 CFR 63, Subpart CCCCCC is incorporated by reference into Permit Condition 2.22, and specific applicable requirements will be incorporated into the Tier I operating permit.

40 CFR 63, Subpart EEEEEEE.......................... National Emission Standards for Hazardous Air Pollutants: Gold Mine Ore Processing and Production Area Source Category

§40 CFR 63.11640.. Am I subject to this subpart?

(a) You are subject to this subpart if you own or operate a gold mine ore processing and production facility as defined in §63.11651, that is an area source.

(b) This subpart applies to each new or existing affected source. The affected sources are each collection of "ore pretreatment processes" at a gold mine ore processing and production facility, each collection of "carbon processes with mercury retorts" at a gold mine ore processing and production facility, each collection of "carbon processes without mercury retorts" at a gold mine ore processing and production facility, and each collection of "non-carbon concentrate processes" at a gold mine ore processing and production facility, as defined in §63.11651.

(1) An affected source is existing if you commenced construction or reconstruction of the affected source on or before April 28, 2010.

(2) An affected source is new if you commenced construction or reconstruction of the affected source after April 28, 2010.

(c) This subpart does not apply to research and development facilities, as defined in section 112(c)(7) of the Clean Air Act (CAA).

(d) If you own or operate a source subject to this subpart, you must have or you must obtain a permit under 40 CFR part 70 or 40 CFR part 71.

§40 CFR 63.11651.. What definitions apply to this subpart?

Terms used in this subpart are defined in the Clean Air Act, in §63.2, and in this section as follows:

Autoclave *means a pressure oxidation vessel that is used to treat gold ores (primarily sulfide refractory ore) and involves pumping a slurry of milled ore into the vessel which is highly pressurized with oxygen and heated to temperatures of approximately 350° to 430 °F.*

Calomel-based mercury control system *means a mercury emissions control system that uses scrubbers to remove mercury from the gas stream of a roaster or combination of roasters by complexing the mercury from the gas stream with mercuric chloride to form mercurous chloride (calomel). These scrubbers are also referred to as "mercury scrubbers."*

Carbon adsorber *means a control device consisting of a single fixed carbon bed, multiple carbon beds or columns, carbon filter packs or modules, and other variations that uses activated carbon to remove pollutants from a gas stream.*

Carbon kiln *means a kiln or furnace where carbon is regenerated by heating, usually in the presence of steam, after the gold has been stripped from the carbon.*

Carbon processes with mercury retorts *means the affected source that includes carbon kilns, preg tanks, electrowinning cells, mercury retorts, and melt furnaces at gold mine ore processing and production facilities that use activated carbon, or resins that can be used as a substitute for activated carbon, to recover (adsorb) gold from the pregnant cyanide solution.*

Carbon processes without mercury retorts *means the affected source that includes carbon kilns, preg tanks, electrowinning cells, and melt furnaces, but has no retorts, at gold mine ore processing and production facilities that use activated carbon, or resins that can be used as a substitute for activated carbon, to recover (adsorb) gold from the pregnant cyanide solution.*

Concentrate *means the sludge-like material that is loaded with gold along with various other metals (such as silver, copper, and mercury) and various other substances, that is produced by electrowinning, the Merrill-Crowe process, flotation and gravity separation processes. Concentrate is measured as the input to mercury retorts, or for facilities without mercury retorts, as the input to melt furnaces before any drying takes place. For facilities without mercury retorts or melt furnaces, concentrate is measured as the quantity shipped.*

Deviation *means any instance where an affected source subject to this subpart, or an owner or operator of such a source:*

(1) Fails to meet any requirement or obligation established by this subpart, including but not limited to any emissions limitation or work practice standard;

(2) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit; or

(3) Exceeds any operating limit established under this subpart.

Electrowinning *means a process that uses induced voltage on anode and cathode plates to remove metals from the continuous flow of solution, where the gold in solution is plated onto the cathode. Steel wool is typically used as the plating surface.*

Electrowinning Cells *means a tank in which the electrowinning takes place.*

Gold mine ore processing and production facility *means any industrial facility engaged in the processing of gold mine ore that uses any of the following processes: Roasting operations, autoclaves, carbon kilns, preg tanks, electrowinning, mercury retorts, or melt furnaces. Laboratories (see CAA section 112(c)(7)), individual prospectors, and very small pilot scale mining operations that processes or produces less than 100 pounds of concentrate per year are not a gold mine ore processing and production facility. A facility that produces primarily metals other than gold, such as copper, lead, zinc, or nickel (where these metals other than gold comprise 95 percent or more of the total metal production) that may also recover some gold as a byproduct is not a gold mine ore processing and production facility. Those facilities whereby 95 percent or more of total mass of metals produced are metals other than gold, whether final metal production is onsite or offsite, are not part of the gold mine ore processing and production source category.*

Melt furnace *means a furnace (typically a crucible furnace) that is used for smelting the gold-bearing material recovered from mercury retorting, or the gold-bearing material from electrowinning, the Merrill-Crowe process, or other processes for facilities without mercury retorts.*

Mercury retort *means a vessel that is operated under a partial vacuum at approximately 1,100° to 1,300 °F to remove mercury and moisture from the gold bearing sludge material that is recovered from electrowinning, the Merrill-Crowe process, or other processes. Mercury retorts are usually equipped with condensers that recover liquid mercury during the processing.*

Merrill-Crowe process *means a precipitation technique using zinc oxide for removing gold from a cyanide solution. Zinc dust is added to the solution, and gold is precipitated to produce a concentrate.*

Non-carbon concentrate processes *means the affected source that includes mercury retorts and melt furnaces at gold mine ore processing and production facilities that use the Merrill-Crowe process or other processes and do not use carbon (or resins that substitute for carbon) to recover (adsorb) gold from the pregnant cyanide solution.*

Ore dry grinding *means a process in which the gold ore is ground and heated (dried) prior to additional preheating or prior to entering the roaster.*

Ore preheating *means a process in which ground gold ore is preheated prior to entering the roaster.*

Ore pretreatment processes *means the affected source that includes roasting operations and autoclaves that are used to pre-treat gold mine ore at gold mine ore processing and production facilities prior to the cyanide leaching process.*

Pregnant solution tank (or preg tank) *means a storage tank for pregnant solution, which is the cyanide solution that contains gold-cyanide complexes that is generated from leaching gold ore with cyanide solution.*

Pregnant cyanide solution *means the cyanide solution that contains gold-cyanide complexes that are generated from leaching gold ore with a dilute cyanide solution.*

Quenching *means a process in which the hot calcined ore is cooled and quenched with water after it leaves the roaster.*

Roasting operation *means a process that uses an industrial furnace in which milled ore is combusted across a fluidized bed to oxidize and remove organic carbon and sulfide mineral grains in refractory gold ore. The emissions points of the roasting operation subject to this subpart include ore dry grinding, ore preheating, the roaster stack, and quenching.*

Because the permittee will own or operate a gold mine ore processing and production facility at an area source of HAP, requirements in Subpart EEEEEEE are applicable. The collection of ore pretreatment processes and the carbon process with mercury retort are affected sources. Ore pretreatment processes include the autoclave (AC). Carbon processes with mercury retort include the electrowinning cells and pregnant solution tank (EW), the mercury retort (MR), induction melting furnace (MF), and the carbon regeneration kiln (CKD).

Any source subject to 40 CFR 63, Subpart EEEEEEE is a Tier I source as defined in IDAPA 58.01.01.006.122.c. In accordance with IDAPA 58.01.01.313.01.b., the permittee must submit a complete application to DEQ for an initial Tier I operating permit within 12 months of becoming a Tier I source.

This subpart includes mercury emissions limits for the collection of new ore pretreatment processes and for the new carbon processes with mercury retort. This subpart also requires weight measurement devices for measuring ore throughput for the autoclave (AC) and mineral-bearing solution throughput for the electrowinning cells and pregnant solution tank (EW). Requires monitoring of mercury emissions, and monitoring of either inlet gas temperature for each process unit with a carbon filter (EW, MR, MF, CKD) or both water flow and pressure drop for each process unit with a wet scrubber not followed by a carbon filter (AC).

40 CFR 63, Subpart EEEEEEE is incorporated by reference into Permit Condition 2.22, and specific applicable requirements will be incorporated into the Tier I operating permit.

Permit Conditions Review

This section describes the permit conditions for this initial permit.

Permit Conditions 1.1–1.2 describe the purpose of this permitting action and the emission sources and the control equipment regulated by this permit. This reflects information presented in the application and relied upon in the development of emissions inventories, and in the evaluation of ambient air impacts in the modeling analyses. Refer to the Emissions Inventories and the Ambient Air Quality Impact Analyses sections for additional information concerning these analyses.

Because specific vendor and manufacturer information was unavailable at the time of permitting, documentation and testing requirements were included (Permit Condition 2.20) to verify consistency with the information specified in the application. Production values and limits were based on process flow diagrams and engineering design information provided.

Permit Conditions 2.1–2.8 incorporate fugitive dust emission limits and control requirements as required by IDAPA 58.01.01.650-651. Compliance is ensured by implementing reasonable control precautions and corrective actions when appropriate, excluding public access to operations, and complying with inspection, monitoring, recordkeeping, and notification requirements. Specific precautions are identified and required in the fugitive dust control plan (FDCP), and specific measures to control public access within the operations boundary are identified in and required by the Access Management Plan (AMP; Permit Conditions 2.6 and 2.7, respectively). A trigger level for haul roads was also established requiring employment of control measures (Permit Condition 2.5).

Reduction of PM emissions from each of the identified conveyors by 80% was supported by assuming location of these material transfers at below grade (OC9, OC10) or enclosure on all sides (OC11). Reduction of PM emissions from haul roads by a combined 93.3% was supported by assuming appropriate application of water and magnesium chloride dust suppression; DEQ is cognizant that to consistently achieve this level of control requires conscientious efforts, vigilant inspection and monitoring, and a comprehensive FDCP. Because continuous operation was proposed, suppression measures will need to account for and accommodate all weather conditions including diurnal and seasonal variability, and all traffic loads including mining and public traffic along publicly accessible roads. Conditions outside of what may normally be anticipated may require additional measures such as a reduction in vehicle speeds or selection of a more effective chemical dust suppressant. Although the FDCP specifies a minimum of efforts required, additional operational limits and monitoring are to be considered moving forward and evaluated for incorporation into the FDCP. Certification of employees for visible emissions inspection, training and orientation of relevant employees, and periodic evaluation of FDCP requirements are also required.

Access control measures are described in the Ambient Air Boundary section of the application (Section 5.6), and address primary access points, secondary access points, and surveillance.

Permit Conditions 2.9–2.12 incorporate visible emission limits and control requirements (Permit Condition 2.9) in accordance with IDAPA 58.01.01.625. Compliance is ensured by implementing corrective actions when appropriate and complying with inspection, monitoring, and recordkeeping requirements. Certification of employees for visible emissions inspection is also required.

Permit Condition 2.13 incorporates PM emission limits for process equipment as defined in IDAPA 58.01.01.006, in accordance with IDAPA 58.01.01.700-703, which includes all ore processing, ore concentration and refining, lime production, aggregate production, and concrete production equipment (Table 1). Compliance with operational and material throughput limits (Permit Conditions 3.3–3.8, 4.5–4.12, and 5.4–5.8) and control equipment requirements (Permit Conditions 2.6, 3.9–3.11, 4.13–4.17, and 5.9–5.15) and associated monitoring were considered adequate to ensure compliance with process weight-based PM emission limitations.

Permit Conditions 2.14–2.15 incorporate odorous emission limits in accordance with IDAPA 58.01.01.776.01. Compliance is ensured by complying with monitoring and recordkeeping requirements, including corrective action when appropriate.

Permit Conditions 2.16–2.17 incorporate sulfur content limits for distillate fuel oil, in accordance with IDAPA 58.01.01.725. Compliance is ensured by complying with monitoring and recordkeeping requirements.

Permit Conditions 2.18–2.19 limit facility-wide gasoline fuel throughput. Limiting gasoline throughput limits PTE, ensures avoidance of Subpart CCCCCC requirements applicable to GDF exceeding 100,000 gal/mo, and requires recordkeeping in accordance with 40 CFR 63.11111(e). Compliance is ensured by complying with monitoring and recordkeeping requirements.

Permit Conditions 2.20–2.21 require developing and complying with the requirements of an O&M manual to ensure compliance with control equipment maintenance and operation general provisions (Permit Condition 7.2). Documentation of as-built process equipment specifications and control equipment performance guarantees and establishing control equipment operating parameters and procedures were required, since these were relied upon in the development of emissions inventories, and in the evaluation of ambient air impacts in the modeling analyses. Compliance is ensured by complying with monitoring and recordkeeping requirements.

Permit Condition 2.22 incorporates applicable general compliance, notification, recordkeeping, reporting, general provisions, and other federal requirements by reference in accordance with IDAPA 58.01.01.107.03 and 590-591. Compliance is ensured by complying with applicable federal testing, monitoring, recordkeeping, and reporting requirements. In the event there is a conflict between the subparts and/or emission sources listed (Permit Condition 2.22), the federal requirements shall apply.

With regard to permit conditions referenced in accordance with federal requirements (i.e., NSPS and NESHAP requirements), should there be a conflict between the language of the permit condition and the language of the requirement, the language of the requirement shall govern. Refer to NSPS Applicability (40 CFR 60) and MACT/GACT Applicability (40 CFR 63) sections for additional information concerning applicable requirements.

Permit Conditions 2.23–2.24 require notification upon becoming a Tier I source and require the permittee to obtain a Tier I operation permit within 12 months of commencement of operation of any ore concentration and refining equipment (i.e., NESHAP Subpart EEEEEEE-affected sources) in accordance with IDAPA 58.01.01.313.01.b.

Permit Condition 2.25 specifies recommended test methods to be used when performance testing is required, unless otherwise specified in the permit, in accordance with IDAPA 58.01.01.157. The permittee is required to comply with notification and reporting requirements and is encouraged to submit performance test protocol to DEQ for approval prior to any performance testing in accordance with the performance testing general provisions (Permit Condition 7.7–7.9).

Permit Condition 2.26 provides DEQ agency contact information.

Permit Conditions 3.1–3.2 describe mining and ore processing equipment and controls. This reflects information presented in the application and relied upon in the development of emissions inventories, and in the evaluation of ambient air impacts in the modeling analyses.

Permit Conditions 3.3–3.8 and 3.11–3.16 establish limits on material throughput and production. These limits were relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses. Overall mine throughput is limited by hauling and excavating limits (Permit Condition 3.5). Compliance is ensured by complying with monitoring and recordkeeping requirements (Permit Conditions 3.11–3.16).

Permit Conditions 3.9–3.10 require measures to include in the FDCP to control fugitive emissions. Use of reasonable controls were relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses. Compliance is ensured by complying with fugitive dust monitoring and recordkeeping requirements (Permit Conditions 2.1–2.8).

Permit Conditions 4.1–4.2 describe ore concentration and refining equipment and controls. This reflects information presented in the application and relied upon in the development of emissions inventories, and in the evaluation of ambient air impacts in the modeling analyses.

Permit Condition 4.3, and 4.33–4.34 establish emissions limits for ore concentration and refining equipment, consistent with estimates relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses for these sources. A sulfuric acid emission limit consistent with the modeled TAP emission rate from the autoclave was established in accordance with IDAPA 58.01.01.210.08. Compliance is ensured by complying with equipment operating and testing requirements (Permit Conditions 4.5–4.17, and 4.33–4.34).

Permit Conditions 4.4, 4.5–4.6, 4.7–4.12 and 4.18–4.25 limit operations of ore concentration and refining process equipment, consistent with the hours of operation, reagent usage, and material throughput assumptions relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses for these sources. Compliance is ensured by complying with monitoring and recordkeeping requirements (Permit Conditions 4.18–4.25). Cyanide is consumed, recycled, and destroyed in the process, and cyanide HAP emissions (and emission factors) dependent upon leachant concentration and basicity. Monitoring of these parameters was established to ensure that emissions do not exceed 10 T/yr of cyanide HAP to avoid classification as a HAP major source. Re-classification as a major source would affect NSPS and NESHAP applicability determinations, such as Subpart AAAAA as discussed in the NESHAP Applicability (40 CFR 61) section.

Permit Conditions 4.13–4.17 and 4.26–4.32 require control equipment for ore concentration and refining processes, consistent with controls relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses. Compliance is ensured by complying with monitoring and recordkeeping requirements (Permit Conditions 4.26–4.32).

Permit Condition 4.33 and 4.34 require testing of ore concentration and refining emission sources to demonstrate compliance with emissions limits (Permit Condition 4.3).

Permit Conditions 5.1–5.2 describe lime, aggregate, and concrete production equipment and controls. This reflects information presented in the application and relied upon in the development of emissions inventories, and in the evaluation of ambient air impacts in the modeling analyses.

Permit Condition 5.3 establishes emissions limits for lime, aggregate, and concrete production equipment, consistent with estimates relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses for these sources. Compliance is ensured by complying with equipment operating requirements (Permit Conditions 5.4–5.15).

Permit Conditions 5.4–5.8 and 5.16–5.20 limit operations of each lime, aggregate, and concrete production process equipment, consistent with material throughput assumptions relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses for these sources. Compliance is ensured by complying with monitoring and recordkeeping requirements (Permit Conditions 5.15–5.20).

Permit Conditions 5.9–5.10 require measures to include in the FDCP to control fugitive emissions. Use of water sprays, building enclosures, and reasonable controls were relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses. Compliance is ensured by complying with fugitive dust monitoring and recordkeeping requirements (Permit Conditions 2.1–2.8).

Permit Conditions 5.11–5.15 and 5.21–5.24 require control equipment for lime, aggregate, and concrete production processes, consistent with controls relied upon in the development of emissions inventories and in the evaluation of ambient air impacts in the modeling analyses. Compliance is ensured by complying with monitoring and recordkeeping requirements (Permit Conditions 5.21–5.24).

Permit Condition 6.1 describes the emergency power generation equipment. This reflects information presented in the application and relied upon in the development of emissions inventories, and in the evaluation of ambient air impacts in the modeling analyses.

Permit Conditions 6.2 and 6.3–6.4 limit operations of each emergency power generation engine, consistent with the purpose and hours of operation assumptions relied upon in the development of emissions inventories, in the determination of federal regulatory applicability, and in the evaluation of ambient air impacts in the modeling analyses for these sources. Compliance is ensured by complying with monitoring, recordkeeping, and notification requirements (Permit Conditions 6.3–6.4).

Permit Condition 7.1, the duty to comply general compliance provision, requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Permit Condition 7.2, the maintenance and operation general compliance provision, requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Permit Condition 7.3, the obligation to comply general compliance provision, specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Permit Condition 7.4, the inspection and entry provision, requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Permit Condition 7.5, the permit expiration construction and operation provision, specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

Permit Condition 7.6, the notification of construction and operation provision, requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.01 and 211.03.

Permit Condition 7.7, the performance testing notification of intent provision, requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Permit Condition 7.8, the performance test protocol provision, requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157 and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Permit Condition 7.9, the performance test report provision, requires that the permittee report any performance test results to DEQ within 60 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Permit Condition 7.10, the monitoring and recordkeeping provision, requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Permit Condition 7.11, the excess emissions provision, requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

Permit Condition 7.12, the certification provision, requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Permit Condition 7.13, the false statement provision, requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Permit Condition 7.14, the tampering provision, requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Permit Condition 7.15, the transferability provision, specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Permit Condition 7.16, the severability provision, specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c. During this time, there was a request for a public comment period on DEQ's proposed action. Refer to the Application Chronology for public comment opportunity dates.

Public Comment Period

Comment periods were made available to the public in accordance with IDAPA 58.01.01.209.01.c. An initial comment period and extension were provided to address the initial application and proposed action (i.e., permit and technical statement of basis), and a final comment period was provided to address updates to the proposed action resulting from a HAP/TAP application addendum[2] submitted by Midas Gold that included new HAP and TAP emission estimates, additional information and discussion supporting HAP and TAP emission estimates, new and updated TAP increment compliance demonstrations which included particulate TAP emissions from fugitive sources, and a source-by-source inventory of HAP and TAP emissions. During this time, comments were submitted in response to DEQ's proposed action. Refer to the Application Chronology for the dates of each public comment period.

A response to public comments document has been crafted by DEQ based on comments submitted during each public comment period. That document is part of the final permit package for this permitting action.

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES REVIEW MEMORANDUM

M E M O R A N D U M

DATE: February 8, 2021

TO: Morrie Lewis, Permit Writer, Air Program

FROM: Pao Baylon, Modeling Review Analyst, Air Program
Through Kevin Schilling, Modeling Supervisor, Air Program

PROJECT: P-2019.0047 PROJ 62288, Permit for an Open-pit Gold Mine and On-site Ore Preparation and Gold Extraction Operation located in Valley County, Idaho.

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
acfm	Actual cubic feet per minute
ADJ_U*	AERMOD Adjusted Friction Velocity Model Option
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Air Sciences	Air Sciences, Inc. (permittee's permitting and modeling consultant)
amsl	Above mean sea level
ANFO	Ammonium Nitrate Fuel Oil
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ASOS	Automated Surface Observing System
B_o	Bowen Ratio
BNF	Boise National Forest
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
BT	Bradley Tailings
BULKRN	Meteorological data processed using Bulk Richardson Method
CAPCOA	California Air Pollution Control Officers Association
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
CSIRO	Commonwealth Scientific and Industrial Research Organization
DEQ	Idaho Department of Environmental Quality
DR	Development Rock
DRSF	Development Rock Storage Facility
DV	Design Values
EF	Emission Factors
EFSFSR	East Fork of the South Fork of the Salmon River
EIS	Environmental Impact Statement
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
FDRSF	Fiddle Development Rock Storage Facility
g/cm^3	Grams per Cubic Centimeter
GEP	Good Engineering Practice
H_2SO_4	Sulfuric Acid Gas
HAP	Hazardous Air Pollutant
HFDRSF	Hangar Flats Development Rock Storage Facility
HFP	Hangar Flats Pit
Hg	Mercury
hr	Hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01

in	Inches
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
km	Kilometers
lb/hr	Pounds per hour
lb/yr	Pounds per year
LOM	Life of Mine
m	Meters
m/sec	Meters per second
MBACT	Mercury Best Available Control Technology
MERPs	Modeled Emission Rates for Precursors
mg/m^3	Milligrams per Cubic Meter
Midas Gold	Midas Gold Idaho, Inc. (permittee)
MM	Million
MMBtu	Million British Thermal Units
mph	Miles per hour
NAAQS	National Ambient Air Quality Standards
NAD83	North American Datum of 1983
NED	National Elevation Dataset
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NON-BULKRN	Meteorological data processed without Bulk Richardson Method
NOx	Oxides of Nitrogen
NSPS	New Source Performance Standards
NSR	New Source Review
NW AIRQUEST	Northwest International Air Quality Environmental Science and Technology Consortium
NWS	National Weather Service
O_3	Ozone
OLM	Ozone Limiting Method
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
PNF	Payette National Forest
ppb	parts per billion
ppm	parts per million
PRIME	Plume Rise Model Enhancement
PRO	Midas Gold Plan of Restoration and Operations
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
PVMRM	Plume Volume Molar Ratio Method
r	Albedo

scfm	Standard cubic feet per minute
SED	Segment Emission Denominator
SGP	Stibnite Gold Project
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
STKP	Crusher Stockpile
TAP	Toxic Air Pollutant
ton/day	Tons per Day
ton/year	Tons per Year
TSF	Tailings Storage Facility
TSP	Total Suspended Particulate
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
WBAN	Weather-Bureau-Army-Navy
WEDRSF	West End Development Rock Storage Facility
WEP	West End Pit
YPDRSF	Yellow Pine Development Rock Storage Facility
YPP	Yellow Pine Pit
z_o	Surface Roughness Length
ºF	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air
µm	Microns

1.0 Summary

Midas Gold Idaho, Inc. (Midas Gold) submitted a Permit to Construct (PTC) application to construct and operate the Stibnite Gold Project (SGP) in Valley County, Idaho. The SGP will consist of conventional open-pit mining operations and onsite ore preparation and gold extraction processes. The potential air emissions from the SGP are less than the applicable major source thresholds for both criteria and hazardous air pollutants (HAP), and therefore, the facility is designated as a minor source for Title V and New Source Review (NSR) requirements, and an area source for National Emission Standards for Hazardous Air Pollutants (NESHAP) applicability. Project-specific air quality analyses involving atmospheric dispersion modeling of estimated emissions associated with the facility were submitted to DEQ to demonstrate that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03). This memorandum provides a summary of the applicability assessment for analyses and air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

Air Sciences, Inc. (Air Sciences), on behalf of Midas Gold, prepared the PTC application and performed ambient air impact analyses for this project. DEQ review of submitted data and DEQ analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not evaluated in this modeling review memorandum.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 Code of Federal Regulations (CFR) 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information and analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES.	
Criteria/Assumption/Result	**Explanation/Consideration**
General Emission Rates. Emission rates used in the air impact analyses must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emission rates greater than those used in the air impact analyses.
Air Impact Analyses for Criteria Pollutant Emissions. Stibnite Gold Project (SGP) facility-wide maximum potential to emit are greater than the respective Level I thresholds for all criteria pollutants and averaging periods except for Lead. Therefore, modeling is triggered for applicable averaging periods for $PM_{2.5}$[a], PM_{10}[b], CO[c], NOx[d], and SO_2[e]. Modeling was not required for Lead.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutant increases above Below Regulatory Concern (BRC) thresholds, or for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds (where the BRC exclusion cannot be used).
Air Impact Analyses for TAP Emissions. SGP facility-wide potential Toxic Air Pollutant (TAP) emissions exceed the respective screening emission levels (ELs) for arsenic, cadmium, formaldehyde, nickel, aluminum, barium, calcium carbonate, calcium oxide, iron, sulfuric acid, thallium, and vanadium. Therefore, air dispersion modeling was required for these 12 TAPs. TAPs also classified as Hazardous Air Pollutants (HAPs) emitted from sources addressed by New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) were not required to be evaluated for compliance with TAP increments in accordance with IDAPA 58.01.01.210.20.	A TAP increment compliance demonstration would be required for any TAPs with emissions above ELs. IDAPA 58.01.01.210.20 states that if TAP emissions from a specific source are addressed by NSPS or NESHAP, then a TAP impact analysis is not required for that TAP from that specific source.
Significant Impact Level Analysis Not Conducted. A Significant Impact Level (SIL) analysis was not conducted for the SGP facility.	Based on the magnitude of the facility-wide emissions and preliminary modeling analyses, it was determined that the impacts from the SGP emissions exceeded the SIL for most criteria pollutants. Therefore, SIL analyses were considered redundant and not performed for the project.
Multiple Modeling Scenarios. To evaluate the worst-case air impacts from the SGP facility, a total of 14 scenarios were modeled. These scenarios represent the hauling of material, which can be either ore or development rock (DR), from four possible origins (three pits and a tailings facility) to five possible destinations (ore will be hauled to the crushing area while DR will be hauled to one of four development rock storage facilities [DRSF]). Modeled design values listed in this modeling memo represent the worst-case modeling scenario for every modeled pollutant and averaging period.	Conventional open-pit methods will be used to extract ore and DR from four possible origins (Yellow Pine Pit [YPP], Hangar Flats Pit [HFP], West End Pit [WEP], and Bradley Tailings [BT]). Ore and DR will be hauled to five possible destinations (Stockpile [STKP], Yellow Pine DRSF [YPDRSF], Hangar Flats DRSF [HFDRSF], West End DRSF [WEDRSF], and Fiddle DRSF [FDRSF]). Only 14 of the 20 possible scenarios were modeled. Six scenarios were not feasible because the timing of the activity within the sequence of mine operations makes the scenarios logistically impossible. Modeled results listed in this memo represent worst-case modeling scenarios.
Modeling of Material Origin and Destination. Each material origin location (YPP, HFP, WEP, and BT) was modeled as an AREA source. Ore destination (STKP) was modeled as a VOLUME source. Each DR destination (YPDRSF, HFDRSF, WEDRSF, and FDRSF) was modeled as a VOLUME source.	Each material origin location comprised appropriate emissions from drilling, material loading, dozing, and surface exploration. Ore destination comprised ore unloading emissions. Each DR destination comprised appropriate emissions from DR unloading, dozing, and wind erosion. For the four AREA and five VOLUME sources, the dimensions were developed by reasonably fitting an equal-area rectangle within the actual footprint of each fugitive source. For the pit and DRSF fugitive activity locations, the release height was based on the haul truck height. The applicable initial lateral dispersion for each VOLUME source was calculated from the respective shorter dimension and EPA-specified methods. The applicable initial vertical dispersion for each AREA and VOLUME source was

