IDAHO CONSERVATION LEAGUE ⇹ SAVE THE SOUTH FORK SALMON
EARTHWORKS ⇹ IDAHO RIVERS UNITED

April 28, 2021

Linda L. Jackson
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Re: Stibnite Gold Project Air Quality Issues

Dear Ms. Jackson:

Idaho Conservation League, Save the South Fork Salmon, Earthworks, and Idaho Rivers United submit these joint comments highlighting serious air quality issues with Perpetua Resources' proposed Stibnite Gold Project that have come to light through the Idaho Department of Environmental Quality's air permit to construct process.

These comments represent the work of the coalition of groups described above, which have notable expertise in air quality issues, including those issues that stem from mining projects, as well as numerous professional scientific consultants. This letter is in addition to any separate letters that the groups mentioned above may submit. For all the reasons detailed in our attached comments, we urge the Payette National Forest to develop a new Draft or Supplemental Environmental Impact Statement with a bolstered air quality analysis for public review.

Idaho Conservation League is a non-profit organization dedicated to preserving Idaho's clean water, wilderness, and quality of life through citizen action, public education, and advocacy. Earthworks is a national non-profit conservation organization dedicated to protecting communities and the environment against the adverse impacts of mining and energy development. Save the South Fork Salmon is a grassroots, community-based organization in Valley County dedicated to protecting the South Fork of the Salmon River watershed, its outstanding and remarkable natural values, and the economies that depend on those values. Its members and supporters have a strong interest in protecting natural resources, maintaining recreational opportunities and access, and ensuring future generations can enjoy and benefit from these resources and opportunities in the South Fork of the Salmon River watershed. Idaho Rivers United is an non-profit environmental advocacy organization dedicated to protecting Idaho rivers and restoring native fish populations.

Background

In parallel with the USFS permitting process, Perpetua Resources has also been pursuing their required air quality permit through the Idaho Department of Environmental Quality (IDEQ) for the proposed Stibnite Gold Project (SGP). IDEQ first received an application for a permit to construct from Perpetua (then Midas Gold) in August 2019. Four separate times, IDEQ determined that the application was incomplete due to missing important emissions information and modeling analyses. Finally, the application was deemed complete and a draft permit to construct (PTC) was noticed for public comment in September 2020. IDEQ received a number of substantive public comments, including from some of the organizations signed on to this letter, prompting IDEQ to request supplemental information from the applicant. A revised PTC was noticed for public comment in February 2021, and IDEQ once again received a number of critical comments, including from EPA Region 10.

Through this permitting process, we had the opportunity to take a deeper dive into the emissions inventory and modeling analysis associated with the air quality components of the SGP. While IDEQ remains the permitting authority for Perpetua's permit to construct, the USFS has a responsibility to consider and evaluate the broader air quality impacts of the project under the purview of the NEPA process. Accordingly, we would like to highlight for the USFS the key takeaways from our technical analysis of potential air quality impacts from the SGP.

We have included the technical comments submitted by ICL, SSFS, TerraGraphics International Foundation, and EPA Region 10 as attachments to this letter. We refer the USFS to these attachments for the specific, technical details related to air quality issues, and will summarize the salient points in this letter.

Air Quality Issues

1. **Updated Air Emissions Calculations**

The air quality analysis in the DEIS is predicated upon the emissions inventory and calculations presented in Appendix F of the DEIS. The 'Air Emissions Calculations' in Appendix F are dated to October 10, 2018. In response to public comments on the PTC, IDEQ requested additional information from the applicant, including missing TAP (Toxic Air Pollutant) and HAP (Hazardous Air Pollutant) emissions estimates. In December 2020, the applicant provided IDEQ with a HAP/TAP addendum to the application,[1] updated HAP and TAP emissions estimates,[2] updated TAP modeling analyses,[3] and supporting references.[4] These

[1] "HAP/TAP Addendum," Midas Gold, December 18, 2020. (2020AAG2150)
[2] "20200623-Midas Gold SGP PTC EI - Final-TAPr2.2.xls," Midas Gold, December 21, 2020. (2020AAG2152)
[3] "Modeling Files 2020-12.zip," Midas Gold, December 21, 2020. (2020AAG2154)
[4] "References-20201222T020853Z-001.zip," Midas Gold, December 21, 2020. (2020AAG2153)

additions/corrections changed the emissions inventory and the associated calculations significantly (and may still not be completely accurate).

The new HAP and TAP emission estimates included emissions from materials mined, moved, processed, and refined; from process reagent usage; and from fuel combustion at SGP. All permitted sources (fugitive and point) were evaluated, including the autoclave, lime kiln, and tailings storage facility; this made a significant difference in the emissions calculations compared to what was included in the prior permit application (and the DEIS).

<u>Given the significant changes to the emissions inventory, the Forest Service's initial air quality analysis in the DEIS is outdated and must be updated with a new analysis and a new DEIS based on the corrected emissions calculations.</u>

2. Cumulative Impacts Not Assessed

Through a veritable maze of regulatory determinations, IDEQ has only modeled and assessed less than 1% of the total Hazardous/Toxic Air Pollutant (HAP/TAP) emissions from this project. Put another way, over 99% of the emissions of a pollutant like arsenic were not assessed in the current draft permit to construct. This is the result of IDEQ claiming that 99% of the emissions were generated from sources that were "addressed" by EPA and therefore do not need to be addressed by the State. We are currently disputing this claim for sources such as fugitive emissions. But for the purposes of this letter, we would like to emphasize to the Forest Service that the true cumulative impact of hazardous and toxic pollutant air emissions from this project will likely <u>not</u> be considered by the state air permit. Thus far, IDEQ has not shown a willingness to calculate the true ambient air quality impacts of the SGP.

In order to fulfill their obligations under NEPA, the Forest Service should formally request that IDEQ (with technical assistance from EPA) calculate and model the full, cumulative impacts of <u>all air emissions sources</u> from the SGP as part of the EIS process. This analysis should be disclosed to the public in either a new DEIS or a supplemental DEIS.

3. Need for Human Health Risk Assessment

As it currently stands, neither IDEQ nor the USFS have analyzed or modeled the anticipated ambient concentration of toxic and hazardous air pollutants that people will breathe at, and beyond, the project boundary of the SGP if the project were to move forward as proposed. In particular, this assessment should consider the high concentrations of arsenic in fugitive dusts, which exceed both carcinogenic and non-carcinogenic critical toxicity criteria by orders of magnitude. Arsenic-laden particulates are potentially an unacceptable risk for both inhalation and incidental ingestion through direct contact with recently deposited dusts. Human health risk assessments should be performed to address this critical pathway.

Numerous issues could be resolved if the USFS, in coordination with IDEQ and EPA, were to complete such an assessment with the following considerations:

- Include all project emissions regardless of the regulatory interpretation of who has authority to regulate what sources;
- Reflect the range of uncertainties in PM, PM10, and arsenic emission rates; and
- Calculate cancer and non-carcinogenic risk associated with HAPs/TAPs.

The results of this assessment would be invaluable to understanding the true human health risks of the SGP from the air quality standpoint and fall under the purview of what the USFS should analyze and disclose in their environmental analysis of the project.

Next Steps

Based on the information presented, we urge the Forest Service to withdraw the DEIS, correct the deficiencies, incorporate newly available information, and reanalyze the impacts with respect to air quality (and other issues highlighted in previous comments). Subsequently, the Forest Service should issue either a new DEIS or a supplemental DEIS and resume the process of public notice, review, and comment. Doing so would clearly be in the public's interest and would conform to the letter and intent of the NEPA.

We look forward to your response and continuing the conversation on these important issues and their implications for human health and the environment.

Sincerely,

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Attachments

Attachment #1 - ICL Comments on Stibnite PTC, dated 3/19/21

Attachment #2 - SSFS Comments on Stibnite PTC, dated 3/19/21

Attachment #3 - TerraGraphics Foundation Comments on Stibnite PTC, dated 3/19/21 (included with permission)

Attachment #4 - EPA Comments on Stibnite PTC, dated 3/19/21

Attachment #1

IDAHO
CONSERVATION
LEAGUE

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March 19, 2021

Submitted via email to: morrie.lewis@deq.idaho.gov

RE: Proposed permit to construct for Midas Gold/Perpetua Resources (PTC No. P-2019.0047)

Dear Mr. Lewis:

Thank you for considering our supplemental comments regarding the proposed permit to construct for Midas Gold/Perpetua Resources ("the applicant") Stibnite Gold Project (PTC No. P-2019.0047). We have previously submitted two comment letters on this proposed permit in fall 2020 that we incorporate by reference in these comments. We also attended IDEQ's informational public hearing on the permit on March 3, 2021 and had subsequent conversations with IDEQ staff regarding this permit.

Since 1973, the Idaho Conservation League ("ICL") has been Idaho's leading voice for clean water, clean air, and wilderness – values that are the foundation for Idaho's extraordinary quality of life. As a 501(c)(3) nonprofit organization, ICL works to protect these values through public education, outreach, advocacy, and policy development. ICL is Idaho's largest state-based conservation organization and represents over 30,000 supporters, many of whom have a deep personal interest in protecting Idaho's human health and environment.

We continue to have grave concerns about whether this permit would be protective of human health and if the permit is in accordance with state and federal regulations. Accordingly, we urge IDEQ to deny Midas/Perpetua's application for a permit to construct. Please do not hesitate to contact me if you have any questions regarding our comments. We appreciate your consideration of our comments and look forward to continued dialogue with IDEQ on this matter.

Sincerely,

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ICL Comments on Revised Midas Gold/Perpetua Resources PTC

General Comments

ICL appreciates the work that IDEQ has put into this permit so far and for the opportunity to participate in the helpful public hearing on March 3, 2021. We recognize that this is an exceedingly complex and difficult application to review from both a technical and regulatory perspective. However, despite the modifications that have been made to the draft permit thus far, we still remain very concerned that this permit will not adequately protect public health.

First and foremost, we are surprised and concerned by the revelation at the recent public hearing that through a maze of regulatory determinations, upwards of 99% of arsenic emissions (a potent carcinogen) were treated as "addressed" by federal regulations and therefore "exempt" from compliance under state regulations. Put another way, when developing this permit, IDEQ only modeled and analyzed less than 1% of the arsenic emissions likely to be generated from this project. According to the Statement of Basis, "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" (pg. 28) - i.e. for this massive gold mining operation, those are the only emission sources that IDEQ is actually modeling and regulating in this permit.

While toxic air pollutants that are subject to federal regulations like NSPS and NESHAP are theoretically addressed to some degree by the application of technology-based standards, the fact remains that neither EPA nor IDEQ have done specific analysis for the 99% "exempted" emissions. These technology-based standards do not consider the ambient impact of the pollutants, but rather rely on the application of control technologies. As such, pollutants emitted under sources covered by NESHAPs are not monitored, modeled or assessed for ambient impacts. Thus, air quality modeling done for compliance does not include pollutants regulated under the federal NESHAPs. This is, in effect, is an <u>incremental </u>standard. TAPs are not evaluated for their cumulative impacts, but only as to their stand-alone contribution of a limited number of total emissions - not helpful from a toxicological perspective.

The regulatory agencies have not provided the information and analysis required to truly understand what the impacts to human health will be from this project. For example, at this stage in the permitting process, the public has no idea what the true concentration of a carcinogenic pollutant like arsenic will be at the property boundary.The end result is that IDEQ is proposing to issue a permit to construct for a large gold mining operation that will potential emit thousands of tons of toxic air pollutants (like arsenic) without considering the true and total potential impacts to human health.

Regulatory Review
Per Idaho rules (58.01.01.210.20), no demonstration of compliance with TAP provisions is required if the TAP is also a listed HAP from emission sources covered or addressed by NSPS or by NESHAP.

> *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).*

Thus, an accurate delineation of what emission sources are covered or addressed by those federal regulations is critical to conducting proper compliance demonstrations for toxic and hazardous air pollutants. **In this section of our comments, we highlight two major regulatory review issues with significant ramifications for this permit: 1) the general applicability of NESHAP 7E, and 2) the specific applicability of NESHAP 7E to fugitive emissions.**

<u>General Applicability of NESHAP 7E</u>
In their permit to construct application (HAP/TAP addendum), the applicant claims the following with regards to NESHAP 7E applicability (emphasis added):

> *40 CFR 63, Subpart EEEEEEE, NESHAP: Gold Mine Ore Processing and Production Area Source Category covers HAP emissions from the SGP autoclave (Source ID No.*

AC) and the EW cells, pregnant solution tank, mercury retort, induction melting furnace, and carbon regeneration kiln (Source ID No. EW, MR, MF, and CKD). Because the NESHAP source category is for "Gold Ore Mining," it also addresses HAP emissions from the SGP mining activities, specifically fugitive dust-generating activities (drilling, blasting, excavating, hauling, etc.), explosives use and storage (Source ID No. PS), cyanide leaching, tailings storage, ore processing (Source ID No. OC1-13), ore processing heating (Source ID No. ACB, CKB, PV, and HS), and ore processing reagent use; PAX and sodium cyanide (NaCN).

The NESHAP source category is defined as "Gold Ore Mining..., NAICS code 212221, Establishments primarily engaged in developing the mine site, mining, and/or beneficiating (i.e., preparing) ores valued chiefly for their gold content. Establishments primarily engaged in transformation of the gold into bullion or doré bar in combination with mining activities are included in this industry" (EPA 2011). In addition, the EPA rule-making docket (Docket ID EPA-HQ-OAR-2010-0239) for this NESHAP Subpart provides documents pertaining to HAP metal emissions from mining fugitive dust, HCN emissions from cyanide leaching, and downwind ambient monitoring.

It appears that IDEQ took that information and incorporated it into the "Regulatory Review" section of the Statement of Basis (SOB). Table 8 in the SOB in reference to NESHAP Subpart EEEEEEE defines the Source Category Subject and Addressed the same way Midas/Perpetua did in their application:

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. Doré bars are an amalgam of gold and silver.

The above "definition" from Table 8 is not found in the current federal regulations pertaining to NESHAP 7E in 40 CFR 63. Rather, it is directly taken from the preamble (non-regulatory & non-binding) portion of the 2/17/2011 posting of the rule in the Federal Register (Vol. 76, No. 33, pg. 9450)[1] where it says "Examples of regulated entities" in a brief table:

[1] National Emission Standards for Hazardous Air Pollutants: Gold Mine Ore Processing and Production Area Source Category; and Addition to Source Category List for Standards. U.S. Environmental Protection Agency. Published February 17, 2011. https://www.federalregister.gov/d/2011-2608.

Category	NAICS code[1]	Examples of regulated entities
Industry: Gold Ore Mining	212221	Establishments primarily engaged in developing the mine site, mining, and/or beneficiating (*i.e.*, preparing) ores valued chiefly for their gold content. Establishments primarily engaged in transformation of the gold into bullion or dore bar in combination with mining activities are included in this industry.

[1] North American Industry Classification System.

The preamble immediately goes on to state (emphasis added):

> *This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this action. To determine whether your facility would be regulated by this action, you should examine the applicability criteria in 40 CFR 63.11640 of subpart EEEEEEE (National Emission Standards for Hazardous Air Pollutants (NESHAP): Gold Mine Ore Processing and Production Area Source Category).*

The aforementioned applicability criteria in the rule say you are subject to this subpart if you "own and operate a gold mine ore processing and production facility as defined in §63.11651..." §63.11651 ("What definitions apply to this subpart?") contains the following definition (emphasis added):

> *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.*

The last sentence of the source category definition in §63.11651 is of particular interest. According to Midas/Perpetua's January 27, 2021 feasibility study[2], the total recovered metal production during life of mine projects to be 4,238 Koz of Gold and 115 Mlbs of Antimony (Table 1-1). This Table indicates total gold production will account for roughly 0.23% of the

[2] Stibnite Gold Project: Feasibility Study Technical Report. Prepared for Midas Gold, January 27, 2021. https://investors.perpetuaresources.com/site/assets/files/2459/2021-01-27-feasibility-study.pdf.

mass of metals produced, with antimony accounting for more than 99% of metal mass. The percentage of total metals production represented by gold is nowhere near the 5% minimum threshold and would indicate that this facility does not fall under the definition of a “gold mine ore processing and production facility” and therefore is not eligible for exclusions under the NESHAP 7E “gold rule.”

Because IDEQ is basing some of their NESHAPs exemptions on a non-regulatory “definition” for the 7E source category rather than the true regulatory definition in §63.11651, a whole suite of emissions are being inappropriately excluded from modeling and compliance analysis in this permit. Based on the information provided, the Stibnite project should not qualify as a “gold mine ore processing and production facility” under NESHAP 7E and therefore does not qualify for an exemption under Subsection 210.20. Accordingly, those emission sources should be included in the subsequent modeling and compliance determinations.

Specific Applicability of NESHAP 7E to Fugitive Emissions

The EPA specifically promulgated NESHAP 7E to address mercury emissions (except for fugitive Hg emissions) from gold mining operations. Yet in this permitting process, the applicant and IDEQ are asserting two falsehoods - 1) that non-Hg emissions are addressed by this rule, and 2) that fugitive emission sources for any pollutant are addressed by this rule.

EPA states in 9458 Federal Register / Vol. 76, No. 33 / Thursday, February 17, 2011 / Rules and Regulations (emphasis added):

> *Gold mine ore processing is an area source category listed under section 112(c)(6) for regulation under section 112(d)(2) solely due to its mercury emissions.*
>
> *Due to the lack of information, we have not included fugitive mercury emissions at gold mine facilities in our 1990 baseline emission estimate (or in our more recent emissions estimates) for the gold mine ore processing and production area source category. Accordingly, these fugitive emissions are not part of the source category we are listing and in this final rule.*
>
> *As explained in the proposed rule, the gold mine ore processing and production area source category covers the thermal processes that occur after ore crushing, including roasting operations (i.e., ore dry grinding, ore preheating, roasting, and quenching), autoclaves, carbon kilns, electrowinning, preg tanks, mercury retorts, and furnaces.*

IDEQ, in their regulatory review, has apparently 1) changed the definitions of those activities regulated by the EPA under NESHAPs, 2) added source categories specifically identified by

EPA as <u>not</u> part of the rule (e.g. fugitive emissions from mining), and 3) then argued that EPA had "addressed" these same items. The end result is that some of the largest emissions sources of a highly toxic and prevalent pollutant like arsenic are being assumed to be addressed by a NESHAP when they really are not, leaving a massive void in the regulatory oversight of this project.

