

Data Submitted (UTC 11): 10/21/2020 6:00:00 AM

First name: Hugh

Last name: Miller

Organization:

Title:

Comments: I am an Associate Professor in the Mining Engineering Department at the Colorado School of Mines, where I teach and conduct research in a variety of areas related to project feasibility, mine design, and occupational safety and health. Prior to entering academia, I spent 13 years in mine operations and project engineering, including 5 years as the Director of Operations for international engineering company. In total, I have nearly 35 years of mining industry experience, which includes service on several boards for both companies and professional organizations, and regularly teach technical short-courses to industry and government audiences in a diversity of subjects on a global basis. In 2019, I had the pleasure of serving as the President of the Society for Mining, Metallurgy, and Exploration (SME).

Given my expertise, I ask that you consider my comments on several components of the project. These comments are based on my review of the Draft EIS and supporting documents that the U.S. Forest Service (USFS) has made available on its dedicated website for the Stibnite Gold Project. I very much appreciate the volume of information made available on this website and the ease of access to supporting documents and information developed for the project analyses.

#### Sufficiency of the Alternatives Analyzed in the Draft EIS

Chapter 2 of the Draft EIS analyzes four action alternatives that evaluate various configurations for the project facilities. This analysis incorporates Midas Gold's (the project proponent) excellent summary in Appendix G of their proposed operating plan (POP) of the design criteria the Company utilized to focus on a more detailed review of the various mine and infrastructure components with trade off studies. Midas Gold used design criteria both from a conceptual standpoint and in a more technically focused manner to evaluate the project, which reflects sound engineering practice.

Section 2.8 of the Draft EIS discusses the range of alternatives that were evaluated in Appendix G and explains why many of the alternatives considered are not economically or technically feasible or do not result in any meaningful environmental benefits and thus, did not warrant detailed evaluation as project alternatives in the Draft EIS. The alternatives evaluated were based on detailed reviews of nearly all major project components that could have significant impacts including:

- [bull] Siting and location of various project infrastructure components;
- [bull] Evaluation of mining methods (open pit versus underground);
- [bull] Evaluation of tailings storage facility construction and tailings management methodologies and alternatives to siting of the facility;
- [bull] Evaluation of various ore processing flowsheets and processing/mine support facilities locations;
- [bull] Development rock management options;
- [bull] Water management;
- [bull] Fish passage during and post operations;
- [bull] Blowout Creek restoration components, water and sediment management;
- [bull] Site access;
- [bull] Site power;
- [bull] On-site employee housing; and
- [bull] Employee transportation.

These major project components were then analyzed with a set of design criteria to produce a site layout and POP to optimize project economics and feasibility, and to minimize environmental and ecological impacts by:

- [bull] Proposing the location of project infrastructure on previously disturbed areas wherever practicable;
- [bull] Designing and proposing construction of facilities to minimize impacts to aquatic and terrestrial wildlife, and improve habitat across the site;
- [bull] Proposing activities in a manner to not only protect anadromous and local aquatic populations, but to restore and enhance stream channels and riparian habitats that were altered or impacted by historic mining, thereby providing shade for cooling of water, and enhancing fish habitat;
- [bull] Protect and improve local surface water and groundwater quality;
- [bull] Repair, relocate, or construct new ecologically diverse stream channels and wetlands to mitigate those disturbed by legacy and new mine development
- [bull] Remove existing barriers to fish migration and re-establish salmon and steelhead passage as a beneficial environmental outcome;
- [bull] Placing a focus on developing access to spawning habitat and creation or improvement of spawning habitat quality for salmon for the long term;
- [bull] Remove and re-process uncontained legacy tailings left over from the WWII era that are impacting ground and surface water quality;
- [bull] Remove and re-use legacy development rock and spent ore material for construction activities;
- [bull] Revegetate the area where it was impacted by mining, the former townsite, past logging and/or forest fires in order to enhance vegetative cover and wildlife habitat;
- [bull] Implementing watershed-scale sediment control actions, such as repairing Blowout Creek, removing or mitigating uncontained legacy development rock dumps, and reforestation to reduce erosion;
- [bull] Reduce fossil fuel energy consumption at the site by the targeted application of solar power and through the use of line power over diesel generation for processing and mining, thereby reducing human emissions of greenhouse gases; and
- [bull] Siting and site layouts to protect employee and public safety.