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES.	
Criteria/Assumption/Result	**Explanation/Consideration**
	calculated from the respective vertical dimension and EPA-specified methods.
Modeling of Haul Roads. A representative haul road network for hauling material from inside the pit to various destinations was developed for each of the 14 modeling scenarios.	The haul road network was divided into 22 sections. Each section was further divided into multiple segments with a length equal to twice the adjusted haul road width. Each of the segments was characterized as an individual VOLUME source in the model. Material hauling emissions associated with each origin-destination route were assigned to each segment along the route based on estimated total emissions along the route and traffic distribution along each section.
Modeling of Blasting Emissions. Blasting emissions were represented by a VOLUME source inside a pit (YPPBL, HFPBL, and WEPBL). Blasting is not expected to occur in BT but was modeled (BTBL) in order to streamline the permitting process.	The blasting physical parameters were developed from dimensions based on blast area used in the emission calculation. The blasting release height was the midpoint of the blasting height. The initial lateral and vertical dispersion dimensions for blasting were calculated per methods specified in the AERMOD User's Guide.
Modeling of Burntlog Route Access Road. The access road portion within the operations boundary was characterized by a series of LINE sources laid along the actual route.	Emissions associated with the portion of the Burntlog Route mine access road that is within project boundary (from the south gate to the process area) are included in the SGP analyses. These include dust emissions generated from travel of maintenance equipment, light-duty pickup trucks and buses used for employee, visitor, and contractor transportation, and heavy-duty trucks used for cargo (including fuel, consumables, machine parts, ore processing supplies, ore concentrate, etc.) and services (including food supplies, trash, recyclables, etc.) transportation. Release parameters for the LINE sources were based on an estimated average vehicle height. The access road emissions were evenly distributed along the road by dividing the total access road emissions by its total area.
Control of Fugitive Dust from Roadways. Fugitive particulate emissions from roadways were assumed to be controlled above 93%, which is an aggressive level of control.	The high level of emission control was needed to demonstrate compliance with NAAQS. Compliance is not demonstrated for emissions greater than those associated with above 93% control.
NOx Chemistry and NO_2/NOx In-Stack Ratios. Ozone Limiting Method (OLM), a Tier 3 NO_2 screening method, was used to estimate the 1-hour and annual NO_2 impacts. The following NO_2/NOx In-Stack Ratios (ISR) were used in the modeling analyses: Blasting: 0.036 Diesel engines: 0.11 Propane heaters: 0.10	The OLM method requires an input of NO_2/NOx ISRs for each modeled source. The NO_2/NOx ratio for blasting was based on blasting plume measurements provided in published literature. The NO_2/NOx ratio for stationary diesel combustion sources was based on heavy-duty diesel trucks in the California Air Pollution Control Officers Association (CAPCOA) Guidance Document. This NO_2/NOx ratio (11 percent) is conservatively higher than the diesel combustion NO_2/NOx ratio provided in the EPA ISR database: 6 percent average, 9.8 percent maximum. The CAPCOA document and the EPA ISR database do not provide an NO_2/NOx ratio for propane boilers. The CAPCOA-recommended NO_2/NOx ratio for natural gas boilers was selected for the propane boilers. The natural gas boilers NO_2/NOx ratio is considered appropriate for the propane boilers because both are gaseous fuels with relatively similar combustion characteristics and are expected to have similar NO_2/NOx ratios. DEQ performed a sensitivity analysis using Tier 2 (Ambient Ratio Method 2), a more conservative NO_2 screening method, and found that the facility is safely below the 1-hour and annual NO_2 NAAQS.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES.	
Criteria/Assumption/Result	**Explanation/Consideration**
Alternate Meteorological Data Processed Using Cloud Cover. An alternative meteorological dataset was processed without using the Bulk Richardson (BULKRN) method. This alternate processing (NON-BULKRN) used upper air data from Boise airport, supplemented with the cloud-cover data collected at the National Weather Service station in McCall, Idaho.	Meteorological data processing with and without BULKRN are considered acceptable regulatory options by EPA. The NON-BULKRN meteorological data yielded lower modeled design values than the meteorological data processed using the BULKRN method.
Ambient Air Boundary. Midas Gold will legally control the SGP, an active industrial site where mining activities will occur, such as heavy equipment operation. Most areas of the mine will require strict safety protocols and controlled access. Midas Gold has established an operations boundary to identify the area where public access will be excluded. Public access inside the operations boundary will be restricted for the life of the mine by physical barriers at points of potential access, including the current Stibnite Road point of entry and proposed site access via the Burntlog Route, as well as natural features of the landscape that prevent access.	Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." Receptors must be placed at any portion of the atmosphere that is considered ambient air.
Onsite Background $PM_{2.5}$ and PM_{10} Concentrations. The following background $PM_{2.5}$ and PM_{10} concentrations were measured at SGP in 2014 and used in the cumulative NAAQS impact analysis: Annual $PM_{2.5}$: 3.5 µg/m^3 (weighted average of quarterly means) 24-hour $PM_{2.5}$: 15.0 µg/m^3 (98th percentile/8th high) 24-hour PM_{10}: 37.0 µg/m^3 (highest 1st high)	Midas Gold developed an onsite monitoring program to collect site-specific meteorological parameters and determine ambient particulate matter ($PM_{2.5}$ and PM_{10}) concentrations at its Stibnite monitoring station. $PM_{2.5}$ and PM_{10} background concentrations were based on calendar year 2014 instead of the complete dataset (November 2013 through June 2015). For 24-hour PM_{10}, the design value is the *second-highest* 24-hour average concentration in a given year. However, the background value that was used in the modeling analyses represents the *first-highest* 24-hour average concentration measured in 2014. Therefore, using a larger background concentration adds a layer of conservatism to the calculated total impact for 24-hour PM_{10}.
NW AIRQUEST Background CO, NO_2, and SO_2 Concentrations. The following background concentrations for CO, NO_2, and SO_2 were used in the cumulative NAAQS impact analysis: 1-hour CO: 1,740 µg/m^3 8-hour CO: 1,110 µg/m^3 1-hour NO_2: 4.3 µg/m^3 Annual NO_2: 0.9 µg/m^3 1-hour SO_2: 12.3 µg/m^3 3-hour SO_2: 16.8 µg/m^3	Gaseous pollutant background concentrations were determined using the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST) online tool. The NW AIRQUEST tool uses regional scale modeling of pollutants in Washington, Oregon, and Idaho, with model results adjusted according to available monitoring data.
Medium-Traffic Background Concentrations. To provide additional information regarding the relative contribution of traffic emissions, background concentrations were obtained from NW AIRQUEST for the road section between mile markers 143 and 144 on Highway 55 passing through the town of McCall.	The McCall location is approximately 38 miles west of the SGP. The annual average daily traffic count for this road section is over 10,000 vehicles per day. Although the background concentrations at McCall are not representative of the rural SGP area, they provide additional information regarding the relative contribution of traffic emissions.
Weight-of-Evidence Analyses for 24-hour PM_{10}. PM_{10} modeling with meteorological dataset processed using the site-specific BULKRN method shows up to five hotspot receptors for Scenario W5 (the highest PM_{10} modeling scenario) that exceed NAAQS. All modeled violations occur during winter when the average snow depth and average precipitation at the project site are 21-68 inches and 6.0 inches, respectively. Therefore, fugitive road dust emissions during high-modeled impact hours could be overestimated. PM_{10} modeling simulation was based on a mining production rate of 180,000 ton/day of development rock (65,700,000 ton/year, which is more conservative than the	Meteorological data processing with and without BULKRN are considered acceptable by EPA, with the BULKRN method utilizing more of the onsite collected meteorological parameters. However, the BULKRN-processed meteorological data yielded higher modeled design value impacts for the SGP facility than the meteorological data processed without the BULKRN method. DEQ's supplemental analyses suggest that when emissions are more-closely representative of typical daily mining production rates for a high-production period (everything else held constant), the SGP facility is able to demonstrate

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES.	
Criteria/Assumption/Result	**Explanation/Consideration**
expected peak production rate of 42,692,000 ton/year). To investigate the effect of a lower modeled mining production rate on design value concentrations, DEQ performed a modeling simulation where mining production rate was assumed to be 120,000 ton/day instead of 180,000 ton/day, but everything else was held constant. Maximum modeled concentration, when summed with the background concentration, is lower than the 24-hour PM_{10} NAAQS thereby demonstrating NAAQS compliance. DEQ's weight-of-evidence analyses conclude that, considering all the collective conservative layers of the modeling analyses, including the use of meteorological data processed by two different methods, there is a satisfactory level of confidence that operation of the project as described in the application will not cause or contribute to a violation of NAAQS.	compliance with 24-hour PM_{10} NAAQS at those few receptors showing a potential violation when using meteorological data processed with the BULKRN method.

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
[c] Carbon monoxide.
[d] Nitrogen oxides.
[e] Sulfur dioxide.

Summary of Submittals and Actions

May 30, 2019 — Modeling protocol was submitted to DEQ by Brown and Caldwell on behalf of the applicant.

June 27, 2019 — Conditional modeling protocol approval was provided to Brown and Caldwell by DEQ.

August 21, 2019 — Regulatory start date. PTC application and modeling report were prepared by Air Sciences on behalf of the applicant.

September 19, 2019 — Application deemed incomplete by DEQ.

October 4, 2019 — DEQ received a preliminary response and supplemental information from the applicant.

October 15, 2019 — DEQ met with the applicant to review and discuss the preliminary response.

October 22, 2019 — DEQ determined that the application remained incomplete while the applicant prepared a response to remaining items previously identified, and included a summary of recommendations provided at the meeting.

November 8, 2019 — DEQ requested additional information from the applicant via e-mail, relating to items previously identified.

November 21, 2019 — Applicant requested extension until November 27, 2019 to respond to incompleteness.

November 27, 2019 — DEQ received supplemental information from the applicant, including a revised application with updated emission inventories and modeling analyses.

December 24, 2019	DEQ determined that the application was incomplete.
January 8, 2020	Applicant requested extension until February 7, 2020 to respond to incompleteness.
February 5, 2020	DEQ received supplemental information from the applicant, including a revised application with updated emission inventories and modeling analyses.
March 6, 2020	DEQ determined that the application was incomplete.
April 2, 2020	Applicant requested extension until April 15, 2020 to respond to incompleteness.
April 15, 2020	DEQ received supplemental information from the applicant, including updated modeling analyses.
May 15, 2020	DEQ determined that the application was complete.
June 24, 2020	DEQ received the final updated application.
July 14, 2020	DEQ made available the draft permit and statement of basis for applicant review.
July 31, 2020	DEQ made available an updated draft statement of basis for applicant review.
August 3 and 13, 2020	DEQ received comments from the applicant on the draft permit and statement of basis.
September 10 – October 12, 2020	DEQ provided a public comment period on the proposed action.
October 12, 2020	DEQ received a request to extend the public comment period.
October 13 – November 11, 2020	DEQ extended the public comment period.
November 20, 2020	DEQ requested additional information from the applicant to address substantive public comments received, including missing HAP and TAP emission estimates.
December 18, 2020	DEQ received supplemental information from the applicant, including a HAP/TAP addendum, updated HAP and TAP emission estimates, and updated TAP modeling analyses.
January 28, 2021	DEQ received updated modeling files with corrections for formaldehyde and sulfuric acid, and an updated figure showing TAP modeled impacts.

2.0 Background Information

This section provides background information applicable to the project and the site proposed for the facility. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

The SGP will require the construction of significant infrastructure, including a power transmission line, a primary mine site access road, onsite haul roads, an ore processing facility, onsite workspaces, employee housing and recreation, water storage and distribution facilities, and sewage disposal facilities.

The SGP will include three years of pre-mining development and construction activities, followed by an operating mine life of approximately 12 years. Mining will occur in three open pits: Yellow Pine Pit (YPP), Hangar Flats Pit (HFP), and West End Pit (WEP). The general sequence of mining will be the YPP deposit, followed by the HFP and WEP deposits. Legacy tailings from the Meadow Creek valley (Bradley Tailings [BT]) also will be reclaimed and reprocessed during the initial project schedule. Surface exploration drilling will continue within the pits and the Scout Prospect decline (underground exploration) throughout the mine operation period. Restoration and reclamation of other legacy mining features will occur prior to mining, throughout the life of the mine, and as part of the mine closure.

Conventional open-pit methods including drilling, blasting, excavating, and hauling will be used to extract ore and waste rock, termed development rock (DR). Hydraulic shovels and front-end loaders will be used to load ore and DR into haul trucks. DR will be used for construction, restoration, and backfilling, or hauled to the dedicated development rock storage facilities (DRSF). Approximately 340 million tons of DR will be handled over the life of the mine. Ore will be hauled to the primary crusher area, where it will be fed directly into the crusher dump pocket or stockpiled. The ore crushing plant will be designed to operate at a maximum rate of 25,000 tons per day (ton/day). Approximately 100 million tons of ore will be mined from the three pits over the life of the project.

The metal-recovery process from ore will include conventional crushing and grinding, followed by froth-flotation circuits that will generate separate gold-silver and antimony-silver concentrates. The antimony-silver concentrate will be shipped offsite for refining, whereas additional onsite processing of the gold-silver concentrate will include pressure oxidation, carbon-in-leach circuits, and refining processes to recover gold and minor amounts of silver. The finely ground leftover ore material from the mineral-recovery process, termed tailings, will be neutralized, thickened, and transported via a pipeline to the tailings storage facility (TSF).

Lime used in the ore processing will either be purchased or manufactured onsite from limestone available at the site. In addition, certain construction and maintenance activities during operations may require sized aggregate. To allow for the operational flexibility to produce construction aggregate onsite, the application included two portable crushing and screening plants.

The following air pollutants are expected from operations at the SGP facility:

- Criteria air pollutants: carbon monoxide (CO), oxides of nitrogen (NOx), particulate matter less than 2.5 microns (μm) and 10 μm ($PM_{2.5}$ and PM_{10}), sulfur dioxide (SO_2), lead (Pb), and ozone (O_3) precursor volatile organic compounds (VOC)
- Hazardous air pollutants (HAP), including mercury (Hg)
- Other non-HAP toxic air pollutants (TAP)
- Greenhouse gases

Based on the uncontrolled potential to emit (PTE) and controlled PTE, the SGP facility will be a "synthetic minor" source of PM, PM_{10}, $PM_{2.5}$, and HAP emissions for new source review (NSR) and Title V (Tier I) permitting purposes. The uncontrolled PTE for the remaining criteria pollutants (SO_2, NOx, CO, VOC) confirm that the SGP facility will be a natural minor source for these emissions. Facility classification is reviewed by the permit writer. Detailed calculations and explanations are provided in the DEQ Statement of Basis.

The PTC addresses all air pollutant-emitting activities associated with the facility.

2.2 Facility Location and Area Classification

The SGP is located in the Stibnite-Yellow Pine Mining District in Valley County, central Idaho (Northing: 4,973,751 meters [m]; Easting: 632,038 m; UTM Zone 11), approximately 100 miles northeast of Boise, 38 miles east of McCall, and approximately 10 miles east of Yellow Pine. A facility location map for the SGP is presented in Figure 1. This figure also shows the proposed Burntlog Route (access road) that will provide a year-round safe access to the site. The SGP site layout is presented in Figure 2.

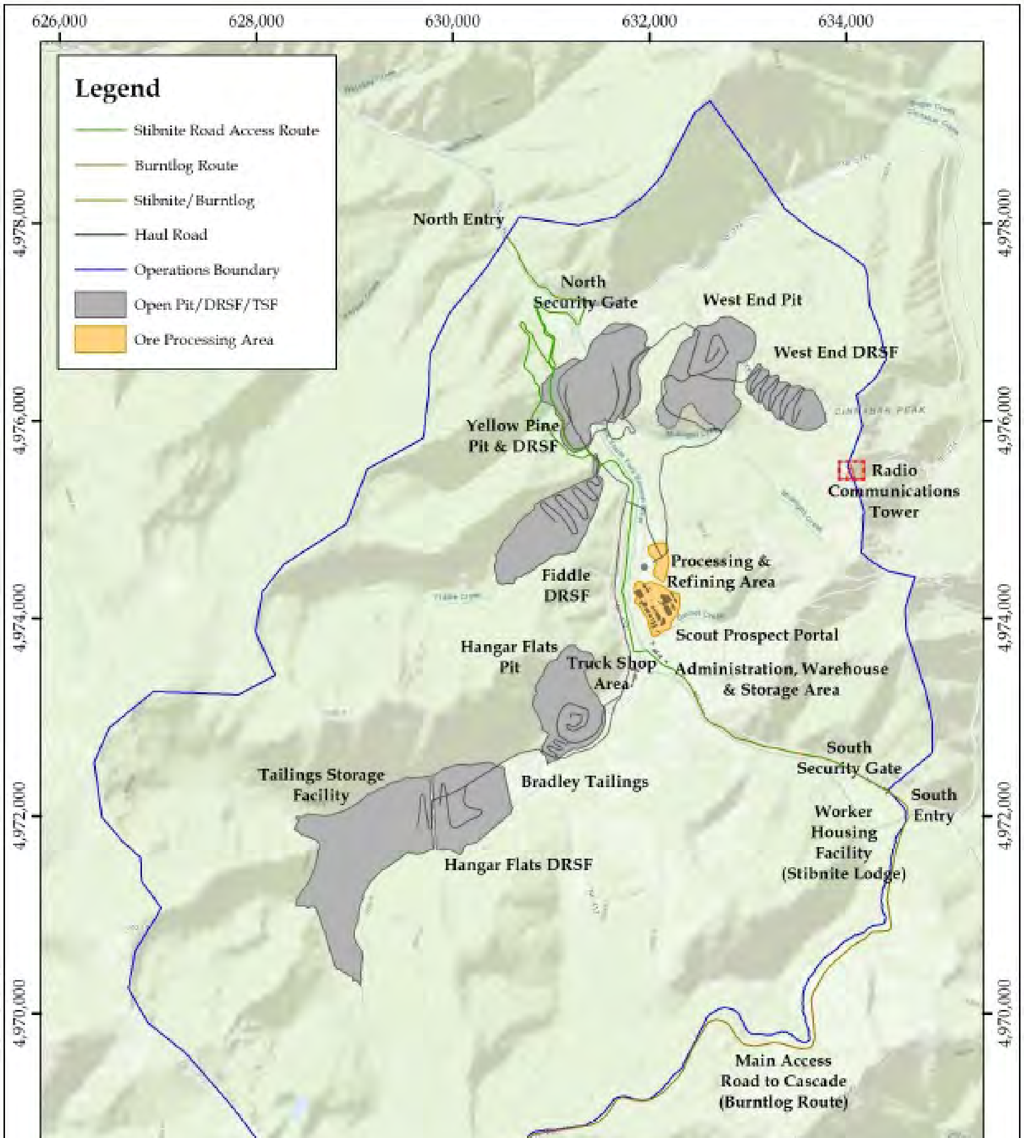
The Stibnite-Yellow Pine Mining District is characterized by historic mining activities and unpatented (federal land) and patented (private land) mining claims that include deposits of gold, silver, tungsten, and antimony. The district lies in both Boise National Forest (BNF) and Payette National Forest (PNF), but is administered by the PNF's Krassel Ranger District (Midas Gold 2017a). The project area terrain is characterized by narrow valleys 6,000 to 6,600 feet above mean sea level (amsl), surrounded by steep mountains ranging over 8,500 feet amsl. The main drainage basin in the project area is the East Fork of the South Fork of the Salmon River (EFSFSR).

The EFSFSR joins Johnson Creek 16 miles downstream, near the village of Yellow Pine. The project area is encompassed by the watersheds of EFSFSR tributaries, including Sugar Creek, Meadow Creek, Johnson Creek, Riordan Creek, Burntlog Creek, Midnight Creek, and Trout Creek. Primary commercial activity in the area comprises mineral exploration, mining, logging, and dispersed recreation.

This area is designated as an attainment or unclassifiable area for SO_2, NO_2, CO, Lead, O_3, PM_{10}, and $PM_{2.5}$. The area is not classified as non-attainment for any criteria pollutants.

Figure 1. SGP FACILITY LOCATION MAP.

Figure 2. SGP SITE LAYOUT AND STIBNITE ROAD ACCESS ROUTE.



2.3 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*

__02. NAAQS__. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.

***03. Toxic Air Pollutants.** Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

***02. Estimates of Ambient Concentrations**. All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho Air Rules Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho Air Rules Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted in accordance with methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

Table 2. APPLICABLE REGULATORY LIMITS.

Pollutant	Averaging Period	Significant Impact Levels[a] (μg/m³)[b]	Regulatory Limit [c] (μg/m³)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 μg/m³)	75 ppb[p] (196 μg/m³)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 μg/m³)	100 ppb[s] (188 μg/m³)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]

	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

If modeled maximum pollutant impacts to ambient air from the emission sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

If the cumulative NAAQS impact analysis indicates an exceedance of NAAQS, a culpability analysis can determine if this exceedance is due to emissions from the proposed project. The permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation (DEQ 2014); or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emission increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emission increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

TAPs also classified as HAPs emitted from sources addressed by New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAP) were not required to be evaluated for compliance with TAP increments in accordance with IDAPA 58.01.01.210.20 (Subsection 210.20). The DEQ permit writer evaluates the applicability of specific TAPs to the Subsection 210.20 exclusion. Guidance and clarification of Subsection 210.20 source exemptions are included in the DEQ Statement of Basis.

IDAPA 58.01.01.215 sets requirements for mercury emissions. For this standard, fugitive emissions and sources in a source category subject to 40 CFR 63 are exempt. The DEQ permit writer evaluates the applicability of mercury emissions to the exemption criteria. Details are provided in the DEQ Statement of Basis. Adjusted mercury emissions from non-fugitive and non-NESHAP-addressed sources were below the level (25 pounds per year) at which Mercury Best Available Control Technology (MBACT) review is required.

3.0 Analytical Methods and Data

This section describes the methods and data used in the analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the SGP facility were estimated by Air Sciences for various applicable averaging periods. The calculation of potential emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling applicability analyses and any modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

Emissions from unpaved roads were calculated based on a control efficiency of 90% from chemical application and 33% from watering (combined control efficiency above 93%). Emission controls and emission calculations are not reviewed in this modeling memorandum. However, it is critical for NAAQS compliance that this high level of control be achieved.

Activity-specific (e.g., drilling, blasting, material crushing and conveying, refining, and other ancillary sources) emissions were estimated based on maximum activity rates, coupled with applicable emission estimation techniques. Maximum emissions were calculated on a short-term (hourly and daily) and long-term (annual) basis for ore processing and mining operations, as discussed below.

The ore-processing rate will range from 20,000 ton/day to 25,000 ton/day at full production. Therefore, maximum potential daily ore processing emissions were based on the maximum design rate of 25,000 ton/day. Maximum potential annual emissions were based on potential daily emissions multiplied by 365 days per year.

Emissions from mining operations (drilling, blasting, material extraction and movement, mobile mine machinery use, and other ancillary sources) vary for each year of the life of the mine (LOM). However, for the modeling analyses, the mining operation potential emissions were estimated using conservatively high maximum activity rates provided in Table 3.

Table 3. MINING ACTIVITY RATES FOR POTENTIAL EMISSION CALCULATIONS.

Activity	Maximum Rate		Comments
Drilling	600	holes per blast	--
Blasting	2	blasts per day	--
	1	blast per hour	--
Material extraction and hauling	180,000	tons per day	Ore or DR
Onsite dozing	144	hours per day	6 dozers operating continuously
Onsite grading	72	hours per day	3 graders operating continuously
Onsite water trucking	48	hours per day	2 trucks operating continuously

The potential hourly emission rates for ore processing and mining operation activities were calculated by dividing the daily rate by the 24 hour-per-day operation schedule, and annual rates were calculated by multiplying maximum daily emissions with 365 days per year. This is conservative because the mine is expected to operate for only 355 days per year.

The maximum mine production rate is approximately 42.7 million (MM) tons per year (ton/yr); however, a maximum daily production rate of 180,000 ton/day used for potential emission calculations results in a conservatively higher production rate of approximately 65.7 MMton/yr, approximately 50 percent higher than the projected production rate.

Midas Gold will employ newer model year mining and maintenance machines (excavators, shovels, haul trucks, dozers, graders, portable light plants, etc.) that are expected to meet or exceed applicable regulatory emission standards. Non-road mobile equipment engines are exempt from permitting requirements; therefore, the tailpipe emissions resulting from fuel combustion in the non-road mobile equipment are not quantified for the SGP facility. Background concentrations from McCall, 38 miles west of the SGP, were used in the cumulative NAAQS impact analyses (Section 4.1.2) to conservatively account for the impact contribution of traffic emissions.

The approximately 38-mile long Burntlog Route mine access road will be outside the project ambient air boundary and open to the public. Traffic emissions on public roads generally are considered to be part of background concentrations. Therefore, emissions on the Burntlog Route mine access road that are outside of the project boundary are not included in the SGP analyses. However, the emissions associated with the portion of the Burntlog Route mine access road that is within project boundary (from the south gate to the process area) are included in the SGP analyses. These include dust emissions generated from travel of maintenance equipment, light-duty pickup trucks and buses used for employee, visitor, and contractor transportation, and heavy-duty trucks used for cargo (including fuel, consumables, machine parts, ore processing supplies, ore concentrate, etc.) and services (including food supplies, trash, recyclables, etc.) transportation.

3.1.1 Criteria Pollutant Modeling Applicability and Modeled Emission Rates

If project-specific emission increases for criteria pollutants would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant, then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "*A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant*" (DEQ 2014). The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. The BRC exemption cannot be used to exempt a project from a pollutant-specific NAAQS compliance demonstration in most cases where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline* (DEQ 2013). These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If total project-specific emission rate increases of a pollutant are below Level I Modeling Applicability Thresholds, then project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Applicability Thresholds is conditional, requiring DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emission sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors.

For the SGP analyses, several modeling scenarios were considered to evaluate the worst-case air impacts from the SGP facility. The different modeling scenarios are discussed in Section 3.1.3. Table 4 provides a comparison between facility-wide maximum PTE for the highest-emitting scenario (W3) and modeling applicability thresholds. The short-term and long-term PTE emissions are equal to the sum of process and ancillary emissions and mining fugitive emissions. It is important to note that the process and ancillary source emissions remain the same for each modeling scenario discussed in Section 3.1.3.

Table 4. SITE-SPECIFIC CRITERIA POLLUTANT MODELING APPLICABILITY.

Source Category	Carbon Monoxide (CO)	Nitrogen Oxides (NOx)		$PM_{2.5}$[a]		PM_{10}[b]	Sulfur Dioxide (SO_2)		Lead (Pb)
	lb/hr[c]	ton/yr[d]	lb/hr	ton/yr	lb/hr	lb/hr	ton/yr	lb/hr	lb/month[e]
Process and ancillary	33.5	37.9	55.4	36.4	13.4	21.7	6.5	1.88	0.0437
Mining fugitive	1,742.0	17.1	46.8	98.9	22.5	224.7	0.03	0.09	--
Total	1,775.5	55.0	102.2	135.3	35.9	246.4	6.5	1.97	0.0437
Level I threshold	15.0	1.2	0.2	0.35	0.054	0.22	1.2	0.21	14.0
Modeling required	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometer.
c. Pounds per hour.
d. Tons per year.
e. Pounds per month.

As indicated in Table 4, the SGP facility-wide maximum PTE are greater than the respective Level I thresholds for all criteria pollutants and averaging periods except for Pb. Therefore, modeling is triggered for applicable averaging periods for CO, NOx, $PM_{2.5}$, PM_{10}, and SO_2. Modeling is not required for Pb. The use of Level II modeling thresholds was not approved by DEQ for this project.

Tables 5-7 list criteria pollutant emission rates used in the cumulative NAAQS impact analyses for the worst-case modeling scenarios. Significant Impact Level (SIL) analyses were not performed. Based on the magnitude of the facility-wide emissions and preliminary modeling analyses, it was determined that the impacts from the SGP emissions exceeded the SIL for most criteria pollutants. Therefore, SIL analyses were considered redundant and not performed for this report. Table 5 lists the source-specific modeled emission rates for 24-hour and annual $PM_{2.5}$ and 24-hour PM_{10} (worst-case modeling scenario: W5). Table 6 lists the source-specific modeled emission rates for 1-hour and 8-hour CO and annual NO_2 (worst-case modeling scenario: W1). Table 7 lists the source-specific modeled emission rates for 1-hour NO_2 and 1-hour and 3-hour SO_2 (worst-case modeling scenario: B1). Modeling scenarios are discussed in Section 3.1.3. For 1-, 3-, and 8-hour averaging times, hourly emission rates provided in pounds per hour were used. For 24-hour averaging time, daily emission rates provided in pounds per day were used. For the annual averaging time, annual emission rates provided in tons per year were used. All modeled emission rates in Tables 5-7 are listed in units of pounds per hour (lb/hr). The total modeled input emission rates (highest emission scenario) are listed in Table 8.

Table 5. MODELED 24-HOUR PM_{10}, 24-HOUR $PM_{2.5}$, AND ANNUAL $PM_{2.5}$ EMISSION RATES FOR CUMULATIVE NAAQS IMPACT ANALYSES (WORST-CASE MODELING SCENARIO, W5).