<u>The Question of "Addressed"</u>
IDEQ included guidance in the Statement of Basis specifically pertaining to what constitutes "addressed" in Subsection 210.10. According to this guidance, the term "addressed" is interpreted to mean that EPA (1) specifically regulated, (2) specifically regulated by a surrogate, (3) reviewed, or (4) evaluated, the HAP emissions that are also TAPs. We are concerned that IDEQ will continue to improperly expand the meaning of the term "addressed" in the context of NESHAP exemptions under Subsection 210.20. Thus, we would like to preemptively counter that potential argument with relation to the regulatory review comments we have provided here.

With respect to the general applicability of NESHAP 7E to the Stibnite Gold Project as a whole, the facility definition within federal rule precludes Stibnite from being considered part of the gold mine ore processing and production source category based on metals total mass percentages. Thus, it is clear that a primarily antimony mine (by mass) is explicitly *not addressed* under this NESHAP and therefore does not qualify for 7E source exemptions under Subsection 210.20.

With respect to the applicability of NESHAP 7E to fugitive emissions, the EPA clearly states that fugitive emissions are not part of the source category and they are not accounting for those kinds of emissions under a surrogate. Thus, it is clear that fugitive emissions are explicitly *not addressed* under this NESHAP and therefore do not qualify for an exemption under Subsection 210.20.

We also note that on page 9 of the TAP/HAP Addendum to their application, the applicant cites ancillary documents within the EPA's rulemaking docket for NESHAP 7E (Docket ID EPA-HQ-OAR-2010-0239) as supposed justification for that subpart "addressing" HAP metal emissions from mining fugitive dust. The mere inclusion of old industry documents in that docket <u>does not</u> mean that EPA has addressed those topics. The documents in question were not cited in the rule. For example, the document cited by the applicant with respect to fugitive dust - *EPA-HQ-OAR-2010-0239-0157, Recommended Methodology for Quantification of Fugitive Dust Metals Emissions from Mining Activities for Title V Applicability* - is actually just a 1996 Memorandum from the Air Quality Subcommittee of the Nevada Mining Association to Nevada Division of Environmental Protection. In our opinion, the link between that or other docket supporting documents to a determination by IDEQ that fugitive emissions are addressed under

NESHAP 7E and therefore are subject to exemption under Subsection 210.20 requires significant leaps of logic and is not an appropriate interpretation of the state and federal regulations.

Regulatory Review Summary

We have come to the conclusion that IDEQ's regulatory evaluation is deeply flawed with respect to the claimed NESHAPs exemptions under the 7E rule, which carries with it significant compliance ramifications for this permit. Based on the available information, IDEQ has seemingly accommodated the applicant's interpretations of the rules and regulations without question, rather than challenging those interpretations when appropriate. As a result, the largest sources of both NAAQS PM10 and HAPs (particularly a highly toxic carcinogen in arsenic) are placed under a NESHAP exclusion that precludes objective evaluation of potential harm to human health and the environment.

In summary, we request that IDEQ:

- Reassess the applicability of NESHAP 7E to this project and accordingly redo ambient air modeling and TAPs/HAPs compliance analysis to incorporate both fugitive emission sources of all pollutants + emission sources previously claimed to be excluded under NESHAP 7E.
- If that reanalysis demonstrates that the proposer project would be out of compliance with air quality standards and regulations, then the permit should not be issued.

Arsenic Emissions

An in-depth review of the Emissions Inventory reveals there are several factors that have not been given appropriate treatment in developing the arsenic emissions totals. To evaluate this issue, substantial reverse engineers efforts have been conducted by experts in the field, and we would like to echo their findings in our comments:

a) A crucial error in the calculation of fugitive dust emissions is the use of a 4% silt content value in the road surface material[3]. That 4% number is derived from the *Soil Resources Baseline Study* (Midas Gold, 2015) and is in fact based upon surface soil samples. Surface soil is not at all representative for the road surface material given the volume of traffic proposed and the traction materials Midas/Perpetua proposes for roadbeds. Page 23 of the MODPRO2 (Midas/Perpetua's revised plan of operations submitted to the Forest Service for NEPA review) states, "The haul roads would be built and maintained for year-round access and would be surfaced with gravel aggregate." Given that it does not make engineering sense to use native soils on the surface of the haul roads, then similarly it does not make sense to use local soil silt content to estimate fugitive dust emissions. Furthermore, there does not appear to be any locally derived data

[3] See pg. 96 of SOB, Air Emissions Calculations Page 6 of 20 done by Air Sciences Inc.

available that would be useful in the prediction of the silt-sized fraction of haul road surface aggregate.

For comparative sake, EPA's AP-42, Table 13.2.2-1[4] shows silt content for freshly graded road surfaces at Western coal mines of 24%, and for haul roads to and from pits in three kinds of mines ranging from 5.8% to 8.4%. IDEQ analysis indicates that half of the modeled emissions were eliminated via deposition. That deposition would increase the emission rate over time as those deposited materials add to the TAP concentrations on the roadbeds, in the material being processed, and in wind erosion.

The technical analyses presented in the comments from TerraGraphics International Foundation/von Lindern demonstrate that appropriate application of the cited AP-42 guidance for estimating silt content substantially changes the overall PM emissions estimates (road dust TAP emissions should be estimated as a percentage of PM, not from PM10 as currently done in the emission inventory and modeling analyses). These modifications also increase arsenic and other HAP emissions. PM emissions from haul roads are likely 1.6 to 3.5 times greater than those used by IDEQ in the regulatory determinations and ambient impact modeling. Similarly, PM10 emissions are likely 1.9 to 5 times greater. These adjustments require, by the current methodology employed by the applicant and IDEQ, fugitive dust control efficiencies ranging from 96% to >98%. Given the substantial doubt regarding the applicant's ability to achieve the required 93.3% control level in the current draft permit, IDEQ should reconsider the compliance issues with respect to PM10.

b) The AP-42 guidance used by the applicant is specifically limited to PM, PM10 and PM2.5 emissions estimates. Applying these formulae to estimate arsenic and other metal contaminant emission rates requires determining the appropriate metal content of silts in the roadbed. The applicant's methodology is questionable on two counts. Because the potential emissions reflect the aggregate accumulation of metals from both roadbed construction material (crushed gravel from Development Rock) and spills (hauled and tracked Ore and Development Rock), weighted average concentrations of As in the materials placed and hauled should be used. The average concentration of As in 909 ppm in development rock and 6999 ppm in ore rock. The use of median concentrations from rock cores, much of which will never be excavated, is incorrect. The weighted average As concentration in the materials proposed for use is 1812 ppm. This value should be used for arsenic concentration in road emissions, not the median of development rock samples of 667 ppm used by the applicant in their calculations. The correct use of average values increases the As content in silt by 2.5 times. Per IDEQ guidance, in all other emission

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[4] AP 42, Fifth Edition, Volume I, Chapter 13: Miscellaneous Sources, Unpaved Roads (13.2.2), November 2006. U.S. Environmental Protection Agency
https://www.epa.gov/sites/production/files/2020-10/ documents/13.2.2_unpaved_roads.pdf

calculations for Subsection 586 carcinogenic TAPs, the average concentration in the materials processed should be used rather than the median concentration.

In addition, it has long been recognized in EPA guidance that estimating metals emissions from unpaved roads at contaminated mining sites requires application of enrichment factors. Enrichment factors are necessary due to physical and chemical properties of the metals interacting with the clays and soil materials and the physical effect of traffic over the materials. The enrichment factor recommended by EPA for As at these types of sites is 1.28[5]. As a result, total As emissions should be increased by a factor of 5.6 to 12 times.

iii) Finally, there is concern, even at the underestimated emission rates in the current application, that the total ambient impact of arsenic emissions at the property boundary are a substantial threat to public health. Unfortunately, IDEQ has thus far taken the position that the agency is forbidden by state and federal rules from estimating and disclosing these concentrations to a concerned public.

If IDEQ were to properly address these issues, predicted arsenic concentrations would likely exceed the HAP major source threshold and result in ambient air impacts exceeding IDAPA 58.01.01.585 and 586 limits. We refer IDEQ to the calculations and other information presented in the TerraGraphics International Foundation/von Lindern technical comments to support the findings in this section of our comments.

The underestimation of arsenic emissions, combined with the inappropriate exclusion of fugitive As emissions under NESHAP 7E, is especially troublesome, given the enormous amounts of arsenic that will be processed at this facility. Refractory gold recovery, as anticipated at Stibnite, relies on arsenopyritic ores. The EPA has identified that the oxidation products of these types of ores are among the most toxic and bioavailable chemical species of arsenic compounds. These are potent carcinogens with serious non-carcinogenic effects in several organ systems. Millions of truckloads of arsenic contaminated ores and development rock will be transported across this site. Development rock will presumably be crushed to gravel these roads and continuous unavoidable spillage will occur. Arsenic and other metals will accumulate, and naturally oxidize, in the road materials over-time, likely providing increasingly toxic, but nevertheless unmonitored, ambient impacts.

In summary, IDEQ should:

- Reassess arsenic emissions totals based on more appropriate, conservative assumptions and reanalyze the potential impacts accordingly.

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[5] *Estimation of Air Impacts from Area Sources of Particulate Air Emissions at Superfund Sites* - EPA Report ASF32, 1993.

IDAPA 585 TAPs

An in-depth review of the Emissions Inventory reveals there are several factors that have not been given objective treatment in developing the non-carcinogen TAPs emissions totals. Per IDEQ guidance, emission from material processing for IDAPA 58.01.01.585 non-carcinogens should be calculated from the maximum potential impacts over 24 hours for comparison against the acute impact limits in that regulation. The information provided by the applicant on the derivation of permit and model emission factors for the IDAPA 58.01.01.585 TAPs acknowledged that those pollutants could be emitted at rates orders of magnitude above the IDEQ screening emission levels. While it was challenging for reviewers to prepare precise analytical refinements to the IADAP 58.01.01.585 HAP emission estimates or ambient impact predictions or recommend specific adjustments, scaling analyses show major cause for concern.

Emissions of iron and aluminum in the permit analyses are based upon mean concentrations of those metals in the development rock samples in the assays. IDEQ and federal guidance for modeling pollutants with short term ambient standards require the use of potential emissions over the duration of that averaging period, which means maximum daily emissions for IDAPA 58.01.01.585 TAPs. That would require conservative estimates of emissions well above the mean or median rate; the 90^{th} percentile of concentrations of those TAPs in the material to be used for the roads (development rock and spent ore disposal area (SODA) materials, per the proposed action) would be most appropriate. The 90^{th} percentile concentration for iron in the development rock (from the 56,000 assay samples Midas/Perpetua provided) is 32,700 ppm. That concentration would be increased when calculating the weighted average with the SODA component, more than doubling the iron emission rate from road dust.

Given the regulatory focus on acute short term potential impacts inherent in the 24-hour average impact limit for these TAPs, conservatism should also be used for the same compounding factors identified for arsenic (appropriate silt content, enrichment from the physical effects of heavy road traffic, basing emissions on PM rather than PM10 using the weighted average of actual materials proposed for the road base, deposition increasing the concentrations of the TAPs in surface materials over time).

Without taking into account these factors, IDEQ's sensitivity analysis for TAPs impact modeling shows iron at 14.1% of the applicable AAC and aluminum of 5.5% of the applicable AAC when taking into account deposition (SOB, Table 35). Without taking into account deposition, TAPs impact modeling shows increased potential impacts of both iron (27.7% of the AAC) and aluminum (10.8% of the AAC) (SOB, Table 36). Based on preliminary calculations taking into account all of the relevant factors, it seems likely that an appropriately complete and accurate analysis would show impermissible impacts of iron and aluminum for those TAPs beyond the property boundary. Deposition could indeed be a critical factor for demonstrating TAP compliance when the aforementioned factors are appropriately taken into account.

We refer IDEQ to the calculations and other information presented in Save the South Fork Salmon's technical comments to support the above findings in this section of our comments.

In summary, IDEQ should:

- Reassess all HAPs emissions totals based on more appropriate, conservative assumptions and reanalyze the potential impacts accordingly.
- If the updated modeling demonstrates non-compliance with acceptable ambient concentrations, then the permit cannot be issued.

Facility Classification

In the Statement of Basis, IDEQ determines that the permittee will be a "synthetic minor" source based on uncontrolled and permitted potential to emit. A number of comments by ICL and other reviewers address instances where we believe that HAP emissions have been underestimated. Once IDEQ completes the appropriate analyses and calculations to verify the HAP emissions, the agency should assess whether the source still meets the requirements of a synthetic minor. If the Total HAP increases to >25 T/yr or a Single HAP (e.g. arsenic) increases to >10 T/yr, the permittee would thus have to be reclassified as a "major" source.

Furthermore, the classification of the facility as a synthetic minor source for criteria pollutants and HAPs is entirely dependent upon the target 93.3% fugitive dust control effectiveness. A permit issued without legally enforceable conditions to ensure those fugitive controls, which IDEQ states will be challenging to show continual compliance with, would have to be considered HAP major source.

Fugitive Dust Control Plan

Although the section of the Statement of Basis related to the Fugitive Dust Control Plan was not highlighted, we would like to provide additional comments on this issue to address DEQ's response to our previous comments.

According to IDEQ, for the applicant to attain compliance with NAAQS standards, they will need to continuously control their fugitive particulate emissions at greater than 93.3% efficiency. That is a very high bar to achieve consistently.As noted in the Statement of Basis, "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%..." (pg. 21). The threshold of dust control efficiency to show TAPs/HAPs compliance is likely even greater than the 93.3% level developed for criteria pollutants due to the very high concentrations of pollutants like arsenic in the fugitive dust coming from ore and development rock.

IDEQ has required the applicant to complete a Fugitive Dust Control Plan (FDCP) as a condition of this permit. However, despite the FDCP clearly being a crux of the applicant's air quality compliance, it does not appear as if the public will have the opportunity to review and comment on this plan. We formally request the opportunity to do so. Furthermore, the permit specifies that the FDCP shall be submitted within 60 days of permit issuance. In this case, the permit could be approved without IDEQ or the public knowing specifically how the applicant will attain this aggressive standard of dust control. For instance, we have no indication of how the applicant will suppress fugitive emissions sources other than roads.

Given that the specifics of the FDCP are crucial to ascertaining exactly how the applicant will achieve the lofty 93.3% dust control efficiency required to achieve compliance, this permit <u>should not</u> be approved until a FDCP is submitted to IDEQ, reviewed by both IDEQ, EPA, and the public, and approved or denied pending modifications. A review of the FDCP prior to permit issuance is necessary to ensure compliance with air quality standards. <u>This permit cannot be issued without enforceable provisions and limits to ensure that the high bar of fugitive dust control will actually be attained at the Stibnite Gold Project.</u>

IDEQ should:

- Incorporate clear, enforceable limits for fugitive dust control into this permit *before* any potential approval.
- Allow for public review and comment on the Fugitive Dust Control Plan *before* it is finalized.

Need for Human Health Risk Assessment

Given the significance and scale of this project and the intense public interest it has garnered, we once again highlight the pressing need for risk assessment for HAPs/TAPs that can impact human health. In particular, this assessment should consider the high concentrations of As in fugitive dusts, which exceed both carcinogenic and non-carcinogenic critical toxicity criteria by orders of magnitude. Arsenic laden particulate is potentially an unacceptable risk for both inhalation and incidental ingestion through direct contact with recently deposited dusts. Because these dusts will tend to accumulate seasonally, the air quality analyses conducted for this PTC are insufficient to assess this potential human health risk. Human health risk assessments should be performed to address this critical pathway. It may be necessary to collect fugitive dust emissions and appropriately dispose of the particulates to avoid unacceptable cumulative exposures.

In the second stage of the NESHAP regulatory process, the CAA requires the EPA to undertake two different analyses, referred to as the technology review and the residual risk review. A residual risk review has not yet been undertaken for the NESHAP 7E category for gold mining and processing. Under the residual risk review, which is limited to the MACT standards, EPA must evaluate the risk to public health remaining after application of the technology-based standards and revise the standards, if necessary, to provide an ample margin of safety to protect public health or to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect. The residual risk review is required within 8 years after promulgation of the technology-based MACT standards, pursuant to CAA section 112(f). Technology-based MACT standards for NESHAP 7E were promulgated in February 2011, over 10 years ago.

IDEQ should either:

- Conduct a Stibnite-specific human health risk assessment themselves.
- Formally request that EPA conduct a risk assessment given their statutory authority and onus to do so.

Concluding Comments

Based on the information provided in our comments, we request that IDEQ either deny this application for a permit to construct until IDEQ or EPA conducts a responsible evaluation of the potential ambient air impacts of the proposed facility. If IDEQ decides to make substantive changes to the proposed permit to address our (and others') concerns, the permit should be re-noticed for public comment. There is well-founded concern, even at the underestimated emission rates in the current application, that the total ambient impact of arsenic emissions at the property boundary is a substantial threat to public health. Ultimately, IDEQ must fulfill their underlying obligation to protect public health when considering this permit.

Attachment #2

Save the
South Fork
Salmon River

P.O. Box 1808, McCall, ID 83638
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March 19, 2021

Re: Midas Gold/Perpetua Resources proposed permit to construct, Permit No. P-2019.0047

Dear Ms. Rowley:

Thank you for the opportunity to comment on Midas Gold's/Perpetua Resources application for a permit to construct for the Stibnite Gold Mine, P-2019.0047. Save the South Fork Salmon ("SSFS") submitted two comments on the original draft permit to construct in October and November 2020, which are incorporated by reference. We also incorporate by reference the comments submitted by Dr. Ian von Lindern, P.E., Ph.D. on March 19, 2021. SSFS attended the public hearing on March 3, 2021, hosted by the Idaho Department of Environmental Quality ("IDEQ").

Save the South Fork Salmon is a community-based citizens' organization, headquartered in Valley County, ID. We are dedicated to protecting the South Fork of the Salmon River watershed, its outstanding and remarkable natural values, and the economies that depend on those values. SSFS's members and supporters have a strong interest in protecting the area's natural resources, including its air resources, maintaining recreational opportunities and access, and ensuring that future generations can enjoy the benefit of these resources and opportunities of the South Fork of the Salmon watershed.