The USFS's alternatives screening criteria described in Section 2.8, appropriately considers environmental benefits and tradeoffs, technical and economic feasibility, and whether the alternative meets the project proponent's and the agency's purpose and need. The alternatives screening process that the USFS, its third-party technical contractor (AECOM), and Midas Gold used was no doubt time consuming and expensive and was clearly done in an iterative fashion reflecting application of a thorough and robust approach to project alternatives analyses. This process ultimately identified the four project alternatives that are evaluated in detail in the Draft EIS.

Given that backdrop, I would like to comment and express my opinion on several project components and alternatives as they are important from an operational and environmental protection, water quality, and public safety standpoint. I suggest selection of Alternative 2 as the preferred alternative, and hope you and your team can continue to work with Midas Gold and its contractors to mitigate and minimize impacts where practical and reasonable as the project advances.

#### Transportation Management

There are two primary routes to the site that were considered in the DEIS - the project proponents preferred route along Burntlog Road (Alternative 1-3) and an existing network of roads along Johnson Creek and Stibnite-Yellow Pine Road (Alternative 4). Midas provided the results of an extensive series of trade off studies looking at road alternatives and proposed the route along the existing Burntlog Road with some modifications and additions to make a connection to the existing site road network. The access route proposed by Midas Gold in their POP, along Burntlog Road (Alternative 1) as modified in Alternative 2 seems to be the logical route for life of mine access, as compared to Alternative 4 along the existing Johnson Creek- Stibnite-Yellow Pine roads as described in Section 2.6.4.1 of the DEIS. The DEIS and the analyses presented by Midas in their Appendix G note the various reasons for that route selection and reflect application of sound road management practices in their

choice of the Burntlog Road route over Alternative

4. From this analysis, I urge you to select Alternative 2 due to the benefits of that route which include:

- [bull] Allows mine-related truck traffic to access the mine site while avoiding existing routes that parallel fish bearing drainages, which reduces the risks of potential spills and minimizes risks of fugitive dust/sediment delivery to adjacent waterways;
- [bull] Avoids numerous and often active and unpredictable winter avalanche sites and rock falls;
- [bull] Reduces potential traffic conflicts with other road users and reduces congestion along the Johnson Creek and Stibnite-Yellow Pine roads;
- [bull] Eliminates routine mine truck traffic past residential areas along Johnson Creek Road and in the Yellow Pine area;
- [bull] Eliminates the need for major earthwork along stream drainage routes near a series of narrow, steep and dangerous sections of Johnson Creek and the Stibnite-Yellow Pine roads to make the road sections geotechnically stable and safe for drivers for long term mine traffic use; and
- [bull] Responds to public opinion received during project scoping on local stakeholder's transportation route preferences.

I was pleased to see Midas propose the use of buses for staff transportation to the site, which minimizes traffic, improves public safety, and reduces fugitive dust and greenhouse gas emissions. Although it was appropriate for the Forest Service to consider the different project access road network in Alternative 4, the most logical choice is the Alternative 2 road network because it best satisfies the alternatives screening criteria.

#### Tailings Storage Facility

I was pleased to see the proposed tailings storage facility (Alternatives 1, 2, and 4) was sited to provide the maximum amount of geotechnical stability with a planned high factor of safety (PO, Section 11.2.1, pp. 11-2 to 11-5; Appendix G, Section 8.3, pp. 29-54; DEIS, Section 2.3.5.7, Tailings Storage Facility). The planned downstream construction method, the 65-million ton development rock buttress for the embankment, and operation as a "closed circuit" (zero discharge) facility (PO, Section ES.15, p. ES-17; PO, Section 11.7, pp. 11-7 to 11-10) represents the most technically and economically feasible configuration that is also the most environmentally sound design for the tailings facility. Appendix G of the POP (Tables T3, T4, T5, pp. G48, G52, G53) and Section 2.8.3 of the Draft EIS present a detailed series of impact/benefit discussions and matrices to evaluate the construction methods, positioning, and other factors relating to tailings management of each of the sites evaluated as potential locations for the tailings facility. This is an excellent evaluation and represents sound engineering design practice.

