Public Comment on Midas Stibnite Gold Project: Edith R. Welty, MD

I. Introduction:

I am a retired family physician living in McCall for the past 13 years. I was a commissioned officer in the U.S. Public Health Service for 27 years: 24 working in direct patient care for Indian Health Service, and 3 working as an Epidemic Intelligence Service (EIS) officer and preventive medicine resident at Centers for Disease Control and Prevention, Atlanta, GA. During my years working on the Navajo Reservation, we found that many Navajo men who had worked in uranium mines had adverse health outcomes from mine-related uranium radiation exposure (cancer) and from mine dust (chronic lung disease), and found serious ailments in children born to women who had drunk from uranium-contaminated ponds during pregnancy. We also treated many patients with a variety of infectious diseases, such as TB spread by living in crowded quarters (including dormitories) and sexually transmitted diseases (STDs). For the 2 years as a CDC EIS officer, I worked for the Special Studies Branch, which dealt with evaluating adverse human health effects at Superfund (CERCLA) sites. For the 3rd year at CDC, I worked for the Sexually Transmitted Disease Division, evaluating STD clinics around the U.S. and helping write CDC STD Guidelines. My public comments will be based primarily on potential human health adverse effects from the Stibnite Gold Project (SGP).

II. Human health outcomes from exposure to heavy metals

The table below **(Ref. 1)** shows the acute and chronic health effects of heavy metal exposure and the treatment of heavy metal toxicity. The potential health outcomes are devastating, and the treatments are difficult and expensive.

Table1. Typical Presentation of the Most Commonly Encountered Metals and Their Treatment

Metal	Acute	Chronic	Toxic Concentration	Treatment
Arsenic	Nausea, vomiting, "rice-water" diarrhea, encephalopathy, MODS, LoQTS, painful neuropathy	Diabetes, hypopigmentation/ hyperkeratosis, cancer: lung, bladder, skin, encephalopathy	24-h urine: ≥50 µg/L urine, or 100 µg/g creatinine	BAL (acute, symptomatic) Succimer DMPS (Europe)
Bismuth	Renal failure; acute tubular necrosis	Diffuse myoclonic encephalopathy	No clear reference standard	*
Cadmium	Pneumonitis (oxide fumes)	Proteinuria, lung cancer, osteomalacia	Proteinuria and/or ≥15 µg/ g creatinine	*

Metal	Acute	Chronic	Toxic Concentration	Treatment
Chromium	GI hemorrhage, hemolysis, acute renal failure (Cr6+ ingestion)	Pulmonary fibrosis, lung cancer (inhalation)	No clear reference standard	NAC (experimental)
Cobalt	Beer drinker's (dilated) cardiomyopathy	Pneumoconiosis (inhaled); goiter	Normal excretion: 0.1-1.2 µg/L (serum) 0.1-2.2 µg/L (urine)	NAC CaNa2 EDTA
Copper	Blue vomitus, GI irritation/ hemorrhage, hemolysis, MODS (ingested); MFF (inhaled)	vineyard sprayer's lung (inhaled); Wilson disease (hepatic and basal ganglia degeneration)	Normal excretion: 25 µg/24 h (urine)	BAL D-Penicillamine Succimer
Iron	Vomiting, GI hemorrhage, cardiac depression, metabolic acidosis	Hepatic cirrhosis	Nontoxic: < 300 µg/dL Severe: >500 µg/dL	Deferoxamine
Lead	Nausea, vomiting, encephalopathy (headache, seizures, ataxia, obtundation)	Encephalopathy, anemia, abdominal pain, nephropathy, foot-drop/ wrist-drop	Pediatric: symptoms or [Pb] ≥45 µ/dL (blood); Adult: symptoms or [Pb] ≥70 µ/dL	BAL CaNa2 EDTA Succimer
Manganese	MFF (inhaled)	Parkinson-like syndrome, respiratory, neuropsychiatric	No clear reference standard	*
Mercury	Elemental (inhaled): fever, vomiting, diarrhea, ALI; Inorganic salts (ingestion): caustic gastroenteritis	Nausea, metallic taste, gingivo-stomatitis, tremor, neurasthenia, nephrotic syndrome; hypersensitivity (Pink disease)	Background exposure "normal" limits: 10 µg/L (whole blood); 20 µg/L (24-h urine)	BAL Succimer DMPS (Europe)

