

Draft Permit to Construct - Midas Gold - Boise

Comments Regarding Draft Permit to Construct No. P-2019.0047 Project ID 62288, submitted for Midas Gold, Inc. Stibnite, Idaho – Facility ID 085-00011

Commenter / 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 last US 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 Medecins 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.

General Comments: I have reviewed the Draft Permit to Construct No. P-2019.0047 Project ID 62288, submitted for Midas Gold, Inc. Stibnite, Idaho – Facility ID 085-00011 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 TIFO supports scientifically-sound and transparent analyses of the environmental and human health issues faced by mining communities; and the development of solutions implemented within local socio-economic and cultural capabilities. The Stibnite proposal is of interest because both the industry and the US regulatory arena have the capacity to implement 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 has not been analyzed and presented in a manner protective of health or the environment, nor reflective of the capabilities of the applicant or the regulatory agency.

This permit application has been submitted to IDEQ and returned as incomplete on four occasions in seven months. From the public review perspective, it remains critically incomplete and should again be returned for supplemental analyses. The application lacks transparency and coherence. It is not possible, in the time allotted with the reference material provided, for an independent reviewer to assess the consistency and accuracy of the applicant's assertions. IDEQ has taken the position of accepting the applicant's assertions and processed the permit accordingly. IDEQ, seemingly will rely on post-construction testing to determine the validity of the applicant's claims. Given the magnitude of this

proposed project, the already compromised status of the local environment, that no other combined antimony/gold mineral processing facility of its type operates in the U.S., and the glaring lack of understanding of antimony toxicity to both human health and the environment; it seems incumbent that IDEQ would require more verification of the applicant's assertions and not forgo all toxic metal testing and monitoring beyond the federal minimums.

Public Review Period: The allotted review period is too short to evaluate a source of this magnitude, even if the application were complete and transparent. The review period runs concurrent with several other State and federal review processes, making it onerous on the public and nearly impossible for a competent thorough review. This is particularly true, as there are apparent inconsistencies in the applicant's assertions to different review authorities with respect to issues important to IDEQ's PTC review. Many of the sources of these inconsistencies were not made available to IDEQ in the cited reference materials for the application. Even in a less than complete review, fatal flaws are identifiable in the application, IDEQ's Midas-Gold-ptc-statement-of-basis analysis, and the draft permit. This finding alone, given the abbreviated public review period, is sufficient for the application to be denied and returned for revision.

Consideration of Toxic Metals Releases: As a result, these comments are limited to toxic metals releases. With regard to toxic metals, the applicants screening analysis indicates potential exceedance of carcinogenic and non-carcinogenic toxicity criteria for arsenic, antimony, cadmium and nickel, in addition to mercury. IDEQ has dismissed any concern relative to these toxins based on Air Quality modeling results provided by the applicant. These results are, of course, dependent on the source terms and dispersion characteristics inherent in the models. There are considerable uncharacterized uncertainties in these source terms and emissions estimates that cannot be appropriately evaluated without a representative material balance for toxic metals disposition being provided. This facility anticipates mining and processing an estimated 200 to 600 tons of Hg, 200K to 1M tons of Sb, 400K to 1M tons of As. Approximately 85% of the antimony and some undetermined fraction of the mercury will exit the site as product. The remaining toxic metals will be discharged to various environmental media, sinks and repositories on-site or shipped to hazardous waste facilities. The applicant projects that the most significant thermal source on the site will exhaust 0.2 pounds per year of mercury over 20 years to the atmosphere. This extraordinary level of control must be verified by material balance calculations to be relied upon. The applicant has not produced a material balance for toxics, and IDEQ has not assessed the overall coherence of toxic metal pathways necessary to verify the applicant's assertions. It is not possible in the allotted time frame to appropriately develop an independent material balance with the references provided.

Moreover, it seems that the draft IDEQ Permit, (other than the minimal annual NESHAPS 7E Hg emission tests) does not require measurement, monitoring, reporting, or testing of these toxic metals either in the process streams, emissions or releases from the operations - during the entire 20-year life of mining, milling and refining. With respect to toxic metals, the Permit only requires the applicant to operate the equipment in conformance with manufacturers' recommendations with the implicit assumption that this will result in health protective Hg, Sb, As, Cd, and Ni ambient concentrations.

If this interpretation is correct, then neither the emission estimates nor ambient metals concentrations will be verified by IDEQ. This conclusion should be reconsidered by IDEQ by thoroughly reviewing material balance summaries that are currently absent in the application. Should IDEQ then retain this

policy, the PTC should be subject to a Public Hearing following a reasonable review time, rather than a 30-day incomplete review period ending on a federal Holiday (October 12).