The DEIS evaluates two tailings disposal facility sites in detail: 1) the Meadow Creek Valley site in Alternatives 1, 2, and 4; and 2) the East Fork of the South Fork of the Salmon River site as Alternative 3. I note that the Alternative 3 location occurs adjacent to identified geotechnical and slope stability hazards that pose an unnecessary risk to the tailings storage facility embankment stability which should preclude its selection as the preferred alternative. I also note that the Alternative 3 tailings facility location would impact a pristine reach of the East Fork South Fork of the Salmon River and would have a disturbance footprint nearly 100 acres greater than the Meadow Creek Valley location. In addition, if the Alternative 3 site were selected, the legacy tailings and spent ore material currently sitting in an unlined facility in the Meadow Creek drainage would remain as is which would be contrary to one of the purposes and needs for the project which includes a goal to: "Ensure that the selected alternative, where feasible, would minimize adverse environmental impacts on National Forest System (NFS) surface resources" (DEIS, Executive Summary Section 3.1, p. ES-5).

The negative consequences of selecting Alternative 3 and tailings location in the East Fork South Fork of the Salmon River compared to the Meadow Creek Valley location in Alternatives 1, 2 and 4 outweigh any positive benefits of Alternative 3. I also note that selection of the tailings storage facility in Alternative 3 fails to meet the

purpose and need of the U.S. Army Corps of Engineers (a cooperating agency) to fulfill their mandate to meet requirements of Section 404 of the Clean Water Act pertaining to wetlands impacts. Given the information provided and results of the analyses, I would urge you to select the Meadow Creek tailings storage facility site as the preferred alternative in the FEIS and ROD versus the site outlined in Alternative 3 in the East Fork drainage. Additionally, the enhanced liner design for the tailings impoundment included in Alternative 2 is another reason it is the environmentally preferred alternative.

#### Critical Minerals Supply Chain Benefits

Midas Gold's proposed project includes mining and processing of antimony-bearing ores and would produce antimony as a by-product of their precious metals extraction and beneficiation operations. Antimony is a rare, but highly utilized material in many industrial and defense applications and is a major component in many fire retardants used across the manufacturing and consumer products spectrum.

Historically and still today, China is the world's dominant producer of antimony and uses its dominance in the upstream and downstream parts of the supply chain to further its political and economic interest across the globe. This includes use of trade embargoes and export restrictions to cripple foreign businesses that rely on its supplies. The majority of the antimony mines and beneficiation facilities in China are government owned and China has repeatedly been brought before the World Trade Organization for violating free market trade policies in the mining sector, including manipulating the rare earth and antimony markets.

China is rapidly building up its military presence and exerting its influence in the South Pacific and elsewhere. They are fully aware of antimony's importance to the defense sector where it is widely used in munitions, explosives formulations, high tech military hardware and in nuclear applications. In fact, during World War II, part of the Japanese and German collaboration included cutting off supplies of antimony, among other strategic and critical materials, to the allies for use in their war efforts.

To counter the effects of the Japanese and German supply blockade, the Stibnite site ended up providing approximately 90% of the U.S. antimony needs during war time. The rapid and unconstrained development to meet the military's demands left the Stibnite site heavily impacted since the primary objectives were extraction of the materials to supply the U.S. and allies war efforts - not to preserve and enhance the environment. The Midas Gold project will not only address these longstanding and still unaddressed environmental and ecological impacts, but will also provide a domestic source for antimony. Since modern mining regulations require minimizing adverse environmental impacts and the use of environmental safeguards and protection technologies during operations, and reclamation when mining is completed, the impacts created during wartime development will not occur due to Midas Gold's proposed redevelopment and restoration plan for the Stibnite site.