Metal	Acute	Chronic	Toxic Concentration	Treatment
Nickel	Dermatitis; nickel carbonyl: myocarditis, ALI, encephalopathy	Occupational (inhaled): pulmonary fibrosis, reduced sperm count, nasopharyngeal tumors	Excessive exposure: ≥8 µg/L (blood) Severe poisoning: ≥500 µg/L (8-h urine)	*
Selenium	Caustic burns, pneumonitis, hypotension	Brittle hair and nails, red skin, paresthesia, hemiplegia	Mild toxicity: [Se] >1 mg/L (serum); Serious: >2 mg/L	*
Silver	Very high doses: hemorrhage, bone marrow suppression, pulmonary edema, hepatorenal necrosis	Argyria: blue-grey discoloration of skin, nails, mucosae	Asymptomatic workers have mean [Ag] of 11 µg/L (serum) and 2.6 µg/L (spot urine)	Selenium, vitamin E (experimental)
Thallium	Early: Vomiting, diarrhea, painful neuropathy, coma, autonomic instability, MODS Late: Alopecia, Mees lines, residual neurologic symptoms	Alopecia, neuropathy	Toxic: >3 µg/L (blood)	MDAC Prussian blue
Zinc	MFF (oxide fumes); vomiting, diarrhea, abdominal pain (ingestion)	Copper deficiency: anemia, neurologic degeneration, osteoporosis	Normal range: 0.6-1.1 mg/L (plasma) 10-14 mg/L (red cells)	*

*No accepted chelation regimen; contact a medical toxicologist regarding treatment plan.

MODS, multi-organ dysfunction syndrome; LoQTS, long QT syndrome; ALI, acute lung injury; ATN, acute tubular necrosis; ARF, acute renal failure; DMPS, 2,3-dimercapto-1-propane-sulfonic acid; CaNa2 EDTA, edetate calcium disodium; MDAC, multi-dose activated charcoal; NAC, N-acetylcysteine.

References for Human Health Effects Section:

1. **Heavy Metal Toxicity.** Medscape. Updated: Aug 24, 2018. Adefris Adal, MD, MS; Chief Editor: Sage W Wiener, MD

Question:

1. **Diagnosis and treatment of heavy metals exposures are very difficult and expensive and requires specialized care. How will Midas provide care to workers or community members who are exposed?**

III. Baseline Studies

From the DEIS Table ES4-1 Summary and Comparison of the Potential Environmental Impacts Associated with the Significant Issues by Alternative)

At baseline, heavy metals are present in all areas of the mine site, but the following are elevated above water quality standards: arsenic in the West End pit, Fiddle Creek, and Yellow Pine pit; antimony in West End; iron and manganese in Hangar Flats Development Rock Storage Facilities (DRSF); and mercury in the Yellow Pine pit. Contamination is currently present downstream, with mercury elevated in the EFSFSR at the confluence with Sugar Creek below the mine site.

Per the Idaho DEQ Interim Report (copyright 2020) on the EFSFSR **(Ref 4),** the following sampling was at 2 sites in EFSFSR. IDEQ supported the sites for aquatic life and salmonid spawning, but did not support it for domestic water use because of high antimony and arsenic levels or for secondary contact recreation use (fishing/eating fish) because of high arsenic levels. Nonetheless, they designated the site status as **pass**. They did not assess the water for primary recreation or wildlife habitat. Some samples collected from 9/2011 to 8/2012 exceeded the human health WQ criterion for antimony (5.6 mcg/L) and exceeded the criterion for arsenic for fish consumption (10 mcg/L).

The 2011-2017 baseline study **(Ref. 2)** of water levels of dissolved arsenic, antimony, and mercury performed by the USGS, in collaboration with Midas Gold and the Idaho Dept of Lands showed marked increases from upstream (arsenic average 8.86 mcg/liter and antimony 0.93mcg/L to downstream (56.5 and 27.9 mcg/L respectively). All samples of both these metals in the downstream EFSFSR showed higher concentrations of dissolved arsenic than the human health acute water quality criteria (10 mcg/L and 5.6 mcg/L for arsenic and antimony, respectively, but did not exceed the criterion for arsenic in aquatic life (no criterion has been established for aquatic life for antimony). These dissolved metal levels were highest during low-flow months, suggesting groundwater contamination, whereas mercury levels were highest in particulates during high-flow months, suggesting mercury contamination in surface materials. Summertime water temperature at all sites exceeded criteria for salmon spawning.