Type of Source	Source ID	Description	24-hour PM_{10} (lb/hr)[a]	24-hour $PM_{2.5}$ (lb/hr)	Annual $PM_{2.5}$ (lb/hr)
Point Sources	LS1L	Mill Lime Silo #1 Loading	3.54E-03	5.21E-04	2.50E-05
	MILLS2L	Mill Lime Silo #2 Loading	3.54E-03	5.21E-04	2.50E-05
	SB1	Sb Dryer (2.72 MMBtu/hr Propane-Fired)	2.08E-02	2.08E-02	2.08E-02
	SB2	Sb Bagging	1.18E-01	1.18E-01	1.18E-01
	AC	Autoclave	5.08E+00	5.08E+00	5.08E+00
	ACB	POX Boiler (17 MMBtu/hr Propane-Fired)	5.42E-03	5.42E-03	4.45E-04
	ACS1L	AC Lime Silo #1 Loading	1.42E-02	2.08E-03	9.99E-05
	ACS2L	AC Lime Silo #2 Loading	1.42E-02	2.08E-03	9.99E-05
	ACS3L	AC Lime Silo #3 Loading	1.42E-02	2.08E-03	9.99E-05
	ACS4L	AC Lime Silo #4 Loading	7.08E-03	1.04E-03	4.99E-05
	CKD	Carbon Regeneration (Drum)	4.20E-01	4.20E-01	4.20E-01
	CKB	Carbon Regeneration (Kiln)	1.73E-02	1.73E-02	1.73E-02
	EW	Electrowinning Cells and Pregnant Solution Tank	7.00E-02	7.00E-02	7.00E-02
	MR	Mercury Retort	1.00E-02	1.00E-02	1.42E-03
	MF	Induction Melting Furnace	1.42E+00	1.42E+00	2.02E-01
	EDG1	Camp Emergency Generator (Mfr. Yr. >2007; diesel)	1.84E-02	1.84E-02	5.03E-03
	EDG2	Plant Emergency Generator #1 (Mfr. Yr. >2007; diesel)	1.84E-02	1.84E-02	5.03E-03
	EDG3	Plant Emergency Generator #2 (Mfr. Yr. >2007; diesel)	1.84E-02	1.84E-02	5.03E-03
	EDFP	Mill Fire Pump (Mfr. Yr. >2009; diesel)	3.67E-03	3.67E-03	1.01E-03
	PV	Propane Vaporizer (0.1 MMBtu/hr Propane-Fired)	7.65E-04	7.65E-04	7.65E-04
	HS	Strip Circuit Solution Heater (5 MMBtu, Propane-Fired)	3.83E-02	3.83E-02	3.83E-02
	H1M	Mine Air Heater #1 (4 MMBtu/hr Propane-Fired)	3.06E-02	3.06E-02	3.06E-02
	H2M	Mine Air Heater #2 (4 MMBtu/hr Propane-Fired)	3.06E-02	3.06E-02	3.06E-02
	HM	Mill HVAC Heaters (4 x 1.0 MMBtu Propane-Fired)	3.06E-02	3.06E-02	3.06E-02
	HAC	Autoclave HVAC Heater (0.25 MMBtu Propane-Fired)	1.91E-03	1.91E-03	1.91E-03
	HR	Refinery HVAC Heater (0.25 MMBtu Propane-Fired)	1.91E-03	1.91E-03	1.91E-03
	HA	Admin HVAC Heater (0.25 MMBtu Propane-Fired)	1.91E-03	1.91E-03	1.91E-03

Table 5. MODELED 24-HOUR PM_{10}, 24-HOUR $PM_{2.5}$, AND ANNUAL $PM_{2.5}$ EMISSION RATES FOR CUMULATIVE NAAQS IMPACT ANALYSES (WORST-CASE MODELING SCENARIO, W5).					
Type of Source	**Source ID**	**Description**	**24-hour PM_{10} (lb/hr)[a]**	**24-hour $PM_{2.5}$ (lb/hr)**	**Annual $PM_{2.5}$ (lb/hr)**
	HMO	Mine Ops. HVAC Heaters (2 x 0.25 MMBtu Propane-Fired)	3.83E-03	3.83E-03	3.83E-03
	HTS	Truck Shop HVAC Heaters (2 x 1.0 MMBtu Propane-Fired)	1.53E-02	1.53E-02	1.53E-02
	HW	Warehouse HVAC Heaters (3 x 1.0 MMBtu Propane-Fired)	2.30E-02	2.30E-02	2.30E-02
	PSL	Prill Silos Loading (2 x 100 ton)	5.83E-02	8.83E-03	8.83E-04
	CS1L	Cement/Shotcrete Silo #1 Loading	1.13E-03	1.67E-04	3.42E-04
	CS2L	Cement/Shotcrete Silo #2 Loading	1.13E-03	1.67E-04	3.42E-04
	LS6	Limestone transfer to Ball Mill Feed Bin	5.18E-02	8.00E-03	6.17E-03
	LSBM	Limestone Ball Mill	1.60E+00	5.70E-01	4.39E-01
	LS9	Limestone transfer to Kiln Feed Bin	1.22E-02	1.89E-03	1.60E-03
	LK	Parallel Flow Regenerative (PFR) Shaft Lime Kiln	9.15E-01	9.15E-01	7.77E-01
	LKC	PFR Shaft Lime Kiln Combustion	1.69E-01	1.69E-01	1.43E-01
	LCR	Lime Mill Crushing and associated transfers In and Out	2.39E-01	8.52E-02	7.23E-02
	LSL	Pebble Lime Silo Loading via Bucket Elevator	6.20E-03	6.20E-03	5.26E-03
Area Sources	WEP	West End Pit	3.69E+01	3.32E+00	3.32E+00
	UGEXP	Underground Exploration	1.66E-04	2.51E-05	2.51E-05
Line Sources	AR01	Access Road within Operations Boundary	7.02E-02	7.02E-03	7.03E-03
	AR02	Access Road within Operations Boundary	5.39E-02	5.40E-03	5.41E-03
	AR03	Access Road within Operations Boundary	1.36E-01	1.36E-02	1.37E-02
	AR04	Access Road within Operations Boundary	1.31E-01	1.31E-02	1.31E-02
Volume Sources	WEPBL	West End Pit Blasting	1.39E+01	8.04E-01	8.04E-01
	WEDRSF	West End Pit Development Rock Storage Facility	2.38E+00	1.26E+00	1.26E+00
	OC1	Loader Transfer of Ore to Grizzly	4.79E-02	1.35E-02	1.35E-02
	OC2	Grizzly to Apron Feeder	4.79E-02	1.35E-02	1.35E-02
	OC3	Apron Feeder to Dribble Conveyor	4.79E-02	1.35E-02	1.35E-02
	OC4	Apron Feeder to Vibrating Grizzly	4.79E-02	1.35E-02	1.35E-02
	OC5	Dribble Conveyor to Vibrating Grizzly	4.79E-02	1.35E-02	1.35E-02
	OC6	Vibrating Grizzly to Primary Crusher or Coarse Ore Stockpile Feed Conveyor	4.79E-02	1.35E-02	1.35E-02
	OC7	Primary Crusher and Associated Transfers out to Coarse Ore Stockpile Feed Conveyor	5.63E-01	1.04E-01	1.04E-01
	OC8	Coarse Ore Stockpile Feed Conveyor Transfer to Stockpile	4.79E-02	1.35E-02	1.35E-02
	OC9	Stockpile Transfers to Reclaim Conveyors	2.53E-01	3.91E-02	3.91E-02
	OC10	Reclaim Conveyors to SAG Mill Feed Conveyor	2.53E-01	3.91E-02	3.91E-02
	OC11	SAG Mill Feed Conveyor Transfer to SAG Mill	2.53E-01	3.91E-02	3.91E-02
	OC12	Pebble Crusher and Associated Transfers in (from SAG Mill) and out (to Pebble Discharge Conveyor)	6.21E-01	1.15E-01	1.15E-01
	OC13	Pebble Discharge Conveyor to SAG Mill Feed Conveyor	5.29E-02	1.50E-02	1.50E-02
	LS1U	Mill Lime Silo #1 Unloading to SAG Mill Conveyor	2.92E-02	4.37E-03	2.10E-04
	MILLS2U	Mill Lime Silo #2 Unloading to SAG Mill	2.92E-02	4.37E-03	2.10E-04

Table 5. MODELED 24-HOUR PM_{10}, 24-HOUR $PM_{2.5}$, AND ANNUAL $PM_{2.5}$ EMISSION RATES FOR CUMULATIVE NAAQS IMPACT ANALYSES (WORST-CASE MODELING SCENARIO, W5).					
Type of Source	**Source ID**	**Description**	**24-hour PM_{10} (lb/hr)[a]**	**24-hour $PM_{2.5}$ (lb/hr)**	**Annual $PM_{2.5}$ (lb/hr)**
		Conveyor			
	ACS1U	AC Lime Silo #1 Unloading to Lime Slaker	5.60E-02	8.00E-03	7.99E-04
	ACS2U	AC Lime Silo #2 Unloading to Lime Slaker	5.60E-02	8.00E-03	7.99E-04
	ACS3U	AC Lime Silo #3 Unloading to Lime Slaker	5.60E-02	8.00E-03	7.99E-04
	ACS42U	AC Lime Silo #4 Unloading to Lime Slaker	5.60E-02	8.00E-03	4.00E-04
	PSU	Prill Silos Unloading (2 x 100 ton)	5.83E-02	8.83E-03	8.83E-04
	CS1U	Cement/Shotcrete Silo #1 Unloading	9.33E-03	1.33E-03	2.74E-03
	CS2U	Cement/Shotcrete Silo #2 Unloading	9.33E-03	1.33E-03	2.74E-03
	CAL	Aggregate Bin Loading	3.30E-01	5.00E-02	2.85E-02
	CAU	Aggregate Bin Unloading	3.30E-01	5.00E-02	2.85E-02
	CM	Central Mixer Loading	1.83E-02	2.67E-03	5.48E-03
	PCSP1	Portable Crushing and Screening Plant 1	2.33E-01	3.04E-02	3.04E-02
	PCSP2	Portable Crushing and Screening Plant 2	2.33E-01	3.04E-02	3.04E-02
	LS1	Limestone transfer to Primary Crusher Hopper	5.18E-02	8.00E-03	6.17E-03
	LS2	Primary Crushing and Associated Transfers In and Out	1.13E-01	1.69E-02	1.31E-02
	LS3	Primary Screening and Associated Transfers In and Out	4.10E-01	6.21E-02	4.79E-02
	LS4	Secondary Crushing and Associated Transfers In and Out	1.13E-01	1.69E-02	1.31E-02
	LS5	Secondary Screening and Associated Transfers In and Out	4.10E-01	6.21E-02	4.79E-02
	LS7	Limestone transfer to Ball Mill Feed Conveyor	5.18E-02	8.00E-03	6.17E-03
	LS8	Ball Mill Feed transfer to Ball Mill	5.18E-02	8.00E-03	6.17E-03
	LS10	Limestone transfer to Lime Kiln Feed Conveyor	1.22E-02	1.89E-03	1.60E-03
	LS11	Fines Screening and Associated Transfers In and Out	9.68E-02	1.47E-02	1.25E-02
	LS12	Kiln Feed transfer to PFR Shaft Lime Kiln	1.22E-02	1.89E-03	1.60E-03
	LSU	Pebble Lime Silo discharge to Lime Slaker	6.20E-04	6.20E-04	5.26E-04
	HRT001-HRT072	Haul Road[b]	9.09E-01	9.10E-02	9.11E-02
	HRN001-HRN022	Haul Road[b]	9.09E-01	9.10E-02	9.11E-02

a. Pounds per hour.
b. The Haul Road was represented in the model as a series of volume sources. The emission rates listed in this table represent each individual volume source.

Table 6. MODELED 1-HOUR CO, 8-HOUR CO, and ANNUAL NO_2 EMISSION RATES FOR CUMULATIVE NAAQS IMPACT ANALYSES (WORST-CASE MODELING SCENARIO, W1).				
Type of Source	**Source ID**	**Description**	**1-hour, 8-hour CO (lb/hr)[a]**	**Annual NO_2 (lb/hr)**
Point Sources	SB1	Sb Dryer (2.72 MMBtu/hr Propane-Fired)	2.23E-01	3.86E-01
	ACB	POX Boiler (17 MMBtu/hr Propane-Fired)	1.39E+00	8.27E-03
	CKD	Carbon Regeneration (Drum)	1.20E-01	1.20E-02
	CKB	Carbon Regeneration (Kiln)	1.85E-01	3.20E-01
	EDG1	Camp Emergency Generator (Mfr. Yr.	7.72E+00	1.61E-01

		>2007; diesel)		
	EDG2	Plant Emergency Generator #1 (Mfr. Yr. >2007; diesel)	7.72E+00	1.61E-01
	EDG3	Plant Emergency Generator #2 (Mfr. Yr. >2007; diesel)	7.72E+00	1.61E-01
	EDFP	Mill Fire Pump (Mfr. Yr. >2009; diesel)	1.54E+00	2.01E-02
	PV	Propane Vaporizer (0.1 MMBtu/hr Propane-Fired)	8.20E-03	1.42E-02
	HS	Strip Circuit Solution Heater (5 MMBtu, Propane-Fired)	4.10E-01	7.10E-01
	H1M	Mine Air Heater #1 (4 MMBtu/hr Propane-Fired)	3.28E-01	5.68E-01
	H2M	Mine Air Heater #2 (4 MMBtu/hr Propane-Fired)	3.28E-01	5.68E-01
	HM	Mill HVAC Heaters (4 x 1.0 MMBtu Propane-Fired)	3.28E-01	5.68E-01
	HAC	Autoclave HVAC Heater (0.25 MMBtu Propane-Fired)	2.05E-02	3.55E-02
	HR	Refinery HVAC Heater (0.25 MMBtu Propane-Fired)	2.05E-02	3.55E-02
	HA	Admin HVAC Heater (0.25 MMBtu Propane-Fired)	2.05E-02	3.55E-02
	HMO	Mine Ops. HVAC Heaters (2 x 0.25 MMBtu Propane-Fired)	4.10E-02	7.10E-02
	HTS	Truck Shop HVAC Heaters (2 x 1.0 MMBtu Propane-Fired)	1.64E-01	2.84E-01
	HW	Warehouse HVAC Heaters (3 x 1.0 MMBtu Propane-Fired)	2.46E-01	4.26E-01
	LK	Parallel Flow Regenerative (PFR) Shaft Lime Kiln	3.17E+00	1.44E+00
	LKC	PFR Shaft Lime Kiln Combustion	1.81E+00	2.66E+00
Volume Source	WEPBL	West End Pit Blasting	1.74E+03	3.90E+00

a. Pounds per hour.

Table 7. MODELED 1-HOUR NO_2, 1-HOUR SO_2, AND 3-HOUR SO_2 EMISSION RATES FOR CUMULATIVE NAAQS IMPACT ANALYSES (WORST-CASE MODELING SCENARIO, B1).

Type of Source	Source ID	Description	1-hour NO_2 (lb/hr)[a]	1-hour, 3-hour SO_2 (lb/hr)
Point Sources	SB1	Sb Dryer (2.72 MMBtu/hr Propane-Fired)	3.86E-01	4.73E-02
	AC	Autoclave	0.00E+00	6.53E-01
	ACB	POX Boiler (17 MMBtu/hr Propane-Fired)	2.42E+00	2.95E-01
	CKD	Carbon Regeneration (Drum)	1.20E-02	0.00E+00
	CKB	Carbon Regeneration (Kiln)	3.20E-01	3.92E-02
	EDG1	Camp Emergency Generator (Mfr. Yr. >2007; diesel)	0.00E+00	1.45E-02
	EDG2	Plant Emergency Generator #1 (Mfr. Yr. >2007; diesel)	0.00E+00	1.45E-02
	EDG3	Plant Emergency Generator #2 (Mfr. Yr. >2007; diesel)	0.00E+00	1.45E-02
	EDFP	Mill Fire Pump (Mfr. Yr. >2009; diesel)	0.00E+00	2.90E-03
	PV	Propane Vaporizer (0.1 MMBtu/hr Propane-Fired)	1.42E-02	1.74E-03
	HS	Strip Circuit Solution Heater (5 MMBtu, Propane-Fired)	7.10E-01	8.69E-02
	H1M	Mine Air Heater #1 (4 MMBtu/hr Propane-	5.68E-01	6.95E-02

		Fired)		
	H2M	Mine Air Heater #2 (4 MMBtu/hr Propane-Fired)	5.68E-01	6.95E-02
	HM	Mill HVAC Heaters (4 x 1.0 MMBtu Propane-Fired)	5.68E-01	6.95E-02
	HAC	Autoclave HVAC Heater (0.25 MMBtu Propane-Fired)	3.55E-02	4.34E-03
	HR	Refinery HVAC Heater (0.25 MMBtu Propane-Fired)	3.55E-02	4.34E-03
	HA	Admin HVAC Heater (0.25 MMBtu Propane-Fired)	3.55E-02	4.34E-03
	HMO	Mine Ops. HVAC Heaters (2 x 0.25 MMBtu Propane-Fired)	7.10E-02	8.69E-03
	HTS	Truck Shop HVAC Heaters (2 x 1.0 MMBtu Propane-Fired)	2.84E-01	3.48E-02
	HW	Warehouse HVAC Heaters (3 x 1.0 MMBtu Propane-Fired)	4.26E-01	5.21E-02
	LK	Parallel Flow Regenerative (PFR) Shaft Lime Kiln	1.69E+00	8.45E-03
	LKC	PFR Shaft Lime Kiln Combustion	3.13E+00	3.83E-01
Volume Source	BTBL	Bradley Tailings Blasting	4.68E+01	9.36E-02

a. Pounds per hour.

Table 8. CRITERIA POLLUTANT TOTAL MODELED EMISSION RATES (WORST-CASE MODELING SCENARIOS).

Pollutant	Averaging Time	Emissions[a]	
CO	8 hours	1,775.50	lb/hr
	1 hour	1,775.50	lb/hr
NO_2	1 year	54.93	ton/yr
	1 hour	58.07	lb/hr
$PM_{2.5}$	1 year	135.23	ton/yr
	24 hours	781.69	lb/day
PM_{10}	24 hours	5,768.93	lb/day
SO_2	3 hours	1.97	lb/hr
	1 hour	1.97	lb/hr

a. Combined process, ancillary, and fugitive emissions modeled. Fugitive emissions vary by pit scenario. Maximum pit scenario emissions are shown.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource-intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 within the context of permitting a new stationary source has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."

"The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."

DEQ determined it was not appropriate or necessary to require a quantitative source-specific O_3 impact analysis because allowable emission estimates of VOCs and NOx are below the 100 tons/year threshold.

3.1.2 TAPs Modeling Applicability and Modeled Emission Rates

A comparison of the applicable non-carcinogenic and carcinogenic screening emission levels (EL) for the TAP from IDAPA 58.01.01, Sections 585 and 586, respectively, with applicable facility-wide maximum potential TAP emissions for the highest-emitting scenario (W3) is provided in Table 9. Note that TAPs also classified as HAPs emitted from sources addressed by NSPS or NESHAP were not required to be evaluated for compliance with TAP increments in accordance with IDAPA 58.01.01.210.20.

Table 9. TAP MODELING APPLICABILITY DETERMINATION.

HAP/TAP	Emissions (lb/hr)			EL (lb/hr)		Determination
	(a)	(b)	Total	(c)	(d)	
1,3-Butadiene	--	--	--	--	2.4E-5	EL not exceeded
3-Methylchloranthrene	--	3.2E-8	3.2E-8	--	2.5E-6	EL not exceeded
Acetaldehyde	--	--	--	--	3.0E-3	EL not exceeded
Acrolein	--	--	--	1.7E-2	--	EL not exceeded
Antimony	--	--	--	3.3E-2	--	EL not exceeded
Arsenic	--	5.7E-6	5.7E-6	--	1.5E-6	Carcinogenic EL exceeded
Benzene	--	3.8E-5	3.8E-5	--	8.0E-4	EL not exceeded
Benzo(a)pyrene[e]	--	2.1E-8				
Benz(a)anthracene[e]	--	3.2E-8				
Benzo(b)fluoranthene[e]	--	3.2E-8				
Benzo(k)fluoranthene[e]	--	3.2E-8	2.0E-7	--	2.0E-6	EL not exceeded
Chrysene[e]	--	3.2E-8				
Dibenzo(a,h)anthracene[e]	--	2.1E-8				
Indenol(1,2,3-cd)pyrene[e]	--	3.2E-8				
Beryllium	--	2.3E-7	2.3E-7	--	2.8E-5	EL not exceeded
Biphenyl	--	--	--	1.0E-1	--	EL not exceeded
Cadmium	--	2.0E-5	2.0E-5	--	3.7E-6	Carcinogenic EL exceeded
Carbon disulfide	--	--	--	2.0E+0	--	EL not exceeded
Chromium	--	2.7E-5	2.7E-5	3.3E-2	--	EL not exceeded
Chromium (VI)	--	3.4E-7	3.4E-7	--	5.6E-7	EL not exceeded
Cobalt	--	1.5E-6	1.5E-6	3.3E-3	--	EL not exceeded
Cyanide	--	--	--	3.3E-1	--	EL not exceeded
Dichlorobenzene	--	2.1E-5	2.1E-5	3.0E+1	--	EL not exceeded
Formaldehyde	--	1.3E-3	1.3E-3	--	5.1E-4	Carcinogenic EL exceeded
Hexane	--	3.2E-2	3.2E-2	1.2E+1	--	EL not exceeded
Hydrogen Chloride	--	--	--	--	5.0E-2	EL not exceeded
Manganese	--	3.6E-5	3.6E-5	6.7E-2	--	EL not exceeded
Naphthalene	--	1.1E-5	1.1E-5	3.3E+0	--	EL not exceeded
Nickel	--	4.0E-5	4.0E-5	--	2.7E-5	Carcinogenic EL exceeded

Table 9. TAP MODELING APPLICABILITY DETERMINATION.						
HAP/TAP	**Emissions (lb/hr)**			**EL (lb/hr)**		**Determination**
	(a)	(b)	**Total**	(c)	(d)	
Phenol	--	--	--	1.3E+0	--	EL not exceeded
Phosphorus	--	8.2E-6	8.2E-6	7.0E-3	--	EL not exceeded
PAH (except 7-PAH) [(e)]	--	--	--	--	9.1E-5	EL not exceeded
Selenium	--	4.3E-7	4.3E-7	1.3E-2	--	EL not exceeded
Toluene	--	6.1E-5	6.1E-5	2.5E+1	--	EL not exceeded
Xylene	--	--	--	2.9E+1	--	EL not exceeded
Aluminum	57.9	6.5E-1	58.5	6.7E-1	--	Non-carcinogenic EL exceeded
Barium	6.5E-1	6.8E-3	6.6E-1	3.3E-2	--	Non-carcinogenic EL exceeded
Calcium Carbonate	11.4	2.24	13.7	6.7E-1	--	Non-carcinogenic EL exceeded
Calcium Oxide	--	7.0E-1	7.0E-1	1.3E-1	--	Non-carcinogenic EL exceeded
Copper	4.1E-3	5.3E-4	4.6E-3	6.7E-2	--	EL not exceeded
Cyclohexane	--	1.0E-3	1.0E-3	7.0E+1	--	EL not exceeded
Hydrogen Sulfide	--	9.0E-1	9.0E-1	9.3E-1	--	EL not exceeded
Iron	14.8	2.1E-1	15.0	6.7E-2	--	Non-carcinogenic EL exceeded
Molybdenum	8.1E-4	4.7E-4	1.3E-3	3.3E-1	--	EL not exceeded
Pentane	--	1.2E-1	1.2E-1	1.2E+2	--	EL not exceeded
Silver	4.1E-4	4.1E-4	8.2E-4	7.0E-3	--	EL not exceeded
Sulfuric Acid	--	2.03	2.03	6.7E-2	--	Non-carcinogenic EL exceeded
Thallium	8.1E-3	5.2E-4	8.7E-3	7.0E-3	--	Non-carcinogenic EL exceeded
Uranium	8.1E-3	5.2E-4	8.7E-3	1.3E-2	--	EL not exceeded
Vanadium	2.3E-2	8.4E-4	2.4E-2	3.0E-3	--	Non-carcinogenic EL exceeded
Trimethyl Benzene	--	1.1E-2	1.1E-2	8.2E+0	--	EL not exceeded
Tungsten	8.1E-3	5.2E-4	8.7E-3	3.3E-1	--	EL not exceeded
Zinc	2.9E-2	2.2E-3	3.1E-2	6.7E-1	--	EL not exceeded

a. Total HAP/TAP emissions for EL evaluation from mining (i.e., pits, blasting, haul roads, stockpiles and DRSF, access road, and underground exploration) and leaching. Emissions from sources addressed by NSPS/NESHAP are not included in the evaluation for modeling applicability.

b. Total HAP/TAP emissions for EL evaluation from processing and production (i.e., ore processing, ore concentration and refining, process heating, lime production, aggregate production, concrete production, HVAC, emergency power, fuel storage). Emissions from sources addressed by NSPS/NESHAP are not included in the evaluation for modeling applicability.

c. Non-carcinogenic EL from IDAPA 58.01.01 Section 585.

d. Carcinogenic EL from IDAPA 58.01.01 Section 586.

e. Polycyclic aromatic hydrocarbon (PAH). The group of seven PAH with a single EL are regulated as polycyclic organic matter (POM) equivalent in potency to benzo(a)pyrene as specified in IDAPA 58.01.01.586.

Table 9 shows that the SGP facility-wide potential TAP emissions exceed the respective EL for arsenic, cadmium, formaldehyde, nickel, aluminum, barium, calcium carbonate, calcium oxide, iron, sulfuric acid, thallium, and vanadium. Therefore, modeling was required for these 12 TAPs.

Table 10 lists the source-specific modeled emission rates for all 12 TAPs (worst-case modeling scenario: W5).

Table 10. MODELED TAP EMISSION RATES (WORST-CASE MODELING SCENARIO, W5).													
Type of Source	**Source ID**	**ALUM[a] (lb/hr)[b]**	**ARSE[c] (lb/hr)**	**BARI[d] (lb/hr)**	**CACA[e] (lb/hr)**	**CADM[f] (lb/hr)**	**CAOX[g] (lb/hr)**	**FORM[h] (lb/hr)**	**IRON (lb/hr)**	**NICK[i] (lb/hr)**	**SULF[j] (lb/hr)**	**THAL[k] (lb/hr)**	**VANA[l] (lb/hr)**
Point Sources	LS1L	2.33E-04	0	1.50E-06	0	0	7.63E-03	0	1.07E-04	0	0	5.16E-08	1.60E-07
	MILLS2L	2.33E-04	0	1.50E-06	0	0	7.63E-03	0	1.07E-04	0	0	5.16E-08	1.60E-07
	SB1	0	0	0	0	0	0	0	0	0	0	0	0
	SB2	0	0	0	0	0	0	0	0	0	0	0	0
	AC	2.31E-05	0	2.31E-05	2.31E-05	0	0	0	2.31E-05	0	2.03E+00	2.31E-05	2.31E-05
	ACB	0	0	3.06E-06	0	0	0	0	0	0	0	0	1.60E-06
	ACS1L	9.32E-04	0	5.98E-06	0	0	3.05E-02	0	4.27E-04	0	0	2.06E-07	6.39E-07
	ACS2L	9.32E-04	0	5.98E-06	0	0	3.05E-02	0	4.27E-04	0	0	2.06E-07	6.39E-07
	ACS3L	9.32E-04	0	5.98E-06	0	0	3.05E-02	0	4.27E-04	0	0	2.06E-07	6.39E-07
	ACS4L	4.66E-04	0	2.99E-06	0	0	1.53E-02	0	2.13E-04	0	0	1.03E-07	3.20E-07
	CKD	9.59E-05	0	9.59E-05	9.59E-05	0	0	0	9.59E-05	0	0	9.59E-05	9.59E-05
	CKB	0	0	9.73E-06	0	0	0	0	0	0	0	0	5.08E-06
	EW	9.59E-05	0	9.59E-05	9.59E-05	0	0	0	9.59E-05	0	0	9.59E-05	9.59E-05
	MR	9.59E-05	0	9.59E-05	9.59E-05	0	0	0	9.59E-05	0	0	9.59E-05	9.59E-05
	MF	9.59E-05	0	9.59E-05	9.59E-05	0	0	0	9.59E-05	0	0	9.59E-05	9.59E-05
	EDG1	0	0	0	0	0	0	0	0	0	0	0	0
	EDG2	0	0	0	0	0	0	0	0	0	0	0	0
	EDG3	0	0	0	0	0	0	0	0	0	0	0	0
	EDFP	0	0	0	0	0	0	0	0	0	0	0	0
	PV	0	0	4.31E-07	0	0	0	0	0	0	0	0	2.25E-07
	HS	0	0	2.16E-05	0	0	0	0	0	0	0	0	1.13E-05
	H1M	0	7.84E-07	1.73E-05	0	4.31E-06	0	2.94E-04	0	8.24E-06	0	0	9.02E-06
	H2M	0	7.84E-07	1.73E-05	0	4.31E-06	0	2.94E-04	0	8.24E-06	0	0	9.02E-06
	HM	0	7.84E-07	1.73E-05	0	4.31E-06	0	2.94E-04	0	8.24E-06	0	0	9.02E-06
	HAC	0	4.90E-08	1.08E-06	0	2.70E-07	0	1.84E-05	0	5.15E-07	0	0	5.64E-07
	HR	0	4.90E-08	1.08E-06	0	2.70E-07	0	1.84E-05	0	5.15E-07	0	0	5.64E-07
	HA	0	4.90E-08	1.08E-06	0	2.70E-07	0	1.84E-05	0	5.15E-07	0	0	5.64E-07
	HMO	0	9.80E-08	2.16E-06	0	5.39E-07	0	3.68E-05	0	1.03E-06	0	0	1.13E-06
	HTS	0	3.92E-07	8.63E-06	0	2.16E-06	0	1.47E-04	0	4.12E-06	0	0	4.51E-06
	HW	0	5.88E-07	1.29E-05	0	3.24E-06	0	2.21E-04	0	6.18E-06	0	0	6.76E-06
	PSL	0	0	0	0	0	0	0	0	0	0	0	0
	CS1L	0	2.90E-08	0	0	0	0	0	0	2.86E-07	0	0	0
	CS2L	0	2.90E-08	0	0	0	0	0	0	2.86E-07	0	0	0
	LS6	3.19E-03	0	2.05E-05	3.88E-02	0	0	0	1.46E-03	0	0	7.06E-07	2.19E-06
	LSBM	4.30E-02	0	2.76E-04	5.22E-01	0	0	0	1.97E-02	0	0	9.51E-06	2.95E-05
	LS9	7.54E-04	0	4.84E-06	9.16E-03	0	0	0	3.45E-04	0	0	1.67E-07	5.17E-07
	LK	2.07E-02	0	1.33E-04	2.51E-01	0	0	0	9.47E-03	0	0	4.58E-06	1.42E-05

Table 10. MODELED TAP EMISSION RATES (WORST-CASE MODELING SCENARIO, W5).													
Type of Source	**Source ID**	**ALUM[a] (lb/hr)[b]**	**ARSE[c] (lb/hr)**	**BARI[d] (lb/hr)**	**CACA[e] (lb/hr)**	**CADM[f] (lb/hr)**	**CAOX[g] (lb/hr)**	**FORM[h] (lb/hr)**	**IRON (lb/hr)**	**NICK[i] (lb/hr)**	**SULF[j] (lb/hr)**	**THAL[k] (lb/hr)**	**VANA[l] (lb/hr)**
	LKC	0	0	9.51E-05	0	0	0	0	0	0	0	0	4.97E-05
	LCR	6.43E-03	0	4.12E-05	0	0	2.11E-01	0	2.94E-03	0	0	1.42E-06	4.41E-06
	LSL	1.40E-04	0	8.99E-07	0	0	4.59E-03	0	6.41E-05	0	0	3.10E-08	9.60E-08
Area Sources	WEP	5.59E+00	0	6.29E-02	1.10E+00	0	0	0	0	0	0	0	0
	UGEXP	2.49E-05	0	2.80E-07	4.91E-06	0	0	0	0	0	0	0	0
Line Sources	AR01	2.02E-02	0	2.28E-04	3.99E-03	0	0	0	0	0	0	0	0
	AR02	1.56E-02	0	1.75E-04	3.07E-03	0	0	0	0	0	0	0	0
	AR03	3.93E-02	0	4.43E-04	7.75E-03	0	0	0	0	0	0	0	0
	AR04	3.77E-02	0	4.25E-04	7.43E-03	0	0	0	0	0	0	0	0
Volume Sources	WEPBL	1.90E+00	0	2.14E-02	3.75E-01	0	0	0	4.88E-01	0	0	2.68E-04	7.50E-04
	WEDRSF	8.58E-01	0	9.66E-03	1.69E-01	0	0	0	2.20E-01	0	0	1.21E-04	3.38E-04
	OC1	1.04E-02	0	1.17E-04	2.04E-03	0	0	0	2.65E-03	0	0	1.46E-06	4.08E-06
	OC2	1.04E-02	0	1.17E-04	2.04E-03	0	0	0	2.65E-03	0	0	1.46E-06	4.08E-06
	OC3	1.04E-02	0	1.17E-04	2.04E-03	0	0	0	2.65E-03	0	0	1.46E-06	4.08E-06
	OC4	1.04E-02	0	1.17E-04	2.04E-03	0	0	0	2.65E-03	0	0	1.46E-06	4.08E-06
	OC5	1.04E-02	0	1.17E-04	2.04E-03	0	0	0	2.65E-03	0	0	1.46E-06	4.08E-06
	OC6	1.04E-02	0	1.17E-04	2.04E-03	0	0	0	2.65E-03	0	0	1.46E-06	4.08E-06
	OC7	8.87E-02	0	1.00E-03	1.75E-02	0	0	0	2.28E-02	0	0	1.25E-05	3.50E-05
	OC8	1.04E-02	0	1.17E-04	2.04E-03	0	0	0	2.65E-03	0	0	1.46E-06	4.08E-06
	OC9	4.90E-02	0	5.52E-04	9.66E-03	0	0	0	1.26E-02	0	0	6.90E-06	1.93E-05
	OC10	4.90E-02	0	5.52E-04	9.66E-03	0	0	0	1.26E-02	0	0	6.90E-06	1.93E-05
	OC11	4.90E-02	0	5.52E-04	9.66E-03	0	0	0	1.26E-02	0	0	6.90E-06	1.93E-05
	OC12	9.80E-02	0	1.10E-03	1.93E-02	0	0	0	2.51E-02	0	0	1.38E-05	3.86E-05
	OC13	1.14E-02	0	1.29E-04	2.25E-03	0	0	0	2.93E-03	0	0	1.61E-06	4.51E-06
	LS1U	1.13E-03	0	7.25E-06	0	0	3.70E-02	0	5.18E-04	0	0	2.50E-07	7.75E-07
	MILLS2U	1.13E-03	0	7.25E-06	0	0	3.70E-02	0	5.18E-04	0	0	2.50E-07	7.75E-07
	ACS1U	2.17E-03	0	1.39E-05	0	0	7.10E-02	0	9.94E-04	0	0	4.80E-07	1.49E-06
	ACS2U	2.17E-03	0	1.39E-05	0	0	7.10E-02	0	9.94E-04	0	0	4.80E-07	1.49E-06
	ACS3U	2.17E-03	0	1.39E-05	0	0	7.10E-02	0	9.94E-04	0	0	4.80E-07	1.49E-06
	ACS42U	2.17E-03	0	1.39E-05	0	0	7.10E-02	0	9.94E-04	0	0	4.80E-07	1.49E-06
	PSU	0	0	0	0	0	0	0	0	0	0	0	0
	CS1U	0	2.90E-08	0	0	0	0	0	0	2.86E-07	0	0	0
	CS2U	0	2.90E-08	0	0	0	0	0	0	2.86E-07	0	0	0
	CAL	1.56E-02	0	1.00E-04	0	0	0	0	7.14E-03	0	0	3.45E-06	1.07E-05
	CAU	1.56E-02	0	1.00E-04	0	0	0	0	7.14E-03	0	0	3.45E-06	1.07E-05
	CM	0	2.03E-06	0	0	4.86E-09	0	0	0	1.70E-06	0	0	0
	PCSP1	1.41E-02	0	9.06E-05	1.72E-01	0	0	0	6.47E-03	0	0	3.12E-06	9.69E-06