SSFS appreciates the Department's consideration of its prior comments, and continued extensive work on this complex project and permit to construct. SSFS has reviewed the second draft permit to construct, the response to comments, statement of basis and other associated documents. Despite modifications to the draft permit to construct, SSFS still has significant concerns about the permit's consistency with state and federal regulations, sufficiency of the data used for the calculations of the Project's potential to emit both criteria and hazardous air pollutants, and the lack of consideration and disclosure of a significant majority of emissions that may have serious impacts on human health and the environment. SSFS therefore requests that IDEQ deny the permit to construct. Additional details are in the comment letter below.

If you have any further questions regarding the comments, please feel free to contact me.

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Save the South Fork Salmon's Comments on Stibnite Gold Project
Revised Draft Permit to Construct

Under the National Emission Standards for Hazardous Air Pollutants ("NESHAP") program, the Environmental Protection Agency ("EPA") established a list of hazardous air pollutants ("HAP") and regulations establishing technology-based emission standards for each list of source categories for HAPs. According to Idaho's air permit rules, if equipment or an activity is covered by a NESHAP or a source category addressed by a NESHAP, IDAPA § 58.01.01.210.20 exempts the permittee from compliance with the requirement to analyze emissions of any toxic air pollutants (TAP) listed in IDAPA § 58.01.01.586 ("586 TAP") that are also federally-listed HAPs.

In this case, as discussed in detail below, the Idaho Department of Environmental Quality's ("IDEQ") incorrect application of source category NESHAP EEEEEEE ("NESHAP 7E") to the Stibnite Gold Project, and erroneous interpretation of what activities and HAPs NESHAP 7E covers allowed Midas Gold/Perpetua Resource to ignore analysis and disclosure of the impacts of approximately 99 percent of emissions of carcinogenic air pollutants on human health and the environment.

To add to the domino effect of unaccounted for hazardous emissions, it appears that the selective data Midas Gold/Perpetua used in its emissions calculations for fugitive dust volumes and elemental concentrations have potentially and significantly underestimated the true potential to emit particulate matter, arsenic, and other TAPs and HAPs from the Stibnite Gold Project, calling into question the threshold determinations of whether the Stibnite Gold Project can comply with National Ambient Air Quality Standards ("NAAQS"), and whether it should be considered a major source for HAP emissions.

The full extent of emission that will go unaccounted for cannot be discerned from documents submitted to IDEQ. The permit package included significant volumes of information, but without sufficient detail on or public access to the information and calculations that were behind the most critical emission determinations. Those limitations made through analytical review and critique within the 30-day public comment period impractical, if not impossible.

Point blank, this draft permit to construct is not consistent with federal or state requirements, and fails to meet one of the fundamental purposes of the Clean Air Act to control air pollutants in order to protect human health and the environment. For the reasons discussed in further detail below, SSFS urges IDEQ to deny this permit to construct.

1. IDEQ incorrectly applied NESHAP 7E to the Stibnite Gold Project, thus a IDAPA § 585 and § 586 TAP analysis is required.

A. The Stibnite Gold Project does not meet the definition of a "gold mine processing and production facility" in NESHAP 7E; the Project cannot hide behind federal regulations to avoid compliancewith a 586 TAP analysis.

IDEQ incorrectly applied NESHAP 7E to the Stibnite Gold Project, and thus erroneously exempted the Stibnite Gold Project from a 586 TAP analysis required under IDAPA § 58.01.01.203.03 for a permit to construct. *See* Statement of Basis at 42 ("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 result of this decision leads to more than 99 percent of emissions of some HAPs, in particular arsenic, being unaccounted for, and a lack of full understanding and disclosure of the human health and environmental impacts that will result from this Project. IDEQ, therefore, must require Midas Gold/Perpetua Resources to fully disclose all TAP emissions, ensure that such emissions comply with TAP carcinogenic and non-carcinogenic increments found in IDAPA § 58.01.01.585 and 586, and ensure that emissions of TAPs from the Stibnite Gold Project "would not injure or unreasonably affect human or animal life or vegetation." IDAPA § 58.01.01.203.03.

NESHAP 7E, a regulation promulgated by the EPA, applies to "a gold mine ore processing and production facility, as defined in [40 C.F.R.] § 63.11651, that is an area source." 40 C.F.R. § 63, subpt. EEEEEEE. Section 63.11651 defines a gold mine ore processing and production facility as follows:

> 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 <u>mass</u> 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.

(emphasis added).

The Stibnite Gold Project does not meet this definition. According to the Stibnite Gold Project Draft Environmental Impact Statement ("DEIS"), the "current estimated recoverable mineral resource consists of 4 to 5 million ounces of gold, 6 to 7 million ounces of silver, and 100 to 200 million pounds of antimony." DEIS 1-5 (Aug. 2020). In other words, the Stibnite Gold Project will produce approximately 0.16 to 0.25 percent total mass of gold, and over 99 percent total mass of metals other than gold. According to NESHAP 7E, "[a] facility that produces primarily metals other than gold . . . that may also recover some gold as a byproduct <u>is not a gold mine ore processing and production facility.</u>" 40 C.F.R. § 63, subpt. EEEEEEE (emphasis added).

There is nowhere in the Statement of Basis that even mentions such an analysis of the Stibnite Gold Project against the regulations definition of a gold mine processing and production facility. Rather, Table 8 in the Statement of Basis creates a definition for the NESHAP source category, stating that "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." Statement of Basis at 28. This definition is nowhere in the federal regulations.

IDEQ cannot reasonably claim that because the Stibnite Gold Project will have some components of a gold mine ore processing and production facility listed in NESHAP 7E, such as an autoclave or melt furnaces, that the entire Project <u>or any of its components</u> fit under the source category definition in NESHAP 7E. Determination of whether NESHAP 7E applies to a project is based on whether the project's "total mass of metals produced" is primarily gold, and the Stibnite Gold Project fails to meet this criteria.

Because the Stibnite Gold Project is not a NESHAP 7E source category facility, IDEQ cannot exempt it nor any of its emissions from being "evaluated for compliance with TAP increments in accordance with IDAPA § 58.01.01.210.20 (Subsection 210.20)." Statement of Basis at 22. Exempting the entire Stibnite Gold Project on the incorrect basis that it is a "gold mine ore processing and production facility" and thereby exempting the project from the IDAPA § 58.01.01.203.03 TAP analysis has the effect of ignoring a significant portion of emitted HAPs. *See* Statement of Basis at 28 (Table 8). Midas Gold/Perpetua Resources disclosed in its HAP/TAP Addendum that uncontrolled HAP emissions for the Stibnite Gold

Project would be beyond major source threshold levels of 25 tons per year of total HAP. HAP/TAP Addendum at 3. A large majority of the potential to emit HAP emissions (whether uncontrolled or controlled) are coming from haul roads, and contain significant amounts of arsenic and which can have significant adverse impacts on human health. *See* Statement of Basis at 18.

The application of NESHAP 7E to the Stibnite Gold Project on the basis that it is consistent with the definition of a "gold mine processing and production facility" is incorrect. IDEQ therefore needs to reconsider the requirements for compliance with IDAPA rules for a permit to construct, including the need to do a complete IDAPA § 58.01.01.203 TAP analysis.

B. IDEQ can not apply NESHAP 7E to the Stibnite Gold Project because it is a "synthetic" HAP area source.

The Stibnite Gold Project is not a source category within the meaning of NESHAP 7E because it is not an "area (minor) source," as required under NESHAP 7E.

An area source is any source that "is not a major source." 40 C.F.R. § 63.2. A major source is one that emits or has the potential to emit "10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants." *Id.* When a source can reduce HAP emissions below the major source threshold by using control equipment, it is called a "synthetic minor" source, or synthetic area source. Statement of Basis at 16 ("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.").

Because "the uncontrolled HAP [potential to emit] for [the Stibnite Gold Project] is estimated to exceed 25 tons per year (T/yr) without application of the specified control equipment (Table 1)," Statement of Basis at 18, the Stibnite Gold Project is a "synthetic" area source.

> 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, PM10, PM2.5, and HAP emissions for new source review and Title V (Tier I) permitting purposes. The uncontrolled PTE for the remaining criteria pollutants (SO2, NOx, CO, VOC) confirm Midas Gold will be a natural minor source for these emissions.

Statement of Basis at 26.

The distinction between an "area source" and a "synthetic minor source"[1] for HAP emissions is significant. EPA has taken the position that a "synthetic minor source" is equivalent to a "major source" for the NESHAP program. And courts have affirmed EPA's interpretation:

> A "major source" is defined as one that "emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants." 42 U.S.C. § 7412(a)(1) (emphasis added). An "area source" is defined as "any stationary source of hazardous air pollutants that is not a major source." *Id*. § 7312(a)(2). The CAA does not define "synthetic minor source" or "synthetic area source."
>
> The EPA explained that a synthetic minor source emits lower quantities of hazardous air pollutants than a major source "because they use some emission control device(s), pollution prevention techniques or other measures ...." Summary of Public Comments and Responses, at 46–47, Docket # EPA-HQ-OAR-2013-0291-0685 (Sept. 2015). However, "[i]f not for the enforceable controls they have implemented, synthetic minor sources would be major sources under ... the CAA." *Id.* at 47. The EPA's definition of a synthetic minor source conforms to the plain text of the CAA, which states that major sources include sources with "the potential to emit considering controls." 42 U.S.C. § 7412(a)(1).

Sierra Club v. EPA, 895 F.3d 1, 17 (D.C. Cir. 2018) (emphasis removed).

Based on EPA's prior interpretation that a synthetic minor source is a major source for HAP analysis, NESHAP 7E, which applies to area (minor) sources, IDEQ cannot apply NESHAP 7E to the Stibnite Gold Project.

[1] Synthetic "minor" source and synthetic "area" source are used interchangeably. Area source is the term used for a minor source in the NESHAP program.

2. Even if NESHAP 7E applies, IDEQ cannot use it to exempt the Stibnite Gold Project from compliance with IDAPA rules requiring analysis of the most harmful emissions.

IDAPA § 58.01.01.210.20 provides:

> No demonstration of compliance with the toxic air pollutant provisions is required to obtain a permit to construct or to demonstrate permit to construct exemption criteria for a new source or for modification of an existing source if the toxic air pollutant is also a listed hazardous air pollutant from: a. The equipment or activity covered by a NSPS or NESHAP; or b. 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.

IDEQ uses this IDAPA rule to exempt activities and the most harmful contaminants that will be emitted by those activities from scrutiny by hiding the Stibnite Gold Project behind the NESHAP 7E source category. IDEQ should reevaluate the requirements for compliance before issuing this permit to construct.

A. IDEQ erred in exempting several Project activities that have a significant potential to emit particulate matter and HAPs from a TAP analysis as being addressed by NESHAP 7E.

Even if the Stibnite Gold Project is considered a "gold mine processing and production facility" as defined in NESHAP 7E, IDEQ erred in exempting all Project activities from the IDAPA § 203.03 TAP analysis for § 586 TAPs.

NESHAP 7E applies specifically only to:

> "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 . . . .

40 C.F.R. § 63-11640(b); *see also* Statement of Basis at 40. The Statement of Basis also indicates that the affected sources are "[t]he collocation of ore pretreatment processes and the carbon process with mercury retort." Statement of Basis at 42. However, Table 8: NSPS and NESHAP Sources, IDEQ states under the NESHAP 7E entry that the sources addressed by NESHAP 7E include "drilling, blasing, excavating, hauling, prill silos, rock dumps and storage piles, tailings." Statement of Basis at 28 (Table 8). Indeed, these activities were excluded from 585 and 586 TAP compliance. *See id.* (stating that after application of the NSPS and NESHAP source categories, the only "remaining sources that are applicable to compliance with TAP provisions" are "concrete production . . . and heating, ventilation, and air conditioning units"). Nothing in NESHAP 7E indicates that the regulation was intended to include such activities as drilling, blasing, excavating, and hauling.

EPA's intent that NESHAP 7E does not cover fugitive emissions is clear in EPA's response to comments published with the final rule:

> [F]ugitive emissions are not part of the source category we are listing and regulating in this final rule. . . . As explained in the proposed rule, the gold mine ore processing and production area source category covers the thermal processes that occur after ore crushing, including roasting operations (i.e., ore dry grinding, ore preheating, roasting, and quenching), autoclaves, carbon kilns, electrowinning, preg tanks, mercury retorts, and furnaces."

National Emission Standards for Hazardous Air Pollutants: Gold Mine Ore Processing and Production Area Source Category; and Addition to Source Category List for Standards, 76 Fed. Reg. 9450, 9458 (Feb. 17, 2011) ("Gold Mine Rule").

IDEQ's misinterpretation of NESHAP 7E and gross oversight of this issue threatens leaving a huge source of HAP emissions unaccounted for, prevents full disclosure to the public of the real threats of the Stibnite Gold Project to human health and the environment, and fails to ensure that "[a]ny contaminant which is by its nature toxic to human or animal life or vegetation [will] 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." IDAPA § 58.01.01.161.

B. NESHAP 7E does not address HAPs other than mercury.

Similar to the issue above, IDEQ wrongly assumed that by applying NESHAP 7E to the Stibnite Gold Project, the Project was excused from 586 TAP compliance for mercury as well as all other listed TAPs. *See* Statement of Basis: Examples of How DEQ Interprets the Word "Addressed" in Subsection 210.20 ("DEQ Guidance").

The DEQ Guidance states that "it is presumed that EPA evaluated the 187 HAPs when developing the emissions standards for new, modified or existing stationary sources regulated by 40 CFR Part 63 Subparts." EPA's Gold Mine Rule response to comments demonstrates that IDEQ's presumption is wrong.

> Therefore, unless an area source category emits a section 112(c)(3) urban HAP or a section 112(c)(6) HAP and EPA determines that such category is needed to meet the 90 percent requirement set forth in section 112(c)(3) and (c)(6), findings related to adverse human health or environmental effects are required before EPA can regulate that area source category— <u>findings EPA is unable to make for nonmercury HAP emitted from the gold mine ore processing and production source category at this time.</u>
>
> EPA does not interpret section 112(c)(6) to create a means of automatically compelling regulation of all HAP emitted by area sources unrelated to the core object of section 112(c)(6), which is control of the specific persistent, bioaccumulative HAP, and thereby bypassing these otherwise applicable preconditions to setting section 112(d) standards for area sources.
>
> EPA disagrees with the comment that it is compelled to promulgate section 112(d)(2) MACT standards for all HAP emitted by gold mine ore processors.

76 Fed. Reg. at 9457.

IDEQ's interpretation, therefore, that the EPA "specifically regulated," "specifically regulated by a surrogate," "reviewed," or "evaluated[ ] the HAP emissions that are also TAPs" other than mercury in NESHAP 7E is just plain wrong. The end result of IDEQ's contorted application of NESHAP 7E to the Stibnite Gold Project will, again, leave a significant portion of HAP emissions, particularly arsenic, unaccounted for and undisclosed to the public that can have severe adverse impacts on human health, on the terrestrial environment, and on water quality.

3. IDEQ has not shown that Midas/Perpetua is able to comply with NAAQS for particulate matter.

"Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [μm] in diameter) in the road surface materials." EPA, *Compilation of Air Pollutant Emission Factors*, *AP-42, Volume 1, Fifth Addition*, Ch. 13-2-2: Unpaved Roads. In this application for a permit to construct, samples used to determine the silt content value for the proposed road surfacing material were inappropriate and resulted in the underestimation of emissions from haul roads. Given the stated need to apply an aggressive 93.3% dust control effectiveness for permit issuance, it is unrealistic, with reasonable data on silt content, that the Stibnite Gold Project can control emissions, including particulate matter, from haul roads sufficiently to demonstrate compliance with NAAQS.

A. Unreasonably low silt content value used to estimate fugitive dust emissions underestimate the true impacts from haul roads.

A key error in the calculation of fugitive dust emissions is the use of a 4% silt content value for the road surfacing material. This source of this figure is cited as *Soil Resources Baseline Study, Midas Gold* (2015) ("Soil Study"). Although not explicitly stated in the text of the Soil Study, it appears that the 4% value was derived by taking an average of the percentage of silt-sized material (that which passes a #200 sieve screen, or <75 micron) from 28 native soil samples. These results of these sieve analyses are given in Appendix B of the Soil Study.

Unless the project intends to run haul trucks on native surfaced roads, the use of local soil silt content to estimate fugitive dust emissions makes no sense. There will be no soil on the surface of the haul roads; some type of aggregate will be used. The lithologic composition and particle size distribution of such surfacing aggregate is unknown at this time.

The Stibnite Gold Project Refined Proposed Action MODPRO2 ("MODPRO2") (Perpetua's revised plan of operations submitted to the Forest Service for NEPA review) states that "haul roads would be built and maintained for year-round access and would be surfaced with gravel aggregate." MODPRO2 at 23. Table 3-3 further states that "[l]imited amounts of development rock would be used to construct haul roads and pad areas for site facilities. In addition, some development rock may be and screened for use as road surfacing material and/or concrete aggregate. The Development Rock Management Plan, to be developed once the preferred alternative is identified, would specify testing to determine which development rock can be used for these applications." *Id.*

This statement illustrates how far out of sequence this permit application is.

A preferred alternative has yet to be chosen; the subsequent characterization of development rock has not been performed. In an earlier version of the Stibnite Gold Project plan, the use of material from the SODA (Spent Ore Disposal Area) was considered as a possible source of construction and/or aggregate material. Although a particle size distribution was not determined for this particular material, it was analyzed for metals content in Table 3-28 of the *Stibnite Gold Project Baseline Geochemical Characterization Report*, SRK (2017). Concentrations of several metals were found to be elevated, with arsenic notably present at a mean concentration of 1600 ppm. Thus, it seems that SODA material would be a poor choice for road surfacing aggregate. There is simply no locally derived data available that would be useful in the prediction of the silt-sized fraction of haul road surface aggregate.

EPA publication AP-42, Table 13.2.2-1 provides some measured silt values for industrial unpaved mine haul roads. (This document is cited in the Statement of Basis in several instances.) Mean silt contents range from 5.8 – 24.0%. This range has a significant degree of variation and the text of AP-42 carries the following caution: "Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data." Nevertheless, the lack of such local data leaves little choice but to consider these values.