Nez Perce Tribe Lawsuit (Ref 3):

Ongoing monitoring subsequent to Midas exploration and mining activities should also be compared with studies of heavy metals in these waters by the Nez Perce Tribe, as voiced in their 8-8-2019 lawsuit, under 33 U.S.C. § 1365(a), the citizen enforcement provision of the Federal Water Pollution Control Act, the Clean Water Act ("CWA"), which prohibits the discharge of any pollutant from a point source to waters of the United States unless done in compliance with a National Pollutant Discharge Elimination System ("NPDES") permit. 33 U.S.C. § 1311(a). Midas Gold has been illegally discharging without an NPDES permit

aluminum, arsenic, antimony, cyanide, iron, manganese, mercury, and thallium into the EFSFSR and its tributaries at documented levels above water quality criteria. Most of the mining areas are located on unpatented mining claims on public land in the Payette National Forest. Nez Perce treaty rights include fishing for spring/summer Chinook salmon, steelhead, bull trout, west slope cutthroat trout, redband rainbow trout, and mountain whitefish. The Tribe's Department of Fisheries Resources Management expends about $2.79 million annually on fisheries supplementation, research, and watershed restoration along the S. Fork Salmon and its tributaries. The CWA enables fines of up to $37,500 per violation per day that occurred through November 2, 2015, and up to $54,833 per violation per day that occurred after that date. Midas sites are situated along tributaries Meadow Creek, Sugar Creek, West End Creek, and Fiddle Creek and the EFSFSR, which flows into the Yellowpine Pit, then out the downstream end of the Pit into the continuation of the EFSFSR.

Pollutant sources include: the Glory Hole, Bradley Tailings Pile and Keyway Dam, Hangar Flats Tailings Pile, Bailey Tunnel DMEA Adit and DMEA Waste Rock Dump, Bonanza Adit, Cinnabar Tunnel, and Meadow Creek. Estimates by USGS in 2015 of heavy metals coming from the Glory Hole drained into the EFSFSR included an average of 2,150 pounds of arsenic, 1,010 pounds of antimony, and 617 pounds of dissolved manganese annually, from 2012-2014. Although Midas has had control of these areas for at least 5 years, they have not remediated nor stopped discharges of pollutants. As polluted water from upstream and from seeps in its walls collect in the Glory Hole, they settle into the sediments in its bottom and are thence discharged downstream at higher concentrations than upstream. The various tailings piles similarly leach pollutants into the watershed. For example, the Hangar Flats Tailings Pile, which is not capped, contains high concentrations of arsenic, antimony, aluminum, iron, manganese, and mercury, which are leached out into the EFSFSR during rain and snow melt.[2]

Section 4.18.2.1.1.4 Surface Water Quality, states that, in 2003, "the Agency for Toxic Substances and Disease Registry (ATSDR) Public Health Assessment found that risks to recreational receptor exposures from surface waters in the Stibnite Area are not expected to be a public health concern." However, more recently, "all inventoried water bodies at the mine site have designated beneficial uses of cold-water communities, salmonid spawning, and primary contact recreation. All waterbodies except Sugar Creek have additional designated beneficial uses of "drinking water supply" and presumed beneficial uses of "secondary contact recreation." "Each of these inventoried waterbodies (except for West End Creek) are listed as impaired for specific uses in accordance with Clean Water Act Section 303(d). The causes for listing of these waters are associated with arsenic, for exceedances of Idaho's human health criterion for consumption of water and organisms. The EFSFSR downstream of Meadow Creek also is listed for antimony for exceedances of Idaho's human health criterion for consumption of water and organisms. Sugar Creek also is listed for mercury, unrelated to human health" (it is related to aquatic life criteria). Yellow Pine pit has 90 feet of contaminated sediment, mostly tailings from the Blowout Creek dam break. This sediment will continue to contaminate the water in the pit and contaminate water flowing into EFSFSR until the pit is cleared, lined and backfilled.

Comment:

Based on the above listings for impaired water quality in waterbodies on or below the mine site, it is clear that the most recent baseline levels of As and Sb exceed water quality criteria for human health and will not improve unless water is continuously treated in perpetuity or the contaminants are removed with further mitigation and no ongoing mining. Thus, Alternative 5 is inadequate to fully remediate EFSFSR water quality. **Ongoing mining will increase the levels of pollutants and costs of remediation, which Midas will likely not be able to afford and thus, will be borne by US taxpayers.**

Questions:

1) Can the current mine site(s) be designated as a CERCLA/Superfund site and mitigated, rather than either leaving the site as it is (Alt 5) or pursuing ongoing mining (Alts 1-4)?