Table 10. MODELED TAP EMISSION RATES (WORST-CASE MODELING SCENARIO, W5).													
Type of Source	**Source ID**	**ALUM[a] (lb/hr)[b]**	**ARSE[c] (lb/hr)**	**BARI[d] (lb/hr)**	**CACA[e] (lb/hr)**	**CADM[f] (lb/hr)**	**CAOX[g] (lb/hr)**	**FORM[h] (lb/hr)**	**IRON (lb/hr)**	**NICK[i] (lb/hr)**	**SULF[j] (lb/hr)**	**THAL[k] (lb/hr)**	**VANA[l] (lb/hr)**
	PCSP2	1.41E-02	0	9.06E-05	1.72E-01	0	0	0	6.47E-03	0	0	3.12E-06	9.69E-06
	LS1	3.19E-03	0	2.05E-05	3.88E-02	0	0	0	1.46E-03	0	0	7.06E-07	2.19E-06
	LS2	5.75E-03	0	3.69E-05	6.98E-02	0	0	0	2.63E-03	0	0	1.27E-06	3.94E-06
	LS3	2.66E-02	0	1.71E-04	3.23E-01	0	0	0	1.22E-02	0	0	5.88E-06	1.82E-05
	LS4	5.75E-03	0	3.69E-05	6.98E-02	0	0	0	2.63E-03	0	0	1.27E-06	3.94E-06
	LS5	2.66E-02	0	1.71E-04	3.23E-01	0	0	0	1.22E-02	0	0	5.88E-06	1.82E-05
	LS7	3.19E-03	0	2.05E-05	3.88E-02	0	0	0	1.46E-03	0	0	7.06E-07	2.19E-06
	LS8	3.19E-03	0	2.05E-05	3.88E-02	0	0	0	1.46E-03	0	0	7.06E-07	2.19E-06
	LS10	7.54E-04	0	4.84E-06	9.16E-03	0	0	0	3.45E-04	0	0	1.67E-07	5.17E-07
	LS11	6.29E-03	0	4.03E-05	7.63E-02	0	0	0	2.88E-03	0	0	1.39E-06	4.31E-06
	LS12	7.54E-04	0	4.84E-06	9.16E-03	0	0	0	3.45E-04	0	0	1.67E-07	5.17E-07
	LSU	1.40E-05	0	8.99E-08	0	0	4.59E-04	0	6.41E-06	0	0	3.10E-09	9.60E-09
	HRT001-HRT072[m]	2.62E-01	0	2.95E-03	5.16E-02	0	0	0	6.71E-02	0	0	3.69E-05	1.03E-04
	HRN001-HRN022[m]	2.62E-01	0	2.95E-03	5.16E-02	0	0	0	6.71E-02	0	0	3.69E-05	1.03E-04

a. Aluminum.
b. Pounds per hour.
c. Arsenic.
d. Barium.
e. Calcium carbonate.
f. Cadmium.
g. Calcium oxide.
h. Formaldehyde.
i. Nickel.
j. Sulfuric acid.
k. Thallium.
l. Vanadium.
m. The Haul Road was represented in the model as a series of volume sources. The emission rates listed in this table represent each individual volume source.

3.1.3 Modeling Scenarios

As discussed in Section 2.1, conventional open-pit methods will be used to extract ore and DR from three pits: YPP, HFP, and WEP, and legacy tailings from BT. Ore will be hauled to the crushing area, and the DR will be moved to four DRSF: Yellow Pine (YPDRSF), Hangar Flats (HFDRSF), West End (WEDRSF), and Fiddle (FDRSF). The SGP site layout provided later in Figure 4 shows these locations.

Midas Gold plans for an up to three-year construction schedule to build mine site facilities and infrastructure, as well as the power transmission line, followed by 12 years of mining operations (i.e., LOM Years 1 through 12). Depending on the mine design and operating schedule, mining activity rates will vary temporally and spatially during the 12 years of mine production and operation. For example, ore production varies from approximately 6.8 MMton in LOM Year 1 (67% in YPP, 26% in WEP, and 7% in BT) to 9 MMton in LOM 3 (78% in YPP, 10% in BT, 7% in WEP, and 5% in HFP). Similarly, DR production varies from approximately 4.8 MMton in LOM Year 12 (100% in WEP) to 34 MMton in each of LOM Years 4 through 9, with varying distribution among the four DRSF for each LOM Year. The total material (ore and DR) production varies from approximately 12.5 MMton in LOM Year 12 to 42.7 MMton in LOM Year 4.

Similar to the material production, the distribution and hauling of DR to the four destinations (YPDRSF, HFDRSF, WEDRSF, FDRSF) also will vary for each LOM year. Depending on the material origin (pits and BT) and destination (crushing area and DRSF), material hauling distances also will vary for each LOM year.

Therefore, depending on material production rates and origin, DR destination, and hauling distances, mining emissions will vary spatially and temporally throughout the mine life. For permitting purposes, Midas Gold used a maximum production rate of 180,000 tons of material (ore and/or DR) per day, for an annual production rate of 65.7 MMton/yr. This annual production rate is more than 50% higher than the estimated maximum total material production rate of 42.7 MMton/yr.

In order to allow Midas Gold with operation flexibility and to capture variability in material origin and destination in the air quality analyses, several pit scenarios were developed for the SGP air quality analyses. Each pit scenario uses the maximum production rate of 180,000 ton/day in a single pit and uses a single material destination. Each pit has a dedicated ore scenario that assumes all material produced is ore and is hauled to the crusher area; and depending on mine design multiple DR destination scenarios each assuming all material produced is DR and is transported to a single DRSF. For example, most of the DR from HFP will be moved to HFDRSF and during LOM Years 2 through 10, but a fraction of this rock will be moved to FDRSF during LOM Years 3 and 8, and a fraction to YPDRSF during LOM Year 9. Therefore, in order to evaluate all hauling scenarios originating from HFP, the following four (one for ore hauling, three for DR hauling) HFP scenarios were modeled:

1. HFP Scenario 1 – 180,000 ton/day of ore produced and hauled to the crusher area
2. HFP Scenario 2 – 180,000 ton/day of DR produced and hauled to the FDRSF
3. HFP Scenario 3 – 180,000 ton/day of DR produced and hauled to the HFDRSF
4. HFP Scenario 4 – 180,000 ton/day of DR produced and hauled to the YPDRSF

Overall, 14 scenarios were modeled for $PM_{2.5}$ and PM_{10} analyses to cover all possible origin and destination combinations. Each modeling scenario included processing and ancillary source potential emissions. The multiple scenarios modeled for $PM_{2.5}$ and PM_{10} analyses are presented in Table 11. This table also shows the six origin/destination options that are not applicable to the SGP Project as denoted by

"0 ton/day." These six scenarios are not feasible because the timing of the activity within the sequence of mine operations makes the scenarios logistically impossible.

Table 11. MODELING SCENARIOS FOR $PM_{2.5}$ AND PM_{10} ANALYSES.									
Pit Scenario	Pit/Origin (ton/day)				Ore Destination (ton/day)	DR Destination (ton/day)			
	YPP	HFP	WEP	BT	STKP	FDRSF	HFDRSF	YPDRSF	WEDRSF
Y1	180,000	--	--	--	180,000	--	--	--	--
Y2	180,000	--	--	--	--	180,000	--	--	--
Y3	180,000	--	--	--	--	--	180,000	--	--
Y4	0	--	--	--	--	--	--	0	--
Y5	0	--	--	--	--	--	--	--	0
H1	--	180,000	--	--	180,000	--	--	--	--
H2	--	180,000	--	--	--	180,000	--	--	--
H3	--	180,000	--	--	--	--	180,000	--	--
H4	--	180,000	--	--	--	--	--	180,000	--
H5	--	0	--	--	--	--	--	--	0
W1	--	--	180,000	--	180,000	--	--	--	--
W2	--	--	180,000	--	--	180,000	--	--	--
W3	--	--	180,000	--	--	--	180,000	--	--
W4	--	--	180,000	--	--	--	--	180,000	--
W5	--	--	180,000	--	--	--	--	--	180,000
B1	--	--	--	180,000	180,000	--	--	--	--
B2	--	--	--	180,000	--	--	180,000	--	--
B3	--	--	--	0	--	0	--	--	--
B4	--	--	--	0	--	--	--	0	--
B5	--	--	--	0	--	--	--	--	0

Scenario Y4 is not applicable because the YPDRSF and the YPP are in the same area; therefore, the pit cannot be backfilled with development rock until after mining of the pit is completed. Scenarios Y5 and H5 are not applicable because the WEDRSF will only be utilized by the WEP because of its proximity; it is only accessible from the WEP. Scenarios B3, B4 and B5 are not applicable because the development rock from the BT will only be hauled to the HFDRSF because of its proximity. All other development rock storage facilities are significantly farther away from BT.

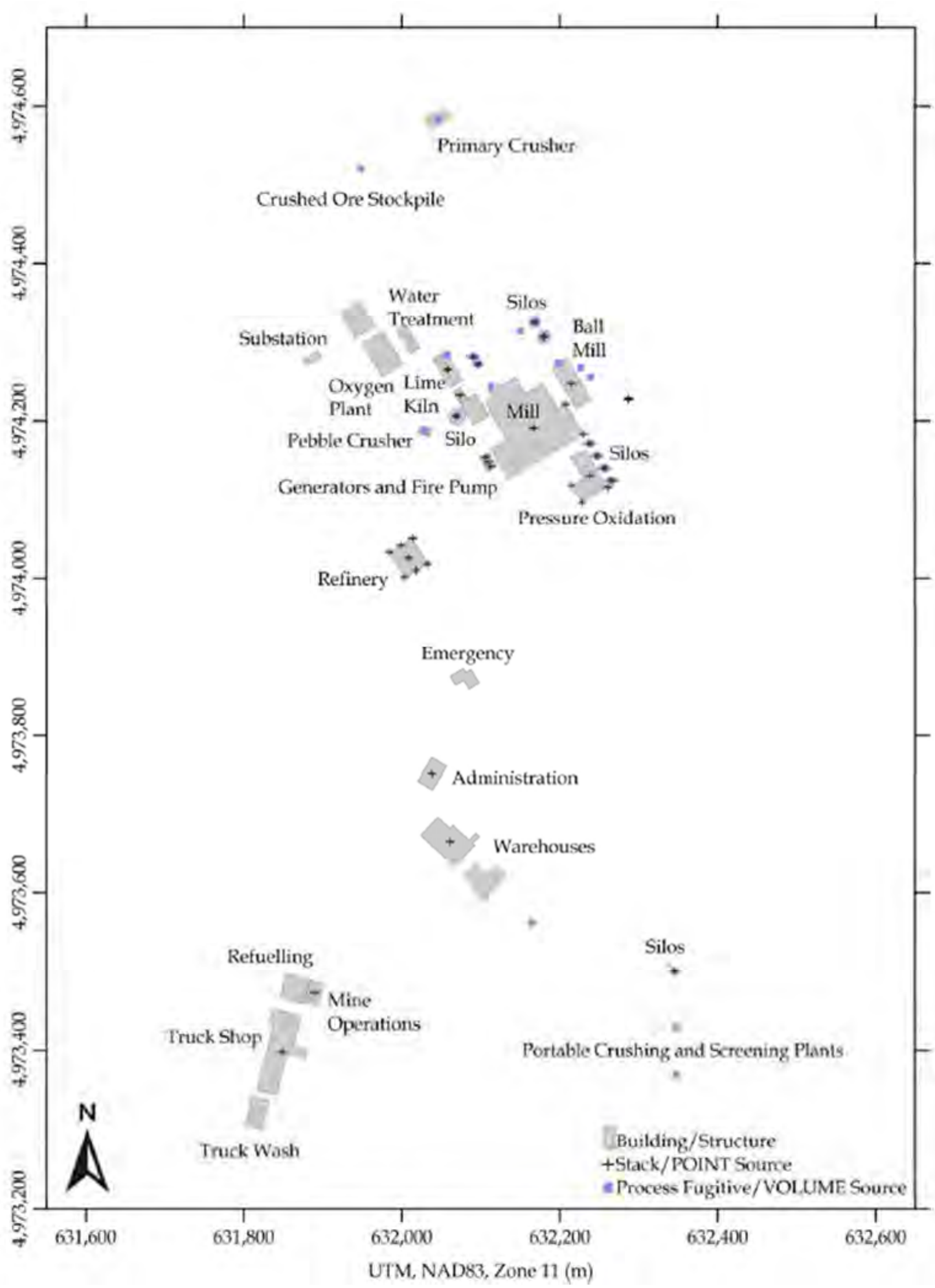
The fugitive CO, NO_2, and SO_2 emissions are limited to pits only, and they do not vary by ore and/or DR hauling and destinations. Therefore, for these pollutants, one scenario for each pit, including processing and ancillary source potential emissions, was modeled, i.e., scenarios Y1, H1, W1, and B1.

The TAP emissions are limited to processing and ancillary sources, so a single scenario was modeled for each applicable TAP analysis.

3.1.4 Processing, Refining, and Ancillary Sources

The processing, refining, and ancillary sources with exhaust stacks, such as baghouse-equipped sources, generators, process and building heaters, autoclave, retort, smelting furnace, carbon kiln, lime kiln, etc., were modeled as POINT sources. The process sources without exhaust stacks, such as material transfers, ore screening and crushing, etc., were modeled as VOLUME sources. A plot plan showing the processing and refining area buildings and sources is provided in Figure 3. Process and ancillary source model input parameters are provided later in Tables 15 and 16.

Figure 3. PROCESSING AND REFINING AREA BUILDING AND SOURCE LAYOUT.



3.1.5 Fugitive Sources: Blasting, Material Origin and Destination, and Underground Exploration Emissions

Blasting emissions were represented by a VOLUME source located inside a pit. Each material origin location (YPP, HFP, WEP, BT) was modeled as an AREA source and comprised appropriate emissions from drilling, material loading, dozing, and surface exploration. Ore destination (crusher area) was modeled as a VOLUME source and comprised ore unloading emissions. Each DR destination (FDRSF, HFDRSF, YPDRSF, WEDRSF) was modeled as a VOLUME source comprising appropriate emissions from DR unloading, dozing, and wind erosion. Emissions from underground core sampling drilling (UGEXP) in the Scout prospect decline were represented by an AREA source characterized by the portal opening dimensions.

Model input physical characteristics for blasting and possible material origin and destination locations, and Scout portal are presented in Table 12. This table also shows the source type and associated dimensions for each of the modeled fugitive source/location. The VOLUME source dimensions for blasting provided in Table 12 were based on an estimated blast area. For the remaining AREA and VOLUME sources listed in Table 12, the dimensions were developed by reasonably fitting an equal-area rectangle within the actual footprint of each fugitive source. Blasting is not expected to occur in BT. However, blasting emissions were modeled in BT (BTBL) in order to streamline the permitting process.

Table 12. MODELED FUGITIVE ACTIVITY LOCATIONS.

Model ID	Activity Location	Type	Lateral Dimensions (m)	Emission Sources
YPP	Yellow Pine Pit	AREA	882 × 882	Drilling, loading, dozing, surface exploration
HFP	Hangar Flats Pit	AREA	491 × 491	Drilling, loading, dozing, surface exploration
WEP	West End Pit	AREA	376 × 376	Drilling, loading, dozing, surface exploration
BT	Bradley Tailings	AREA	820 × 420	Loading, dozing, wind erosion
YPPBL	Yellow Pine Pit (Blasting)	VOLUME	87 × 87	Blasting
HFPBL	Hangar Flats Pit (Blasting)	VOLUME	87 × 87	Blasting
WEPBL	West End Pit (Blasting)	VOLUME	87 × 87	Blasting
BTBL	Bradley Tailings (Blasting)	VOLUME	87 × 87	Blasting
STKP	PC Stockpile	VOLUME	229 × 229	Unloading, dozing, wind erosion
FDRSF	Fiddle DRSF	VOLUME	775 × 775	Unloading, dozing, wind erosion
HFDRSF	Hangar Flats DRSF	VOLUME	752 × 752	Unloading, dozing, wind erosion
YPDRSF	Yellow Pine DRSF	VOLUME	784 × 784	Unloading, dozing, wind erosion
WEDRSF	West End DRSF	VOLUME	533 × 533	Unloading, dozing, wind erosion
UGEXP	Scout Portal	AREA	4.9 × 4.9	Sample core drilling

The model input physical parameters for blasting, material origin and destination locations, and Scout portal are provided in Table 13.

Table 13. MODEL INPUT PARAMETERS FOR FUGITIVE ACTIVITY LOCATIONS.

Model ID	Base Elevation (m)	Release Height (m)	Initial Lateral Dispersion (m)	Initial Vertical Dispersion (m)
YPP	1,832.4	4.7	N/A	4.4
HFP	1,993.3	4.7	N/A	4.4
WEP	2,191.8	4.7	N/A	4.4
BT	2,011.7	4.7	N/A	4.4
YPPBL	1,717.2	15.0	20.2	7.0
HFPBL	1,890.6	15.0	20.2	7.0
WEPBL	1,994.0	15.0	20.2	7.0

BTBL	2,011.7	15.0	20.2	7.0
STKP	1,979.8	4.7	53.3	4.4
FDRSF	2,115.2	4.7	180.2	4.4
HFDRSF	2,079.8	4.7	174.8	4.4
YPDRSF	1,904.1	4.7	182.2	4.4
WEDRSF	2,376.5	4.7	124.1	4.4
UGEXP	2,018.0	0	N/A	0

The blasting physical parameters were developed from dimensions (provided in Table 12) based on blast area used in the emission calculation. The blasting release height is the midpoint of the blasting height (30 m).

The initial lateral and vertical dispersion dimensions for blasting were calculated per methods specified in (EPA 2018c) for a volume source not on or adjacent to a building, as:

$$Initial\ Lateral\ Dispesion = \frac{Width\ (87\ m)}{4.3}$$

$$Initial\ Vertical\ Dispesion = \frac{Height\ (30\ m)}{4.3}$$

For the pit and DRSF fugitive activity locations listed in Table 12, i.e., YPP, HFP, WEP, BT, FDRSF, HFDRSF, and WEDRSF, the release height was based on the haul truck height (weighted based on model-specific usage) and calculated using the recommendations provided in the Haul Road Workgroup Report (EPA 2012), as:

$$Release\ Height = \frac{Plume\ Top\ (Weighted\ Truck\ Height \times 1.7)}{2}$$

The applicable initial lateral dispersion for each VOLUME source was calculated from the respective shorter dimension and EPA-specified methods (EPA 2018c) (EPA 2016) as follows:

$$Initial\ Lateral\ Dispesion = \frac{Short\ Lateral\ Dimension}{2.15}$$

The applicable initial vertical dispersion for each AREA and VOLUME source was calculated from the respective vertical dimension and EPA-specified methods (EPA 2018c) (EPA 2016) as follows:

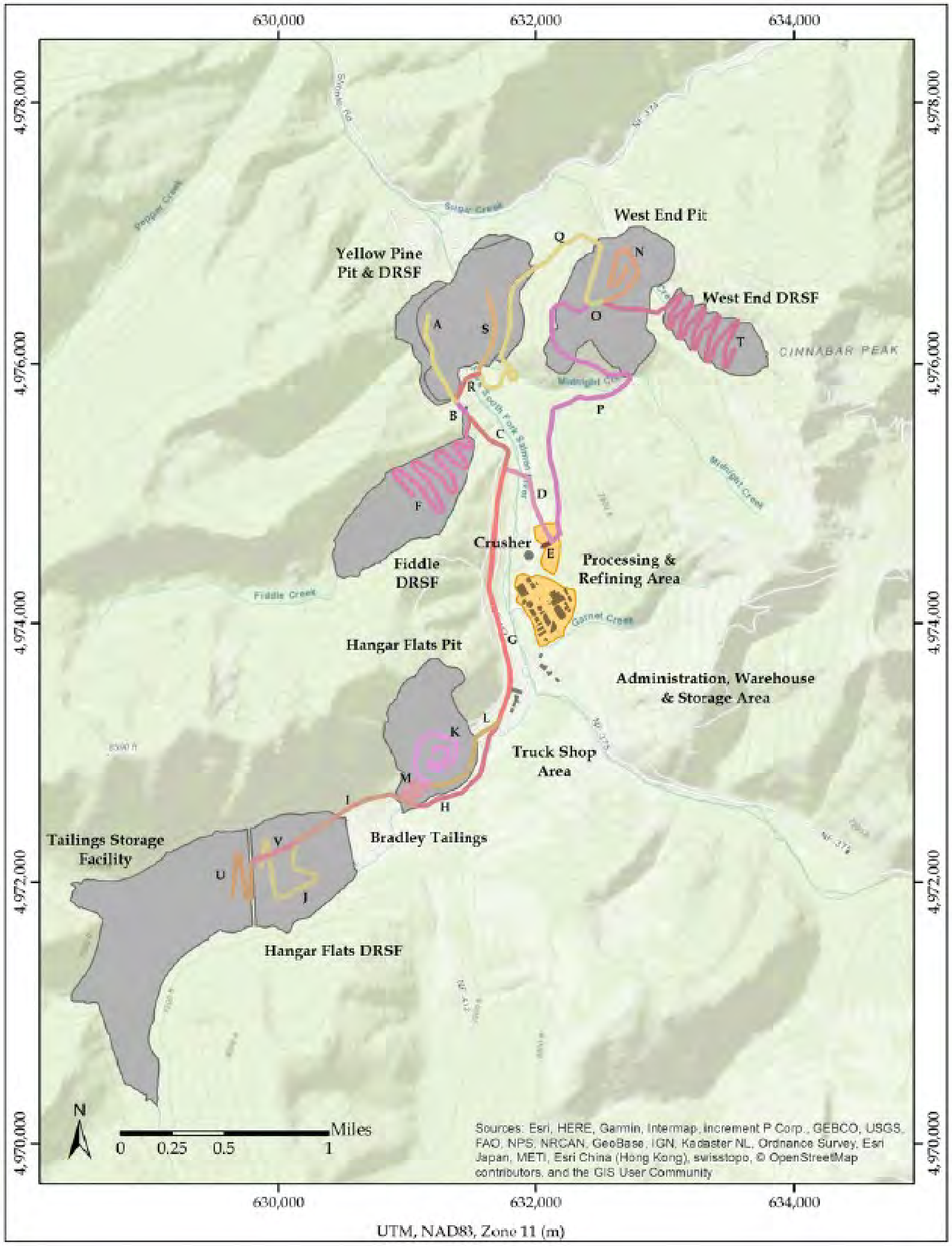
$$Initial\ Vertical\ Dispersion = \frac{Plume\ Top\ (Weighted\ Truck\ Height \times 1.7)}{2.15}$$

Scout portal was modeled as a surface-based AREA source with zero release height.

3.1.6 Fugitive Sources: Haul Roads

A representative haul road network for hauling material from inside the pit (or origin) to various destinations was developed for each pit scenario provided in Table 11. The haul road network is presented in Figure 4.

Figure 4. HAUL ROAD NETWORK AND SECTIONS.



As shown in Figure 4, the haul road network was divided into 22 sections, A through V. Each section was further divided into multiple segments with a length equal to twice the adjusted haul road width of 32.5 m (26 m road width plus 6 m (EPA 2012)). Each of the segments was characterized as an individual VOLUME source in the model, with a release height of 4.75 m (weighted-average truck height times 1.7, divided by 2 (EPA 2012)), an initial lateral dispersion of 15.1 m (adjusted road width divided by 2.15 (EPA 2012)), and an initial vertical dispersion of 4.42 m (weighted-average top-of-plume height divided by 2.15 (EPA 2012)). Material hauling emissions associated with each origin-destination route were assigned to each segment along the route based on estimated total emissions along the route and traffic distribution along each section, as provided in Table 14 for the four HFP scenarios.

Table 14. HAUL ROAD EMISSION DISTRIBUTION GRID FOR HFP SCENARIOS.					
Pit Scenario		**H1**	**H2**	**H3**	**H4**
Route: Origin-Destination		**HFP-STKP**	**HFP-FDRSF**	**HFP-HFDRSF**	**HFP-YPDRSF**
Segment Emission Denominator		96	148	87	115
Section	**No. of Segments**	**Traffic Distribution per Route**			
A	37	--	--	--	--
B	3	--	--	--	1
C	11	--	1	--	1
D	14	1	--	--	--
E	2	--	--	--	--
F	55	--	1	--	--
G	38	1	1	--	1
H	20	--	--	--	--
I	20	--	--	1	--
J	27	--	--	1	--
K	28	1	1	1	1
L	16	1	1	--	1
M	12	--	--	1	--
N	22	--	--	--	--
O	2	--	--	--	--
P	57	--	--	--	--
Q	49	--	--	--	--
R	6	--	--	--	1
S	13	--	--	--	1
T	72	--	--	--	--
U	19	--	--	--	--
V	7	--	--	--	--

The top row in Table 14 shows the pit scenarios, and the next two rows show hauling route and the associated segment emission denominator (SED) used to distribute segment emissions along each route. The remainder of Table 14 presents the number of segments for each road section (shown in Figure 4) and the associated traffic distribution factor for each route. The emission distribution for each applicable segment is illustrated in the following example.

For route: HFP–STKP (Hangar Flats pit to crusher stockpile), Figure 4 shows that material from HFP will be hauled to the crusher area following the route along Sections K, L, G, and D. All (100%) of the ore from HFP will travel on each of these sections; therefore, each of these sections has a traffic distribution factor of 1.0 for this route.

The SED for each route is the sum-product of the number of segments and traffic distribution for the applicable sections. The SED for the HFP–STKP route is calculated as:

$$SED_{(HFP-STKP)} = (28 \times 1) + (16 \times 1) + (38 \times 1) + (14 \times 1) = 96$$

Emissions for each section-segment were estimated by dividing the total emissions along the route by its SED and multiplying by the section distribution factor. For example, the emission rate for each of the 28 segments along Section K was calculated as:

$$Emission\ Rate - Section\ K_{(Segments\ 1-28)} = \frac{Total\ Emissions_{(HFP-STKP)}}{96} \times 1$$

3.1.7 Fugitive Sources: Burntlog Route Access Road

The access road portion within the operations boundary was characterized by a series of LINE sources laid along the actual route. Emissions associated along this access road include dust emissions generated from travel of maintenance equipment, light-duty pickup trucks and buses used for employee, visitor, and contractor transportation, and heavy-duty trucks used for cargo and services transportation. These sources were assigned a release height of 3 m and an initial vertical dispersion of 2.8 m. These release parameters were based on an estimated average vehicle height of 3.5 m, which is representative of an overall approximation of anticipated vehicle heights (grader – 3.7 m, heavy-duty truck – 3.6 m, and pickup truck – 3.2 m) and the AREA source parameterization recommendations provided in the Haul Road Workgroup Report (EPA 2012). The AERMOD emission input units for AREA source are grams per meter square. The access road emissions were evenly distributed along the road by dividing the total access road emissions by its total area, i.e., the Burntlog Route section within the operations boundary (2,950 m) multiplied by the road width (6.1 m).

3.1.8 Emission Release Parameters

Table 15 lists the emission release parameters, including stack height, exhaust temperature, exhaust velocity, and stack diameter for SGP's process and ancillary point sources in metric units (English units are in parentheses). Table 16 lists the emission release parameters for SGP's process and ancillary volume sources in metric units (English units are in parentheses). Emission release parameters were based on information provided in the application. Justification for emission release parameters is summarized in the next section.

Table 15. PROCESS AND ANCILLARY POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).