Further support for using values higher than 4% can be found in the U.S. Department of Transportation Gravel Roads Maintenance and Design Manual. Table 1, pg. 42 indicates that surface aggregate should have 4-15% silt content. Regardless of what silt fraction value would be most appropriate for fugitive dust emission calculations, it is clear that the use of 4% is a decidedly <u>unconservative</u> value and will result in a significant underestimation of emissions.

B. Unrealistic projections of fugitive dust control efficiency coupled with underestimated dust emissions indicate that the permit to construct will not comply with NAAQS.

Calculations of fugitive dust emissions not only use unconservative values of road surface aggregate silt content, but estimates of dust suppression effectiveness are also unconservative. This is confirmed in the Statement of Basis where it states that emission control levels exceeding 93% represent an "aggressive level of control." Statement of Basis at 120. The Air Sciences 2018 report cited to support this level of control contains a lengthy argument that the 80% dust suppression effectiveness given in AP-42 13.2.2 is overly conservative and a figure of 90% can be derived from a review of the sources cited in that document. Curiously, although the Air Sciences report claims to have reviewed the AP-42 13.2.2 sources, none of the titles listed in the Section 13.2.2 references are included in Table 1 of the Air Sciences document. The relation of these Table 1 sources to AP-42 13.2.2 is unclear.

A review of one of the papers that is cited in the Air Sciences report (*Environmental Technology Verification Dust Suppressant Products*, EPA/600/R-05/128, January 2006) indicates that three separate studies were conducted, with PM_{10} control efficiencies of 84%, 86%, and 90% reported. The Air Sciences report only cites the 90% figure with no justification given for omission of the other values. The Air Sciences report also fails to cite evidence for the claim that supplemental application of water will provide the additional 3.3% efficiency determined to be necessary for compliance with NAAQS. As others have pointed out, the record suggests that rather than analyzing the potential control measures to quantify their effectiveness for a given set of conditions, a required control level may have been chosen prior to defining the measures needed to achieve it. If so, this seems to reflect a questionable analytical process.

Regardless of whether 80% or 90% represents a more accurate value for suppression efficiency or not, a more realistic value for silt content (as previously noted) will require more than 93.3% efficiency in dust control that the permit to construct now requires. As stated in the Statement of Basis, "Compliance [with NAAQS] is not demonstrated for emissions greater than those associated with above 93% control." Statement of Basis at 120. IDEQ has also noted that "it may prove challenging to consistently and continuously achieve targeted levels of fugitive dust control."

Given these issues, a Fugitive Dust Control Plan with details documenting how the targeted dust control measures will be achieved and compliance verified must be included in the permit and available for public review and comment. Additionally, given the unconservtive estimates of silt content value, if more realistic data is used, it is likely that fugitive dust emissions will exceed NAAQS limits even if 93.3% control efficiency can be achieved.

C. Arsenic concentrations in fugitive dust are underestimated and calls into question the determination that the Stibnite Gold Project is a synthetic minor source for HAP emissions.

Fugitive dust from haul roads remains to be one of the largest and unaccounted for sources of HAP emissions for the Stibnite Gold Project. The underestimated 4% silt content value used to calculate potential fugitive dust emissions likely resulted in a significant underestimation of haul roads potential to emit HAPs, particularly arsenic.

The Statement of Basis states that the Stibnite Gold Projects controlled HAP potential to emit arsenic emissions from haul roads of 0.464 pounds per hour. Statement of Basis at 18. This emission rate is based on the presumed concentration of arsenic in silt-sized particles present on the road surface. The validity of the process by which this crucial concentration value was determined is still in question. *See* above. As SSFS noted in the previous comment period, considerable discrepancy exists between elemental concentration values reported in a publicly available geochemistry paper (SRK, 2017) and the proprietary concentration data used for the permit to construct analysis. In their Response to IDEQ's Request for Information (2020), Midas/Perpetua contends that their proprietary data is better suited for air quality analysis as follows:

> **MG Response:** The commenter referred to the following alternative data:
>
> HAP metal concentration values can be found in Table 30-7 **[3-7]** of SRK, Stibnite Gold Project Baseline Geochemical Characterization Report (2017) at page 3-27.
>
> This report, Table 3-7 on page 3-27 of the 2017 Geochemical Characterization, was produced to distinguish between gold ore and development rock materials and calculated the mean metal concentrations from only 428 core samples. Therefore, for emissions calculations purposes, the data in this table is not representative of the metal concentrations for either ore or development rock.
>
> The median metal concentrations used in the PTC application for emissions calculations were derived from over 55,000 core samples taken primarily from the more mineralized zones of the SGP pits (i.e., in and around gold ore deposits) and are, therefore, a more representative dataset for estimating emissions. Because gold ore will constitute only 25% of the total materials mined, these data are both more robust and more conservative when applied to mining fugitive dust.
>
> Within the applied data set, the mean value is unduly influenced by a small number of high values in a skewed distribution. The median statistic provides a better measure of the central tendency of the data. The use of the median (or sometimes the geomean) instead of the mean for environmental data is consistent with the approach used by both EPA and IDEQ.

SSFS would like to offer several points in response to the three main advantages claimed for the proprietary data: 1) larger sample size, 2) values from "*more mineralized zones*" provide a conservative bias, and 3) median values are superior to mean values.

A closer review of the SRK 2017 report indicates that Table 3-1 (reproduced below) displays a summary of a much more robust dataset for comparative purposes.

Table 3-1. Statistical Summary of Key Multi-Element Results from the Exploration Database

Location	Development Rock/ Ore	n	Statistic[1]	Aluminum (ppm)	Arsenic (ppm)	Calcium (ppm)	Mercury (ppm)	Magnesium (ppm)	Manganese (ppm)	Sulfur (ppm)	Antimony (ppm)
Average crustal abundance (Mason, 1966)				81,300	1.8	36,300	0.08	20,900	950	260	0.2
Yellow Pine	Development Rock	19,268	P5	38,000	7	3,400	0.11	900	88	100	5
			Average	68,000	1,300	17,000	0.48	4,700	320	5,600	62
			P50	71,000	650	15,000	0.35	3,600	300	4,200	18
			P95	81,000	4,600	33,000	1.2	12,000	630	16,000	76
	Ore	4,889	P5	52,000	570	1,900	0.2	1,000	42	3,600	16
			Average	68,000	4,200	12,000	1.2	4,100	290	13,000	1,600
			P50	69,000	3,500	9,100	0.64	3,200	260	13,000	45
			P95	80,000	10,000	30,000	3.3	10,000	630	23,000	7,800
West End	Development Rock	4,853	P5	3,200	10	500	0.1	700	37	100	5
			Average	43,000	340	61,000	0.93	29,000	430	2,500	84
			P50	34,000	140	23,000	0.5	12,000	270	1,000	20
			P95	94,000	1,400	190,000	3.3	110,000	1300	9,200	150
	Ore	1,236	P5	17,000	310	1,400	0.18	2,000	65	100	15
			Average	58,000	2,500	37,000	1.8	16,000	350	8,500	130
			P50	60,000	1,600	26,000	0.9	13,000	310	7,200	52
			P95	96,000	7,800	110,000	6.3	45,000	770	23,000	370
Hangar Flats	Development Rock	12,147	P5	65,000	7	5,900	0.12	900	100	200	5
			Average	73,000	1,200	15,000	1.6	4,200	320	3,500	260
			P50	74,000	470	16,000	0.91	4,100	320	1,900	21
			P95	81,000	5,200	22,000	5.3	6,200	480	12,000	110
	Ore	3,594	P5	50,000	840	1,300	0.12	1,100	28	4,100	31
			Average	69,000	5,400	8,500	4.4	3,400	230	14,000	3,900
			P50	72,000	4,900	7,100	3.4	2,900	180	14,000	110
			P95	79,000	12,000	19,000	11	6,000	570	24,000	20,000

[1] P5 = 5th percentile; P50 = 50th percentile; P95 = 95th percentile

Source: SRK, Lith Representivity Analysis 200900.060 Id Rev06

	< 3 times average crustal concentration
	3 to 6 times average crustal concentration
	6 to 12 times average crustal concentration
	> 12 times average crustal concentration

It should be noted that in this case the total sample size is just shy of 46,000, not appreciably different for statistical validity purposes from the 55,000 proprietary sample set. It is quite possible that the n=46K data is a subset of the n=55K dataset, since why would one completely disregard such data in favor of a completely different set?

As far as the 667 ppm arsenic value derived from the 55K dataset being representative of "more mineralized zones" "in and around ore deposits," a comparison with the Table 3-1 P50 ore values would seem useful. Such values range from 1600 ppm in the West End pit to 4900 ppm in the Hanger Flats pit. A significant discrepancy.

When it comes to using median vs. mean values, the claim of high-end skew in the 55K dataset is used to justify use of the median. Without access to the actual statistical analysis performed there is no way to verify whether this is indeed a reasonable rationale. The statement that use of the median is consistent with approaches used by IDEQ and EPA is unsupported by any reference to EPA/IDEQ guidelines or other documentation. It should be noted that if one is interested in long term, cumulative exposure risk, using median values can lead to vastly underestimated total amounts, while estimates based on the mean will not have that bias.

The above observations are made primarily to illustrate the fact that there are enough discrepancies between the publicly available arsenic concentration data and the proprietary data used for emissions calculations in the permit to construct to call all subsequent calculations based on this data into question. IDEQ should seek to validate the statistical analysis and assumptions involved in deriving these fundamental HAP concentration values.

Given the major uncertainties and unconservative assumptions described above in the silt content of haul road surfaces, dust suppression efficiencies, and the arsenic content of fugitive dust, the accuracy of subsequent emissions calculations based on these parameters is highly suspect and likely to significantly underestimate actual PM and HAP/TAP emissions.

The validity and accuracy of the actual PM and HAP/TAP emissions determination is critical to the determination of whether the Stibnite Gold Project is a major source regardless of pollution controls under the NESHAP program.

4. Non-carcinogenic TAP analyses underestimated the emissions rates of acute exposure to iron and aluminum from fugitive dust .

The basic underpredictions of fugitive emissions due to the use of unreasonably low silt content value, as discussed above, indicate that the true potential to emit other IDAPA § 585 TAPs, such as iron oxides and aluminum, could also be significantly underpredicted. Calculations of IDAPA § 585 TAP increments also suffer from cherry-picking of data so as to make it appear that emissions will comply with the stated increments in IDAPA § 58.01.01.585.

According to IDEQ guidance, IDAPA § 585 TAPs exposure limits should be calculated from the maximum potential impacts over 24 hours for comparison against the acute impact limits. Modeling pollutants with short-term ambient air standards requires the use of a potential emissions rate that occurs over the duration of that averaging period, which for IDAPA § 585 TAPs is a maximum daily emissions. This would require conservative estimates that are well above the median rate of emissions; in other words, emission rates should be based on a concentration much higher than the median, and closer to the 90th percentile of the concentration of the pollutant in the source material.

The analyses of the short-term effects of iron and aluminum emissions here, however, were based on the median concentrations of those metals in the development rock samples in the assays, thus potentially significantly underestimating the predicted emission rates. Additionally, compounding factors, such as an underestimation of silt content value, enrichment from physical effects of heavy road traffic, and deposition (which increases TAP concentrations in surface materials over time), and basing emissions on PM rather than PM10, have all contributed to an underestimation of emission rates.

Moreover, it is unclear--because there is no development rock management plan and no specified preferred alternative by the Forest Service--exactly what material will be used for haul roads. As discussed above, one alternative in the DEIS proposes using development rock as well as spent ore disposal area material, while the MODPRO2--which is yet to be evaluated by the Forest Service--only mentions the use of development rock. This uncertainty and lack of planning calls into question the data presented in the permit to construct and Statement of Basis.

The data presented in the application for the permit to construct already indicate that ambient air concentrations of iron will increase by 14.1%, and 5.5% for aluminum. IDEQ's review of these analyses in the Statement of Basis indicates impacts as high as 27% for iron and

10% for aluminum. It is likely, based on the discussion above, that a new analysis of the impacts of iron and aluminum would show that emissions would cause exceedances of the ACC ambient impact limits that go beyond the emission limits established in IDAPA 58.01.01.585 for non-carcinogenic TAPs, creating an noncompliant ambient impact and unacceptable public health inhalation risk.

Conclusion

Based on the comments above, SSFS asks that IDEQ deny this draft permit to construct.

Attachment #3

Comments on Revised Midas Gold/Perpetua Resources PTC

Ian von Lindern, P.E. PhD, TerraGraphics International Foundation

Moscow, Idaho March 19, 2021

Reviewer Qualifications: My name is Ian von Lindern. I reside in Moscow, Idaho. I am a licensed Professional Engineer in Chemical Engineering in Idaho and have practiced in the disciplines of Environmental Engineering and Risk Assessment in Idaho for the last 47 years. I hold a BS degree in Chemical Engineering, and MS and PhD degrees in Environmental Science and Engineering specializing in air pollution and public health. I was the Regional Environmental Engineer for the IDEQ's predecessor agencies in both the Coeur d'Alene and Twin Falls offices and processed Air Quality permits for the Agency for several years at the major mining and smelting operations in the State, including the US last operational antimony smelter at Big Creek, Idaho. I was President and Principal Scientist for TerraGraphics Environmental Engineering for 30 years and was Project Manager and lead risk assessor for the Bunker Hill Superfund Site as IDEQ's lead consultant. During that tenure, I directed more than 30 major environmental health investigations at mining and smelting sites, both nationally and internationally. Since retiring from the consulting business, I co-founded TerraGraphics International Foundation (TIFO) and continued to work in mining-related health and safety issues in poor countries. Most notably, I am currently working with the international humanitarian organization Médecins sans Frontieres (Doctors Without Borders) assisting the Kyrgyz Republic Ministry of Health in developing health protective strategies to reopen both mercury and antimony smelters in Batken, Kyrgyzstan. These facilities were among the largest Hg and Sb producers in the former Soviet Union and are essential to the regional economy. As such, I have considerable insight and experience with the issues associated with the proposed antimony-gold operation at Stibnite.

I have reviewed the revised Draft Permit to Construct revisions and associated documents on behalf of TIFO. TIFO's mission is to assist mining and mineral processing communities to operate as safely as practicable while maintaining essential economic activities. In that regard we support scientifically-sound and transparent analyses of the environmental and human health issues faced by mining communities; and the development of local solutions implemented within local socio-economic and cultural capabilities. The Stibnite proposal is of interest because both the industry and the US regulatory have the capacity to implement the best practices that are not available to poor communities throughout the world. In that regard, although the current effort has collected and assembled a large amount of credible scientific data, it is not been analyzed and presented in a health/environment protective manner reflective of capabilities of the applicant or the regulatory agency.

General Comments: The reviewer appreciates IDEQ's openness and frank discussion in the March 3, 2021 Public Information Hearing. The hearing was helpful in understanding the Applicant's (Midas') and IDEQ's approach and the regulatory determinations with respect to the pending Permit to Construct (PTC). It has also led this reviewer to undertake more detailed analysis of the emissions estimates, NESHAPS exclusions, and subsequent modelling and compliance issues in the areas IDEQ is requesting additional comment.

This is an exceedingly complex and difficult application to review. IDEQ staff has done a commendable effort to assess ambient hazards within the constraints imposed by the regulatory determinations of State and federal rules. IDEQ's presentation - in terms of the three-legged stool of **Emissions Inventory**, **Regulatory**, and **Modeling** - provides useful insight into the permitting process. However, in terms of the underlying obligations of State and federal agencies to protect health and the environment, the result is a public health travesty.

It is incredible that through the maze of regulatory determinations, more than 99% of the emissions of arsenic, a potent carcinogen, were eliminated from the emissions inventory, resulting in modeling of less than 1% of the toxic impact. The ultimate result is that IDEQ is proposing to issue a draft Permit to Construct for a facility that will potentially emit thousands of tons of toxic air pollutants without considering the potential impacts on human health.

These comments are limited and do not cover several salient points (both within and beyond the particular areas to which IDEQ's request for comments extends), that also call for complete re-evaluation of the PTC Application. All of the following comments pertain directly or indirectly to the .464 lbs/hr As emission rate cited by IDEQ in reclassifying the facility following the last round of Public Comments.

The basic points to these comments are:

1) The Applicant has underestimated particulate emissions (PM, PM10 and PM2.5) by 1.9 to 5 times, and the subsequent arsenic emissions by 5.6 to 12 times.
2) The underestimates are the result of a combination of assuming minimal values for key parameters not consistent with appropriate guidance and scientific rigor.
3) The level of controls assumed for fugitive dust emissions are doubtful and, likely, unprecedented. No supporting literature or manufacturers' guarantees are provided.
4) Were the emission rates corrected, and reasonable control efficiencies applied, the subsequent modeling would likely show non-compliance with both NAAQS and HAP/TAP regulations.
5) The .464 lb/hr arsenic Potential To Emit (PTE) figure cited by IDEQ is underestimated by 5 to 12 times, depending on the estimated silt content and arsenic concentration in the roadbeds.
6) IDEQ's regulatory determinations preclude IDEQ from calculating and disclosing the cancer risks associated with these emissions.
7) This prohibition is the result of IDEQ's acceptance of an unprecedented exclusion of non-mercury fugitive emissions from State regulation. IDEQ assumes the federal USEPA regulations are protecting Idaho citizens.
8) IDEQ's faith in the federal government is misplaced in this situation. Cursory examination of the modeling results suggests that residual cancer risk, due to Haul Roads alone, at the minimal emission rates proposed by the Applicant, exceed 10E-06 (1 in 1 million) cancer risk, the USEPA's threshold for concern.
9) Residual cancer risk is after applying all required emissions controls and assuming the unlikely control levels are achieved. Specifically stated, the best case scenario by the applicant's own estimates, likely, exceeds threshold levels for risk of respiratory cancer.

10) Application of more reasonable arsenic emission rates show potential cancer risks as high as 10E-03 (1 in 1000), well beyond the USEPA's acceptable risk range.
11) Precise calculations are not available, as IDEQ has not undertaken the analyses, or is refusing to disclose the same if produced in the modeling runs.
12) IDEQ's interpretation of the rules specifically forbids the Agency from disclosing these risks to the public in evaluating this PTC.
13) IDEQ could provide this protective service with minimal effort in comparison to time and resources already dedicated to this PTC.