The importance of the antimony reserves and resources of the project is recognized in the September 10, 2020 announcement of the addition of the project to the High Priority Infrastructure Project (HPIP) Permitting Dashboard - the first mine development project in the U.S. to be so included. Information on HPIPs is published on the Council on Environmental Quality website and provides for enhanced coordination between federal agencies.

The goals of applying for and being granted the HPIP listing are to:

- [bull] Ensure effective communications and timely permitting for the project;
- [bull] Provide a domestic supply of critical minerals for national security; and
- [bull] Restore a long abandoned and contaminated mine site.

These goals, in addition to guidance in Executive Order 13817 (December 20, 2017) A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals, provide impetus for expediting the NEPA and

permitting processes for the Stibnite project because near-future operation of this project is in the best interests of the public and U.S. national security.

Pursuant to the order, the Secretary of the Interior, in coordination with the Secretary of Defense, and in consultation with the heads of other relevant executive departments and agencies, were tasked with developing and submitting a list of minerals defined as critical minerals to the Federal Register. The final list of critical minerals was published in the Federal Register on May 18, 2018 (83 FR 23295), citing 35 minerals or mineral material groups, including antimony. In addition, and supporting this Federal Register list, the USGS released a comprehensive report on the 35 mineral commodities (USGS, 2018). The first commodity chapter in this USGS publication covers antimony and I suggest you review that chapter to gain a better understanding of the wide range of industrial and military applications and strategic significance to US interests of redevelopment of the Stibnite site. I have attached the antimony chapter from the USGS Critical Minerals Professional Paper for your review since it describes the wide range of uses, and tight supply chain structure and provides the background on why Stibnite is an important site.

### Safety

Midas Gold's POP and DEIS includes a number of important safety considerations that should be considered in your decision-making process. One of the project components critical from a safety standpoint relates to transportation. A key aspect of the proposal includes moving the workforce to and from the site in busses. This is a prudent choice since it minimizes traffic counts. I suggest you keep this as a requirement of the plan. It's also important to note that the two major alternative road routes are vastly different in elevation and layout. The Burntlog route (Alternatives 1-3) generally runs through high elevation country versus the Johnson Creek and Stibnite-Yellow Pine route (Alternative 4), which is an important consideration given the occurrence of snow and poor weather. Roads located at the base of slopes (such as those in Alternative 4) tend to present much more risk to traffic from avalanche, rock falls, and debris flow hazards due to the positioning of these roads relative to the slopes. Avalanche, debris slides and rock falls can occur very rapidly, and typically unpredictably, where areas above the slide runout areas are generally much safer for traffic than roads down slope. This factor should influence your decision not to select Alternative 4 since public safety should be of paramount concern and supersede other considerations. I understand the Burntlog route also has fewer impacts on streams, wetlands, and Riparian Conservation Areas than the Alternative 4 route. As such, it would seem this option would be far superior from the perspective of both safety and environmental impacts. I also note that the plan calls for large truck and hazardous materials travel to be limited to weekdays, which I agree is prudent choice and should be implemented as a requirement for the project since it minimizes risks of interaction between mine traffic and recreational and other road users on the weekends.

Since mine operations require the use of explosives, it is important to ensure operations meet the requirements of several Federal agencies, including the Bureau of Alcohol, Tobacco and Firearms (BATF) and the Mine Safety and Health Administration (MSHA). I was pleased to see that within Chapter 2 of the DEIS, a discussion regarding explosives management plan addresses the transportation and storage of explosives. I was also pleased to see that the DEIS includes a discussion on the use of convoys for large truck traffic for ingress and egress to the site. This is wise and I encourage you keep this requirement in the proposal as it advances.

Thank you for allowing me to comment on the DEIS for this project and I appreciate the effort the USPS has taken to review this project.