Release Point	Description	UTM[a] Coordinates Easting-X in m[b]	UTM[a] Coordinates Northing-Y in m	Stack Height in m (ft)[c]	Stack Exhaust Temp. in K (°F)[d]	Stack Exhaust Velocity in m/sec (fps)[e]	Stack Diameter in m (ft)	Orient. Of Release[f]
LS1L	Mill Lime Silo #1 Loading	632,095	4,974,272	13.3 (43.7)	0.0 (-459.7)	18.1 (59.4)	0.15 (0.49)	D
MillS2L	Mill Lime Silo #2 Loading	632,090	4,974,282	13.3 (43.7)	0.0 (-459.7)	18.1 (59.4)	0.15 (0.49)	D
SB1	Sb Dryer (2.72 MMBtu/hr Propane-Fired)	632,231	4,974,183	45.7 (150.0)	455.4 (360.0)	6.9 (22.8)	0.30 (0.98)	D
SB2	Sb Bagging	632,208	4,974,221	45.7 (150.0)	0.0 (-459.7)	6.5 (21.2)	0.30 (0.98)	D
AC	Autoclave	632,229	4,974,096	23.5 (77.0)	364.3 (196.1)	7.4 (24.3)	1.52 (4.99)	D
ACB	POX Boiler (17 MMBtu/hr Propane-Fired)	632,261	4,974,116	23.5 (77.0)	455.4 (360.0)	10.8 (35.6)	0.61 (2.00)	D
ACS1L	AC Lime Silo #1 Loading	632,267	4,974,124	17.4 (57.2)	0.0 (-459.7)	16.1 (52.8)	0.23 (0.75)	D
ACS2L	AC Lime Silo #2 Loading	632,257	4,974,140	17.4 (57.2)	0.0 (-459.7)	16.1 (52.8)	0.23 (0.75)	D
ACS3L	AC Lime Silo #3 Loading	632,248	4,974,156	17.4 (57.2)	0.0 (-459.7)	16.1 (52.8)	0.23 (0.75)	D
ACS4L	AC Lime Silo #4 Loading	632,238	4,974,171	14.5 (47.5)	0.0 (-459.7)	16.1 (52.8)	0.23 (0.75)	D
CKD	Carbon	632,013	4,974,051	16.8	338.7	5.1	0.15	D

Table 15. PROCESS AND ANCILLARY POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).								
Release Point	**Description**	**UTM[a] Coordinates**		**Stack Height in m (ft)[c]**	**Stack Exhaust Temp. in K (°F)[d]**	**Stack Exhaust Velocity in m/sec (fps)[e]**	**Stack Diameter in m (ft)**	**Orient. Of Release[f]**
		Easting-X in m[b]	**Northing-Y in m**					
	Regeneration Kiln (Drum)			(55.0)	(150.0)	(16.6)	(0.49)	
CKB	Carbon Regeneration Kiln (Burners)	631,998	4,974,042	14.0 (46.0)	455.4 (360.0)	5.8 (18.9)	0.30 (0.98)	D
EW	Electrowinning Cells and Pregnant Solution Tank	631,983	4,974,033	16.8 (55.0)	310.9 (100.0)	24.2 (79.4)	0.30 (0.98)	D
MR	Mercury Retort	632,003	4,974,001	16.8 (55.0)	338.7 (150.0)	1.5 (5.1)	0.09 (0.30)	D
MF	Induction Melting Furnace	632,032	4,974,019	16.8 (55.0)	338.7 (150.0)	21.5 (70.6)	0.38 (1.25)	D
EDG1	Camp Emergency Generator (Mfr. Yr. >2007; diesel)	634,274	4,972,050	2.1 (7.0)	866.5 (1,100.0)	29.7 (97.4)	0.46 (1.51)	D
EDG2	Plant Emergency Generator #1 (Mfr. Yr. >2007; diesel)	632,105	4,974,154	2.1 (7.0)	866.5 (1,100.0)	29.7 (97.4)	0.46 (1.51)	D
EDG3	Plant Emergency Generator #2 (Mfr. Yr. >2007; diesel)	632,109	4,974,148	2.1 (7.0)	866.5 (1,100.0)	29.7 (97.4)	0.46 (1.51)	D
EDFP	Mill Fire Pump (Mfr. Yr. >2009; diesel)	632,113	4,974,141	2.1 (7.0)	866.5 (1,100.0)	23.8 (78.0)	0.23 (0.75)	D
PV	Propane Vaporizer (0.1 MMBtu/hr Propane-Fired)	632,216	4,974,118	20.7 (68.0)	455.4 (360.0)	1.6 (5.2)	0.12 (0.39)	D
HS	Strip Circuit Solution Heater (5 MMBtu, Propane-Fired)	632,017	4,974,010	14.0 (46.0)	455.4 (360.0)	7.5 (24.8)	0.40 (1.31)	D
H1M	Mine Air Heater #1 (4 MMBtu/hr Propane-Fired)	632,287	4,974,227	2.1 (7.0)	455.4 (360.0)	6.0 (19.8)	0.40 (1.31)	D
H2M	Mine Air Heater #2 (4 MMBtu/hr Propane-Fired)	632,288	4,974,228	2.1 (7.0)	455.4 (360.0)	20.8 (68.3)	0.21 (0.69)	D
HM	Mill HVAC Heaters (4 x 1.0 MMBtu Propane-Fired)	632,168	4,974,191	43.0 (141.0)	455.4 (360.0)	28.3 (92.9)	0.09 (0.30)	D
HAC	Autoclave HVAC Heater (0.25 MMBtu Propane-Fired)	632,238	4,974,130	20.7 (68.0)	455.4 (360.0)	7.1 (23.3)	0.09 (0.30)	D
HR	Refinery HVAC Heater (0.25 MMBtu Propane-Fired)	632,008	4,974,026	14.0 (46.0)	455.4 (360.0)	7.1 (23.3)	0.09 (0.30)	D
HA	Admin HVAC Heater (0.25 MMBtu Propane-Fired)	632,038	4,973,751	6.4 (21.0)	455.4 (360.0)	7.1 (23.3)	0.09 (0.30)	D

Table 15. PROCESS AND ANCILLARY POINT SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).								
Release Point	**Description**	**UTM[a] Coordinates**		**Stack Height in m (ft)[c]**	**Stack Exhaust Temp. in K (°F)[d]**	**Stack Exhaust Velocity in m/sec (fps)[e]**	**Stack Diameter in m (ft)**	**Orient. Of Release[f]**
		Easting-X in m[b]	**Northing-Y in m**					
HMO	Mine Ops. HVAC Heaters (2 x 0.25 MMBtu Propane-Fired)	631,889	4,973,472	12.5 (41.0)	455.4 (360.0)	1.3 (4.3)	0.21 (0.69)	D
HTS	Truck Shop HVAC Heaters (2 x 1.0 MMBtu Propane-Fired)	631,848	4,973,398	12.5 (41.0)	455.4 (360.0)	5.2 (17.1)	0.21 (0.69)	D
HW	Warehouse HVAC Heaters (3 x 1.0 MMBtu Propane-Fired)	632,060	4,973,664	12.5 (41.0)	455.4 (360.0)	5.2 (17.1)	0.21 (0.69)	D
PSL	Prill Silos Loading (2 x 100 ton)	632,346	4,973,500	7.8 (25.5)	0.0 (-459.7)	18.1 (59.4)	0.15 (0.49)	D
CS1L	Cement/Shotcrete Silo #1 Loading	632,095	4,974,272	13.3 (43.7)	0.0 (-459.7)	24.1 (78.9)	0.15 (0.49)	D
CS2L	Cement/Shotcrete Silo #2 Loading	632,095	4,974,272	13.3 (43.7)	0.0 (-459.7)	24.1 (78.9)	0.15 (0.49)	D
LS6	Limestone transfer to Ball Mill Feed Bin	632,181	4,974,307	8.8 (29.0)	0.0 (-459.7)	0.001 (0.003)	0.30 (0.98)	D
LSBM	Limestone Ball Mill	632,215	4,974,248	21.3 (70.0)	0.0 (-459.7)	26.7 (87.5)	0.61 (2.00)	D
LS9	Limestone transfer to Kiln Feed Bin	632,169	4,974,325	8.8 (29.0)	0.0 (-459.7)	0.001 (0.003)	0.30 (0.98)	D
LK	Parallel Flow Regenerative (PFR) Shaft Lime Kiln	632,057	4,974,265	45.7 (150.0)	449.8 (350.0)	26.4 (86.5)	0.61 (2.00)	D
LKC	PFR Shaft Lime Kiln Combustion	632,057	4,974,265	45.7 (150.0)	449.8 (350.0)	26.4 (86.5)	0.61 (2.00)	D
LCR	Lime Mill Crushing and associated transfers In and Out	632,073	4,974,233	15.2 (50.0)	0.0 (-459.7)	28.7 (94.3)	0.23 (0.75)	D
LSL	Pebble Lime Silo Loading via Bucket Elevator	632,069	4,974,206	8.8 (29.0)	0.0 (-459.7)	4.1 (13.4)	0.10 (0.33)	D

a. Universal Transverse Mercator.
b. m: meters.
c. ft: feet.
d. K: Kelvin; °F: degrees Fahrenheit.
e. m/sec: meters per second; fps: feet per second.
f. D: default (vertical, uninterrupted release); R: raincap; H: horizontal.
g. The exhaust temperature for the new silo was set to 0 K. This triggers AERMOD to use the actual temperatures from the meteorological data input files.

Table 16. PROCESS AND ANCILLARY VOLUME SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).							
Release Point	**Description**	**UTM[a] Coordinates**		**Release Height in m (ft)[c]**	**Init. Horiz. Dim. in m (ft)**	**Init. Vert. Dim. in m (ft)**
		Easting-X in m[b]	**Northing-Y in m**			
OC1	Loader Transfer of Ore to Grizzly	632,045	4,974,583	19.5 (64.0)	3.8 (12.3)	18.1 (59.5)
OC2	Grizzly to Apron Feeder	632,045	4,974,583	19.5 (64.0)	3.8 (12.3)	18.1 (59.5)
OC3	Apron Feeder to Dribble Conveyor	632,045	4,974,583	19.5 (64.0)	3.8 (12.3)	18.1 (59.5)
OC4	Apron Feeder to Vibrating Grizzly	632,045	4,974,583	19.5 (64.0)	3.8 (12.3)	18.1 (59.5)
OC5	Dribble Conveyor to Vibrating Grizzly	632,045	4,974,583	19.5 (64.0)	3.8 (12.3)	18.1 (59.5)
OC6	Vibrating Grizzly to Primary Crusher or Coarse Ore Stockpile Feed Conveyor	632,045	4,974,583	19.5 (64.0)	3.8 (12.3)	18.1 (59.5)
OC7	Primary Crusher and Associated Transfers out to Coarse Ore Stockpile Feed Conveyor	632,045	4,974,583	19.5 (64.0)	3.8 (12.3)	18.1 (59.5)
OC8	Coarse Ore Stockpile Feed Conveyor Transfer to Stockpile	631,947	4,974,520	10.9 (35.8)	0.2 (0.7)	10.2 (33.3)
OC9	Stockpile Transfers to Reclaim Conveyors	631,947	4,974,520	1.2 (4.0)	0.6 (1.9)	1.1 (3.7)
OC10	Reclaim Conveyors to SAG Mill Feed Conveyor	631,947	4,974,520	1.2 (4.0)	0.6 (1.9)	1.1 (3.7)
OC11	SAG Mill Feed Conveyor Transfer to SAG Mill	632,113	4,974,243	20.7 (69.0)	0.3 (0.9)	0.6 (1.9)
OC12	Pebble Crusher and Associated Transfers in (from SAG Mill) and out (to Pebble Discharge Conveyor)	632,028	4,974,187	3.0 (10.0)	2.3 (7.6)	2.8 (9.3)
OC13	Pebble Discharge Conveyor to SAG Mill Feed Conveyor	632,028	4,974,187	3.0 (10.0)	2.3 (7.6)	2.8 (9.3)
LS1U	Mill Lime Silo #1 Unloading to SAG Mill Conveyor	632,095	4,974,272	1.4 (4.5)	0.1 (0.2)	0.1 (0.5)
MillS2U	Mill Lime Silo #2 Unloading to SAG Mill Conveyor	632,090	4,974,282	1.4 (4.5)	0.1 (0.2)	0.1 (0.5)
ACS1U	AC Lime Silo #1 Unloading to Lime Slaker	632,267	4,974,124	1.4 (4.5)	0.1 (0.2)	0.1 (0.5)
ACS2U	AC Lime Silo #2 Unloading to Lime Slaker	632,257	4,974,140	1.4 (4.5)	0.1 (0.2)	0.1 (0.5)
ACS3U	AC Lime Silo #3 Unloading to Lime Slaker	632,248	4,974,156	1.4 (4.5)	0.1 (0.2)	0.1 (0.5)
ACS42 U	AC Lime Silo #4 Unloading to Lime Slaker	632,238	4,974,171	1.4 (4.5)	0.1 (0.2)	0.1 (0.5)
PSU	Prill Silos Unloading (2 x 100 ton)	632,346	4,973,500	1.4 (4.5)	0.1 (0.2)	0.1 (0.5)
CS1U	Cement/Shotcrete Silo #1 Unloading	632,095	4,974,272	1.5 (5.0)	5.1 (16.8)	1.4 (4.7)
CS2U	Cement/Shotcrete Silo #2 Unloading	632,095	4,974,272	1.5 (5.0)	5.1 (16.8)	1.4 (4.7)
CAL	Aggregate Bin Loading	632,095	4,974,272	1.5 (5.0)	5.1 (16.8)	1.4 (4.7)
CAU	Aggregate Bin Unloading	632,095	4,974,272	1.5 (5.0)	5.1 (16.8)	1.4 (4.7)
CM	Central Mixer Loading	632,095	4,974,272	1.5	5.1	1.4

Table 16. PROCESS AND ANCILLARY VOLUME SOURCE EMISSION RELEASE PARAMETERS IN METRIC UNITS (ENGLISH UNITS IN PARENTHESES).						
Release Point	Description	UTM[a] Coordinates		Release Height in m (ft)[c]	Init. Horiz. Dim. in m (ft)	Init. Vert. Dim. in m (ft)
		Easting-X in m[b]	Northing-Y in m			
				(5.0)	(16.8)	(4.7)
PCSP1	Portable Crushing and Screening Plant 1	632,348	4,973,429	2.1 (7.0)	13.1 (43.1)	2.0 (6.5)
PCSP2	Portable Crushing and Screening Plant 2	632,348	4,973,369	2.1 (7.0)	13.1 (43.1)	2.0 (6.5)
LS1	Limestone transfer to Primary Crusher Hopper	632,239	4,974,256	3.4 (11.3)	1.6 (5.2)	3.2 (10.5)
LS2	Primary Crushing and Associated Transfers In and Out	632,239	4,974,256	3.4 (11.3)	1.6 (5.2)	3.2 (10.5)
LS3	Primary Screening and Associated Transfers In and Out	632,239	4,974,256	3.4 (11.3)	1.6 (5.2)	3.2 (10.5)
LS4	Secondary Crushing and Associated Transfers In and Out	632,227	4,974,268	3.4 (11.3)	1.6 (5.2)	3.2 (10.5)
LS5	Secondary Screening and Associated Transfers In and Out	632,227	4,974,268	3.4 (11.3)	1.6 (5.2)	3.2 (10.5)
LS7	Limestone transfer to Ball Mill Feed Conveyor	632,181	4,974,307	1.1 (3.5)	0.1 (0.2)	0.4 (1.4)
LS8	Ball Mill Feed transfer to Ball Mill	632,200	4,974,273	8.5 (28.0)	0.3 (0.9)	0.6 (1.9)
LS10	Limestone transfer to Lime Kiln Feed Conveyor	632,169	4,974,325	1.1 (3.5)	0.1 (0.2)	0.4 (1.4)
LS11	Fines Screening and Associated Transfers In and Out	632,151	4,974,314	0.8 (2.5)	0.6 (1.9)	0.7 (2.3)
LS12	Kiln Feed transfer to PFR Shaft Lime Kiln	632,056	4,974,285	20.7 (68.0)	0.3 (0.9)	0.6 (1.9)
LSU	Pebble Lime Silo discharge to Lime Slaker	632,069	4,974,206	1.1 (3.5)	0.1 (0.2)	0.4 (1.4)

a. Universal Transverse Mercator.
b. m: meters.
c. ft: feet.

3.1.9 Emission Release Parameter Justification

Modeled Process and Ancillary Point Sources

The pneumatic transfer silo loadings and bin transfers (LS1L, MillS2L, ACS1L, ACS2L, ACS3L, ACS4L, PSL, CS1L, CS2L, LS6, LSBM, LS9, LSL) were modeled as POINT sources with a 3-foot bin vent above standard silo height as release height. Exit velocity was estimated using the standard stack diameter and flow rates for similar sources (NDEP 2019) or 0.001 meter per second for horizontal exhaust. These sources were modeled with ambient exhaust temperature.

For propane-fired process (Sb1, ACB, CKB, PV, HS) and building heaters (H1M, H2M, HM, HAC, HR, HA, HMO, HTS, HW), exhaust flow rates were calculated using EPA Method 9 with 3% oxygen content and 15% moisture content. Standard stack diameters were selected based on the heater rating. The process heaters were modeled with a 10-foot stack above the building, whereas the building heaters were modeled with a release height of 1 foot above the respective buildings.

Similar source exhaust temperature, flow, and diameter from (NDEP 2017) were used for refinery sources, including the carbon regeneration kiln (CKD), electrowinning cells (EW), mercury retort (MR), and induction furnace (MF). Each of these sources was modeled with a 10- foot stack above the refinery building.

For emergency generators (EDG1, EDG2, EDG3) and the fire pump (EDFP), the exhaust flow rates were calculated using EPA Method 9 with 9% oxygen content and 8% moisture content. Standard stack diameters were selected based on engine rating. Each engine was modeled with a 7-foot-high stack.

Antimony bagging (Sb2), autoclave (AC), lime kiln (LK) (common stack with kiln burner (LKC)), and lime crushing (LCR) were characterized with similar source parameters from (NDEP 2015b), (APT 2013), and (NDEP 2010). Each of these sources was modeled with a 10-foot stack above its respective building.

Release parameters for the process and ancillary point sources were appropriately documented and justified. DEQ's source-group analysis (Table 29 in Section 4.1.4) suggests that the process and ancillary point sources contribute a small amount to the modeled design concentrations.

Modeled Process and Ancillary Volume Sources

For the following VOLUME source characterization discussion, release height was estimated as half of the vertical length (for example, building height), initial vertical dispersion was calculated by dividing the vertical length by the applicable EPA-recommended constant (EPA 2018c) for a single VOLUME source (4.3), and initial lateral dispersion was determined using the lesser lateral dimension (for example, building width) divided by the applicable EPA-recommended constant (EPA 2018c) for the surface source or elevated source with a building (2.15).

The sources associated with the primary crusher building, including loader transfer (OC1), grizzly feeder (OC2), apron feeders (OC3, OC4), ore transfers (OC5, OC6), and primary crusher (OC7), were characterized by the primary crusher building dimensions: 128' high and 52.9' wide.

The stockpile height (71.6') and the conveyor width (3') were used to determine the VOLUME source parameters for the stockpile feed conveyor (OC8).

Tunnel exit dimensions (8' high and 8' wide) were used to estimate the VOLUME release parameters for the stockpile transfer points (OC9, OC10). The SAG mill feed conveyor transfer (OC11) was characterized by a building opening (4' high and 4' wide) at the mid-height (70') of the mill building.

Pebble crusher building dimensions (20' high and 32.7' wide) were used to characterize the pebble crusher-associated sources (OC12, OC13).

Silo/bin unloading sources (LS1U, Mill2SU, ACS1U, ACS2U, ACS3U, ACS42U, PSU) were characterized by a typical screw discharge feeder characteristic, i.e., 5' above the ground with a 1' diameter.

Aggregate transfer and handling sources (CS1U, CS2U, CAL, CAU, CM) were characterized by the aggregate stockpile dimensions: 20' high and 72.2' wide.

Each portable crushing and screening plant was characterized by typical portable crushing and screening plant dimensions: 14' high and 185' wide.

Sources associated with limestone crushing (LS1, LS2, LS3, LS4, LS5) were characterized by the associated crusher building dimensions: 22.6' high and 22.6' wide.

The crushed limestone/pebble lime transfers (LS7, LS10, LSU) were characterized by a typical screw discharge to a conveyor characteristic, i.e., 5' above the ground, 3' drop, and a 1' diameter.

The limestone ball mill feed discharge (LS8) was characterized by a building opening (4' high and 4' wide) at the mid-height (30') of the ball mill building.
The limestone fines screening (LS11) was characterized by screen dimensions: 5' drop and 8' wide.

The limestone kiln feed (LS12) was characterized by a building opening (4' high and 4' wide) at the mid-height (70') of the kiln building.

Model input source characterization for fugitive emissions is described in Sections 3.1.5 and 3.1.6. Fugitive activity locations and their respective dimensions are provided in Table 12 and associated release parameters are listed in Table 13.

Release parameters for the process and ancillary volume sources were appropriately documented and justified. DEQ's source-group analysis (Table 29 in Section 4.1.4) suggests that the process and ancillary volume sources contribute a small amount to the modeled design concentrations.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS.

3.2.1 Onsite Particulate Monitoring

To establish background ambient air conditions for the SGP area, Midas Gold developed an onsite monitoring program to collect site-specific meteorological parameters and determine ambient particulate matter ($PM_{2.5}$ and PM_{10}) concentrations at its Stibnite monitoring station.

In September 2015, Midas Gold submitted the data collected at the Stibnite monitoring station for the period of November 2013 through June 2015 to DEQ. After reviewing the data and associated quality control procedures, DEQ concluded that the $PM_{2.5}$ and PM_{10} data collected at the Stibnite monitoring station satisfied the applicable regulatory requirements and approved the data to be used for background concentrations in the SGP air quality analyses (DEQ 2015). In its conclusions, DEQ recommended that the $PM_{2.5}$ and PM_{10} background concentrations should be based on calendar year 2014 instead of the complete dataset (November 2013 through June 2015).

DEQ-approved $PM_{2.5}$ and PM_{10} background concentrations, in units of micrograms per cubic meter ($\mu g/m^3$), are provided in Table 17. For 24-hour PM_{10}, the design value is the *second-highest* 24-hour average concentration in a given year. However, review of the Meteorological and Air Quality Data Summary for the SGP Monitoring Network (Midas Gold 2015) indicates that the DEQ-approved background for 24-hour PM_{10} (37.0 $\mu g/m^3$) is the *first-highest* 24-hour average concentration measured in 2014 (DEQ 2015). Therefore, using the first-high instead of the second-high as background adds a layer of conservatism to the cumulative NAAQS impact analyses for 24-hour PM_{10}.

Table 17. DEQ-APPROVED $PM_{2.5}$ AND PM_{10} BACKGROUND CONCENTRATIONS FOR SGP.			
Pollutant	**Averaging Time**	**Background Concentration (µg/m³)**	**Design Value Rank**
$PM_{2.5}$	1 year	3.5	Weighted average of quarterly means
	24 hours	15.0	98th percentile/8th high
PM_{10}	24 hours	37.0	Highest 1st high

3.2.2 Gaseous Pollutant Background Concentrations

With a few exceptions of very large facilities or facilities located in nonattainment areas, regulatory agencies do not require the collection of gaseous criteria pollutants, including CO, NOx (and/or nitrogen dioxide [NO_2]), O_3, and SO_2. For these gaseous pollutants, data collected at government-regulated monitoring stations located in settings similar to the project area in terms of terrain, land use, and proximity of emission sources are typically used to establish background concentrations.

To determine representative background concentrations of CO, NOx, O_3, and SO_2 for the SGP site, which is located in a remote rural area, the DEQ-maintained ambient monitoring network was reviewed by Air Sciences. This review revealed that DEQ only conducts limited trace monitoring for CO, NOx, O_3, and SO_2 in the Boise metropolitan area along the Interstate 84 corridor. Thus, the data collected at these monitors are exposed to high emissions from industrial, urban, and transportation sources (DEQ 2015a) (DEQ 2018). For this reason, the gaseous pollutant concentrations recorded at these urban monitoring locations were not considered to be representative of a rural area, like the SGP site.

The EPA-maintained monitoring stations (EPA 2018a) in Idaho and surrounding states also were reviewed by Air Sciences to determine representative gaseous pollutant background concentrations for the SGP site. This review also did not identify any representative monitoring station to establish background gaseous pollutant concentrations for the SGP site.

The DEQ-recommended (DEQ 2019) CO, NOx, O_3, and SO_2 background concentrations for the SGP air quality analyses in units of parts per billion (ppb) and µg/m³, are provided in Table 18. These background concentrations were obtained from the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST; https://arcg.is/1jXmHH) online tool using the project site coordinates. These background air pollutant levels are based on regional-scale air pollution modeling of pollutants in Washington, Oregon, and Idaho, with modeling results adjusted according to available monitoring data.

Table 18. DEQ-RECOMMENDED GASEOUS POLLUTANT BACKGROUND CONCENTRATIONS FOR SGP.				
Pollutant	**Averaging Time**	**Background Concentration**		**Reference**
		(ppb)	**(µg/m³)**	
CO	8 hours	970	1,110	NW AIRQUEST, 2014-2017 design value
	1 hour	1,520	1,740	
NO_2	1 year	0.5	0.9	
	1 hour	2.3	4.3	
O_3 (for NO_2 modeling)	8 hours	55	107.9	
SO_2	3 hours	6.4	16.8	
	1 hour	4.7	12.3	

3.2.3 Medium-Traffic Pollutant Background Concentrations

For additional information, background concentrations were obtained from NW AIRQUEST for the road section between mile markers 143 and 144 on Highway 55 passing through the town of McCall. This site (latitude 44.906° N, longitude 116.098° W) is approximately 38 miles west of the SGP. The annual average daily traffic count for this road section is over 10,000 vehicles per day. Table 19 provides the background concentrations for this medium-traffic site. Although these concentrations are not representative of the rural SGP area, they do provide additional information regarding the relative contribution of traffic emissions.

Table 19. MEDIUM-TRAFFIC BACKGROUND CONCENTRATIONS.

Pollutant	Averaging Time	Background Concentration		Reference
		(ppb)	($\mu g/m^3$)	
CO	8 hours	1,000	1,145	NW AIRQUEST, 2014-2017 design value, near McCall, ID (44.91°N, 116.10°W)
	1 hour	1,570	1,797	
NO_2	1 year	1.4	2.6	
	1 hour	7.6	14.3	
$PM_{2.5}$	1 year	--	5.1	
	24 hours	--	17.5	
PM_{10}	24 hours	--	60.1	
SO_2	3 hours	6.4	16.8	
	1 hour	4.7	12.3	

3.3 Impact Modeling Methodology

This section describes the modeling methods used by the applicant/consultant to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Impact Analyses

Air Sciences performed the project-specific air pollutant emission inventory and air impact analyses that were submitted with the application. The submitted information/analyses, in combination with results from DEQ's air impact analyses, demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 20 provides a brief description of parameters used in the modeling analyses.

Table 20. MODELING PARAMETERS.

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Stibnite, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191.
Meteorological Data	Onsite and McCall, Idaho surface data; Boise, Idaho upper air data	See Section 3.3.5 of this memorandum for additional details of the meteorological data.
Terrain	Considered	1/3 arc second National Elevation Dataset (NED) was acquired from the USGS for the surrounding area. AERMAP version 18081 was used to process terrain elevation data for all buildings and receptors. See Section 3.3.6 for more details.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility. BPIP-PRIME was used to evaluate building dimensions for consideration of downwash effects in AERMOD. See Section 3.3.7.
NOx Chemistry	Ozone Limiting	See Section 3.3.8.

	Method	
Receptor Grid	**SIL Analysis** A SIL analysis was not performed.	
	Cumulative NAAQS Impact Analysis The selection of receptors for use in the cumulative NAAQS impact analysis is as follows (see Section 3.3.12):	
	Boundary	25-meter (m) spacing
	Grid 1	50-m spacing, 0.25 kilometers (km) out
	Grid 2	100-m spacing, 0.25 km to 1.25 km out
	Grid 3	500-m spacing, 1.25 km to 5 km out
	Grid 4	1,000-m spacing, 5 km to 10 km out
	Hotspot	25-m spacing, 200-m × 200-m around highest model impacts
	TAPs Analysis The receptor network used in the cumulative NAAQS impact analysis was also used in the TAPs analysis.	

3.3.2 Modeling Protocol

A modeling protocol for the SGP analyses was submitted to DEQ prior to the application, on May 30, 2019. The protocol was submitted by Brown and Caldwell on behalf of Midas Gold. Conditional DEQ protocol approval was provided to Brown and Caldwell on June 27, 2019.

3.3.3 Modeling Methodology

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the *Idaho Air Quality Modeling Guideline* (DEQ 2013).

3.3.4 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in Appendix W. The refined, steady-state, multiple-source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of ISCST3, but it includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 19191 was used by Air Sciences for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.5 Meteorological Data

AERMOD requires an input of hourly meteorological data to estimate pollutant concentrations in ambient air resulting from modeled source emissions. These data are commonly obtained from National Weather Service (NWS) stations at airports throughout the state. Applicants select data from an airport site that is determined to be reasonably representative of the permitted site location. Collection of meteorological data from the permitted site is not typically required by DEQ for minor source permit applications. The collection of one year of onsite data is required for permitting projects subject to the Prevention of Significant Deterioration (PSD) program, which is triggered by larger non-fugitive emission quantities.

Site-specific hourly surface meteorological data were collected and used in air impact analyses for this project, as described in the submitted modeling report. These data were collected from January 1, 2014 through December 31, 2014 at the Stibnite monitoring station. They were collected for analyses supporting an Environmental Impact Statement (EIS) and the Idaho DEQ minor source permit.

The site-specific surface data were supplemented with the twice-daily upper-air data (all levels) collected at the National Weather Service (NWS) station in Boise, Idaho (WBAN 24131).

These meteorological datasets were processed with the most recent version (19191) of the AERMOD meteorological pre-processor, AERMET, to produce AERMOD-input-ready hourly surface and profile meteorological files. The default option of adjusted surface friction velocity (ADJ_U*) and the Bulk Richardson (BULKRN) method for boundary layer parameter calculations was used for this meteorological data processing.

Additionally, an alternative meteorological dataset was processed without using the BULKRN method (NON-BULKRN). This alternate processing used the onsite and upper air datasets discussed above, supplemented with the cloud-cover data collected at the NWS station in McCall, Idaho (WBAN 94182).

Both processing methods (BULKRN and NON-BULKRN) are considered default for regulatory modeling analyses. EPA Region X Regional Modeling Contact, Jay McAlpine, PhD, was consulted for guidance on which data processing procedure to require for the analyses supporting the Idaho PTC. The BULKRN method was used for air impact analyses supporting the EIS after consultation with EPA, DEQ, and the US Forest Service. EPA recommended (June 18, 2019, email from Jay McAlpine, EPA, to Kevin Schilling, DEQ) using the BULKRN method since “use of the onsite data best fulfills the Guidance, and ensures consistency with the EIS, but this should be looked upon as technical advice only and not a requirement of the EPA.”

Compliance with all NAAQS was easily demonstrated using meteorological data processed by the NON-BULKRN method; however, a small number of receptors showed 24-hour PM_{10} violations when the meteorological data processed with BULKRN method was used. DEQ performed a weight of evidence analyses (see Section 4.1.4 of this memorandum) to further evaluate the confidence of NAAQS compliance, using sensitivity analyses of various model input variables and the meteorological data processed using the BULKRN method.