A brief Summary of the findings is provided below, followed by detailed analyses. Both are arranged per the three legs of the IDEQ's PTC review process:

Emissions Inventory Summary

In-depth review of the Emissions Inventory reveals there are several factors that have not been given objective treatment in developing the arsenic emissions totals. In some cases, these factors seem in direct contradiction to the guidance cited in the application. Some of these factors relate to the estimation of Total Particulate (PM) and PM10 emission rates, and the scaling of those emissions by HAP/TAP concentrations to assess compliance and potential health risks to the Idaho public. Others relate to the lack of scientific rigor in the selection of characteristic HAP/TAP emission rates used as input to source classification and ambient impact models.

There is a lack of transparency in the emissions estimates and subsequent modeling that requires substantial reverse engineering efforts to evaluate. Unraveling the arsenic emissions/impacts that IDEQ is requesting comment on, requires revisiting i) the particulate emission estimates, ii) the characteristic As (and other HAP) concentrations assigned to the source media (roadbed), and iii) identifying those emissions ignored due to the proposed NESHAPS exclusions.

i) The analyses below demonstrate that appropriate application of the cited AP-42 guidance for estimating silt content substantially changes the overall PM emissions estimates. Subsequently, these modifications also increase arsenic and HAP emissions. PM emissions from haul roads are likely 1.6 to 3.5 times greater than those used by IDEQ in the regulatory determinations and ambient impact modeling. Similarly, PM10 emissions are 1.9 to 5 times greater. By the current methodology employed by Midas and IDEQ, these adjustments require fugitive dust control ranging from 96% to >98%. Given the substantial doubt regarding Midas' ability to achieve the required 93.3% control level in the current draft permit, IDEQ should reconsider the compliance issues with respect to PM10.

ii) The AP-42 guidance used is specifically limited to PM, PM10 and PM2.5 emissions estimates. Applying these formulae to estimate arsenic and other metal contaminant emission rates requires determining the appropriate metal content of silts in the roadbed. Midas' methodology is questionable on two counts: characteristic concentrations and enrichment factors. Because the potential emissions reflect the aggregate accumulation of metals from both roadbed construction material (crushed gravel from Development Rock) and spills (hauled and tracked ores and development rock), the weighted average concentrations of As in the materials placed and hauled should be used to calculate a characteristic contamination concentration. The use of median concentrations from rock cores, much of which will never be excavated, is incorrect. The correct use of average values increases the As content in silt by 2.5 times. In addition, it has long been recognized in USEPA guidance that estimating metals emissions from unpaved roads at contaminated mining sites requires application of enrichment factors. The enrichment factor recommended by EPA for As at these types of sites is 1.28. The combination of use of the median values and failure to apply an enrichment factor, indicate arsenic concentrations should be increased by 3.2 times.

Even more disconcerting, review of the Emissions Inventory suggests that PM emission should be increased by 1.6 to 3.5 times indicating that arsenic emissions are likely 5.6 to 12 times greater than the value (.464 lb/day) IDEQ has cited in soliciting comments. Total As fugitive emission by the Applicant's current minimal projections are >30 TPY uncontrolled, and 2 TPY controlled at the dubious 93.3% control level. More likely fugitive emissions from haul roads are 170 -366 TPY of arsenic uncontrolled, or 17 – 73 TPY with a more realistic 80-90% control efficiency.

Regulatory Summary

It seems that IDEQ's regulatory evaluation has gone to extraordinary lengths to accommodate the Applicant's interpretations of the rules and regulations. IDEQ accepted the Applicant's amending of **40 CFR 63, § 63.11651** definition that would exclude the SGP facility from the gold mine ore processing and production source category, as antimony constitutes 99% of the total mass of metal production over the life of the operations.

IDEQ then, per the Applicant's suggestions, redefined the sources addressed under NESHAPS 7E and adopted a, seemingly extraordinary, interpretation: that the NESHAPS 7E "Gold Rule" applies to this facility and includes arsenic and fugitive emissions. Both interpretations contradict the federal EPA' response to comments in promulgating the rule in 9458 Federal Register / Vol. 76, No. 33 / Thursday, February 17, 2011 / Rules and Regulations. Specifically, EPA states:

> *Gold mine ore processing is an area source category listed under section 112(c)(6) for regulation under section 112(d)(2) solely due to its mercury emissions.*
>
> *Due to the lack of information, we have not included fugitive mercury emissions at gold mine facilities in our 1990 baseline emission estimate (or in our more recent emissions estimates) for the gold mine ore processing and production area source category. Accordingly, these fugitive emissions are not part of the source category we are listing and in this final rule.*
>
> *As explained in the proposed rule, the gold mine ore processing and production area source category covers the thermal processes that occur after ore crushing, including roasting operations (i.e., ore dry grinding, ore preheating, roasting, and quenching), autoclaves, carbon kilns, electrowinning, preg tanks, mercury retorts, and furnaces.*

Although EPA explicitly identifies non-mercury HAPS, all sources before ore crushing, and fugitive emissions sources, as not addressed under the NESHAPS 7E "Gold Rule"; IDEQ nevertheless concluded that those sources were "addressed," represent no risk to public health and the environment, and are excluded from consideration in modeling, impact analyses, and consideration under the "safety valve" Section 161 Rule.

Incredibly, IDEQ's regulatory review i) changes the definitions of those activities regulated by the EPA under NESHAPS, and ii) adds source categories specifically identified by EPA as not part of the rule, and iii) then argues that EPA had "addressed" these same items.

Were the federal NESHAPS rules applied per the federal code, it seems:

> - NESHAPS 7E does not apply as: "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."
>
> - Were NESHAPS 7E applicable – "... the gold mine ore processing and production area source category covers the thermal processes that occur after ore crushing …" ; and "fugitive emissions are not part of the source category we are listing and in this final rule."

IDEQs regulatory determination that EPA is "addressing" the 99% of overwhelming toxic air pollutant emissions from this facility has the unfortunate, and irresponsible, result that the toxic air pollutant emission from this facility will not be evaluated for health impacts, nor monitored, nor measured throughout the life of operations. There is no indication that the federal EPA intends to independently assess these emissions either.

Modeling Summary

IDEQ's regulatory position that Fugitive Emissions of HAPs are covered by NESHAPS 7E results in the facility being classified as a synthetic minor source. Only a miniscule portion of the HAP emissions are evaluated for potential harm to human health and the environment as an incremental impact. IDEQ admitted in the public hearing that the ambient modeling analyses have considered <1% of the As emissions included in Midas' minimal submittal. The explicit value calculated at the minimal emission rates submitted by the Applicant in the Emissions Inventory is 0.82% of the underestimated arsenic emissions. Because arsenic emissions are underestimated by a factor of 5 to 12; modelling efforts have, in reality, evaluated <0.1% (i.e. 1/1000th) of the potential impact to citizens' health.

Nevertheless, IDEQ has clearly expended considerable resources performing an elegant and complex modeling analysis. Unfortunately, the regulatory determinations have rendered it near useless for evaluating public health protectiveness for this PTC. Re-running the models at more conservative emission rates, noted above, would likely change the Source Classification to A, even with the questionable NESHAPS exclusions. Additionally, several of the HAP screening levels in Statement of Basis Tables would exceed threshold values.

With regard to risk of respiratory cancer from haul road arsenic emissions alone, extrapolation of the PM10 and PM2.5 particulate results disclosed by IDEQ are detailed below. These results demonstrate that even the best-case scenarios, using underestimated emission estimates provided by the applicant, respiratory cancer risks exceed the USEPA and IDEQ cancer screening levels. Under more realistic emissions and control scenarios, risk levels are of significant concern well above the USEPA 10E-06 to 10E-04 acceptable criteria.

These results, by necessity, are a semi-quantitative analysis of cancer risk. It is frustrating that IDEQ is withholding these risk calculations from reviewers and the public. Modeling, following proper removal of the fugitive arsenic emissions from the NESHAPS exclusion, would likely require a complete re-evaluation of all three legs of IDEQ's review protocol, and a possible appeal or withdrawal of the PTC application.

Numerous issues could likely be resolved, were IDEQ to model the anticipated ambient concentrations in the air that people will breathe at, and beyond, the property:

- including all emissions regardless of regulatory interpretation,
- at the different emissions levels,
- reflecting the range of uncertainties in PM, PM10, and As emission rates, and
- calculating cancer and non-carcinogenic risk associated HAPA/TAPS

Given the background, competency, and experience with this site, IDEQ staff is capable of performing these analyses in relatively short order. It seems incumbent on any Public Health authority, with the capacity to provide such vital health information, to do so in the interest of the State's citizens. The results would be invaluable in promoting public dialog and consideration of this most important issue.

Summary Discussion and Recommendation

There is well-founded concern, even at the underestimated emission rates in the current application, that the total ambient impact of arsenic emissions at the property boundary is a substantial threat to public health. It is unfortunate that IDEQ believes the Agency is forbidden by State and federal rules from estimating and disclosing these concentrations to a concerned public.

Considering that the Emission Rates in the current analyses are potentially underestimated by an order of magnitude, an assessment of danger to public health by a least one of the regulatory agencies, and the trustees of the adjacent public lands, should be mandatory.

Both IDEQ under Idaho Air Rules Section 161 and the federal EPA under Section 112 of the Clean Air have the statutory authority and obligation to assess and accordingly regulate these fugitive arsenic emissions above and beyond the NESHAPS 7E.

> Section 112 *"…based on a finding of adverse effects to human health or the environment…"*

> 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.*

The Permit should be denied until such time that the IDEQ and EPA, those Agencies that the public depends on to protect health and the environment, conduct (and publicly disclose in a transparent manner) a responsible evaluation of the potential health and environmental ambient air impacts of the proposed facility.

Technical Analyses

Emission Inventory Analysis – Underestimates of PM, PM10, HAP/TAPs including Arsenic

Arsenic emissions were brought to IDEQ's attention in the first comment period. IDEQ queried Midas, and subsequently, IDEQ changed the source classification based on the following statement on page 18 of the Statement of Basis:

> *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.*

Midas' application calculates the cited 0.464 lbs/hr (page 6 of the Mine Tab of the spreadsheet "Copy of 20200623-Midas Gold SGP PTC EI - Final-TAPr2.2" provided by IDEQ staff for independent review). The 0.464 lbs/hr As is derived by multiplying the W3 modeling scenario 3047.34 TPY PM estimate for Haul Roads by 667 ppm As median concentration in roadbed silt. Explicitly calculated, this translates to 2.03 TPY As controlled, or 30.3 TPY As uncontrolled emissions by IDEQ's assertion of 93.3% control.

However, closer examination of the total PM calculation - that is the basis of the cited As emissions - suggests considerable uncertainty in the i) PM, ii) PM10, iii) required control efficiencies, and iv) As concentrations in PM, that are the basis for IDEQ's determination with respect to the As PTE.

Midas' PM calculations underlying the As, and all HAP/TAP, emissions estimates references Equations 1a and 1b in the following guidance as the basis for the calculations:

AP-42, Sec. 13.2.2, Eq. 1a, 11/06

This guidance indicates in the application of these Equations, that the assumed silt content of the roadbed is among the most critical variables and states the following:

> ***13.2.2 Unpaved Roads***
> *13.2.2.1 General*
> *When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.*
>
> *Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [um] in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. A summary of this method is contained in Appendix C of AP-42. Table 13.2.2-1 summarizes measured silt values for industrial unpaved roads. Table 13.2.2-2 summarizes measured silt values for public unpaved roads. It should be noted that the ranges of silt content vary over two orders of magnitude. Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data.*

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 – 19	17
Iron and steel production	Plant road	19	135	0.2 – 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 – 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 – 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 – 25	17
	Haul road (freshly graded)	2	5	18 – 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 – 21	6.4

[a]References 1,5-15.

Midas uses a 4% silt content referencing:

(Midas Gold 2015) *"Soil Resources Baseline Study, Stibnite Gold Project." Reid, Samuel B., Assistant Geology Supervisor, Midas Gold, Inc., April.*

The Appendix to the cited document notes <75 micron fractions for28 on-site sieved soil samples, but it is unclear how the 4% value was selected. Although the guidance indicates the importance of locally collected data, the 4% silt content results cited are most relevant to “dirt roads” operating on native soils. Industrial constructed gravel haul roads are generally designed and maintained at higher silt contents, as indicated in Table 13.2.2.1 of the AP-42 document (i.e., mean values ranging from 5.8% to 24%).

Moreover, Midas’ emission calculations include control assumptions, and are not transparent in explicitly calculating uncontrolled emissions. Specifically, the calculations incorporate the very control adjustments, 93.3% reductions in the uncontrolled emissions, subsequently required by IDEQ to achieve

PM10 compliance. A more conventional approach would be to calculate uncontrolled emissions, objectively estimate potential controls, calculate controlled emissions, and model the impacts. The purpose of such a procedure would be to determine if the available control technology is sufficient to protect public health. Midas appears to have reversed this procedure, inserting the necessary control levels in the calculations *after* determining the minimum levels required. The controls strategy applied to the uncontrolled emissions are found on page 6 of the Emissions Inventory:

Emission Controls			
Unpaved roads - periodic application of water and chemical dust suppressant			
Control efficiency:	90%	*(Air Sciences 2018)*	for chemical suppressant; annual and daily
	33%	*Conservative estimate*	for watering; daily only

The pertinent Guidance (AP-42) discusses application of both technologies. As Midas' control strategy relies largely on chemical dust suppressants, it is important to note the following:

> *As opposed to watering, chemical dust suppressants have much less frequent reapplication requirements. These materials suppress emissions by changing the physical characteristics of the existing road surface material. Many chemical unpaved road dust suppressants form a hardened surface that binds particles together. After several applications, a treated road often resembles a paved road except that the surface is not uniformly flat. Because the improved surface results in more grinding of small particles, the silt content of loose material on a highly controlled surface may be substantially higher than when the surface was uncontrolled. For this reason, the models presented as Equations 1a and 1b cannot be used to estimate emissions from chemically stabilized roads. Should the road be allowed to return to an uncontrolled state with no visible signs of large-scale cementing of material, the Equation 1a and 1b emission factors could then be used to obtain conservatively high emission estimates. p 13.2.2-11*

> *The control effectiveness of chemical dust suppressants appears to depend on (a) the dilution rateused in the mixture; (b) the application rate (volume of solution per unit road surface area); (c) the time between applications; (d) the size, speed and amount of traffic during the period between applications; and (e) meteorological conditions (rainfall, freeze/thaw cycles, etc.) during the period. Other factors thataffect the performance of dust suppressants include other traffic characteristics (e. g., cornering, track-on from unpaved areas) and road characteristics (e. g., bearing strength, grade). The variabilities in the above factors and differences between individual dust control products make the control efficiencies of chemical dust suppressants difficult to estimate. Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM-10 control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month. p 13.2.2-12*

The highlighted sentences suggest considerable uncertainty in Midas' emission calculations for particulates, and that the proposed 93.3% control assumptions are particularly suspect. It is more likely the control efficiencies will, realistically, be 80 to 90% effective. The Emissions Inventory spreadsheet suggests the original model runs were at 90% control from dust suppressants. An additional 33% control factor for watering was subsequently added to effect an overall 93.3%, ostensibly necessary to achieve PM10 compliance. This reviewer is unaware of any evidence that watering chemically treated roadbeds has a multiplicative positive effect. Water may, possibly, *decrease* the duration and effectiveness of the chemical suppressant. IDEQ should require manufacturers' assurances of the effectiveness and duration of this combined control strategy.

Objective consideration of the AP-42 guidance for unpaved industrial haul roads would indicate the minimal 4% silt content emissions estimates should be augmented, or replaced, with a more likely 8% mean, and a 24% reasonable maximum silt content per Table 13.2.2.-1. This is relatively easily accomplished by substitution of the values into the emissions spreadsheet. The following Table summarizes the results.

Emissions by Area				PM_TPY	PM10_PPD	PM10_TPY	PM2.5_PPD	PM2.5_TPY		
				PM	PM10		PM2.5		Control Used	
Area ID	Activity			ton/yr	lb/day	ton/yr	lb/day	ton/yr	Annual	Daily
HR	Onsite Hauling			2,901.3	3,899.4	712.9	389.9	71.3	90.0%	93.3%
CONTROLLED		4	% silt	2,901.3	3,899.4	712.9	389.9	71.3		
	using	8	% silt	4,713.1	7,276.5	1,330.4	727.7	133.0		
		24	% silt	10,169.4	19,558.4	3,576.0	1,955.8	357.6		
Increase from 4%		8	% silt	162%	187%	187%	187%	187%		
		24	% silt	351%	502%	502%	502%	502%		
UNCONTROLLED		4	% silt	29013	58200	7129	5820	713		
		8	% silt	47131	108605	13304	10860	1330		
		24	% silt	101694	291916	35760	29192	3576		
Compliance Point									Control Req.	
Controlled		4	% silt		3,899					93.3%
Uncontrolled					58200					
Controlled		8	% silt		3,899					96.4%
Uncontrolled					108605					
Controlled		24	% silt		3,899					98.7%
Uncontrolled					291916					

The results indicate that appropriate selection of 8% and 24% for roadbed silt content increases uncontrolled PM emission by 162% to 351% (1.6 to 3.5 times), respectively, and PM10 emissions by 1.9 to 5 times, respectively. Total arsenic emissions would increase by the ratios as PM, but particulate As toxicity would be amplified by the PM10 ratios.

Assuming compliance is based on daily PM10 maximum emission rate of 3899 lbs/day and 93.3% control, reverse engineering suggests 96.4% to 98.7% control of Haul Road fugitive emissions would be required under these more realistic scenarios. AP-42 guidance suggests chemical suppression can reliably achieve 80% reductions if rigorously maintained; watering would need to be nearly continuous to achieve the 93.3% level. Higher control efficiencies are not likely achievable with an acceptable degree of certainty.

Total As Emissions: As noted above in the application of AP-42 Equations 1a and 1b,

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.

The explicit calculation is 30.3 TPY As uncontrolled and 2.03 TPY controlled emissions for Haul Roads. Arsenic emissions are a component of PM for assessment purposes, requiring minimum adjusted increases of 1.6 to 3.5 times per the preceding discussion. The .464 lb/hr As emission value can be found on the CALCS Tab at KB16 – or KB18 in Table 1 Tab of the Emissions Inventory Spreadsheet. The value is derived by multiplying the PM emission rate for modelling scenario W3 by the supposed 667 ppm As content of the roadbed cited in the references.