If not:

2) Since levels of As, Sb, & Hg are all in exceedance of human and/or aquatic life criteria farther downstream from the mine site in the EFSFSR and the South Fork, will Midas monitor these downstream reaches to assure they are not elevated above human health standards?

3) Should Midas Gold be required to reimburse the Nez Perce Tribe's Department of Fisheries Resources Management the $2.79 million they spend annually on fisheries supplementation, research, and watershed restoration along the S. Fork Salmon and its tributaries?

4) Should Midas Gold be required to pay the fines of up to $37,500 per violation per day that occurred through November 2, 2015, and up to $54,833 per violation per day that occurred after that date, as specified in the CWA?

5) Should Midas Gold be required to pay for medical care for persons who have been exposed to water on or downstream of the mine site who are suffering from ailments potentially due to arsenic and antimony toxicity?

References for Baseline Studies Section

2. US Dept of Interior. USGS. Scientific Investigation Report 2019 – 5072. Arsenic, Antimony, Mercury, and Water Temperature in Streams near Stibnite Mining Area in Central Idaho 2011-2017
3. Case 1:19-cv-00307-BLW Document 1 Filed 8-08-19. Nez Perce Complaint
4. IDEQ Integrated Report (copyright 2020) https://mapcase.deq.idaho.gov/wq2014/scripts/ADB2014.aspx?WBIDSEGID=ID17060208SL023_03

IV. Operations Phase: 12-15 years

IV. A. Applicable Laws & Regulations:

DEIS 3.9.2.1 Federal Regulations: The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the federally-mandated CWA. Section 402 of the CWA, which authorizes the National Pollutant Discharge Elimination System permit program, controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. On June 5, 2018, EPA approved the Idaho Pollutant Discharge Elimination System Program and authorized the transfer of permitting authority to the state beginning on July 1, 2018. EPA will retain the authority to issue National Pollutant Discharge Elimination System permits for facilities located on tribal lands and/or discharging to tribal waters.

EPA's other responsibilities under Section 404 of the CWA include promulgating and

interpreting environmental criteria used in evaluating permit applications under Section 404(b)(1): Guidelines for Specification of Disposal Sites for Dredged or Fill Material; coordinating with the U.S. Army Corps of Engineers (USACE) in the review of Section 404 permit applications; and sharing responsibility with the USACE in determining the geographic scope of CWA jurisdiction. Section 311 of the CWA also gives EPA regulatory authority with regard to spill prevention, control, and countermeasure plans required for oil storage. Facilities with aboveground and underground storage tanks in excess of specific thresholds are required to develop and implement a Spill Prevention, Control, and Countermeasure Plan.

Under the Safe Drinking Water Act, EPA has established primary and secondary maximum contaminant levels (MCLs) to protect the public against consumption of drinking water contaminants that present a risk to human health. The MCL is the maximum allowable amount of a contaminant in drinking water that is delivered to a consumer (EPA 2018a,b).

In addition, EPA has established National Secondary Drinking Water Regulations that set non- mandatory water quality standards for 15 constituents. EPA does not enforce these secondary MCLs. They were established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color, and odor. These constituents are not considered a risk to human health.

3.9.2.2.1 State Regulations: Surface Water Quality: The Idaho Department of Environmental Quality (IDEQ) implements the CWA in Idaho and regulates waterbodies in the state under its jurisdiction to meet their designated beneficial uses and Idaho water quality standards. **Table 3.9-2** lists the strictest potentially applicable surface water quality criteria used in the water quality analysis in the Environmental Impact Statement. These standards represent a combination of drinking water and cold-water aquatic life criteria that provide a benchmark for evaluating baseline water quality at the mine site and predicted concentration changes resulting from the SGP alternatives described in Section 4.9, Surface Water and Groundwater Quality.

IDEQ administers the Idaho Pollutant Discharge Elimination System program regulating discharges of pollutants into waters of the U.S. under its jurisdiction as described in the state's program application. EPA has approved the State's implementation plan that transfers the administration of specific program components from EPA to the State over a 4-year period in accordance with the Memorandum of Agreement between IDEQ and EPA Region 10. Per this memorandum, EPA will oversee IDEQ administration of the Idaho Pollutant Discharge Elimination System program on a continuing basis for consistency with the CWA, Idaho laws and rules, and all applicable federal regulations(IDEQ and EPA 2016).