AERMET requires the input of three surface boundary layer parameters: midday Bowen ratio (B_o), midday albedo (r), and surface roughness length (z_o). These parameters are dependent on the land use and vegetative cover of the area being evaluated. The EPA-recommended model, AERSURFACE, was used to estimate these surface parameters for the Stibnite meteorological data processing. AERSURFACE uses 1992 National Land Cover Data to determine these surface characteristics.

The determination of B_o is dependent on ambient moisture conditions (i.e., wet, average, or dry). For this purpose, historic 30-year (1985–2014) precipitation data from the Taylor Ranch station in Idaho (the closest station from which this type of data is available) were used.

The 70th and 30th percentile values estimated from the 30-year precipitation data were used to assign a moisture class to each calendar month per the following scheme: monthly precipitation greater than the 70th percentile was considered “wet”; between the 70th and 30th percentiles was considered “average”; and less than the 30th percentile was considered “dry.” The monthly season and moisture classifications and estimated r and B_o for 2014 Stibnite meteorological data processing are presented in Table 21.

Table 21. 2014 MONTHLY SEASON AND MOISTURE CLASSIFICATION, AND CALCULATED *r* AND *B_O*.

Month	Season	*r*	30-Year Precipitation	2014 Precipitation	Moisture Classification	*Bo*

			Percentile (in)		(in)		
			30th	70th			
January	Winter	0.38	0.64	1.29	0.74	Average	0.50
February	Winter	0.38	0.40	0.81	0.99	Wet	0.50
March	Spring	0.13	0.83	1.23	2.33	Wet	0.34
April	Spring	0.13	1.11	1.57	0.99	Dry	1.57
May	Spring	0.13	1.43	2.23	0.74	Dry	1.57
June	Summer	0.13	1.17	1.80	1.32	Average	0.37
July	Summer	0.13	0.46	1.45	0.40	Dry	0.76
August	Summer	0.13	0.42	1.11	2.03	Wet	0.25
September	Fall	0.13	0.27	1.23	0.43	Average	0.87
October	Fall	0.13	0.59	1.69	1.75	Wet	0.35
November	Fall	0.13	0.72	1.44	3.73	Wet	0.35
December	Winter	0.38	0.64	1.16	0.83	Average	0.50

The seasonal z_o values in m for each 30-degree sector of the 1-km radius for the Stibnite monitoring station are provided in Table 22 (i.e., Sector 1 is 0° to 30° clockwise from the north, Sector 2 is 30° to 60° clockwise from the north, etc.).

Table 22. CALCULATED SEASONAL z_o VALUES (m).

Sector	Winter	Spring	Summer	Fall
1	0.410	0.564	0.610	0.607
2	0.212	0.347	0.392	0.387
3	0.517	0.640	0.671	0.669
4	0.769	0.865	0.894	0.894
5	0.989	1.044	1.055	1.055
6	0.741	0.874	0.918	0.915
7	0.400	0.563	0.617	0.614
8	0.414	0.522	0.552	0.550
9	0.049	0.171	0.244	0.243
10	0.060	0.197	0.274	0.274
11	0.183	0.372	0.449	0.449
12	0.576	0.710	0.743	0.742

Winter = December, January, February
Spring = March, April, May
Summer = June, July, August
Fall = September, October, November

Wind frequency distribution for the 2014 Stibnite meteorological dataset is presented in Figure 5, and a map showing the location of the meteorological monitoring stations used for this meteorological data processing is presented in Figure 6.

Figure 5. WIND FREQUENCY DISTRIBUTION FOR 2014 SGP METEOROLOGICAL DATA (NON-BULKRN).

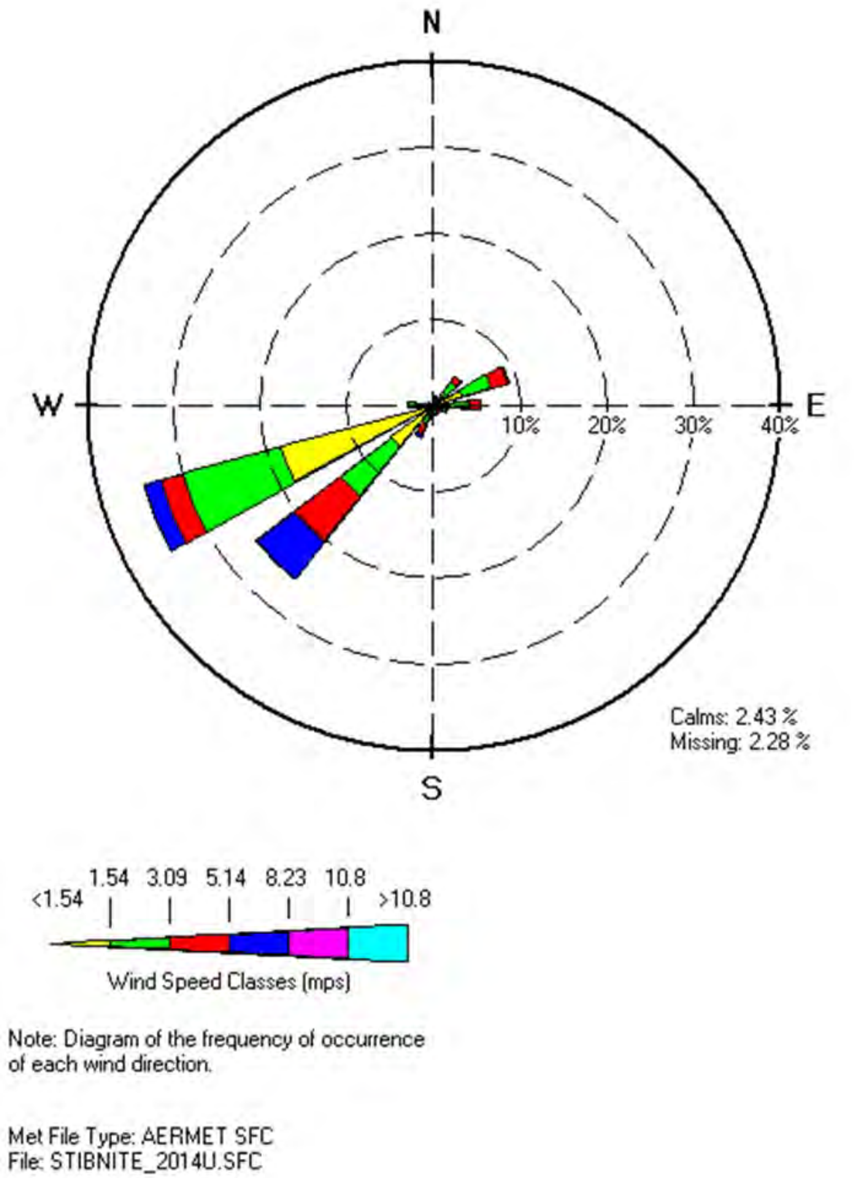


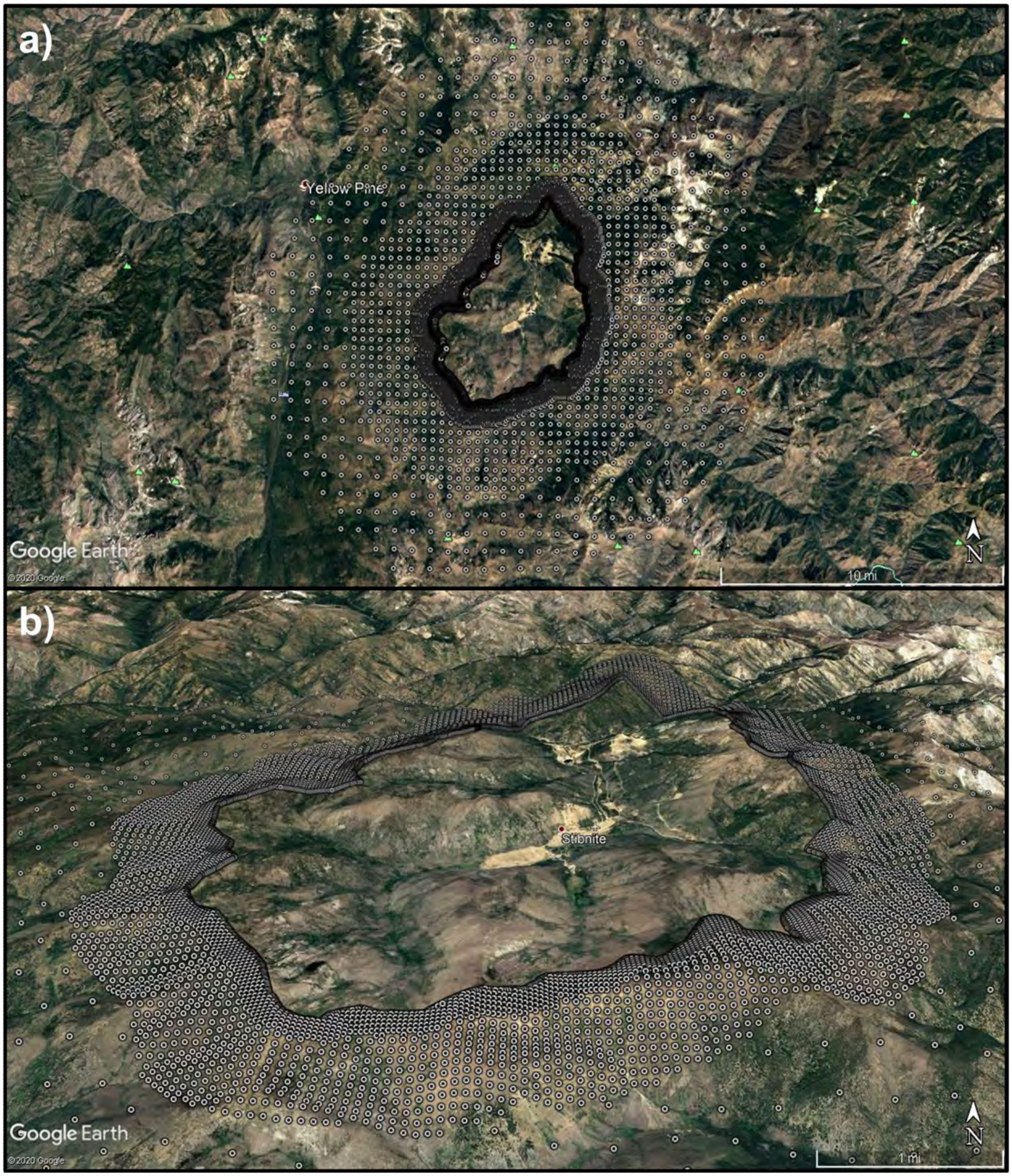
Figure 6. METEOROLOGICAL STATION LOCATIONS FOR SGP MODELING.

3.3.6 Effects of Terrain on Modeled Impacts

Submitted ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files.

The terrain preprocessor AERMAP version 18081 was used by Air Sciences to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emission plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain. Figure 7a depicts the full receptor grid used in the modeling analyses and Figure 7b illustrates a close-up of Figure 7a, overlaid on a terrain image from Google Earth.

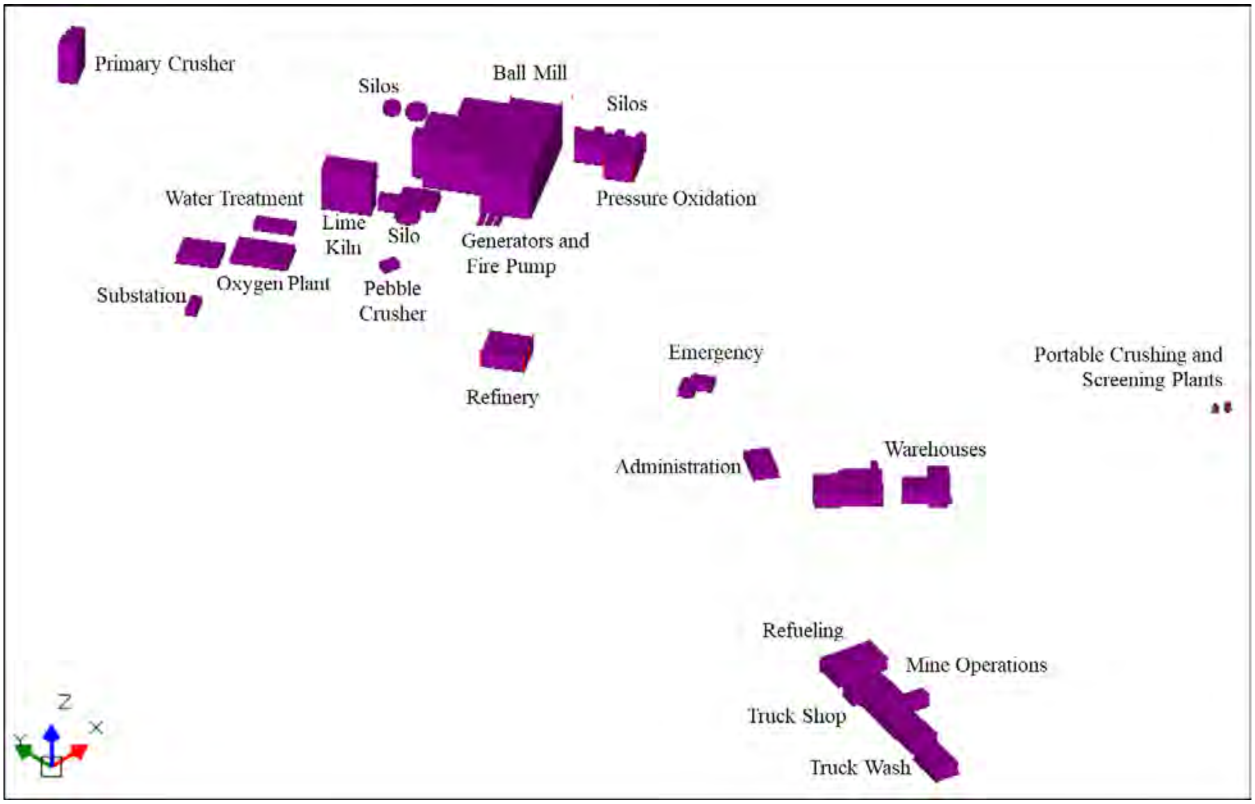
Figure 7. RECEPTOR GRID CENTERED AT THE SGP FACILITY.



3.3.7 *Facility Layout and Downwash*

Figure 3 shows the processing and refining area buildings and sources at the SGP facility. Figure 8 below depicts a three-dimensional view of Figure 3, as viewed from the southwest.

Figure 8. THREE-DIMENSIONAL VIEW OF PROCESSING AND REFINING AREA BUILDINGS AND SOURCES AT THE SGP FACILITY AS VIEWED FROM THE SOUTHWEST.



DEQ verified proper identification of the site location and the ambient air boundary by comparing a graphical representation of the modeling input file to aerial photographs on Google Earth (available at https://www.google.com/earth).

Potential downwash effects on emission plumes were accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of proposed buildings were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME version 04274) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD.

3.3.8 *NOx Chemistry*

The atmospheric chemistry of NO, NO_2, and O_3 complicates accurate prediction of NO_2 impacts resulting from NOx emissions. The conversion of NO to NO_2 can be conservatively addressed through the use of several methods as outlined in a *2014 EPA NO_2 Modeling Clarification Memorandum* (EPA 2014). The guidance outlines a three-tiered approach:

- Tier 1 – assume full conversion of NO to NO_2 where total NOx emissions are modeled and modeled impacts are assumed to be 100 percent NO_2.
- Tier 2 – use an ambient ratio to adjust impacts from the Tier 1 analysis.
- Tier 3 – use a detailed screening method to account for $NO/NO_2/O_3$ chemistry such as the Ozone Limiting Method (OLM) or the Plume Volume Molar Ratio Method (PVMRM).

The default option of the Ozone Limiting Method (OLM), a third-tier method from 40 CFR 51, Appendix W, was used by Air Sciences to estimate the NO_2 1-hour and annual impacts for these analyses. The OLM method requires an input of in-stack NO_2/NOx ratio for each modeled source.

An in-depth literature review was conducted by Air Sciences to identify reasonable NO_2/NOx ratios for different combustion source categories. Based on this research, the NO_2/NOx ratio recommended for the heavy-duty diesel trucks in the California Air Pollution Control Officers Association (CAPCOA) Guidance Document (CAPCOA 2011) was selected for stationary diesel combustion sources. This NO_2/NOx ratio (11 percent) is conservatively higher than the diesel combustion NO_2/NOx ratio provided in the EPA ISR (In-Stack Ratio) database: 6 percent average, 9.8 percent maximum. The CAPCOA document and the EPA ISR database do not provide an NO_2/NOx ratio for propane boilers. The CAPCOA-recommended NO_2/NOx ratio for natural gas boilers was selected for the propane boilers. The natural gas boilers NO_2/NOx ratio is considered appropriate for the propane boilers because both are gaseous fuels with relatively similar combustion characteristics and are expected to have similar NO_2/NOx ratios. The NO_2/NOx ratio for blasting is based on blasting plume measurements provided in an Australian study (CSIRO 2008). The NO_2/NOx ratios used for the SGP NO_2 analyses are presented in Table 23.

Table 23. NO_2/NOx RATIOS.

Source Type	NO_2/NOx Ratio	Reference
Blasting	0.036	Commonwealth Scientific and Industrial Research Organization (CSIRO 2008)
Diesel Engines	0.11	CAPCOA Guidance Document, heavy-duty diesel trucks (CAPCOA 2011)
Propane Heaters	0.10	CAPCOA Guidance Document, natural gas boilers (CAPCOA 2011)

DEQ performed a sensitivity analysis using a Tier 2 screening method (ARM2), which is more conservative than OLM, and found that the SGP facility is safely below the 1-hour and annual NO_2 NAAQS. Results are summarized in Section 4.1.3.

3.3.9 Particulate Deposition

For $PM_{2.5}$ and PM_{10} analyses, default particulate modeling methods, including deposition (Method 1, to account for depletion due to particulate settling), were used. To account for particulate settling, AERMOD requires the following source-specific variables:

1. Mass-mean aerodynamic particle diameter (PARTDIAM) for each particle size bin
2. Mass fraction (MASSFRAX) for each particle size bin
3. Particle density (PARTDENS) for each particle size bin

A list of references that were used to develop the broad source category particle size bins and associated mass fractions was provided in the application. Midas Gold (Midas Gold 2017b) provided the ore and DR material densities. The diesel and propane combustion particulate densities were adopted from technical literature (UMN 2002) and (Khalizov et al. 2012), respectively. Densities for the remaining materials were obtained from the Engineering Toolbox (https://www.engineeringtoolbox.com/density-materials-d_1652.html). An average density was used when a material-specific density range was available.

For sources that were aggregated and modeled as activity locations, deposition parameters were selected for the dominant source within the activity location. For open-pits (YPP, HFP, WEP), approximately 90% of emissions were associated with drilling; therefore, drilling deposition parameters were assigned to these sources. Similarly, emissions from dozing accounted for over 70% of emissions in the DRSF (FDRSF, HFDRSF, WEDRSF) and BT; therefore, these sources were assigned deposition parameters based on a dozing particulate profile.

The deposition parameters including mass fractions, mass mean diameters, and densities for the different source categories/groups are provided in Table 24.

Table 24. DEPOSITION PARAMETERS BY SOURCE CATEGORY.

Source Category	Parameter	PM_{10}				$PM_{2.5}$	
		Bin 1	Bin 2	Bin 3	Bin 4	Bin 1	Bin 2
Haul Roads	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction	0.10	0.90	--	--	1.00	--
	Mass Mean Diameter (µm)	2.50	10.00	--	--	2.50	--
	Density (g/cm^3) (YPP, HFP, WEP DR average)	2.46	2.46	--	--	2.46	--
Material Handling (Ore, DR, Limestone)	Bin Upper Diameter (µm)	2.50	5.00	10.00	--	2.50	--
	Mass Fraction	0.15	0.42	0.43	--	1.00	--
	Mass Mean Diameter (µm)	2.50	5.00	10.00	--	2.50	--
	Density (g/cm^3) (Ore)	Pit-specific, see Table 25.					
	Density (g/cm^3) (Ore and Waste)	Pit-specific, see Table 25.					
	Density (g/cm^3) (Limestone)	1.09	1.09	1.09	--	1.09	--
Baghouses	Bin Upper Diameter (µm)	2.50	6.00	10.00	--	2.50	--
	Mass Fraction	0.28	0.50	0.22	--	1.00	--
	Mass Mean Diameter (µm)	2.50	6.00	10.00	--	2.50	--
	Density (g/cm^3) (Ore)	Pit-specific, see Table 25.					
Diesel Engines	Bin Upper Diameter (µm)	1.00	2.50	6.00	10.00	1.00	2.50
	Mass Fraction	0.85	0.08	0.03	0.03	0.91	0.09
	Mass Mean Diameter (µm)	1.00	2.50	6.00	10.00	1.00	2.50
	Density (g/cm^3) (Diesel Combustion)	1.00	1.00	1.00	1.00	1.00	1.00
Heaters and Boilers	Bin Upper Diameter (µm)	1.00	2.50	6.00	10.00	1.00	2.50
	Mass Fraction	0.29	0.28	0.32	0.11	0.51	0.49
	Mass Mean Diameter (µm)	1.00	2.50	6.00	10.00	1.00	2.50
	Density (g/cm^3) (Propane Combustion)	1.24	1.24	1.24	1.24	1.24	1.24
Lime Loading and Unloading (Quick, Pebble)	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction	0.15	0.85	--	--	1.00	--
	Mass Mean Diameter	2.50	10.00	--	--	2.50	--
	Density (g/cm^3) (Quick)	0.44	0.44	--	--	0.44	--
	Density (g/cm^3) (Pebble)	0.96	0.96	--	--	0.96	--
Lime Unloading (Quick, Pebble)	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction	0.15	0.85	--	--	1.00	--
	Mass Mean Diameter (µm)	2.50	10.00	--	--	2.50	--
	Density (g/cm^3) (Quick)	0.44	0.44	--	--	0.44	--
	Density (g/cm^3) (Pebble)	0.96	0.96	--	--	0.96	--
Cement and Aggregate	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction	0.15	0.85	--	--	1.00	--

Table 24. DEPOSITION PARAMETERS BY SOURCE CATEGORY.							
Source Category	**Parameter**	**PM_{10}**				**$PM_{2.5}$**	
		Bin 1	**Bin 2**	**Bin 3**	**Bin 4**	**Bin 1**	**Bin 2**
Loading and Unloading	Mass Mean Diameter (µm)	2.50	10.00	--	--	2.50	--
	Density (g/cm^3) (Cement)	1.44	1.44	--	--	1.44	--
	Density (g/cm^3) (Aggregate)	1.28	1.28	--	--	1.28	--
Prill Loading and Unloading	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction	0.15	0.85	--	--	1.00	--
	Mass Mean Diameter (µm)	2.50	10.00	--	--	2.50	--
	Density (g/cm^3) (Prill)	0.84	0.84	--	--	0.84	--
Refining Processes	Bin Upper Diameter (µm)	1.00	2.50	6.00	10.00	1.00	2.50
	Mass Fraction	0.78	0.11	0.08	0.03	0.88	0.12
	Mass Mean Diameter (µm)	1.00	2.50	6.00	10.00	1.00	2.50
	Density (g/cm^3) (Diesel Combustion)	1.00	1.00	1.00	1.00	1.00	1.00
Portable Crushing and Screening Plant	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction	0.13	0.87	--	--	1.00	--
	Mass Mean Diameter (µm)	2.50	10.00	--	--	2.50	--
	Density (g/cm^3) (YPP, HFP, WEP DR average)	2.46	2.46	--	--	2.46	--
Lime Kiln and Ball Mill	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction (Kiln)	0.49	0.51	--	--	1.00	--
	Mass Fraction (Ball Mill)	0.36	0.64	--	--	1.00	--
	Mass Mean Diameter (µm)	2.50	10.00	--	--	2.50	--
	Density (g/cm^3)	1.09	1.09	--	--	1.09	--
Blasting and Drilling	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction	0.06	0.94	--	--	1.00	--
	Mass Mean Diameter (µm)	2.50	10.00	--	--	2.50	--
	Density (g/cm^3) (Ore or DR)	Pit-specific, see Table 25.					
Dozing	Bin Upper Diameter (µm)	2.50	10.00	--	--	2.50	--
	Mass Fraction	0.55	0.45	--	--	1.00	--
	Mass Mean Diameter (µm)	2.50	10.00	--	--	2.50	--
	Density (g/cm^3) (DR)	Pit-specific, see Table 25.					

In order to account for variability in ore and DR densities for different pits, pit-specific densities were used for the ore and DR for each modeling scenario, with the following exception – for haul roads, access roads, and portable crushers, the average DR density from YPP, HFP, and WEP was used. Note that the BT density was excluded from those sources because the BT material will not be used for roads or construction. The pit-specific ore and DR densities are provided in Table 25.

Table 25. PIT-SPECIFIC ORE AND DEVELOPMENT ROCK DENSITIES FOR DEPOSITION.		
Pit	**Material**	**Density (g/cm^3)**
YPP	Ore	2.59
BT	Ore	2.00
HFP	Ore	2.59
WEP	Ore	2.68
YPP	DR	2.48
BT	DR	2.00
HFP	DR	2.34
WEP	DR	2.57
Average (YPP,HFP, WEP)	DR	2.46

3.3.10 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as “that portion of the atmosphere, external to buildings, to which the general public has access.”

Midas Gold will legally control the SGP, an active industrial site where mining activities will occur, such as heavy equipment operation. Most areas of the mine will require strict safety protocols and controlled access. Midas Gold has established an operations boundary to identify the area where public access will be excluded. Public access inside the operations boundary will be restricted for the life of the mine by physical barriers at points of potential access, including the current Stibnite Road point of entry and proposed site access via the Burntlog Route, as well as natural features of the landscape that prevent access. Consistent with the guidance provided in the EPA’s draft revised policy on ambient air (EPA 2018b), public access control will include the following measures:

- Primary Access Points: The Stibnite Road (north) and Burntlog Route (south) access points will include locked gates. Guard shacks will be located at each gate to monitor all vehicle ingress/egress. Each gate also will include appropriate adjacent barriers (i.e., fencing, bollards, boulders, or other barriers) to prevent any vehicle from circumventing the gate and gaining site access. These primary access points are also controlled by adjacent natural features, such as streams and creeks, steep topography, and areas of thick vegetation and undergrowth that serve as natural barriers or impediments to access.

- Secondary Access Points: Other potential access points, such as secondary roadways and trails, will include posted signs warning the public against entry into the site. At these locations, boulders will be placed across the trail and at an appropriate width adjacent to the trail to prevent any vehicle from circumventing the barrier. These secondary access points also incorporate adjacent natural features, such as streams and creeks, steep topography, and areas of thick vegetation and undergrowth that serve as natural barriers or impediments to access. Some mine features, such as the TSF and process plant areas, will include perimeter fencing.

- Surveillance: Midas Gold security personnel will routinely patrol mine facilities and roadways for unauthorized individuals. In addition, all onsite personnel will be trained on the necessity of restricting public access to areas within the operations boundary. Any suspected trespassing by unauthorized individuals will be reported immediately to security, and trespassers will be escorted off the site.

In response to comments from local community citizens, Midas Gold will manage an access route to provide the general public with limited access through the SGP site between Stibnite Road at Sugar Creek and Thunder Mountain Road at Meadow Creek (shown in Figure 2). This route will be managed in accordance with the Stibnite Road Access Management Plan which is summarized as follows:

The proposed Stibnite Road access route through the SGP site is meant to provide controlled through-site access that is safe, provides travel-time comparable to current conditions and is consistent with the United States Forest Service travel management plan. The Stibnite Road access route extends from the north entry point southward to the Administration, Warehouse and Storage Area. Continuing southward, the Stibnite Road access route incorporates the Burntlog access road segment that occurs within the operations area and extends to the south entry point as shown on Figure 2. Midas Gold has the legal authority to control access to the Stibnite Road access route and would provide seasonal (non-winter conditions) access only. At the discretion of Midas Gold, additional access controls may occur during various phases of construction, during mine operations that present potential safely hazards such as blasting, due to inclement weather, or under any other circumstances that may present a threat to the protection of public or employee health and safety. Midas Gold has the legal and practical ability to enforce its control over roadway access and to monitor traffic passing through the SGP site. Signage will be placed at the North Security Gate (near the bridge over Sugar Creek) and the South Security Gate (near the Stibnite Lodge) to provide information to travelers, and guard shacks will be located at each gate to monitor all vehicle ingress/egress. Persons wishing to traverse the SGP site on the Stibnite Road access route will be required to check in at the security gate to receive a safety briefing and to alert mine staff of their presence. Travelers will be required to check out upon exiting the site to ensure passage through the site in a safe and timely manner. Travelers will not be allowed to stop or loiter while traveling though the operations area. Along its full length, the Stibnite Road access route would have appropriate signage to direct travelers and would be separated from mine haul roads and areas of mine operations by fencing, berms, or gates to prevent travelers from straying from the route. When possible and to the degree practicable, anticipated public access restrictions will be communicated to the public in a timely manner so that they may plan appropriately. Receptors on the Stibnite Road access route were not included in the SGP air quality analyses as this road is not considered ambient air.

The worker housing facility will be located within the project operations boundary, near the south access security gate. This housing facility will be used strictly for accommodating employees, contractors, and official visitors, and it will not be accessible to the general public. Therefore, the atmosphere over the land occupied by the worker housing facility is not considered ambient air, and receptors were not placed at this location for the air quality analyses.

The operations boundary, shown in Figure 2 above and Figure 9 below, was used to define the ambient air boundary for air dispersion modeling purposes.

3.3.11 Nearby Co-Contributing Sources

If impacts of neighboring emission sources on receptors showing a significant impact from the sources subject to the permitting action are not adequately accounted for by the background concentration used, then emissions from those sources must be modeled. The nearest significant permitted facility to SGP is Tamarack Mill, located more than 75 kilometers (km) west. This facility is located too far away to cause a significant concentration gradient along the periphery of the SGP and was therefore not included in the cumulative impact analyses for SGP.

3.3.12 Receptor Network

DEQ determined that the receptor grid used in the submitted modeling analyses was adequate to resolve maximum modeled impacts.