Arsenic Content of the Roadbed Silt: The AP-42 guidance used is specifically limited to PM, PM10 and PM2.5 emissions estimates. Applying these formulae to estimate arsenic and other metal contaminant emission rates requires determining the appropriate metal content of silts in the roadbed. Midas' methodology is questionable on two counts: i) the use of median concentrations and ii) failure to include the enrichment factors recommended in EPA guidance,

Because the potential emissions reflect the aggregate accumulation of metals from both roadbed construction material (crushed gravel from development rock) and spills (hauled and tracked ores and development rock), weighted average (rather than the median) concentrations of As in the materials placed and hauled should be used. The use of median concentrations from rock cores, much of which will never be excavated, is incorrect. The correct use of average values increases the As content in silt by 2.5 times.

IDEQ noted in the Response to Comments in the previous permit evaluation that "While a material balance is a useful approach to developing emission estimates, it is not a requirement". A complete material balance for arsenic, mercury and antimony for Midas proposed mining and disposition of ores and development rock was developed for the USFS DEIS review. A copy of the Material Balance is attached for IDEQ's consideration. The following Table calculates a weighted average for the arsenic content of the actual development rock and ore haul estimates.

Arsenic Concentrations of Development Rock and Ores Hauled On-site		
		As ppm
DR Total	P5	8.1
	Average	909
	P50	410
	P95	3533
Ore Total	P5	1006
	Average	6999
	P50	5947

	P95	16629
Combined Weighted		As ppm
	P5	156
	Average	1812
	P50	1231
	P95	5476

In addition, it has long been recognized in USEPA guidance that estimating metals emissions from unpaved roads at contaminated mining sites requires application of enrichment factors. The enrichment factor recommended by EPA for As at these types of sites is 1.28. As a result, total As PM emissions should be increased by a factor of 5.6 to 12 times. The following is guidance is excerpted from

Estimation of Air Impacts from Area Sources of Particulate Air Emissions at Superfund Sites - Report ASF32. This methodology remains the best scientifically sound guidance available to translate PM and PM10 emissions derived by AP-42 Equations 1a and1b to HAP metal concentrations.

If the dust is contaminated, the PM or PM_{10} emission rates given in this document may be translated to emission rates of the contaminant as follows:

$$EF_i = X_i \, EF \qquad \text{(Eq. 6)}$$

where EF_i = emission factor of contaminant i [g/VKT]; and
X_i = fraction of contaminant i in particulate matter [unitless].

In general, the dust and silt at a site will contain a higher fraction of the metal species than the bulk soil at the site; i.e. the particulate matter is enriched with the metals.[9] Therefore, X_i is equal to:

$$X_i = C \, Z \, 10^{-6} \qquad \text{(Eq. 7)}$$

where C = concentration of metal in the bulk soil [μg/g];
Z = enrichment factor [unitless]; and
10^{-6} = conversion factor [g/μg].

Table 2.

Metal Concentration and Enrichment Data (Z)

CAAA[a] Metals	Median Enrichment Factor (Z)
Antimony (Sb)	--
Arsenic (As)	1.28
Beryllium (Be)	--
Cadmium (Cd)	1.31
Chromium (Cr)	4.72
Cobalt (Co)	--
Lead (Pb)	7.34
Manganese (Mn)	--
Mercury (Hg)	3.00
Nickel (Ni)	--
Selenium (Se)	2.00
Other Metals	
Barium (Ba)	1.85
Silver (Ag)	1.00

Source: Reference 9

[a]CAAA = Clean Air Act Amendments of 1990

The following Table calculates Potential Total Arsenic Emissions from haul roads adjusting for the appropriate silt content in the roadbed, Arsenic content in the materials placed and hauled, and the Arsenic enrichment factor.

	HAP/TAP Arsenic Emissions Adjusted for Silt Content and Enrichment Factor					
				HR000_pph	TPY	TPY
		ORE	DR	HR000	HR000	HR000
		Concentration (ppm)		lb/hr	Controlled	Uncontrolled
	As a fraction of PM					
4	% silt	667	667	0.464	2.03	30.3
8	% silt	667	667	0.750	3.29	49.1
24	% silt	667	667	1.613	7.06	105.4
4	% silt	1812	1812	1.261	5.52	82.4
8	% silt	1812	1812	2.038	8.93	133.3
24	% silt	1812	1812	4.381	19.19	286.4
	Enrichment Factor Added				0.00	
4	% silt	667	667	0.594	2.60	38.8
8	% silt	667	667	0.960	4.21	62.8
24	% silt	667	667	2.064	9.04	134.9
4	% silt	1812	1812	1.614	7.07	105.5
8	% silt	1812	1812	2.609	11.43	170.6
24	% silt	1812	1812	5.607	24.56	366.6

* There is a discrepancy in the emissions inventory calculations. Haul Road emissions of 2901.3 TPY in the preceding Emissions by Area Table was based on 16415 VMT/da but the basis of 0.464 lb arsenic/day used HR emissions of 3047.34 TPY and 16697 VMT/da.

The results in this Table shows that the .464 lb/hr value that DEQ cites as the basis for source classification is a minimal estimate based on the least-conservative assumptions. More likely uncontrolled arsenic emissions will range from 171 to 367 TPY, or 11 to 25 TPY controlled if 93.3% control can be achieved.

The same analyses apply to all HAPS in haul road fugitive emissions. All HAP emission estimates are at least 1.6 to 3.5 times greater due to underestimation of roadbed silt content and 2 to 3 times greater due to reliance on the median rather than mean concentrations in placed and hauled material. Mercury has an additional 3.0 enrichment factor, indicating Hg emissions from haul roads are underestimated by as much as 28 times.

Regulatory Review Analyses

In the Statement of Basis, Regulatory Analysis Page 27, IDEQ states the following:

> *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).

The following Table 8 in the Statement of Basis in reference to NESHAP Subpart EEEEEEE (a),

defines the **Source Category Subject and Addressed** as:

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. Doré bars are an amalgam of gold and silver.

and **Sources** includes:

Mining- drilling, blasting, excavating, hauling, prill silos, rock dumps and storage piles, tailings

Footnote (a) refers to **NESHAP in 40 CFR 63**

The Source Category definition is the example North American Industry Classification System (NAICS) business category description presented in the preamble to the regulation, not the emission sources covered by NESHAPS 7E. Sources addressed are defined in the promulgation and subsequent regulation. These do not include any emission source prior to ore crushing, nor any fugitive sources. Moreover, those sources, by metal mass are oriented toward antimony production. In reality, prior to crushing and subsequent gold floatation, this facility is clearly an antimony mine in terms of mass metal production. See the attached Material Balance. Neither the inclusion of Mining, nor the individual mining sources, particularly hauling, are found in the current Electronic Code of Federal Regulations (eCFR) **NESHAP in 40 CFR 63,** nor were anticipated or addressed by EPA.

Rather, **§ 63.11651 What definitions apply to this subpart?**, contains the following definition:

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.

This definition is also noted on pages 212-213 of the Midas Stibnite Gold Project Permit to Construct Application, June 2020, regulatory review. However, Midas highlighted portions of the definition and struck the remainder as not applicable to the proposed facility, as follows:

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.~~

The striking of the last sentence is of particular interest. Midas' 2019 feasibility study for the Stibnite Gold Project (-M3_2019_SGP Prefeasibility Study Technical Report), submitted as support ~~material~~ for the US Forest Service (USFS) Draft Environmental Impact Statement (DEIS) contains projections for metal production at the facility. In Section 22, Economic Analysis **- Table 22-2 Projected Metal Production** –total production during facility life projects 4023 Koz of Gold and 98,892 Klbs of Antimony. This Table indicates total gold production will account for 0.25% of the mass of metals produced, with antimony accounting for more than 99% of metal mass. This would indicate that this facility is not a gold mine ore processing and production facility and not eligible for exclusion under NESHAPS 7E.

There is no indication in the Statement of Basis as to why IDEQ would accept the striking of this key definition in the application of NESHAPS 7E. Neither is there any indication of why IDEQ has modified the definition of **Source Category Subject and Addressed** and **Sources** to include mining, and particularly hauling, activities that are the largest source of particulate and HAP emissions.

EPA in promulgating NESHAPS 7E specifically excluded mining. EPA states in **9458 Federal Register** / Vol. 76, No. 33 / Thursday, February 17, 2011 / Rules and Regulations:

> Gold mine ore processing is an area source category listed under section 112(c)(6) for regulation under section 112(d)(2) solely due to its mercury emissions.
>
> Due to the lack of information, we have not included fugitive mercury emissions at gold mine facilities in our 1990 baseline emission estimate (or in our more recent emissions estimates) for the gold mine ore processing and production area source category. Accordingly, these fugitive emissions are not part of the source category we are listing and in this final rule.
>
> As explained in the proposed rule, the gold mine ore processing and production area source category covers the thermal processes that occur after ore crushing, including roasting operations (*i.e.*, ore dry grinding, ore preheating, roasting, and quenching), autoclaves, carbon kilns, electrowinning, preg tanks, mercury retorts, and furnaces.

It seems irrational that IDEQ in its regulatory review would i) change the definitions of those activities regulated by the EPA under NESHAPS, and ii) add source categories specifically identified by EPA as not part of the rule, and iii) then argue that EPA had "addressed" these same items. Were the federal NESHAPS rules applied per the federal code, it seems:

- NESHAPS 7E does not apply as: "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."

- Were NESHAPS 7E applicable – "... the gold mine ore processing and production area source category covers the thermal processes that occur after ore crushing …" ; and "fugitive emissions are not part of the source category we are listing and in this final rule."

It appears that IDEQ regulatory evaluation has gone to extraordinary lengths to accommodate the applicant's interpretations of the rules and regulations. The result is that the largest sources of both NAAQS PM10 and HAPS, particularly a highly toxic carcinogen arsenic, under a NESHAPS exclusion that precludes objective evaluation of potential harm to human health and the environment.

Modeling Analyses

IDEQ has performed an elegant and complex modeling analysis. Unfortunately, the regulatory determinations have rendered it near useless for evaluating public health protectiveness for this PTC. Re-running the models at more conservative emission rates, noted above, would likely change the Source Classification to A, even with the questionable NESHAPS exclusions. Additionally, several of the HAP screening levels in Statement of Basis Tables would exceed threshold values. Modeling, following proper removal of the fugitive arsenic emissions from the NESHAPS exclusion, would likely require a complete re-evaluation of all three legs of IDEQ's review protocol.

The most disconcerting aspect of the modeling is that, as a result of the supposed regulatory constraints, the analyses obscure the most significant health risks. Overall, the complexity of the emissions inventory, available only as a hundred page interconnected spreadsheet, combined with the regulatory exclusion of 99% of the toxic emissions, makes the modeling, perhaps, the definition of "lack of transparency".

With considerable effort, it is possible to "reverse engineer" the results presented in the Statement of Basis tables to estimate a probable range of carcinogenic risk associated with Haul Road arsenic emissions. A brief analysis of potential health can be performed by scaling the results of the Applicant's/ IDEQ evaluation for PM10 compliance in Tables 26 through 30 of the Statement of Basis.

Table 26 indicates the exceedance of the 24-hour 150 ug/g PM10 standard using the W5 modeling scenario 158 ug/m^3.

With respect to the modeled sources (not including background), Table 26 shows haul roads responsible for 51 ug/m^3 PM10 or 42% total non-background PM10 sources contributing to non-compliance.

Table 26. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES.

		All	HR	%HR
PM10	24hr	**121.5**	**51**	**42%**
PM25	24hr	**18.6**	7.8	42%
PM25	1year	**7.7**	3.2	42%

Table 30. KEY ASSUMPTIONS FOR CALCULATING DAILY MINING ACTIVITY EMISSIONS FOR 24-HOUR PM10 (SCENARIO W5)

		HR EMR	TOTAL	HR%	PTE*	%PTE
PM10	24hr	**2050**	3376	61%	4103	50%

Table 30. indicates that this model run uses a Haul Road Emission Rate (HR EMR) of 2050 lbs/day. This is ½ or 50% of the Potential to Emit (PTE) used to calculate the .464 lb/hr baseline arsenic emission rate cited by IDEQ. Table 30 also indicates that the haul roads constitute 61% of the modelled PM10 emissions, although there is some discrepancy with the following Figure 13, which indicates haul roads account for 55% of PM10 emissions.

Table 31. TEN HIGHEST-RANKED MODELED 24-HOUR PM10 IMPACTS IN µg/m^3 FROM DIFFERENT SOURCE GROUPS (SCENARIO W5, BULKRN METEOROLOGICAL DATA).

The 2nd highest-rank scenario confirms the 51 ug/m^3 ambient 24-hour PM10 attributable to haul roads. The Table additionally indicates that haul roads contribute from 4.8 to 52.1 ug/da under all scenarios. This suggest that Haul Roads will provide a baseline 50 ug/m^3 24-hour PM10 during the life of the operations augmented by a similar contribution from other sources that will vary as different ore bodies are accessed.

Arsenic carcinogenic risk is based on long-term PM arsenic exposures, which were not calculated or are being withheld by IDEQ. Reviewers can only attempt to estimate these concentrations by applying ratios to the PM10 and PM2.5 estimates provided in the Statement of Basis. The following Table shows several potential emission scenarios that were used to develop Cancer Risk estimates.

Scenario		**lb/da PM10**	**Emission Rate lb/hr PM10**	**lb/da PM**	**Emission Rate lb/hr PM**
W5	**model**	2050	85.4	8344	348
4	**% silt**	4103	171.0	16698	171
8	**% silt**	7657	319.0	31159	1298
24	**% silt**	20581	857.5	83752	3490
4	**% silt**	4103	171.0	16698	696
8	**% silt**	7657	319.0	31159	1298
Highlighted row corresponds to the Emission used by Applicant in estimating 0.464 lb/hour As emission rate cited in the Statement of Basis					

The highlighted row in this Table, and the Tables that follow, corresponds to the PM emissions used to calculate the .464 lb/hr As emission rate from fugitive sources cited by IDEQ in re-classifying the facility's Source Category designation.

The following 3 Tables extrapolate annual concentrations from ratios of the available ambient concentrations. The first Table calculates the risk of the PM2.5 1-year modeled average assuming the PM25 fraction reflects the estimated As concentration in total PM. This would underestimate the risk of the best-case scenario using the applicant's assertions and assessing a minor fraction of the total PM. The highlighted PTE row shows an estimated cancer risk of 1.86E-05. This is above the USEPA's 10E-07 risk threshold, and well into the 10E-04 to 10E-06 range of concern for respiratory cancer.

Assuming PM25 annual concentration reflects the PM As concentration
Inhalation Unit Risk: 4.3 x 10 -3 per µg/m³

			ALL	HR	As ppm	As ug/m³	Cancer Risk
PM25	1year	W5	**7.7**	3.2	**667**	0.002	9.27E-06
PTE using Applicant As concentration				6.5	667	0.004	1.86E-05
4% silt content using enriched As				6.5	2319	0.015	6.45E-05
8% silt content using enriched As				12.1	2319	0.028	1.20E-04
24% silt content using enriched As				32.4	2319	0.075	3.24E-04

The following two Tables estimate annual concentrations for PM10 by employing respective ratios of 2.4 and 6.5. These results would also likely underestimate risk as no attempt is made to estimate PM concentrations. Using the applicant's emission rates, risk is estimated at 4.48E-05 and 1.21E-04; both values are above the USEPA acceptable risk range.

Assuming PM10 1-year is reflected by PM25/1-year to 24-hr Ambient ratio

			ALL	HR	As ppm	As ug/m³	Cancer Risk
PM10	1year	W5	**PM10**	7.8	667	0.0052	2.24E-05
PTE using Applicant As concentration				15.6	667	0.0104	4.48E-05
4% silt content using enriched As				15.6	2319	0.0362	1.56E-04
8% silt content using enriched As				29.2	2319	0.0676	2.91E-04
24% silt content using enriched As				78.4	2319	0.1817	7.82E-04

Assuming PM10 1-year is reflected by PM10/PM25 24-hr Ambient ratio

			ALL	HR	As ppm	As ug/m³	Cancer Risk
PM10	1year	W5	**7.7**	21.1	667	0.0140	6.06E-05
PTE using Applicant As concentration				42.3	667	0.0281	1.21E-04
4% silt content using enriched As				42.3	2319	0.0979	4.21E-04
8% silt content using enriched As				78.8	2319	0.1828	7.86E-04
24% silt content using enriched As				211.9	2319	0.4915	2.11E-03

The following thee tables estimate PM10 and PM ratios by employing ratios based on relative emissions of PM, PM10 and PM2.5 (i.e., 10 and 40.7, respectively). The latter table is the only effort to estimate PM and it likely overestimates risk because heavier particles in the PM emissions may re-deposit on the property.

Assuming PM10/PM25 ratio is reflected by EMR ratio

Emission Rate Factors	PM	PM10	PM25	
		Page 6 MINE Tab Copy of 20200623-Midas Gold SGP PTC EI - Final-TAPr2.2		
Annual	9.68	2.38	0.24	lb/VMT
Daily	14.43	3.55	0.35	lb/VMT

			ALL	HR	As ppm	As ug/m³	Cancer Risk
PM10	1year	W5	**7.7**	32	667	0.022	9.27E-05
PTE using Applicant As concentration				65	667	0.043	1.86E-04
4% silt content using enriched As				65	2319	0.150	6.45E-04
8% silt content using enriched As				121	2319	0.280	1.20E-03
24% silt content using enriched As				324	2319	0.752	3.24E-03

Assuming PM10/PM25 ratio is reflected by EMR ratio

			ALL	HR	As ppm	As ug/m³	Cancer Risk
PM	1year	W5	**7.7**	132	667	0.088	3.77E-04
PTE using Applicant As concentration				263	667	0.176	7.55E-04
4% silt content using enriched As				263	2319	0.610	2.63E-03
8% silt content using enriched As				491	2319	1.139	4.90E-03
24% silt content using enriched As				1320	2319	3.062	1.32E-02

These results demonstrate that even the best-case scenarios, using underestimated emission estimates provided by the applicant, cancer risks are of concern. It is important to note that these risk estimates are for Haul Road emissions only. At any time during the proposed operations these will constitute approximately 40% to 60% of total PM emissions from a varying number of sources, depending on which ore bodies are being exploited. These sources also contain worrisome levels of arsenic and would increase risk. Under more realistic emissions and control scenarios, unacceptable risk levels are of significant concern and likely unacceptable.