Projects that may result in a discharge to waters of the U.S. require Water Quality Certification under Section 401 of the CWA. IDEQ is the regulatory authority for Section 401 permitting in Idaho. The IDEQ must grant (with or without conditions), deny, or waive Section 401 certification for any project in Idaho that requires a federal permit or license under the CWA before the federal permit or license can be granted, including the Section 404 permit issued by the USACE. This Water Quality Certification is designed to ensure that a federally-approved project would comply with state water quality standards for surface water and any

other water quality requirements under state law.

The CWA also requires the state to prepare a report listing the current condition of all state waters and those waters that are impaired and in need of a total maximum daily load. The first list is referred to as the Section 305(b) list; the second is the Section 303(d) list. Both lists are named in accordance with the sections of the CWA where they are defined; together, and with additional supplementary information, they are known as the Integrated Report.

Impaired waters on the Section 303(d) list are simply a subset of those on the Section 305(b) list. The current applicable report is IDEQ's 2016 Integrated Report (IDEQ 2018). The Idaho Nonpoint Source Management Plan describes the state's strategy for addressing nonpoint source pollution collaboratively with local, state, and federal partners, and provides guidance on evaluating and measuring success in meeting water quality goals for the state (IDEQ 2015). IDEQ's role in nonpoint source management as it relates to mining and natural resource extraction includes the following:

- Assist mining operators to characterize hydrogeological conditions and background groundwater quality prior to initiating mining activities;
- Conduct monitoring and total maximum daily load development;
- Conduct site investigations and inspections as necessary;
- Focus on site cleanup and remediation in areas where mining activities have contaminated soils and surface water; and
- Provide technical assistance to responsible state and federal agencies and private organizations/owners as requested.

Under Idaho's Rules for Ore Processing by Cyanidation (Idaho Administrative Procedures Act [IDAPA] 58.01.13), mining facilities that use cyanide in their mineral extraction processes are required to obtain a permit from IDEQ. IDAPA 58.01.13 establishes procedures and requirement for the issuance and maintenance of permits to construct, operate, and close that portion of a cyanidation facility that is intended to contain, treat, or dispose of process water or process contaminated water containing cyanide. The provisions of these rules also establish requirements for water quality protection which address performance, construction, operation, and closure of a cyanidation facility. The rules are intended to ensure that pollutants associated with the cyanidation process are safely contained, controlled, and treated so that they do not endanger public safety or the environment, or interfere with beneficial use of waters of the state.

In addition to regulations enforced by IDEQ, the Idaho Department of Water Resources (IDWR) regulates stream channels under the Idaho Stream Channel Protection Act. This act requires that a Stream Channel Alteration Permit be obtained from IDWR before any type of channel alteration work, including removal and/or fill and installation of in-water or over-water structures with the potential to affect flow, within the beds and banks of a continuously flowing stream.

IDWR, the USACE, and the Idaho Department of Lands have established a joint process for activities impacting jurisdictional waterways that require review and/or approval

of both the USACE and the State of Idaho. Additionally, IDWR regulates water dams (which may apply to SGP contact water storage ponds) and mine tailings impoundments with dams higher than 30 feet.

3.9.2.2.2 State Regulations: Groundwater Quality

The Idaho Ground Water Quality Rule (IDAPA 2011) establishes minimum requirements for the protection of groundwater by setting standards and beneficial uses and categorizing aquifers to be protected at different levels. The protection levels in IDAPA 58.01.11, summarized in **Table 3.9-2**, include both primary and secondary numerical groundwater quality standards promulgated by IDEQ to protect human health and the environment. These standards apply to *in situ* groundwater, as well as water that infiltrates to groundwater through artificial recharge such as the rapid infiltration basins planned for the SGP (see Section 2.3.5.9, Surface Water and Groundwater Management, Groundwater Management, Rapid Infiltration Basins). After groundwater or artificial recharge through the rapid infiltration basins reaches surface water, the surface water quality standards shown in **Table 3.9-2** would apply.

The IDEQ is responsible for coordinating and administering groundwater quality protection programs in the state of Idaho. IDEQ also is responsible for establishing a point of compliance location, if requested by a mine operator and pursuant to the Idaho Ground Water Quality Rule (IDAPA 2011), where groundwater and surface water downgradient of mining activity must meet established water quality standards.