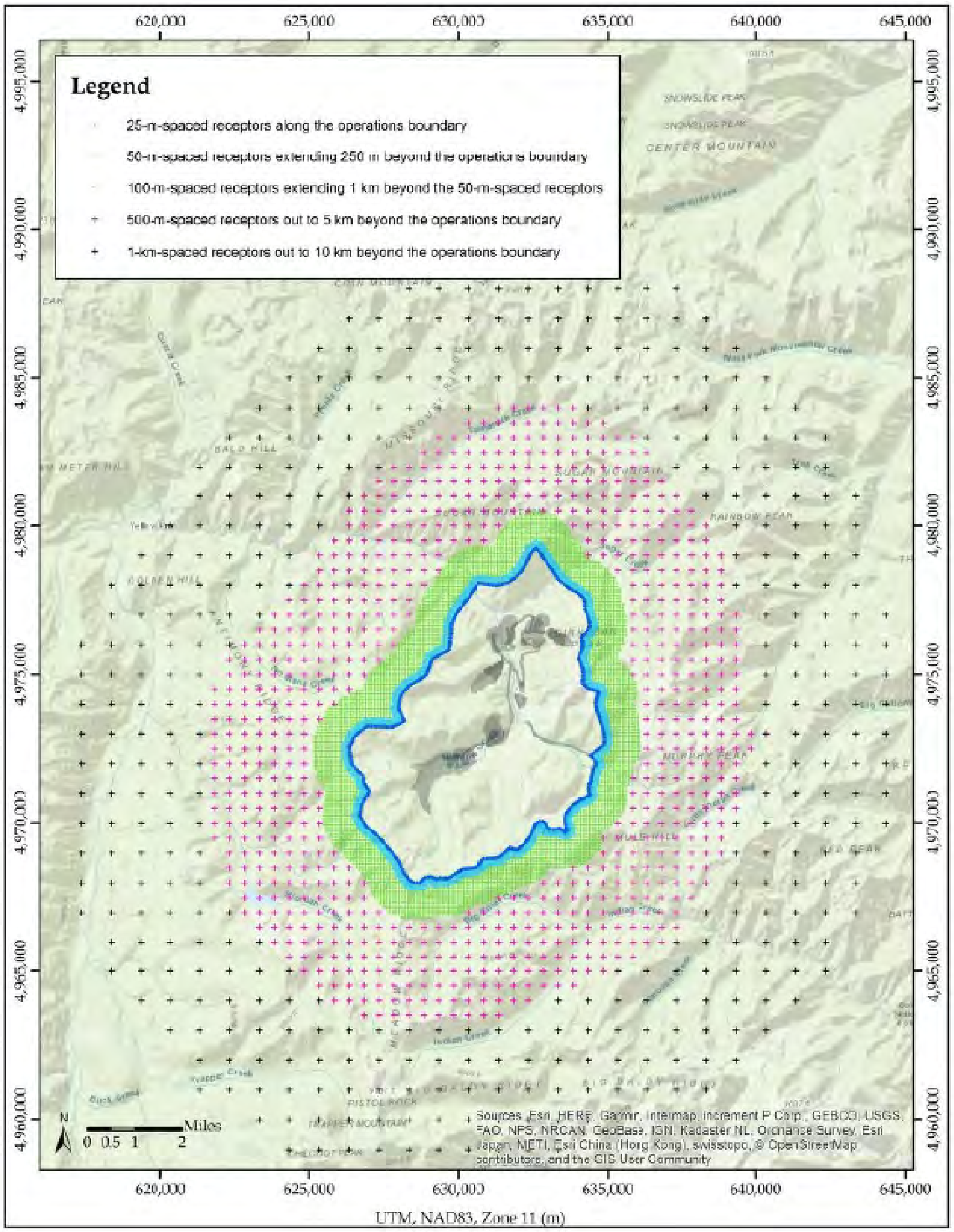
The SGP air quality analyses were performed using the following receptor spacing and extents (Table 20):

- 25-m-spaced receptors placed along the ambient air boundary;
- 50-m-spaced receptors extending 250 m beyond the ambient air boundary;
- 100-m-spaced receptors extending 1 km beyond the 50-m-spaced receptors;
- 500-m-spaced receptors extending 5 km beyond the ambient air boundary; and
- 1-km-spaced receptors extending 10 km beyond the ambient air boundary.

In addition, each highest modeled impact was evaluated further by performing a hot-spot analysis using a finer 25-m-spacing receptor grid. The modeling receptor grid is shown below in Figure 9. The full grid, along with the fenceline receptors, includes a total of 9,631 receptors. A SIL analysis was not conducted. The full receptor grid was used in the cumulative NAAQS impact and TAPs impact analyses.

The receptor grid used in the submitted modeling analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline* (DEQ 2013), and DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

Figure 9. SGP AMBIENT AIR BOUNDARY AND MODELING RECEPTOR GRID.



3.3.13 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

H = S + 1.5L, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

Sources from the SGP facility are below GEP stack height. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 NAAQS and TAPs Impact Modeling Results

4.1 Results for NAAQS Analyses

4.1.1 Significant Impact Level Analyses

A SIL analysis was not performed for the SGP project.

4.1.2 Cumulative NAAQS Impact Analyses

Table 26 provides results (highest of 14 scenarios) for the cumulative NAAQS impact analysis. It provides the model-predicted maximum design concentration (including the hot-spot analyses) and the associated modeling scenario, the background concentration, and the estimated total concentration (SGP impact plus background) for each pollutant-averaging time combination. A comparison of the estimated total concentrations with the applicable NAAQS is also provided in this table. For each pollutant and averaging period, two modeled design concentrations are listed, each corresponding to the meteorological data processed with (BULKRN) and without (NON-BULKRN, grey shading) the Bulk Richardson method.

Table 26. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES.

Pollutant	Averaging Time	Max. Conc.[a] (µg/m³)[b]	Model Scenario	Back. Conc.[c] (µg/m³)	Total Conc.[d] (µg/m³)	NAAQS (µg/m³)	Percent of NAAQS
Carbon monoxide	8 hours	6,218[e]	W1	1,110	7,328	10,000	73.3%
		3,516[f]	W1		4,626		46.3%
	1 hour	17,054	W1	1,740	18,794	40,000	47.0%
		9,467	W1		11,207		28.0%
Nitrogen dioxide	1 year	2.3	W1	0.9	3.2	100	3.2%
		1.4	W1		2.3		2.3%
	1 hour	116.7	B1	4.3	121.0	188	64.4%
		111.0	W1		115.3		61.3%
$PM_{2.5}$[g]	1 year	7.7	W5	3.5	11.2	12	93.3%

		4.2	W5		7.7		64.2%
	24 hours	18.6	W5	15.0	33.6	35	96.0%
		11.0	W5		26.0		74.3%
PM_{10}[h]	24 hours	121.5	W5	37.0[i]	158.5	150	105.7%[j]
		75.7	W5		112.7		75.1%
Sulfur dioxide	3 hours	1.8	B1	16.8	18.6	1,300	1.4%
		1.2	B1		18.0		1.4%
	1 hour	3.2	B1	12.3	15.5	196	7.9%
		2.7	B1		15.0		7.7%

a. Max. Conc. = maximum modeled design concentration.
b. Micrograms per cubic meter.
c. Back. Conc. = background concentration.
d. Total Conc. = total (modeled + background) concentration.
e. The first Max. Conc. value for each pollutant and averaging time represents results using the BULKRN meteorological data.
f. The second (grey-shaded) Max. Conc. value for each pollutant and averaging time represents results using the NON-BULKRN meteorological data.
g. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
i. For 24-hour PM_{10}, the design value is the *second-highest* 24-hour average concentration in a given year. However, the background value that was used in the modeling analyses represents the *first-highest* 24-hour average concentration measured in 2014. Therefore, using a larger background concentration adds a layer of conservatism to the calculated total impact for 24-hour PM_{10}.
j. Results for 24-hour PM_{10} with meteorological data processed using BULKRN show up to five hotspot receptors that exceed NAAQS. Refer to Section 4.1.4 of this modeling memo for a weight-of-evidence analysis demonstrating NAAQS compliance.

Table 26 shows that modeled concentrations derived using the BULKRN meteorological data are higher than the NON-BULKRN dataset. It also shows that the total (modeled + background) concentrations from the SGP cumulative impact analyses do not exceed the applicable NAAQS, except for when the BULKRN meteorological data are used in modeling 24-hour PM_{10} (total concentration is 105.7% of the 24-hour PM_{10} NAAQS).

PM_{10} modeling with the meteorological dataset processed with the BULKRN method shows up to five hotspot receptors for three modeling scenarios (W1, W3, and W5) with slight exceedance of NAAQS. Scenario W5 is the worst-case scenario, with a maximum total concentration of 158.5 $\mu g/m^3$ which exceeds the NAAQS of 150 $\mu g/m^3$. A weight-of-evidence analysis demonstrating PM_{10} NAAQS compliance is presented in Section 4.1.4 of this modeling memo.

The locations of the maximum impacts for each pollutant and averaging time are illustrated in Figure 10. The results presented in this figure include the hot-spot analyses conducted for each applicable pollutant-averaging time combination. For $PM_{2.5}$ and PM_{10}, the alternate meteorological data (NON-BULKRN) were used.

Modeling for ozone and secondary $PM_{2.5}$ were not performed for this minor stationary source. These analyses are typically associated with applications for major stationary sources. Nonetheless, taking the ratio of the VOC, NOx, and SO_2 emissions from the SGP facility by the emissions and resulting concentrations of O_3 and secondary $PM_{2.5}$ from EPA's modeled emission rates for precursors (MERPs) guidance yields estimated O_3 and secondary $PM_{2.5}$ concentrations of less than 1 ppb of O_3 and less than 0.1 $\mu g/m^3$ of $PM_{2.5}$ (24-hour and annual) for the SGP. These estimated concentrations have a negligible effect on compliance demonstration with the NAAQS.

Figure 10. SGP CUMULATIVE IMPACTS (µg/m^3) AND LOCATIONS.

Higher background concentrations from McCall that include medium-traffic emissions provided in Section 3.2.3 were then combined with the SGP model-predicted maximum design concentrations to provide an additional level of conservatism in demonstrating compliance. These results are shown in Table 27. For $PM_{2.5}$ and PM_{10}, the alternate meteorological data (NON-BULKRN) were used. For the rest of the criteria pollutants, the BULKRN meteorological data were used.

Table 27. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES WITH MEDIUM-TRAFFIC BACKGROUND.							
Pollutant	**Averaging Time**	**Max. Conc.[a] (μg/m³)[b]**	**Model Scenario**	**Back. Conc.[c] (μg/m³)**	**Total Conc.[d] (μg/m³)**	**NAAQS (μg/m³)**	**Percent of NAAQS**
Carbon monoxide	8 hours	6,218	W1	1,145	7,363	10,000	73.6%
	1 hour	17,054	W1	1,797	18,851	40,000	47.1%
Nitrogen dioxide	1 year	2.3	W1	2.6	4.9	100	4.9%
	1 hour	116.7	B1	14.3	131.0	188	69.7%
$PM_{2.5}$[e]	1 year	4.2	W5	5.1	9.3	12	77.5%
	24 hours	11.0	W5	17.5	28.5	35	81.4%
PM_{10}[f]	24 hours	75.7	W5	60.1	135.8	150	90.5%
Sulfur dioxide	3 hours	1.8	B1	16.8	18.6	1,300	1.4%
	1 hour	3.2	B1	12.3	15.5	196	7.9%

a. Max. Conc. = maximum modeled design concentration.
b. Micrograms per cubic meter.
c. Back. Conc. = background concentration.
d. Total Conc. = total (modeled + background) concentration.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
f. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

4.1.3 DEQ's Sensitivity Analyses for 1-hour and annual NO_2

DEQ performed a sensitivity analysis for 1-hour and annual NO_2 using a Tier 2 (ARM2) screening method. Minimum and maximum NO_2/NOx ratios of 0.5 and 0.9, respectively, were used. Results from DEQ's cumulative NAAQS impact analyses, summarized below in Table 28, indicate that the SGP facility is safely below the 1-hour and annual NO_2 NAAQS even when using a more conservative NO_2 screening method.

Table 28. RESULTS FOR DEQ'S NO_2 SENSITIVITY ANALYSES USING TIER 2 (AMBIENT RATIO METHOD 2) SCREENING METHOD.							
Pollutant	**Averaging Time**	**Max. Conc.[a] (μg/m³)[b]**	**Model Scenario**	**Back. Conc.[c] (μg/m³)**	**Total Conc.[d] (μg/m³)**	**NAAQS (μg/m³)**	**Percent of NAAQS**
Nitrogen dioxide	1 year	1.8	B1	0.9	2.7	100	2.7%
		1.8	H1		2.7		2.7%
		2.3	W1		3.2		3.2%
		1.8	Y1		2.7		2.7%
	1 hour	110.9	B1	4.3	115.2	188	61.3%
		73.0	H1		77.3		41.1%
		162.6	W1		166.9		88.8%
		59.8	Y1		64.1		34.1%

a. Max. Conc. = maximum modeled design concentration.
b. Micrograms per cubic meter.
c. Back. Conc. = background concentration.
d. Total Conc. = total (modeled + background) concentration.

4.1.4 DEQ's Weight-of-Evidence Analyses for 24-hour PM_{10}

This section describes a weight-of-evidence analysis that provides additional analytical information to evaluate the degree of NAAQS compliance confidence for 24-hour PM_{10}. NAAQS compliance was demonstrated in the submitted application using meteorological data processed with an EPA-approved method using regional cloud cover to calculate stability parameters rather than site-specific monitored solar radiation and measured temperature differences with height. Both methods are considered default for regulatory purposes, and modeling using this dataset shows that the facility is well below NAAQS.

As described in Section 4.1.2, PM_{10} modeling with meteorological dataset processed using the site-specific BULKRN method shows up to five hotspot receptors for Scenario W5 (the highest PM_{10} modeling scenario) that exceed NAAQS (150 µg/m^3). The hotspot receptors have a 25-meter grid spacing. Hotspot receptors that exceed 24-hour PM_{10} NAAQS have total (modeled + background) concentrations of 152.7, 154.3, 155.0, 155.7, and 158.5 µg/m^3. Locations of these receptors are illustrated in Figure 11. Figure 12 shows these receptors overlaid on Google Earth. As noted in Section 3.2.1 of this modeling memorandum, the design value for 24-hour PM_{10} is the *second-highest* 24-hour average concentration in a given year. However, the background value that was used in the modeling analyses (37.0 µg/m^3) represents the *first-highest* 24-hour average concentration measured in 2014. Therefore, using a larger background concentration adds another layer of conservatism to the calculated total impact for 24-hour PM_{10}. If the *second-highest* 24-hour average concentration (34.0 µg/m^3) were used in the modeling analyses, the number of receptors that exceed the 24-hour PM_{10} NAAQS is reduced from five to four.

Figure 11. HOTSPOT RECEPTORS THAT EXCEED 24-HOUR PM_{10} NAAQS (SCENARIO W5, BULKRN METEOROLOGICAL DATA).

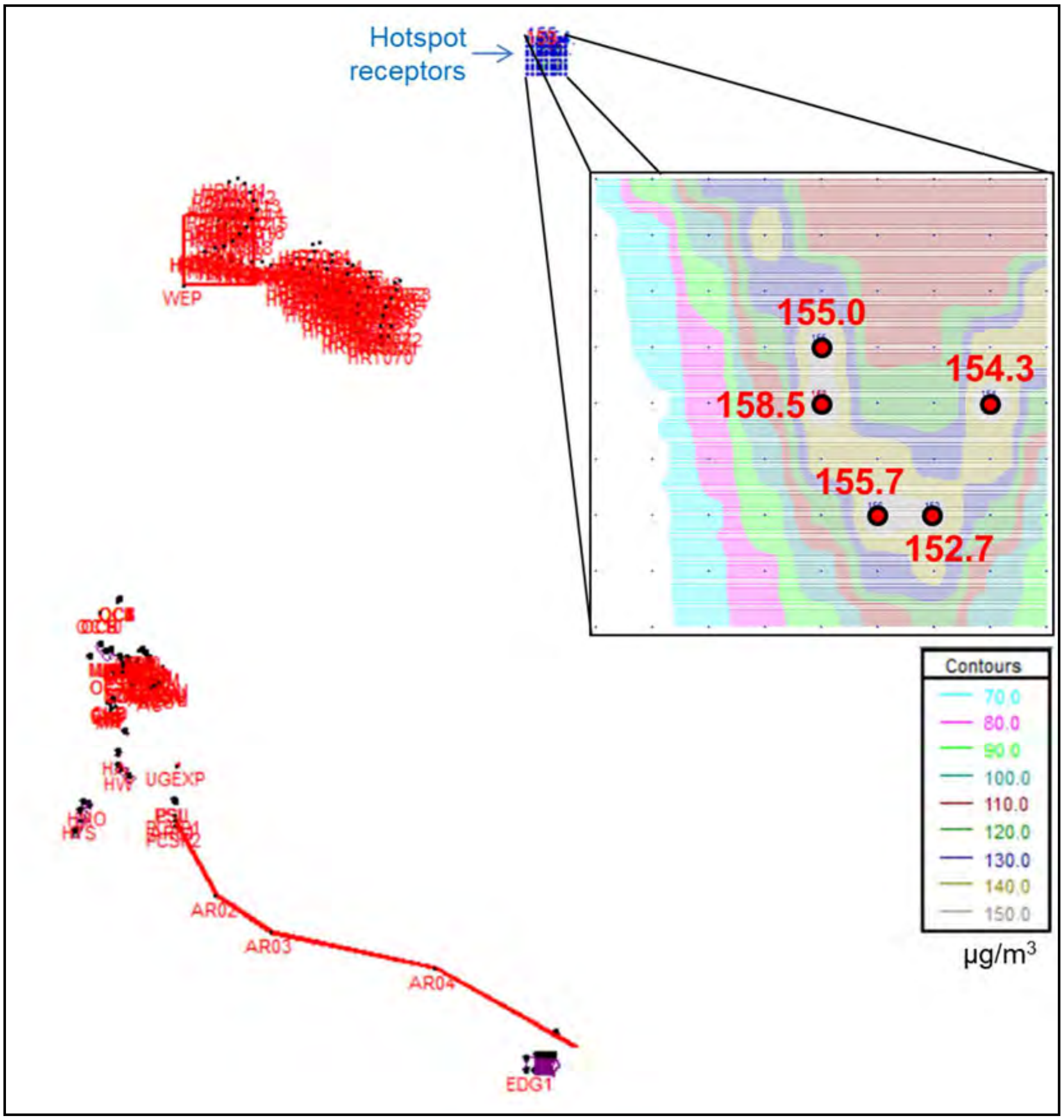
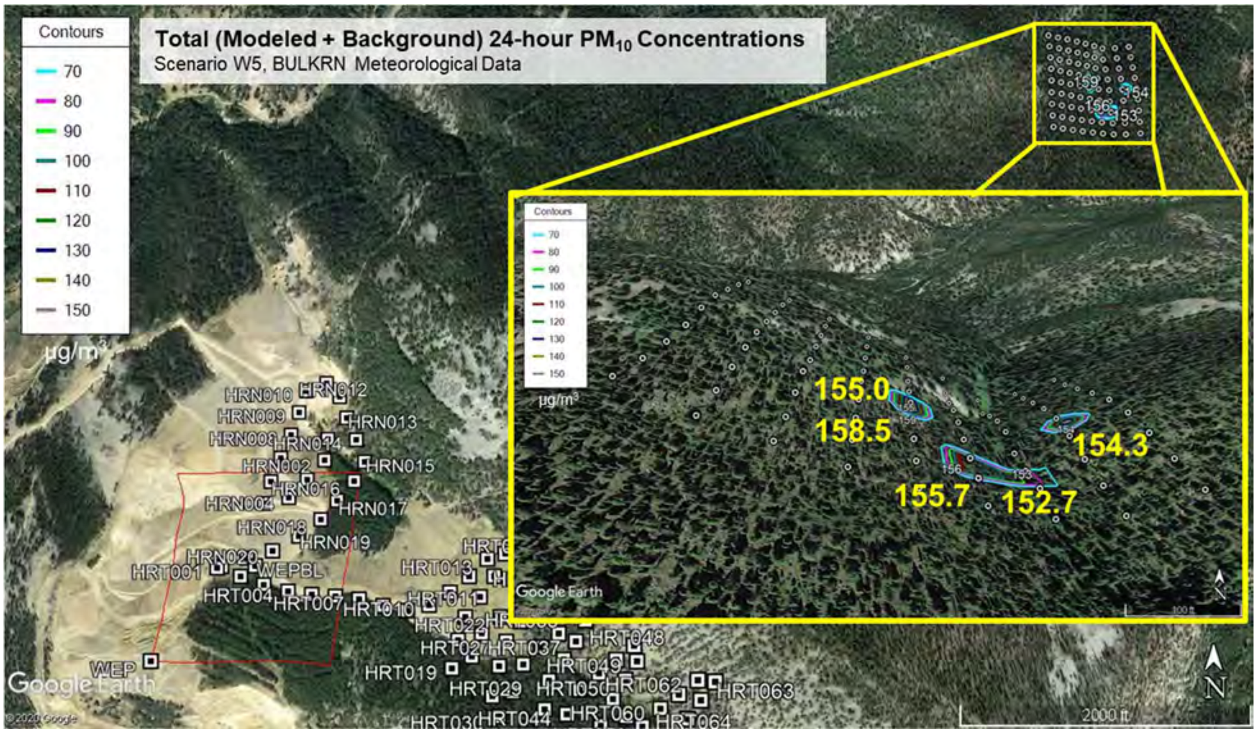


Figure 12. HOTSPOT RECEPTORS THAT EXCEED 24-HOUR PM_{10} NAAQS, OVERLAID ON GOOGLE EARTH IMAGE (SCENARIO W5, BULKRN METEOROLOGICAL DATA).



Figures 11 and 12 show that the modeled PM_{10} NAAQS exceedances are located northeast of the SGP facility. These receptors are located 2 km away from the center of the West End Pit (WEP). The AERMOD output files indicate that all modeled violations occur during winter (all modeled violations occur on December 23, 2014). Data provided in the SGP baseline study (Midas Gold 2017a) specify an average snow depth of 21-68 inches and an average precipitation of 6.0 inches at the project site during this period. Therefore, fugitive road dust emissions during high-modeled impact hours could be overestimated.

DEQ performed a source-group analysis (Table 29) which indicates that emissions from the WEP and the Haul Road (HR) are the largest contributors to the maximum modeled PM_{10} design concentrations. For comparison, source-group analyses using the NON-BULKRN meteorological data are also listed in Table 29.

Table 29. SOURCE-GROUP ANALYSES FOR 24-HOUR PM_{10} (SCENARIO W5).

Emission Source Group	Modeled Design Concentration (µg/m³)[a]	
	BULKRN	NON-BULKRN
ALL	121.5	75.7
West End Pit (WEP)	89.3	24.5
West End Pit Blasting (WEPBL)	1.94	1.81
West End Pit Development Rock Storage Facility (WEDRSF)	0.98	3.47
Haul Road (HR)	51.0	52.5
Access Road (ACCRD)	0.0064	0.0074
Underground Exploration (UGEXP)	0.00001	0.00001

Process & Ancillary Point Sources	0.23	0.76
Process & Ancillary Volume Sources	0.20	0.29

a. Micrograms per cubic meter.

The six source groups listed in Table 29 that are related to mining activity and emissions (WEP, WEPBL, WEDRSF, HR, ACCRD, UGEXP) were examined further. Table 30 lists the daily modeled PM_{10} emissions (in pounds per day [lb/day]), grouped according to mining activity. Key assumptions for calculating the daily emissions are also listed in this table. Total modeled PM_{10} emission from mining activity for Scenario W5 is 3,336.76 lb/day. The contribution from each source group is listed in the second column of Table 30, and a pie chart is illustrated in Figure 13.

Table 30. KEY ASSUMPTIONS FOR CALCULATING DAILY MINING ACTIVITY EMISSIONS FOR 24-HOUR PM_{10} (SCENARIO W5).

Mining Activity	Emissions (lb/day)[a]
WEP (West End Pit)	**885.54**
Open Pit Drilling • Blasting 180,000 tons of material (DR) per day • Drilling 1,200 holes per day	811.20
Material Loading • Blasting 180,000 tons of material (DR) per day	18.00
Dozing • Dozers operating 144 hours per day • Surface material silt content of 6.9% • Material moisture content of 7.9%	54.20
Surface Exploration • Total wet drilling holes of 700 divided by 14 years • 50 holes per year	2.15
WEPBL (West End Pit Blasting)	**334.38**
Open Pit Blasting • Blasting 180,000 tons of material (DR) per day • Two blasts per day	334.38
WEDRSF (West End Pit Development Rock Storage Facility)	**57.12**
Material Unloading • Blasting 180,000 tons of material (DR) per day	2.88
Dozing • Six dozers operating 144 hours per day • Surface material silt content of 6.9% • Material moisture content of 7.9%	54.20
Wind Erosion	0.04
HR (Haul Road)	**2,050.34**
Onsite Hauling • Blasting 180,000 tons of material (DR) per day • One-way hauling distance of 3.07 miles • Total travel of 7,758 vehicle miles traveled (VMT) per day • Surface material silt content of 4% • Daily PM_{10} emission factor of 3.55 pounds per VMT • Control efficiency of 90% for chemical suppressant • Control efficiency of 33% for watering	1,842.97
Grading • Grader average speed of 6.5 mph • Three graders operating 72 hours per day • Control efficiency of 90% for chemical suppressant	60.51
Water Truck Travel • Two water trucks operating 48 hours per day	146.86

• Average truck speed of 15 mph • Surface material silt content of 4% • Daily PM_{10} emission factor of 3.04 pounds per VMT • Control efficiency of 90% for chemical suppressant • Control efficiency of 33% for watering	
ACCRD (Access Road)	**9.38**
Vehicle Travel • Access road length of 1.6 miles (within project boundary) • Surface material silt content of 4% • Daily PM_{10} emission factor of 1.26 pounds per VMT • Control efficiency of 90% for chemical suppressant • Control efficiency of 33% for watering	9.17
Grading • PM_{10} emission factor of 1.3 pounds per VMT • Control efficiency of 90% for chemical suppressant	0.21
UGEXP (Underground Exploration)	**0.004**
Underground Exploration • Wet drilling 25 holes per year	0.004

[a] Pounds per day.

Figure 13. PIE CHART FOR DAILY MODELED PM_{10} EMISSIONS FROM MINING ACTIVITY (SCENARIO W5).

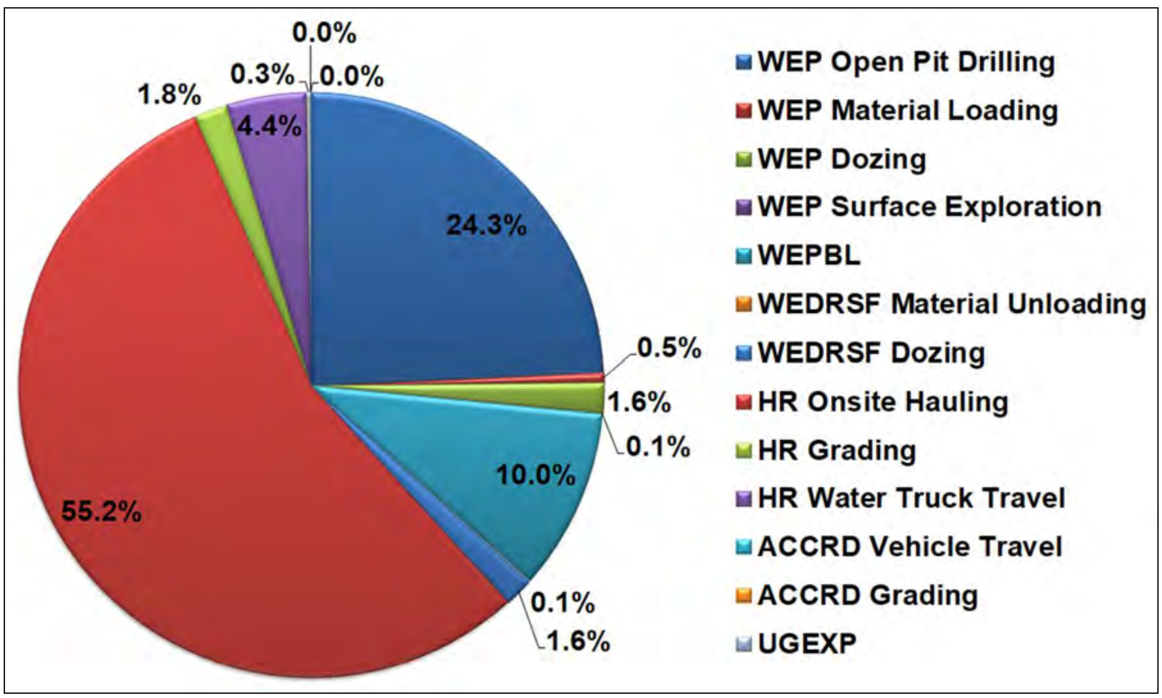


Figure 13 shows that onsite hauling on haul roads ("HR Onsite Hauling") accounts for 55.2% of the total daily PM_{10} emissions. Open pit drilling at the WEP ("WEP Open Pit Drilling") and blasting ("WEPBL") account for 24.3% and 10.0% of the daily PM_{10} emissions, respectively. Therefore, it is not surprising that HR, WEP, and WEPBL are associated with the highest modeled design concentrations in Table 29.

Table 31 shows the ten highest-ranked modeled 24-hour PM_{10} impacts from each emission source group. Note that for 24-hour PM_{10}, the design value is the *second-highest* 24-hour average concentration in a given year. Therefore, the second-high modeled value for source group ALL (121.5 $\mu g/m^3$) was summed with the background concentration for comparison to NAAQS. The calculated total impact (modeled design value + background concentration) is conservative because the background value that was used in the cumulative NAAQS impact analyses (37.0 μg/m^3) represents the *first-highest* 24-hour average concentration measured in 2014.

Table 31. TEN HIGHEST-RANKED MODELED 24-HOUR PM_{10} IMPACTS IN μg/m^3 FROM DIFFERENT SOURCE GROUPS (SCENARIO W5, BULKRN METEOROLOGICAL DATA).

Rank	ALL[a]	WEP[b]	WEPBL[c]	WEDRSF[d]	HR[e]	ACCRD[f]	UGEXP[g]	PRCSPT[h]	PRCSVOL[i]
1ST	142.2	102.5	2.27	1.02	52.1	7.26E-03	1.00E-05	0.24	0.23
2ND	121.5	89.3	1.94	0.98	51.0	6.41E-03	1.00E-05	0.23	0.20
3RD	113.4	78.1	1.83	0.96	49.6	5.31E-03	1.00E-05	0.22	0.13
4TH	110.1	77.0	1.73	0.93	49.4	3.39E-03	1.00E-05	0.20	0.10
5TH	108.5	76.9	1.62	0.90	46.1	3.39E-03	1.00E-05	0.18	0.09
6TH	107.7	75.7	1.57	0.85	45.5	3.22E-03	1.00E-05	0.17	0.08
7TH	105.7	73.3	1.49	0.84	43.4	3.21E-03	0	0.16	0.08
8TH	105.6	72.3	1.30	0.77	42.9	2.91E-03	0	0.15	0.08
9TH	101.5	71.4	1.28	0.77	41.8	2.87E-03	0	0.15	0.08
10TH	99.8	71.2	1.23	0.76	41.8	2.56E-03	0	0.15	0.08

a. ALL = all emission sources.
b. WEP = West End Pit.
c. WEPBL = West End Pit Blasting.
d. WEDRSF = West End Pit Development Rock Storage Facility.
e. HR = Haul Road.
f. ACCRD = Access Road.
g. UGEXP = Underground Exploration.
h. PRCSPT = Process & Ancillary Point Sources.
i. PRCSVOL = Process & Ancillary Volume Sources.