Citing Similar Operations in Nevada: The application makes several references to similar operations in Nevada regulated by the Nevada Department of Environmental Protection (NDEP). IDEQ cites those similar sources as the basis for reliance on the applicant's assertions.

"Estimated emissions from the autoclave and the carbon regeneration kiln relied on emissions data from representative source test emissions data, scaled to the proposed equipment capacity." (p 13, midas-gold-ptc-statement-of-basis).

However, there are significant differences between the Idaho and Nevada regulatory approaches that could question IDEQ's reliance on the Nevada data.

Guidance on Emission Factors for the Mining Industry, (Nevada Division of Environmental Protection Bureau of Air Pollution Control (BAPC) Permitting Branch 901 South Stewart Street, Suite 4001 Carson City, Nevada 89701-5249 Phone (775) 687-9349 May 31, 2017) cites two main sources for developing Emission Factors for Air Quality Permits for the mining industry. Those are (a) "... *the latest issue of Compilation of Air Pollutant Emission Factors, EPA Publication No. AP-42*, and (b) *Material balances ...*".

Accurate and transparent material balances are key to understanding and estimating contaminant sources, releases, migration, transport and transformation, media-specific concentrations, hazards and risks to ecologic and human health, and ultimate disposition of potentially harmful constituents. These documents fail to provide accurate and transparent material balances for toxic contaminants, making the PTC application exceedingly cumbersome and difficult to review, particularly in the abbreviated timeframe for such a challenging project. Moreover, the applicant has simultaneously applied for relief from regulatory requirements from several State and federal agencies with regard to air, water, and mining waste disposal requirements that would profoundly affect the ultimate disposition of contaminants. It is equally difficult to assess and provide comments in these regulatory reviews without a common basis for contaminant behavior, which is complicated by apparent conflicting information being submitted to different agencies.

NDEP does have significant experience with respect to mercury releases from gold mining and refining operations, although NDEP does not have similar level of experience with the antimony mining, milling and refining proposed at Stibnite. According to NDEP web-site information sources, NDEP requirements are significantly more stringent than IDEQ's. NDEP has implemented the Nevada Mercury Control Program (NMCP) that applies mercury emissions controls on thermal units located at precious metal mines that include both the EPA promulgated 40 CFR Part 63 Subpart EEEEEEE and additional State (NMCP) permitting conditions. NMCP requires that all precious metal processing facilities that operate, construct or modify a thermal unit that emits mercury must apply for, and obtain, a Mercury Operating Permit to Construct (Mercury OPTC). IDEQ is requiring only the minimal federal requirements and a generic Permit to Construct. Subpart EEEEEEE (E7) set Hg emission limits for three source categories that are groups of units promulgated in 2013; two of which apply to this application. NMCP requires unit level emission limits that are periodically re-evaluated for applicable sources.

IDEQ relies on alleged similar NDEP emission reports to assess Subpart EEEEEEE (E7) compliance cited in application Appendix B page - 30

40 CFR 63 Subpart 7E MERCURY SOURCES

Mercury Emissions

Subpart 7E Oper. % of Subpart 7E for Controlled Hg Emissions Controlled Systems* Hg Emissions*

Description	ton/yr	hr/yr	%	lb/hr	lb/yr	ton/yr
Autoclave **	0.107	8,760	10.0%	0.002	21.34	0.011
Refinery Sources (Kiln, EW, Retort, Furnace)	0.008	1,248	20.0%	0.003	3.36	0.002
Total	7439-97-6	0.115		0.005	24.70	0.012

*Based on Similar Source Hg Reporting Levels provided below

**Expected actual emissions from Autoclave: 0.0105 g/hr, 2.3E-05 lb/hr, 0.20 lb/yr (M3 2019)

Similar Source Hg Reporting Levels

Goldstrike Autoclaves 2 & 3 (2015 & 2016 Hg Reports) (NDEP 2015a) (NDEP 2016) = 10.9%

Twin Creeks Autoclaves 1 & 2 (2015 & 2016 Hg Reports) (NDEP 2015a) (NDEP 2016) = 0.2%

Goldstrike Refinery (2015 & 2016 Hg Reports) (NDEP 2015a) (NDEP 2016) = 14.3%

Twin Creeks Refinery (2015 & 2016 Hg Reports) (NDEP 2015a) (NDEP 2016) = 27.4%

This somewhat convoluted analysis portends that 2 autoclave examples from Nevada operations show that these facilities are, respectively, utilizing 0.2% to 10.9% of the 84 lb/ton allowable Hg emission; and 14.2% to 27.4% of the allowable .8 lb/ton concentrate carbon-based mercury retort emission limit. It is then assumed a nominal 10.0% and 20.0%, respectively, will be utilized at Stibnite. This results in an estimated 21.34 lbs/yr emissions from the autoclave and 3.36 lbs/yr retort emissions. The ** footnote suggests the actual autoclave emissions will be an extremely low 0.2 lb/yr. The assertion that these two facilities operate in compliance with the federal portion of the Nevada permit is not conclusive evidence that the Stibnite facility will meet the standard without showing that the ore composition, process parameters and operational factors are comparable.