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Table 3.9-2 Criteria for Ground and Surface Water Quality Standards

Parameter	Units	Groundwater Quality Standard Value (1)	Surface Water Quality Standard Value (2)	Surface Water Standard Source
pH	s.u.	6.5-8.5 S	6.5-9.0	IDAPA 58.01.02 – Aquatic Life Use
Alkalinity, Total	mg/L as $CaCO_3$	---	>20	EPA Freshwater Aquatic Life Criteria
Aluminum	mg/L	0.2 S	0.05 t	EPA Secondary Drinking Water Standard
Antimony	mg/L	0.006 P	0.0052 d	IDAPA 58.01.02 – Human Health
Arsenic	mg/L	0.05 P	0.010 t	IDAPA 58.01.02 – Human Health
Barium	mg/L	2 P	2 t	EPA Drinking Water MCL
Beryllium	mg/L	0.004 P	Narrative	IDAPA 58.01.02
Cadmium	mg/L	0.005 P	0.00033(2) d	IDAPA 58.01.02 - CCC (chronic)
Chloride	mg/L	250 S	230	EPA Freshwater Aquatic Life Criteria
Chromium, Total	mg/L	0.1 P	0.1 t	EPA Drinking Water MCL
Copper	mg/L	1.3 P	0.0024(3) d	IDAPA 58.01.02 – CCC (chronic)
Cyanide, Total	mg/L	0.2 P	0.0039	IDAPA 58.01.02 – Human Health
Cyanide, WAD	mg/L	---	0.0052	IDAPA 58.01.02 - CCC (chronic)
Iron	mg/L	0.3 S	0.3 t	EPA Secondary Drinking Water Standard
Fluoride	mg/L	4 P	2	EPA Secondary Drinking Water Standard
Lead	mg/L	0.015 P	0.0009(2) d	IDAPA 58.01.02 – CCC (chronic)
Manganese	mg/L	0.05 S	0.05 t	EPA Secondary Drinking Water Standard
Mercury	mg/L	0.002 P	0.000012 tr	IDAPA 58.01.02 - CCC (chronic)
Methylmercury (fish tissue)	mg/kg	---	0.3	IDAPA 58.01.02 – Human Health
Nickel	mg/L	---	0.024(2) d	IDAPA 58.01.02 – CCC (chronic)
Nitrate + nitrite	mg/L	10 P	---	N/A
Selenium	mg/L	0.05 P	0.0015 t	EPA Freshwater Aquatic Life Criteria
Silver	mg/L	0.1 S	0.0007(2) d	IDAPA 58.01.02 - CMC (acute)
Sulfate	mg/L	250 S	250	EPA Secondary Drinking Water Standard
Total Dissolved Solids	mg/L	500 S	500	EPA Secondary Drinking Water Standard
Thallium	mg/L	0.002 P	0.000017 d	IDAPA 58.01.02 – Human Health
Zinc	mg/L	5 S	0.054(2) d	IDAPA 58.01.02 – CMC/CCC (acute/chronic)

Table Sources: IDAPA 58.01.11; IDAPA 58.01.02; EPA 2018a,b, 2019

Table Notes:

1 Groundwater standards obtained from IDAPA 58.01.11.

2 Strictest potentially applicable surface water quality standard.

3 The criteria for these metals are hardness-dependent. The values listed are based on the EFSFSR hardness of 40 mg/L as calcium carbonate, which represents the 5th percentile hardness during the driest four months at node YP-SR-10 between April 2012 and May 2019.

4 Copper criterion was derived using the Biotic Ligand Model per guidance contained in IDEQ (2017). A conservative chronic copper standard was estimated by applying the lowest of the 10th percentile chronic criteria based on regional classifications for the Salmon River Basin, Idaho Batholith, and third order streams. Per the SGP Water Quality Management Plan (Brown and Caldwell 2020), preliminary calculations using the Biotic Ligand Model and site-specific data have produced similar values to the standard derived using these regional classifications.