Given a background of 37.0 μg/m^3 and a NAAQS of 150 μg/m^3, the critical modeled concentration threshold for any 24-hour PM_{10} NAAQS violation is therefore 113.0 μg/m^3. Table 31 shows that the third-high modeled value for source group ALL (113.4 μg/m^3) barely exceeds NAAQS. Fourth-high (and lower-ranked) modeled impacts, when added to the background concentration, are below NAAQS.

As discussed earlier in this section, HR Onsite Hauling, WEP Open Pit Drilling, and WEP Blasting are the three largest components of the total daily PM_{10} emissions. Therefore, it is not surprising that HR, WEP, and WEPBL are associated with the highest modeled concentrations among all source groups.

To investigate the potential culpability of each source group to the modeled 24-hour PM_{10} NAAQS violation, DEQ performed a culpability analysis using the MAXIFILE output option in AERMOD. The MAXIFILE option provides the receptor location and date of an impact. DEQ performed two MAXIFILE runs. In the first MAXIFILE simulation, the model was run using source group ALL. A threshold value (113.0 μg/m^3) equal to the NAAQS minus background was set. The output file provided a list of the receptors where the NAAQS is exceeded. In the second MAXIFILE simulation, the model was run using only the receptors identified by the first MAXIFILE run. Source groups were included in the second modeling simulation. A threshold value equal to the 24-hour PM_{10} SIL (5.0 μg/m^3) was set. The output file provided a date stamp for any day when a source group exceeds the SIL and potentially contributes to a violation of the NAAQS. A significant contribution to a NAAQS violation would be predicted to occur if the date stamps for source group ALL (from the first MAXIFILE run) and for a specific source group (from the second MAXIFILE run) matched.

DEQ's culpability analyses confirm that emission source groups HR and WEP are culpable for the 24-hour PM_{10} NAAQS exceedances. The date stamps indicate NAAQS violations during the winter season (January 6, January 15, and December 23). We show next that when modeled emissions are more-closely representative of typical daily mining production rates for a high-production period (everything else held constant), the SGP facility is able to demonstrate compliance with 24-hour PM_{10} NAAQS at those few receptors showing a potential violation when using meteorological data processed with the BULKRN method. We also discuss next the implication of NAAQS violations occurring during the winter season.

As listed in Table 30, PM_{10} modeling simulation for Scenario W5 was based on a mining production rate of 180,000 ton/day of development rock. This corresponds to 65,700,000 ton/year, which is more conservative than the expected peak production rate of 42,692,000 ton/year (116,964 ton/day). To investigate the effect of a lower modeled mining production rate on design value concentrations, DEQ performed a modeling simulation ("DEQ Run 1") where mining production rate was assumed to be 120,000 ton/day instead of 180,000 ton/day, but all other model variables were held constant. This adjustment lowered the modeled daily emission rates for WEP, WEDRSF, and HR, which are summarized in Table 32. Because the modeled emission rates were lower, the modeled design concentrations were also lower. Results for DEQ's sensitivity analyses are summarized in Table 33.

Table 32. DAILY MINING ACTIVITY EMISSIONS USED IN DEQ'S SENSITIVITY ANALYSES FOR 24-HOUR PM_{10} (SCENARIO W5).

Mining Activity	Emissions (lb/day)[a]	
	Applicant's Submittal	**DEQ Run 1**
WEP (West End Pit)	**885.54**	**879.54**
Open Pit Drilling	811.20	811.20
Material Loading	18.00	12.00
Dozing	54.20	54.20
Surface Exploration	2.15	2.14
WEPBL (West End Pit Blasting)	**334.38**	**334.38**
Open Pit Blasting	334.38	334.38
WEDRSF (West End Pit Development Rock Storage Facility)	**57.12**	**56.15**
Material Unloading	2.88	1.92
Dozing	54.20	54.20
Wind Erosion	0.04	0.03
HR (Haul Road)	**2,050.34**	**1,436.50**
Onsite Hauling	1,842.97	1,229.13
Grading	60.51	60.51
Water Truck Travel	146.86	146.86
ACCRD (Access Road)	**9.38**	**9.38**
Vehicle Travel	9.17	9.17
Grading	0.21	0.21
UGEXP (Underground Exploration)	**0.004**	**0.004**
Underground Exploration	0.004	0.004
Total	**3,336.76**	**2,715.95**

a. Pounds per day.

Table 33. RESULTS FOR DEQ'S SENSITIVITY ANALYSES FOR 24-HOUR PM_{10} (SCENARIO W5, BULKRN METEOROLOGICAL DATA).

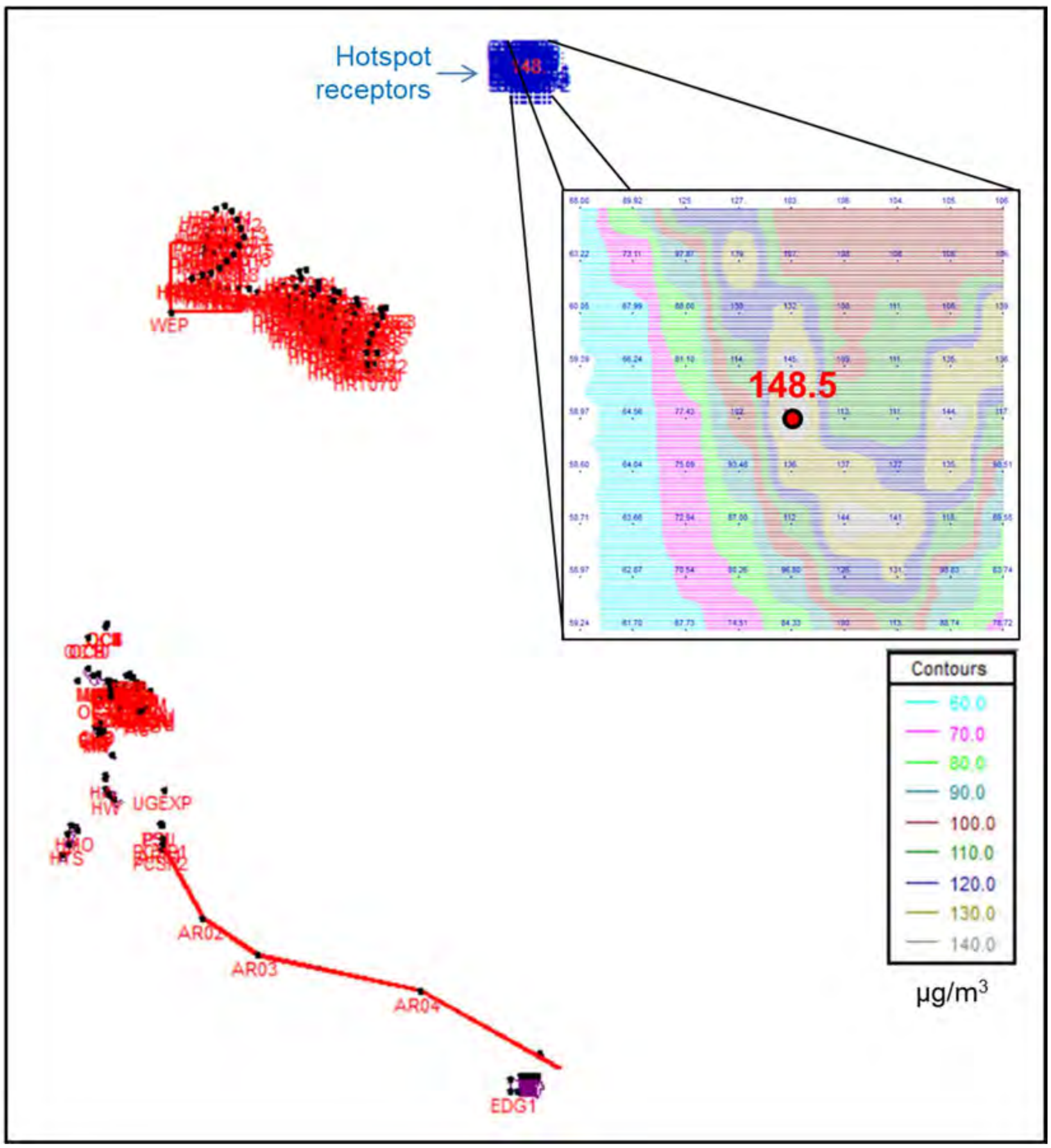
Pollutant	Averaging Time	Max. Conc.[a] ($\mu g/m^3$)[b]	Model Scenario	Back. Conc.[c] ($\mu g/m^3$)	Total Conc.[d] ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}[e]	24 hours	111.5[f]	W5	37.0[g]	148.5	150	99.0%

a. Max. Conc. = maximum modeled design concentration.
b. Micrograms per cubic meter.

c. Back. Conc. = background concentration.
d. Total Conc. = total (modeled + background) concentration.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. DEQ Run 1: mining production rate was modeled at 120,000 ton/day instead of 180,000 ton/day. Everything else was held constant.
g. For 24-hour PM_{10}, the design value is the *second-highest* 24-hour average concentration in a given year. However, the background value that was used in the modeling analyses represents the *first-highest* 24-hour average concentration measured in 2014. Therefore, using a larger background concentration adds a layer of conservatism to the calculated total impact for 24-hour PM_{10}.

Maximum modeled concentration for "DEQ Run 1", when summed with the background concentration, is lower than NAAQS thereby demonstrating NAAQS compliance. Total (modeled + background) concentrations for all hotspot receptors are depicted in Figure 14; maximum total impact is depicted by the red circle. The SGP facility complies with the 24-hour PM_{10} NAAQS when daily mining production rates closer to a more typical daily rate for a high-production period are used in the model, instead of a very conservative mining production rate, even when using site-specific BULKRN meteorological data.

Figure 14. RESULTS FOR DEQ'S SENSITIVITY ANALYSES SHOWING TOTAL (MODELED + BACKGROUND) 24-HOUR PM_{10} CONCENTRATIONS AT HOTSPOT RECEPTORS (SCENARIO W5, BULKRN METEOROLOGICAL DATA).



Meteorological data processing with and without BULKRN are considered acceptable by EPA. However, the BULKRN meteorological data yielded higher modeled design values for the SGP facility than the meteorological data processed without the BULKRN method. DEQ's analyses suggest that when daily mining production rates closer to a more typical daily rate for a high-production period are used (everything else held constant), the SGP facility is able to demonstrate compliance with 24-hour PM_{10} NAAQS at those few receptors showing a potential violation when using meteorological data processed with the BULKRN method.

Maximum modeled design value 24-hour PM_{10} impacts, even with the use of more reasonably expected daily production rates, are still just under the 150 $\mu g/m^3$ NAAQS. As noted earlier in this section, these high values were observed during the winter season. During this period, not only are fugitive emissions minimized because of the higher moisture content of material handled or driven over, but background concentrations in such remote areas are generally much lower because of the absence of wildfires and dust-generating sources.

To summarize, DEQ considered the following assumptions and results in its weight-of-evidence analyses:

a. All modeled impacts are below NAAQS for meteorological data with stability parameters calculated by regional cloud cover data.
b. Modeled impacts over the 24-hour PM_{10} NAAQS using BULKRN meteorological data are limited to a small area and limited period of time.
c. Modeled 24-hour PM_{10} NAAQS exceedances are limited to the winter season, where emissions and background levels are likely overestimated.
d. The model assumes maximum allowable operations/emissions.
e. The model assumes minimum allowable controls on emissions. The permit would require at least 93% control of maximum potential fugitive emissions, but the fugitive emissions may in fact be controlled by more than that, especially during winter and periods of precipitation.
f. Finally, 24-hour PM_{10} background concentrations represent the maximum 1st high (instead of the maximum 2nd high) which is on the higher end of the distribution.

DEQ's weight-of-evidence analyses show that, considering all the collective conservative layers of the modeling analyses, modeling efforts using both site-specific and alternative meteorological datasets show acceptable impacts. DEQ is highly confident that operation of the SGP will not cause or contribute to a violation of NAAQS. This is based on: (1) the submitted application materials and analyses; (2) DEQ's supplemental analyses; and (3) the assumption that the facility is constructed and operated as described in the application and limited by the PTC.

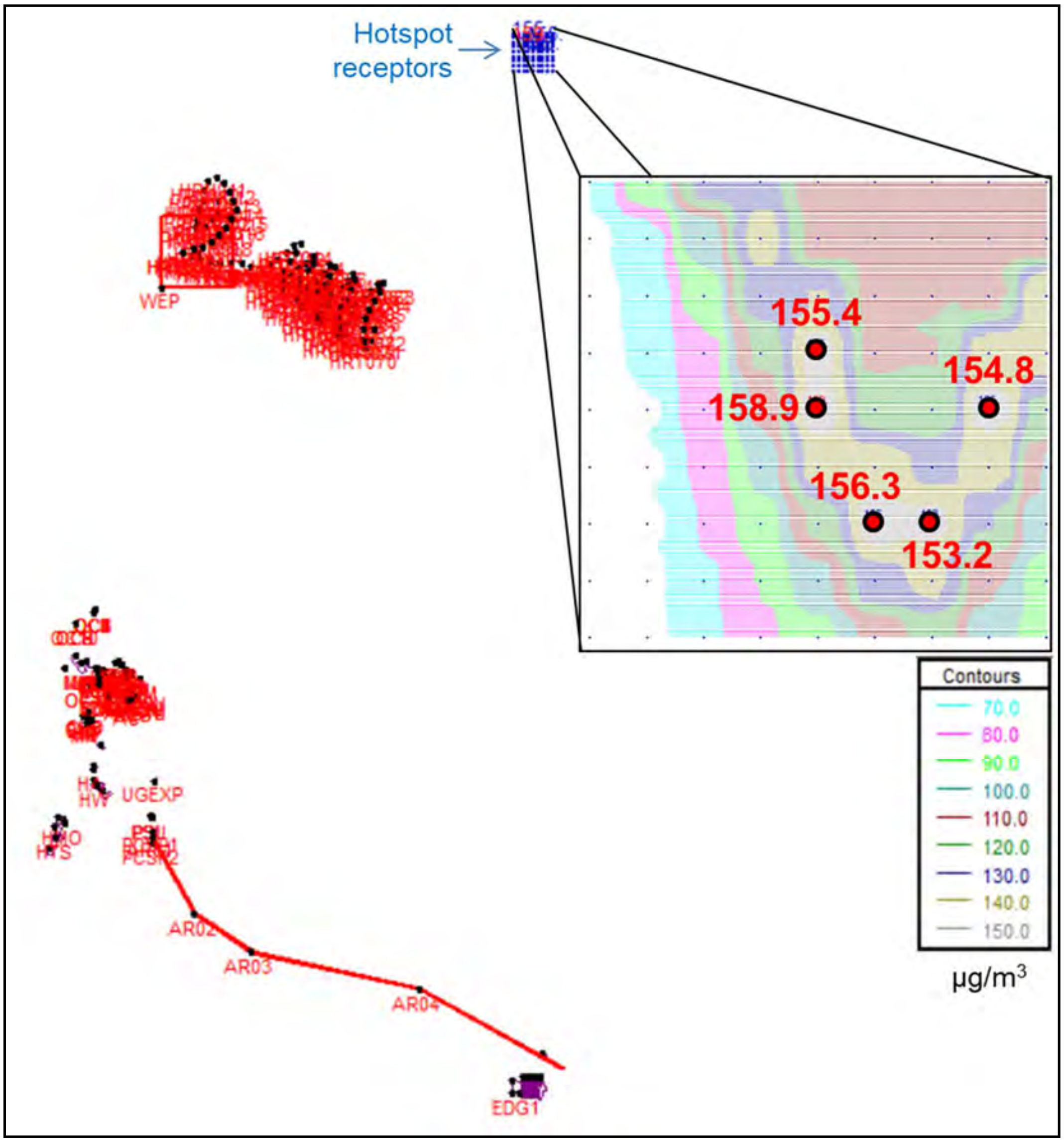
4.1.5 DEQ's Sensitivity Analyses for a Lower Fugitive Road Dust Control Efficiency

Fugitive particulate emissions from roadways were estimated by the applicant to be controlled above 93%, which is an aggressive level of control. The high level of emission control was needed to demonstrate compliance with NAAQS. To investigate the effect of lower unpaved road emission control efficiency, DEQ performed a modeling simulation ("DEQ Run 2") where the control efficiency was set to 90%. The daily mining production rate was assumed to be 120,000 ton/day instead of 180,000 ton/day, but everything else was held constant. These adjustments lowered the daily modeled emission rates for WEP and WEDRSF, but increased the daily modeled emission rate for HR and the Access Road (ACCRD) (Table 34). Five receptors exceed the 24-hour PM_{10} NAAQS. Figure 15 shows the locations of these receptors.

Table 34. DAILY MINING ACTIVITY EMISSIONS USED IN DEQ'S SENSITIVITY ANALYSES FOR 24-HOUR PM_{10} (SCENARIO W5).		
Mining Activity	**Emissions (lb/day)[a]**	
	Applicant's Submittal	**DEQ Run 2**
WEP (West End Pit)	**885.54**	**879.54**
Open Pit Drilling	811.20	811.20
Material Loading	18.00	12.00
Dozing	54.20	54.20
Surface Exploration	2.15	2.14
WEPBL (West End Pit Blasting)	**334.38**	**334.38**
Open Pit Blasting	334.38	334.38
WEDRSF (West End Pit Development Rock Storage Facility)	**57.12**	**56.15**
Material Unloading	2.88	1.92
Dozing	54.20	54.20
Wind Erosion	0.04	0.03
HR (Haul Road)	**2,050.34**	**2,114.24**
Onsite Hauling	1,842.97	1,834.53
Grading	60.51	60.51
Water Truck Travel	146.86	219.20
ACCRD (Access Road)	**9.38**	**13.90**
Vehicle Travel	9.17	13.69
Grading	0.21	0.21
UGEXP (Underground Exploration)	**0.004**	**0.004**
Underground Exploration	0.004	0.004
Total	**3,336.76**	**3,398.21**

a. Pounds per day.

Figure 15. RESULTS FOR DEQ'S SENSITIVITY ANALYSES SHOWING HOTSPOT RECEPTORS THAT EXCEED 24-HOUR PM_{10} NAAQS, ASSUMING MINING PRODUCTION RATE OF 120,000 TONS PER DAY AND FUGITIVE ROAD DUST CONTROL EFFICIENCY OF 90% (SCENARIO W5, BULKRN METEOROLOGICAL DATA).



DEQ's sensitivity analyses suggest that a few hotspot receptors exceed the 24-hour PM_{10} NAAQS when the unpaved road control efficiency falls below 93% and the meteorological data processed with the BULKRN method is used. When the meteorological data processed without the BULKRN method is used, all the hotspot receptors demonstrate compliance with NAAQS at a 90% control efficiency and at both examined production levels:

- maximum impact at 120,000 ton per day: 73.9 $\mu g/m^3$ + 37.0 $\mu g/m^3$ = 110.9 $\mu g/m^3$.
- maximum impact at 180,000 ton per day: 84.6 $\mu g/m^3$ + 37.0 $\mu g/m^3$ = 121.6 $\mu g/m^3$.

While using alternative meteorological data processed without the BULKRN method safely demonstrates compliance with NAAQS, using site-specific BULKRN meteorological data does not. Therefore, DEQ's modeling team recommends that the permit require an aggressive implementation of measures to achieve above 93% control efficiency for fugitive particulate emissions from roadways.

4.2 Results for TAPs Impact Analyses

The SGP TAP modeling results and their comparison with the applicable AACs/AACCs are provided in Table 35.

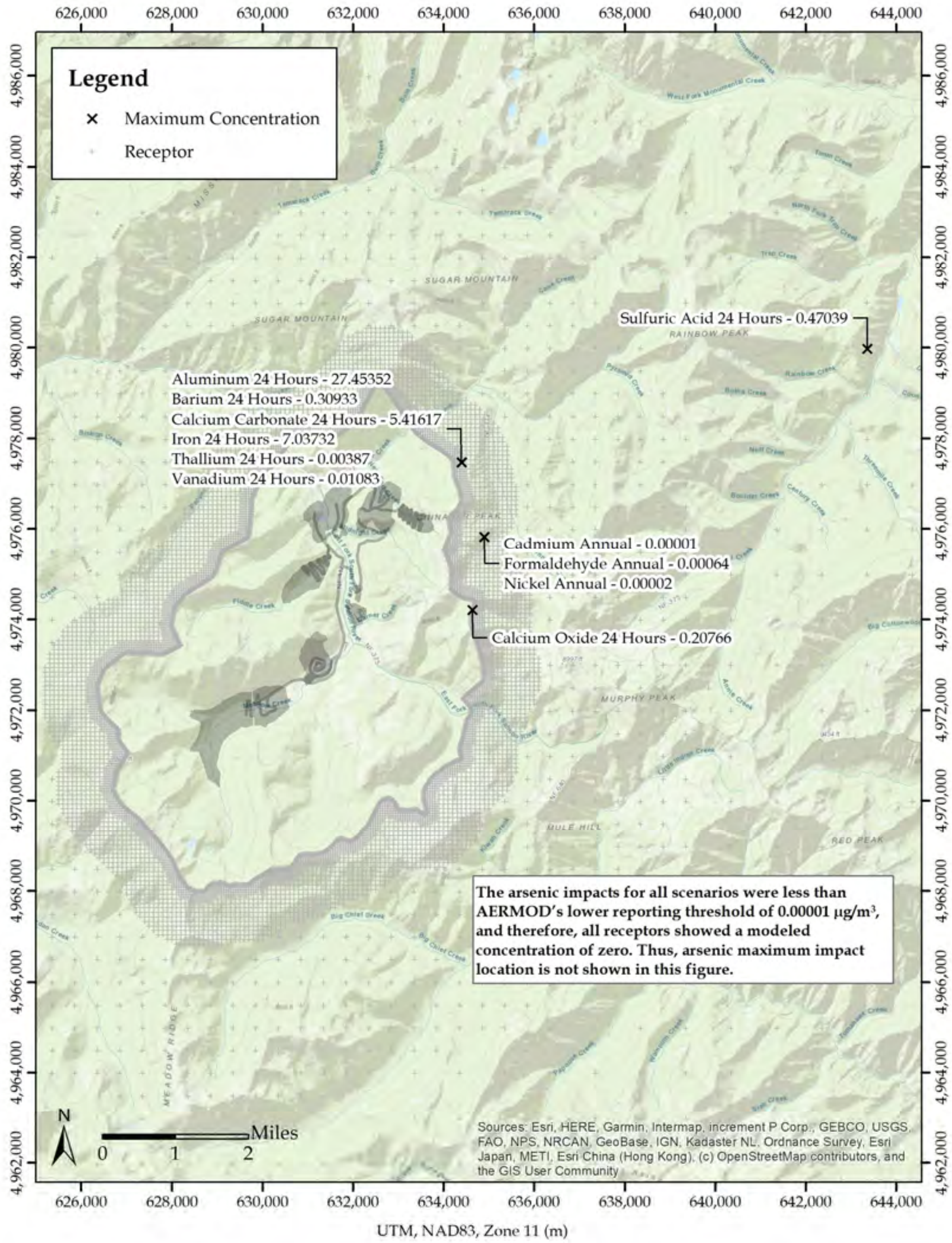
Table 35. RESULTS FOR TAPS IMPACT ANALYSES.

Toxic Air Pollutant	Averaging Time	Maximum Modeled Concentration (μg/m^3)[a]	Model Scenario	AAC[b] (μg/m^3)	AACC[c] (μg/m^3)	Percent of AAC/AACC
Arsenic	Annual	<1.00E-06	All	--	0.00023	<0.4%
Cadmium	Annual	0.00001	All	--	0.00056	1.8%
Formaldehyde	Annual	0.00064[d]	All	--	0.077	0.8%
Nickel	Annual	0.00002	All	--	0.042	0.05%
Aluminum	24-hour	27.454	W5	500	--	5.5%
Barium	24-hour	0.309	W5	25	--	1.2%
Calcium carbonate	24-hour	5.416	W5	500	--	1.1%
Calcium oxide	24-hour	0.208	All	100	--	0.2%
Iron	24-hour	7.037	W5	50	--	14.1%
Sulfuric acid	24-hour	0.470[d]	All	50	--	0.9%
Thallium	24-hour	0.00387	W5	5	--	0.1%
Vanadium	24-hour	0.0108	W5	2.5	--	0.4%

a. Micrograms per cubic meter.
b. Acceptable Ambient Concentration of a non-carcinogenic TAP.
c. Acceptable Ambient Concentration of a Carcinogenic TAP.
d. Deposition was not applied for formaldehyde and sulfuric acid (non-particulate TAPs).

Table 35 shows that the modeled TAP impacts from the SGP sources do not exceed the applicable AACs/AACCs. The locations of the maximum impacts for each TAP are presented in Figure 16.

Figure 16. SGP TAP IMPACTS (µg/m^3) AND LOCATIONS.



To investigate the effect of deposition on modeled TAP impacts, DEQ performed a sensitivity analysis where deposition was not applied in the model (Table 36). Results show that modeled TAP impacts for non-carcinogens are higher than when deposition is applied (Table 35). However, modeled TAP impacts are still well below AACs/AACCs even when deposition is not applied in the model. This result illustrates that deposition is not a critical factor for demonstrating compliance with TAP increments.

Table 36. RESULTS FOR DEQ'S SENSITIVITY ANALYSES FOR TAPS IMPACT MODELING (WITHOUT DEPOSITION).						
Toxic Air Pollutant	**Averaging Time**	**Maximum Modeled Concentration ($\mu g/m^3$)[a]**	**Model Scenario**	**AAC[b] ($\mu g/m^3$)**	**AACC[c] ($\mu g/m^3$)**	**Percent of AAC/AACC**
Arsenic	Annual	<1.00E-06	All	--	0.00023	<0.4%
Cadmium	Annual	0.00001	All	--	0.00056	1.8%
Formaldehyde	Annual	0.00064	All	--	0.077	0.8%
Nickel	Annual	0.00002	All	--	0.042	0.05%
Aluminum	24-hour	54.101	W5	500	--	10.8%
Barium	24-hour	0.610	W5	25	--	2.4%
Calcium carbonate	24-hour	10.670	W5	500	--	2.1%
Calcium oxide	24-hour	0.226	All	100	--	0.2%
Iron	24-hour	13.868	W5	50	--	27.7%
Sulfuric acid	24-hour	0.470	All	50	--	0.9%
Thallium	24-hour	0.00762	W5	5	--	0.2%
Vanadium	24-hour	0.0213	W5	2.5	--	0.9%

a. Micrograms per cubic meter.
b. Acceptable Ambient Concentration of a non-carcinogenic TAP.
c. Acceptable Ambient Concentration of a Carcinogenic TAP.

5.0 Conclusions

The information submitted with the PTC application, combined with DEQ's air impact analyses and the assumption that the facility is constructed and operated as described in the application and limited by the PTC, demonstrated to DEQ's satisfaction that emissions from the Stibnite Gold Project in Valley County, Idaho will not cause or significantly contribute to a violation of any applicable ambient air quality standard or TAP increment.

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APPENDIX F – SUBSECTION 210.20 INTERPRETATION OF ADDRESSED

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Examples of How DEQ Interprets the Word "Addressed" in Subsection 210.20

For example, 40 CFR 63 Subpart 6J - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources regulates HAP emissions from coal, biomass, and oil-fired boilers. However, the subpart specifically exempts gas-fired (i.e. natural gas-fired) boilers because EPA determined that HAP emissions from these sources were too inconsequential to be regulated by the Subpart. DEQ interprets this to mean EPA did "address" natural gas boiler HAP emissions by choosing to exempt them. Thus, HAP emissions that are also TAP emissions from coal, biomass, oil-fired boilers, and natural gas-fired boilers are not required to demonstrate compliance with IDAPA 58.01.01.210 per section 210.20.

For example, 40 CFR 63 Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines regulates HAP emissions from IC engines by regulating CO emissions as a surrogate for HAP emissions. Therefore, HAP emissions from IC engines are not directly regulated by the Subpart. DEQ interprets this to mean EPA "addressed" HAP emissions by regulating CO emissions as a surrogate. Therefore HAP emissions that are also TAP emissions from IC engines are not required to demonstrate compliance with IDAPA 58.01.01.210 per section 210.20.

For example, HAP/TAP emissions from lumber drying kilns were evaluated in promulgating 40 CFR 63 Subpart DDDD - National Emission Standard for Hazardous Air Pollutants: Plywood and Composite Wood Products (PCWP). This Subpart regulates major sources of HAP emissions and includes lumber drying kilns at PCWP manufacturing facilities and "at any other kind of facility" as affected sources, even though this subpart does not include any substantive requirements to control or limit emissions from the kilns. In developing Subpart DDDD EPA stated "…we know of no other lumber kilns that are controlled for HAP, and we know of no cost effective HAP controls for lumber kilns…" (see Fed. Reg. /Vol 68, No. 6/Thursday, Jan 9, 2003/Proposed Rules page 1285). DEQ interprets this to mean EPA "addressed" HAPS that are also TAPS for both major and minor sources of HAP emissions; and therefore, lumber kilns are not required to demonstrate compliance with IDAPA 58.01.01.210, per section 210.20.

For example, when EPA regulated Phosphoric Acid Manufacturing for new sources, only the wet-process phosphoric acid line, superphosphoric acid process line, phosphate rock dryer, and the phosphate rock calciner have specific emissions limits in the rule. However, other emissions sources at facility were also looked at but they were determined by EPA to be insignificant and were not regulated in the rule. Therefore, when EPA looks at a source category to regulate, all emissions sources associated with the source category are "addressed" whether EPA establishes specific emissions limits for the emissions sources or not.
In sum, the term "addressed" is interpreted to mean EPA (1) specifically regulated, (2) specifically regulated by a surrogate, (3) reviewed, or (4) evaluated, the HAP emissions that are also TAPs.

Please note that in all cases it is presumed that EPA evaluated the 187 HAPs when developing the emission standards for new, modified or existing stationary sources regulated by 40 CFR Part 63 Subparts. Therefore, in all cases IDAPA Toxic Air Pollutants that are not one of the 187 Hazardous Air Pollutants will still need to be evaluated for compliance with IDAPA 58.01.01 Section 210.