Review of the cited sources is confusing. There is an obvious and considerable difference in the two example reported values with no explanation for the difference or why the nominal values for the analysis were selected. The State of Nevada regulates more than 35 mines with applicable thermal process units, and has accumulated hundreds of emission test results. There is no indication in the IDEQ application as to why these two particular test results were offered to demonstrate compliance with the applicable NESHAP requirements. The Goldstrike autoclaves report 32 lbs/yr in 2016 and a facility-wide release of 271 lbs/yr and has ranged from 166 to 709 lbs/yr over the previous decade. The unusually low 0.2 lb/yr attributed to (M3 2019) is an undated and unlabeled excel sheet attachment to an email requesting various process information with the single cited value in a column title "Final Cleaned Autoclave Vent Offgas to Atmosphere". It is not discernable from the referenced material what facility or process stream this test result applies to and any indication is appropriate for consideration in relation to the Stibnite proposal.

The application also references pages from the Nevada Operating permit. The NDEP Barrick Goldstrike Mine Class 1 Permit is 148 pages and does not include an antimony facility. The Draft IDEQ Permit, in contrast, is 34 pages and requires almost no toxic metal monitoring, testing, reporting or assessment during the life of the mining operation.

Fugitive Emissions: IDEQ notes that fugitive emissions are exempt from the NESHAP requirements for mercury and does not require any evaluation of fugitive Hg emissions. The application does note that human health toxicity criteria for arsenic, antimony, cadmium and nickel are exceeded and required air quality modeling to assess potential exceedance of ambient criteria. IDEQ has determined that the modelling shows no significant impact and only requires general dust control measures independent of

toxic metal concentrations. This is a dangerous conclusion given the lack of confidence in the source terms that cannot be assessed without a comprehensive toxic metals material balance for the operations.

It is also important to note that during promulgation of NESHAPS E7, the US EPA did not include fugitive emissions in the definition of source categories. This was because there was little information to quantitatively evaluate fugitive emissions and how these may be controlled; not because there were no health concerns. NDEP has since conducted extensive evaluations of fugitive emissions at gold mining sites and has noted that fugitive Hg emissions account for as much as 20% of point source emissions, and that there are large differences in emissions between mines and emissions that vary greatly at different stages of mine development, activity, age, and reclamation. These emissions are dependent on metals concentration/host rock characteristics, surface area of mining disturbed materials, characteristics of tailings impoundments, climatic conditions, ore-processing techniques, age of materials and reclamation, and natural background conditions. IDEQ should take advice from NDEP and require periodic monitoring, testing, reporting and assessment of the metal content and magnitude of fugitive emissions.

Idaho's "Low Jurisdictional Risk": Finally, it should be noted that the applicant is well aware of the relative stringency of IDEQ and other State's regulatory agencies' varying approaches. In the feasibility study cited in the application

M3. 2014. "Prefeasibility Study Technical Report." Prepared for Midas Gold, December 15. (revised 2019)

The analyses conclude that:

There are many significant opportunities that could improve the economics, and/or permitting schedule of the Project beyond those common to the sector (such as increasing metal prices, falling input costs, etc.). The major opportunities that have been identified at this time are summarized in Table 25.2.

The first item in Table 25.2 pp 25-9

General Opportunity G01. Permit Acquisition. In the same way that permit acquisition is a potential risk to the Project schedule, it may also be an opportunity. Idaho is characterized as having a low jurisdictional risk, and as a mining friendly state. In addition, the brownfields nature of the Project site may provide a significant impetus to see the Project, with the extensive remediation of legacy impacts built into the design, accelerated. The opportunity to shorten the permitting schedule exists, bringing value forward.

In summary: IDEQ should deny the current Permit and request that the applicant provide a comprehensive material balance for toxic metals Hg, As, Sb, Cd, and Ni for the operations during key mine-life periods. The applicant should submit a rationale and supporting data for the assertion that similar operations in other States are appropriate to the ores, metallurgical processes, environmental factors and regulatory strategy to be employed at Stibnite. Unless unequivocally demonstrated to be protective, with an appropriate margin of safety, IDEQ should require periodic monitoring and assessments of metals content in fugitive dusts and significant point sources. Decisions of this significance should be addressed in Public Hearings, both formal and informational, that include

opportunities for the public to ask clarifying questions of IDEQ staff, and then be provided sufficient time to comment accordingly.