This is, by necessity, a semi-quantitative analysis of cancer risk. It is frustrating that IDEQ is withholding these risk calculations. Numerous issues could likely be resolved, were IDEQ to model the anticipated ambient concentrations in the air that people will breathe at, and beyond, the property:

- including all emissions regardless of regulatory interpretation,
- at the different emissions levels,
- reflecting the range of uncertainties in PM, PM10, and As emission rates, and
- calculating cancer and non-carcinogenic risk associated HAPA/TAPS.

ATTACHMENTS

Descriptions and attached Tables provide the Basis for Calculation of Weighted Average Arsenic Content in Roadbed Silt for the Stibnite Gold Project – Comments re. Idaho Permit to Construct

Example COC Material Balances and Supporting Spreadsheets

The Following Descriptions and attached Tables provide the Basis for Calculation of Weighted Average Arsenic Content in Roadbed Silt for the Stibnite Gold Project – Comments re. Idaho Permit to Construct

4.3 Example COC Material Balances

4.3.1 Methodology: The Draft EIS provides almost no quantitative material or chemical transformation balance for the COCs (Hg, As, Sb, Cd, Ni). Supporting documents, particularly the (2014, 2019) M3 Feasibility Study and the 2017 SRC Geochemical Characterization Report do carefully track precious metals through the mining and mineral processing steps, antimony as it relates to a salable commodity metal, and arsenic as it relates to processing gold-arsenic ores. These metallurgical and economic reserve calculations can be used to develop a general understanding of the sources, transport, transformation and fate of toxic contaminants through the mining and mineral processing stages.

Rudimentary COC material balances for the overall life of the facility were developed from economic mineral reserve predictions and pilot metallurgical studies in the (2014, 2019) M3 Feasibility Study, and average and 95th-%tile metal content analyses in the 2017 SRC Geochemical Characterization Report. (See attached Supplemental Tables for calculation details). These material balances were assessed to form a general opinion of the likelihood for health and environmental protectiveness, and identify specific needs for supplemental analyses.

Additionally, because there is significant variability in the operations over the projected life with regard to ores mined and processed and seasonal, meteorological and climatic effects, key operational periods should be identified for specific analyses in a DEIS Supplemental as warranted. Neither the DEIS, nor the support documents, provide sufficient detail to track toxic contaminant releases through environmental media or assess potential health and environmental effects. In that sense, the Draft EIS is wholly insufficient.

4.3.2 Mercury Material Balance: An estimated 564-1645 tons of Hg will be disturbed. About 65% of the disturbed Hg will be in the development rock (324-1045 tons) - the largest contributor being Hangar Flats excavations (about 45% of total mercury in development rock, or 30% of all disturbed Hg on site). Development rock will be disposed in four general locations shown in Table 2. One alternative adds an additional Fiddler WRSF. The Hg-laden Hangar Flats waste rock will largely be deposited in the Main WRSF and the lower portions of the Yellow Pine Pit backfill. These two fills will accommodate approximately 75% of waste rock mercury (or 49% of total site Hg). These locations are open to groundwater flow, subject to alternate wet/dry and oxidation/reduction cycles and are potentially a significant source of subsurface contamination. Other final repositories for waste rock Hg are the tailings embankment (18%) and West End WRSF (7%).

An estimated 240- 640 tons of Hg will be present in production ores, 237- 635 tons in newly produced ores and 3-5 tons from historic tailings. These ores will be crushed and ground to a fine sand grain size and processed by floatation. The largest Hg source being Hangar Flats 157-392 tons (or 65%), with Yellow Pine, West End and Historic Tailings contributing 22%, 12% and 1%, respectively, of total Hg from processed ores. High antimony ores (reportedly 15-20% of mined ores) are sent to antimony floatation. Although no accounting is provided, it appears that Hg selectively follows Sb in floatation, being enriched from approximately l–5 mg/kg in Sb-rich ores to 240-350 mg/kg in Sb concentrate. This unknown but substantial amount of Hg will exit the site in the commercial product.

Low-grade Sb ores and the tails from the high-grade Sb floatation are both sent to gold flotation, indicating that all Hg not sold with antimony concentrates (excepting any in oxide ores) will be charged to the gold floatation circuit. The DEIS provides no meaningful insight to Hg disposition in Au floatation. Pilot metallurgical analyses described in the feasibility studies suggest concentrations are 4 to 10 times greater in Hanger Flats ores, or 4 -11 mg/kg Hg versus 1 mg/kg in other ores. These are also the highest Sb ores. Similarly, Hg levels in the Au concentrates from Hangar Flats are similarly elevated above the other ore concentrates. It is not practicable from the data provided in the DEIS and associated references, to determine the partition of Hg to concentrates and tailings from the floatation circuits.

Gold flotation tailings may be recirculated or sent to leaching, depending on Au content. Gold concentrates are sent to the autoclaves for pressure oxidation. Apparently, significant amounts of Hg will be volatilized in the autoclaves. These processes were of considerable concern in Nevada in the last decade accounting for the bulk of Hg emissions in the western US, and a subsequent aggressive air pollution control effort. Mercury control from the Nevada autoclave operations have achieved orders of magnitude reduction in Hg emissions and associated increases in mercury co-products and wastes. The DEIS suggests, and Midas application for a Permit to Construct the facility to the IDEQ asserts controls similar to the Nevada operations will be put in place. However, no estimate of Hg input or volatilization is provided, only an optimistic emission rate seemingly independent of Hg content in the system. Nevertheless, it is apparent that a significant Hg waste or product stream will derive from the autoclave system. Quantities, characteristics or disposal details are absent from all documents. The Nevada operations cited as a model for this operation are reportedly storing the wastes on-site in anticipation of a federal repository being developed. Comments submitted to IDEQ regarding the Midas Permit to Construct are attached and should be considered as part of the record for these DEIS comments.

The unknown quantity of Hg remaining in gold concentrates will discharge to the leach tanks, where it will partition to Au product and carbon electro-winning or be discharged with spent CN solutions. The former will likely be volatilized adding to emissions and Hg co-product disposal issues. Spent CN solutions are among the most hazardous and potentially health and environmentally damaging materials on-site. These are projected to be neutralized and discharged to the TSF. Little information is provided regarding the potential for, and mitigation measures in the event of, a catastrophic release, other than assurances the building will be sized for 110% containment.

In summary, the DEIS provides almost no usable information with respect to the production and disposition of Hg from the Midas operations. Somewhat reliable estimates of Hg production can be developed by applying observations from 3 to 6-year old feasibility studies to the generalizations presented in the DEIS. These indicate that about 65% of Hg (324-1045 tons) disturbed is associated with development rock that will be discharged to the local environment in adverse conditions conducive to chemical transformation and long-term bleeding of toxic Hg compounds into groundwater and eventually biotic systems. Several hundred tons of Hg (240-640 tons) will be processed as ores. The DEIS provides no quantitative estimates as to how this Hg will partition or transform through the metallurgical processes. Pilot floatation, oxidation and leachate test conducted for Sb and Au sometimes provide Hg observations that can be used to generalize likely Hg behavior, but quantification is neither provided, nor can be estimated with any degree of confidence. A significant but unquantifiable portion of Hg will exit the site in either Sb or Au concentrate product. The Sb concentrates will likely be processed in poor and middle income countries, where it will eventually contribute to global Hg burdens of considerable concern, exacerbating international treaty efforts to curtail toxic Hg levels threatening eco-systems worldwide.

Floatation, oxidation and leaching pilot studies indicate the Hg will follow gold, with larger portions volatilizing during pressure oxidation and carbon-based refining. The DEIS optimistically asserts this unknown quantity will largely be captured with only 0.2 pounds per year escaping to the atmosphere. The unknown, but apparently substantial quantity of captured Hg, will reportedly exit the site remainder to an unknown, but cited as licensed, destination. Midas has indicated these materials will be handled similar to model sites in Nevada, which have reportedly been unable to export the hazardous materials and to maintain these wastes in on-site temporary storage for several years. The Hg remaining in CN spent solutions for the leachate process will be discharged to the TSD.

4.3.3 Arsenic Material Balance: An estimated 737,683–2,213,215 tons of As will be disturbed. About 57% of the disturbed As will be in the development rock (317,495-1,216,926 tons). The Yellow Pine Pit excavation is the largest contributor (about 51% of total As in development rock, or 29% of all disturbed As on site). Both the Yellow Pine and Hangar Flats Development Rock are extremely high in As concentration, 1300 - 5200 mg/kg and 1200 -5200 mg/kg, respectively)). USEPA Health-based Regional Screening Levels (RSLs) for arsenic tri-oxide for Residential Soils are 0.68 mg/kg (carcinogenic) and 35 mg/kg non-carcinogenic). Composite Workers soil RSLs for worker ingestion are 3.6 mg/kg (carcinogenic) and 580 mg/kg (non-carcinogenic) https://semspub.epa.gov/work/HQ/200043.pdf.

Dusts generated from waste rock excavation will exceed these criteria by 2 to 9 times for workers non-carcinogenic risk and 1900 to 7650 times for carcinogenic risk, with an order of magnitude greater risk for residential soil criteria. Depending on chemical species, these levels in the air or in any dusts deposited on local surfaces, could represent substantial risk to workers, local populations and frequent site visitors; and will likely require respiratory protection for workers. No analyses in the DEIS address the chemical speciation and the likelihood for transformation to the more dangerous arsenical compounds.

In the 10/27/2020 Public Information Hearing regarding the Permit to Construct of the Stibnite Gold Project, IDEQ indicated that greater than 93% control of fugitive dusts will be required as a permit condition to meet off-site ambient particulate criteria. It is not unreasonable to assume that particulates containing up to 0.5% As would represent inappropriate carcinogenic and carcinogenic risk at the same off-site locations. Moreover, this is, as IDEQ expressed, an aggressive level of control not typical for other sites. Reportedly, Midas Gold has assured IDEQ that this level of control will be achieved, although no details have been developed to support this claim. Of greatest concern is that IDEQ anticipates not requiring any ambient monitoring to assure the 93% criteria is achieved, and no monitoring to assess risk to human health during operations.

The DEIS should provide a human health risk assessment for worker, trespasser, frequent site visitor, and post-reclamation scenarios for these rock dusts, including evaluation of public typical and reasonable maximum exposures at the most sensitive locations identified in IDEQ's NAAQS analyses.

Development rock will be disposed in three general locations shown in Table 2. The As-laden Yellow Pine waste rock is projected to go to the tailings pond embankment and the Main WRSF. Hangar Flats high-As waste rock will largely be deposited in the Main WRSF and the lower portions of the Yellow Pine Pit backfill. The fills will accommodate an estimated >80% of waste rock mercury (or nearly 50% of total site As). These locations are open to groundwater flow, subject to subject to alternate wet/dry and oxidation/reduction cycles and are potentially a significant source of subsurface contamination. The As concentrations are too high to leave these materials exposed as surface soils, in either temporary or permanent management or reclamation efforts. Typical cleanup levels for As at CERCLA sites range from <10 mg/kg to 35 mg/kg, with some sites developing site-specific levels as high as 250 mg/kg. Yellow Pine and Hanger Flat Development Rock are 18-1200 times greater than typical CERCLA critical toxicity criteria.

An estimated 420,188 - 996,290 tons of As will be present in production ores, the vast majority in newly produced ores with an estimated 4,366-8,286 tons from historic tailings. These ores will be crushed and ground to a fine sand grain size and processed by floatation. The largest As sources are Hangar Flats and Yellow Pine ores, each contributing about 45% of the total; with West End contributing 9%, and 1% coming from historic tailings. High antimony ores (reportedly 15-20% of mined ores) are sent to antimony floatation. Although no accounting is provided, it appears that about 3%-7% of the As in high antimony ores will be retained with the Sb concentrate. More than 90% of the As will be charged to gold flotation along with all As in the low-antimony ores (excepting oxide ores that are not discussed in DEIS).

The DEIS provides no meaningful insight to As disposition in gold floatation. However, because refractory gold is largely found in arsenical ores (that are also a primary source of sulfur needed for downstream autothermic oxidation), pilot metallurgical analyses described in the feasibility studies do account for As. For Yellow Pine, about 83-93% of As is captured in the gold flotation concentrates (from high and low Sb ores, respectively). About 8-9% of Yellow Pine As is discharged with the Au float tailings. Recoveries were less for the Hangar Flats ores with 64% and 73% of As retained in gold flotation concentrates from the high and low Sb feeds, respectively. For Hangar Flat ores, 24-36% of As escapes with the tailings. West End ore flotation yielded 83% As capture with 17% discharged with tails. The production descriptions indicate that the gold content of flotation tailings may be recirculated or sent to leaching, depending on Au content.

Gold concentrates are sent to the autoclaves for pressure oxidation (POX). Although the DEIS provides no insight with regard to As disposition or toxicity in relation to the metallurgical processes, it appears between 80-90% of total As in ores will reach the POX (350,000 to 900,000 tons As). A primary aim of the POX is to oxidize the arsenical-gold-sulfide compounds concentrated in the flotation circuits.

The DEIS makes no mention of arsenic speciation in relation to the proposed metallurgic processes or waste characteristics. Arsenic geo-chemistry and toxicity considerations are complex, and species (valence) dependent. Arsenic solubility, bio-availability and toxicity are highly variable among mineral processing applications depending on other metal concentrations, pH, and oxidation-reduction status, among other factors. The 2014-2019 M3 feasibility study makes two brief references to arsenic behavior in wastes.

> The primary product from the gold flotation circuit is an auriferous pyrite concentrate; arsenopyrite and arsenian pyrite are also present in the concentrate. In order to liberate finely encapsulated gold particles in the concentrate, it must be oxidized. The products of oxidation are generally ferric arsenate (scorodite) and sulfuric acid; liberated gold and silver are present within the solids. P17-9

> The POX tailings consist mainly of the oxidation product oxyhydroxy scorodite, a crystalline ferric arsenate mineral and also produced near neutral to alkaline leachates. However, the magnitude of antimony and arsenic release was higher in comparison to the flotation tailings, with an average arsenic concentration of 13.3 mg/L and an average antimony concentration of 0.09 mg/L. In addition, sulfate is elevated above the water quality standards for a few of the SPLP results for POX samples, and weak acid dissociable (**WAD**) cyanide was above the water quality standards for all POX samples. P20-26

The reference to POX tailings is confusing. The process flowsheet (DEIS P-29) shows the POX concentrate is washed and neutralized with concentrate sent to leaching and tailings sent to dewatering. The pilot oxidation studies (M3 2014-19) indicate As remains with the cleaned concentrates (Tables 13-9,13,17). However, the above statement refers to residual cyanide, possibly referring to minor amounts introduced as flotation reagents, or to post-leachate tailings that would have considerable CN toxicity. Most of this arsenic will be discharged to the TSF following treatment either following POX or leaching. The speciation, stability, solubility and toxicity of the As compounds will depend on pH, alkalinity and Fe status. The DEIS offers no indication or discussion of the disposition, nor speciation and stability, of potentially 900,000 tons of As that will be stored in perpetuity in behind a 600 foot dam subject to significant hydrologic head pressure and meteoric waters. Moreover, the applicant is simultaneously seeking relief from redundant liner rules for cyanide leach tailings disposal facilities.

4.3.4 Antimony Material Balance: Antimony is both a salable product and a toxic environmental contaminant. The health implications of antimony contamination are among the least understood of the heavy metals, as it is usually encountered with other toxic metals that are drivers in risk assessment, pollution control, and remediation determinations. An estimated 258,103*–1,130,591 tons of Sb will be disturbed. An estimated 4% to 19%* of the disturbed Sb will be in the development rock (42,114*-40,139 tons). The asterisks (*'s) denote apparent anomalies or errors in the SRC 2017 geochemical results regarding the Sb content of development rock that preclude developing accurate estimates. Sb concentration in development rock are relatively low in comparison to arsenic. Average values range from 62 – 260 mg/kg and 95th %-tile concentrations from 76- 150 mg/kg, although the 260 mg/kg observation is suspect. USEPA Health-based (non-carcinogenic) Regional Screening Levels (RSLs) for antimony for Residential and Composite Worker soils are 35 mg/kg and 4700 mg/kg.

An estimated 215,989 – 1,130,591 tons of Sb will be present in production ores, most from newly produced ores with an estimated 4,572 - 28,660 tons from historic tailings. The largest Sb sources are Hangar Flats and Yellow Pine ores, contributing about 2/3^{rds} and 1/3rd of the total, respectively; with West End and Historic Tailings contributing about 3%. These ores will be crushed and ground to a fine sand grain size and processed by floatation. Reportedly, 15-20% of mined ores will go to Sb flotation. Both Sb flotation tails and low-grade Sb will go to gold flotation (possibly excepting oxide ores). High antimony ores are sent to antimony floatation. Although no accounting is provided, it appears that about 82% of the Sb in high antimony ores will float to produce a 58% Sb concentrate, with about 17% of the Sb discharging in tails sent to gold floatation. It is difficult to estimate how much Sb will leave the site as concentrate product, as there are inconsistencies among metallurgical process, reserves estimates and economic analyses among the references and the DEIS.

Information from disparate sources within the feasibility studies suggests about 60% of Yellow Pine and 15% of Hanger Flats ores will go to Sb floatation, and will yield approximately 70,000 tons of antimony in concentrate form including 5000 tons from historic tailings. At average ore concentrations, this would constitute about 1/3rd of total antimony from ore will exit the site as product, with the remainder (147,000 – 745,000 Sb) tons discharged to gold floatation, either as high-grade Sb tails or low-grade Sb ore.

Limited pilot floatation studies indicate that the Sb in gold floatation will partition approximately 78% to gold concentrate, 22% to floatation tails. The gold floatation concentrates are cleaned and sent to POX for thermal treatment. Tails are either sent to the TSF or leach circuit depending on residual Au assays. Antimony discharged to the tailings are likely stibnite (32,000 – 163,000 tons Sb). The limited pilot studies suggest levels in clean gold concentrate will be 0.5 to 1.1% Sb and will be charged to the autoclaves. There is no discussion in any of the documents reviewed regarding chemical transformation of Sb species in and downstream of the POX. It is unknown if any gold autoclave system has operated with these levels of Sb.

The process flowsheet (DEIS P-29) shows the POX concentrate is washed and neutralized with concentrate sent to leaching and tailings sent to dewatering. There is no information available to determine the chemical form of Sb entering or exiting the cyanide leach cycle. Presumably, 115,000 – 582,000 tons of Sb will be processed concurrent with the precious metal recovery and ultimately discharged to the TSF following CN neutralization. The DEIS makes no mention of antimony speciation in relation to the proposed metallurgic processes or waste characteristics.

No information or discussion of the chemical form, stability, solubility, or toxicity of Sb waste is provided. In total, about 147,000 – 745,000 tons Sb in waste from ore processing, and an additional 40,000* tons from development rock will be disposed on site, with little to no information regarding chemical form and critical stability and toxicity characteristics.

Table S1 Support Calculations for COC Production Material Balance															
Sub-table S1a Mining															
Data Source	**SRK_2017_SGP Baseline Geochemical Characterization Report.pdf**							**M3_2019_SGP Prefeasibility Study Technical Report**							
Table 3-1. Statistical Summary of Key Multi-Element Results from the Exploration Database								**Table 1.4: Stibnite Gold Project Probable Mineral Reserve Estimate**							
Location		**Statistic**						Tables 16.1 and 16.8 for Waste Rock							
Constituent			Arsenic (ppm)	Mercury (ppm)	Antimony (ppm)		Production ktons	Arsenic tons		Mercury tons		Antimony tons		M3 Est Sb Reserve	
Average crustal abundance			1.8	0.08	0.2									k#s	tons
YellowPine							Yrs 2-7								
Development Rock	(n=19,268)						124,304								
		P5	7	0.11	5			870		14		622			
		Average	1,300	0.48	62			161595	51%	60		7707			
		P50	650	0.35	18			80798		44		2237			
		P95	4,600	1.2	76			571798		149		9447			
Ore		(n=4,889)					43985								
		P5	570	0.2	16			25071		9		704			
		Average	4,200	1.2	1,600			184737	44%	53	22%	70376	33%	86376	43188
		P50	3,500	0.64	45			153948		28		1979		High Sb	61%
		P95	10,000	3.3	7,800			439850		145		343083		Low Sb	39%
Hangar Flats							Yrs 6-10								
Development Rock	(n=12,147)						86696								
		P5	7	0.1	5			607		10		433			
		Average	1,200	1.6	260	**		104035		139		22541			
		P50	470	0.9	21			40747		79		1821			
		P95	5,200	5.3	110			450819		459		9537			
Ore	(n=3,594)						35650								
		P5	840	0.1	31			29946		4		1105			
		Average	5,400	4.4	3,900			192510	46%	157	65%	139035	64%	40757	20379
		P50	4,900	3.4	2,110			174685		121		75222		High Sb	15%
		P95	12,000	11	20,000			427800		392		713000		Low Sb	85%
West End							Yrs 6-12								
Development Rock	(n=4,853)	P5	10	0.1	5		129995	1300		13		650			
		Average	340	0.9	84			44198		121		10920			
		P50	140	0.5	20			18199		65		2600			
		P95	1,400	3.3	150			181993		429		19499			
Ore	(n=1,236)						15430								
		P5	310	0.2	15			4783		3		231			
		Average	2,500	1.8	130			38575	9%	28	0.12	2006	1%		
		P50	1,600	0.9	52			24688		14		802		High Sb	0%
		P95	7,800	6.3	370			120354		97		5709		Low Sb	100%
P5 = 5th percentile; P50 = 50th percentile; P95 = 95th percentile															
Source: SRK, Lith Representivity Analysis 200900.060 ld Rev06															
	**	anomaly or error in SRK 2017, Table 3.1				**DR Total**	P5	2777		37		1705			
							Average	309829		319		41167	**		
							P50	139744		187		6658			
							P95	1204611		1038		38483			
						Ore Total	P5	59801		16		2040			
							Average	415822		237		211417			
							P50	353321		163		78003			
							P95	988004		635		1061792			

Table S1 Support Calculations for COC Production Material Balance															
Sub-table S1b Historic Tailings and Spent Ores															
Data Sourc	**SRK_2017_SGP Baseline Geochemical Characterization Report.pdf**														
Data Sourc	**SRK_2017_SGP Baseline Geochemical Characterization Report.pdf**							**M3_2019_SGP Prefeasibility Study Technical Report**							
Table 3-1. Statistical Summary of Key Multi-Element Results from the Exploration Database								**Table 1.4: Stibnite Gold Project Probable Mineral Reserve Estimate**							
Location		**Statistic**								Tables 16.1 and 16.8 for Waste Rock					
Constituent			Arsenic (ppm)	Mercury (ppm)	Antimony (ppm)		Production ktons	Arsenic tons		Mercury tons		Antimony tons		M3 Est Sb Reserve	
Old Tailings															
							3001	0re							
			As	Hg	Sb		5915	Waste							
Spent Ore	Table 3.28		ppm	ppm	ppm		0								
		P5	990	1.4	92			0		0		0			
		Av	1600	2.4	160			0		0		0			
		P50						0		0		0			
		P9	2600	3.8	280			0		0		0			
Bradley Dump	Table 3.39						1501								
		P5	545	0.65	426			818		1		639			
		Av	1614	0.8	1474			2422		1		2212			
		P50						0		0		0			
		P9	3440	2.17	16380			5162		3		24578			
Bradley Tailin	Table 3.42						1501								
		P5	769	0.62	637			818		1		956			
		Av	1296	0.96	1573			1945		1		2360			
		P50						0		0		0			
		P9	2082	1.26	2720			3124		2		4081			
								0		0		0			
							3001								
***Likely Higrade Bradley Dump to meet Sb revovery goals															
						Hist Tails TOTAL	P5	1636		2		1595			
							Ave	4366	1%	3	1%	4572	2%	***	
							P50	0		0		0			
							P95	8286		5		28660			
	Historic Waste Overburden COC Concentrations														
			As	Hg	Sb										
		P5	ppm	ppm	ppm		5915								
			545	0.62	92			3224		4		544			63567
		Average	1296	0.8	160			7666		5		946			29%
		P95	2082	1.26	280			12315		7		1656			

Table S1 Support Calculations for COC Production Material Balance												
Sub-table S1c Total Mining and Historic Tailings and Spent Ores												
				ORES (mined+tails)	**Total**	**Production kts**	**98,066**	**Arsenic tons**		**Mercury tons**		**Antimony tons**
						P5		61,436		18		3,635
						Average		420,188	57%	240		215,989
						P50						
						P95		996,290		640		1,090,452
				DEVLOPMENT ROCK	**Total**	**Production kts**	**346,747**	**Arsenic tons**		**Mercury tons**		**Antimony tons**
						P5		6001		41		2249
						Average		317495	43%	324		42114
						P50						
						P95		1216926		1045		40139
				COMBINED MINING AND HISTORIC TAILS	**Total**	**Production kts**						
							444813					
						P5		67,437	-	59	-	5,885
						Average		737,683	100%	564	-	258,103
						P50		-	-	-	-	-
						P95		2,213,215	-	1,685	-	1,130,591

Table S2 Support Calculations for COC Waste Rock Disposal

Data Source	**M3_2019_SGP Prefeasibility Study Technical Report**									
		Table 16.8								
Waste Rock Repositories			**Production kts**			**Production kts**		**As**	**Hg**	**Sb**
	Tailings Embankmen		60726	18%	**Tailings Embankmen**		60726	tons	tons	tons
	Main WRSF		149448	43%		P5		1051	7	394
	West End WRSF		25174	7%		Average		55603	140	18151
	YP Backfill		111399	32%		P50			0	0
			346747	100%		P95		213121	336	12895
					Main WRSF	Production	149448			
						P5		2586	18	969
						Average		136840	140	18151
						P50		0	0	0
						P95		524495	450	17300
					West End WRSF	Production	25174			
						P5		436	3	163
						Average		23050	24	3057
						P50		0	0	0
						P95		88349	76	2914
					YP Backfill	Production	111399			
						P5		1928	13	723
						Average		102001	104	13530
						P50		0	0	0
						P95		390960	336	12895
					Totals			6001	41	2249
								317495	407	52889
								1216926	1198	46005
				Waste Rock COC Summary				**Arsenic**	**Mercury**	**Antimony**
								tons	tons	tons
					Total Excavated		average	317,495	407	52,889
							95th%tile	1,216,926	1,198	46,005
					Disposition					
					Tailings Embankment		average	55,603	140	18,151
							95th%tile	213,121	336	12,895
					Main WRSF		average	136,840	140	18,151
							95th%tile	524,495	450	17,300
					West End WRSF		average	23,050	24	3,057
							95th%tile	88,349	76	2,914
					YP Backfill		average	102,001	104	13,530
							95th%tile	390,960	336	12,895

Table S3 Support Calculations for COC Beneficiation Calculations

Data Source **M3_2019_SGP Prefeasibility Study Technical Report**

Process Feed				**Arsenic tons**	**Mercury tons**	**Antimony tons**
	Table 16-7	ktons				
	Total Ore to Crusher	95065	average	415,822	237	211,417
			95th%tile	989,183	635	1,063,513
	Historic Tailings	3001	average	4,366	3	4,572
			95th%tile	7,106	5	26,938
	Total Process Feed	98066	average	420,188	240	215,989
			95th%tile	996,290	640	1,090,452

Floatation Cells				**Distribution %**		**COC Concentrations in Process Streams**			
	YellowPine			As	Sb	Table 13.9	**Hg ppm**	**As ppm**	**Sb ppm**
	Table 13.7	High Sb Ore	SbRoughCon	7.4	81.8	SbCleanCon	252	4120	581952
			AuRoughConH	83.2	14.2	AuCleanConH	5.23	31000	4540
			AuRtails	9.4	4	AuRConH	3.01	13700	3140
	Table 13.8	LowSbOre	AuRoughConL	92.8		AuCleanConL	11.9	66000	3600
			AuRtails	7.8		AuRConL	3.72	21000	951
	Hanger Flats			As	Sb	Table 13.15	**Hg ppm**	**As ppm**	**Sb ppm**
	Table 13.13	High Sb Ore	SbRoughCon	3.5	83.4	SbCleanCon	342	1420	579566
			AuRoughConH	73	13.1	AuCleanConH	33.1	48600	11000
			AuRtails	23.5	3.5	AuRConH	15.3	18900	3280
	Table 13.14	LowSbOre	AuRoughConL	64.3		AuCleanConL	67.6	57800	5260
			AuRtails	35.7		AuRConL	38	>10000	1830
	West End			As	Sb	Table 13.17	**Hg ppm**	**As ppm**	**Sb ppm**
	Table 13.16	LowSbOre	AuRoughConL	81.3		AuCleanConL	19	37500	380
			AuRtails	18.7					

Attachment #4

Attachment
Comments by EPA, Region 10
March 19, 2021

Comments submitted to:
Whitney Rowley
Idaho Department of Environmental Quality
whitney.rowley@deq.idaho.gov

Re: Midas Gold Idaho, Inc., Stibnite, Idaho
Docket No. AQ-1675
IDEQ Permit to Construct, Permit No. P-2019.0047

1. PSD Lime Plant Synthetic Minor Emissions PTE Limits less than 100 tons per year (tpy): PSD synthetic minor emissions limits restricting potential to emit (PTE) to less than 100 tpy for the regulated NSR pollutants applicable to the fugitive and non-fugitive emissions sources associated with the Lime Plant must be established in the permit as well as continuous compliance requirements. Production/operational limits are needed for each pollutant-emitting activity to make the associated numerical emissions limits practically enforceable. Where production/operational limits are not used, approved emission factors must be included in the permit for enforceability. Limits should be no more than 12-month rolling averages calculated on a monthly basis and include the necessary monitoring, recordkeeping and reporting to demonstrate compliance with the PSD synthetic minor emissions limits and production/operational limits. Emissions used in calculating compliance with the emissions limits must account for all modes of operation including startup, shutdown, malfunction and any emissions that are not controlled consistent with the key parameters and assumptions in the permit application (i.e., bypass stacks or lack of applying chemical suppression). The application should include the information and analysis necessary to demonstrate how the lime plant emissions (including the associated fugitive and non-fugitive emissions) are less than the 100 tpy PSD major source threshold. [See 40 CFR 52.21(b)(1)(i)(*a*) 100 tpy threshold, 52.21(b)(1)(iii)(*k*) lime plant fugitives; 52.21(b)(4) PTE definition , and 52.21(b)(17) federally enforceable definition ; EPA EAB decision Shell Offshore dated March 30, 2012; EPA EAB decision Peabody Western Coal dated February 18, 2005, EPA Memorandum from Terrell Hunt, Assoc. Enforcement Counsel, U.S. EPA, & John Seitz, Dir., Stationary Source Compliance Div., U.S. EPA, Guidance on Limiting Potential to Emit in New Source Permitting 7 (June 13, 1989); 54 FR 48881 nested sources]

2. PSD Source-Wide (Lime Plant and Gold Mine) Synthetic Minor Emissions PTE limits less than 250 tpy: PSD synthetic minor emissions limits restricting PTE to less than 250 tpy applicable to all of the facility's non-fugitive emission sources must be established in the permit as well as continuous compliance requirements. Fugitive emissions associated with the lime plant must be included. Emissions limits must be established and compliance determined in the same manner as Comment #1. [See 40 CFR 40 CFR 52.21(b)(1)(i)(*a*) 100 tpy major source threshold, 52.21(b)(1)(i)(*b*) 250 tpy major source threshold, 52.21(b)(1)(iii)(*k*) lime plant fugitives, 52.21(b)(4) PTE definition, and 52.21(b)(17) federally enforceable definition; EPA EAB decision Shell Offshore dated March 30, 2012;

EPA EAB decision Peabody Western Coal dated February 18, 2005, EPA Memorandum from Terrell Hunt, Assoc. Enforcement Counsel, U.S. EPA, & John Seitz, Dir., Stationary Source Compliance Div., U.S. EPA, Guidance on Limiting Potential to Emit in New Source Permitting 7 (June 13, 1989); 54 FR 48881 nested sources]

3. Title V Source-Wide (Lime Plant and Gold Mine) Synthetic Minor Emissions PTE Limit less than 100 tpy: Title V synthetic minor emissions limits restricting PTE to less than 250 tpy applicable to all of the facility's non-fugitive emission sources must be established in the permit as well as continuous compliance requirements. In addition to all non-fugitive source emissions, all of the fugitive emissions associated with the lime plant must be included. Emissions limits must be established and compliance determined in the same manner as discussed in Comment #1. [see 40 CFR 70.1(b), 70.2 Major Source (2)(*xi*), 70.2 Emission Unit, and 70.3(a); 54 FR 48881 nested sources]

4. Title V Source-Wide (Lime Plant and Gold Mine) Synthetic Minor Emissions Cap less than 10/25 tpy of hazardous air pollutants (HAP): Title V HAP emissions limits restricting the PTE to less than 10 tons per year for a single HAP and 25 tons per year of all HAPs must be established in the permit as well as continuous compliance requirements. All fugitive and non-fugitive HAP emissions from all regulated pollutant emitting activities within the source must be included. These limits must be established and compliance determined in the same manner as Comment #1. [see 40 CFR 70.1(b), 70.2 Major Source (1)(i), 70.2 Emission Unit, and 70.3(a); and "Reclassification of Major Sources as Area Sources Under Section 112 of the Clean Air Act" at 84 FR 36304; EPA Region 5 letter to Wisconsin Department of Natural Resources dated March 6, 2003]

5. NAAQS Emissions Limits: Emission limits applicable to all fugitive and non-fugitive sources that represent the emission rates used to demonstrate compliance with the NAAQS modeling must be established as requirements in the permit and continuous compliance required. These emissions limits must be established and compliance determined in the same manner as Comment #1. [see EPA EAB decision Shell Offshore dated March 30, 2012 and IDEQ regulations requiring compliance with the NAAQS]

6. Practically Enforceable Production and Operational Limits: In addition to the PSD, Title 5, and NAAQS emissions limits discussed above all key production and operational limits underlying those PSD/Title V/NAAQS emission limits must be included in the permit as practically enforceable requirements. To be enforceable as a practical matter, emission limits must specify: A technically accurate limitation that identifies the portions of the source subject to the limitation; the time period for the limitation (hourly, daily, monthly, and annual limits such as 12-month rolling limits); and the method to determine compliance. The limits must include, appropriate monitoring, recordkeeping and reporting requirements. Key parameters and assumptions underlying the emissions calculations, control efficiencies, or the modeling analyses used in the permit application must be specified in the permit as practically enforceable production and operational limits. These key parameters and assumptions cannot be specified in the permit "for informational purposes" or as part of "off-permit" actions such as the Fugitive Dust Control Plan, Access Management Plan, or Operation and Maintenance (O&M) Manual. For example, the permit includes a 93.3%

control efficiency for controlling fugitive road dust emissions for informational purposes (see permit condition 1.2 and 3.2) but does not require compliance with this control efficiency. The production and operational limits used must be consistent with the key parameters and assumptions used in and supported by the information in the application. For example, the permit includes a 93.3 % control efficiency for excavating and hauling activities while the permit application uses a 90% control efficiency for fugitive road dust emissions. The 90% control efficiency is based upon using chemical suppressant only but the permit allows for use of water on the roads to control fugitive road dust emissions (see permit condition 2.6, 2nd bullet). The permit application indicates that the 90% control efficiency is based on periodic application. However, the permit and permit application does not provide the application frequency or type of chemical suppressant needed to achieve the 90% control efficiency. In addition the 90% control efficiency is contrary to the current version of AP-42 Section 13.2.2 which states that "…chemical dust suppressants provide a PM-10 control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month". The control efficiency of chemical suppressants are affected by various factors so the control efficiency used in determining the excavating and hauling emissions must be shown to be consistent with those factors (see AP-42 Section 13.2.2) In addition, the key underlying parameters associated with calculating these emissions must be specified in the permit such as the speed limit, vehicle type, and vehicle miles (see permit application, Appendix B, page 49) as practically enforceable requirements for fugitive road dust emissions. [EPA EAB decision Shell Offshore dated March 30, 2012; EPA EAB decision Peabody Western Coal dated February 18, 2005, EPA Memorandum from Terrell Hunt, Assoc. Enforcement Counsel, U.S. EPA, & John Seitz, Dir., Stationary Source Compliance Div., U.S. EPA, Guidance on Limiting Potential to Emit in New Source Permitting 7 (June 13, 1989)]