Narrative = No numeric human health standard has been established for beryllium. However, permit authorities will address beryllium in National pollutant Discharge Elimination System permit actions using the narrative criteria for toxics in Section 200 of IDAPA 58.01.02, which states: "Surface waters of the state shall be free from toxic substances in concentrations that impair designated beneficial uses. These substances do not include suspended sediment produced as a result of nonpoint source activities."

s.u. = standard units. mg/L = milligrams per liter.
mg/kg = milligrams per kilogram. $CaCO_3$ = calcium carbonate.
--- = Indicates no standard for this
constituent. P = primary constituent
standard.
S = secondary constituent
standard. d = dissolved
fraction.
t = total fraction.
tr = total recoverable.

3.9.2.3 County Regs: The Valley County Land Use and Development Ordinances have provisions for well head protection. These regulations would likely apply to any drinking water wells installed. The well head protection regulations control the siting of drinking water wells and prevent wells and their potential capture zones from being installed near potential sources of groundwater contamination.

Section 3.2.3.2 Mineral Reserves states: "The amended Preliminary Feasibility Study prepared for Midas Gold for the SGP reports an estimated Probable Mineral Reserve[5] of 4.5 million ounces of gold, 6.9 million ounces of silver, and 137 million pounds of antimony (M3 Engineering and Technology 2019)"

IV.B. Area of Operations Description, Plan, Design:

Per Section 4.9.2.1.1.4, the Meadow Creek operations phase includes **r**emoval of tailings and re-purposing from Meadow Creek valley from historical mining operations, including SODA and Bradley tailings. **The development rock is generally non-acid generating but capable of leaching arsenic, antimony, aluminum, manganese, sulfate, total dissolved solids, copper, cadmium and zinc above water quality criteria**.

Per Nez Perce lawsuit (ref 3 above), "Midas Gold proposes to re-mine some areas of the Site and to double the mining activity area to an added 800 acres on undisturbed fish and

wildlife habitat and may/will "fill three headwater stream valleys with 450 million tons of mine tailings and waste rock and leave two or three new mine pits after they stop mining."[3] Pollutant levels in water and sediment will be repeatedly elevated throughout the mine site from tailings, development rock, and rock walls.

TSF, including liner, drains, groundwater protection projections:

Per section 4.9.2.1.2, Groundwater Quality, "During mine operations, the mine tailings could impact groundwater quality through solute loading and seepage from the base of the TSF." "The potential for seepage impacts would be managed through construction of an engineered liner beneath the TSF that includes the following components:

- Over liner drain system to encourage dewatering and consolidation of deposited tailings;
- 60-mil (0.060-inch) linear low-density polyethylene liner;
- Geosynthetic clay liner approximately 6 millimeters (mm) thick; and
- At least 12-inches of compacted foundation soil.

Underdrains also would be installed beneath the liner to collect groundwater flow from springs and seeps, collect any leakage from the tailings, and convey the water beneath the TSF. If installed properly, the engineered liner would minimize seepage through the base of the TSF. However, there could be manufacturing defects, post-installation damage, holes in the liner, or weaknesses along the seams that may allow minor amounts of seepage to occur. Estimated leakage rates through the liner have been developed by Tierra Group (2018) using the assumption of one liner defect per acre." The data in **Table 4.9-17** indicate that "area-weighted leakage rates through the liner (in mm per year) would be low, ranging from zero during the first year of mining to approximately 0.5 mm per year (0.02 inch per year) during the post closure period." This leakage rate is projected to be less than the groundwater recharge rate (which is estimated to be >500 times greater than the liner leakage rate), thus theoretically negating impacts of liner leakage. Water that leaks "through the TSF liner would be captured by the **underdrain system** and conveyed to a collection sump (Section 2.3.5.7). The sump water would be sampled at routine intervals to evaluate whether the water quality of the underdrain flow has been impacted by tailings seepage."

Comments:

The above liner, under- and overdrain, and monitoring system sounds potentially effective, unless unforeseen events, such as earthquakes, landslides, or other environmental disturbances rip the liner and underdrain system, leading to groundwater contamination. Meanwhile, contaminated surface water and sediment will flow downstream continuously during this12-15 years. In addition to fish consumption from the South Fork Salmon by anglers from Idaho and other states and by tribal members, some of the Nez Perce members sell fish to customers in McCall and other towns. In addition, recreationalists and tribal members will continue to spend time in, and potentially drink,

waters from the EFSFSR and South Fork during mining operations. Thus, several populations are potentially exposed to heavy metals from legacy and ongoing mining due to both fish consumption and primary exposure to surface water.

Although TSF levels of arsenic & antimony are alleged to be within standards at baseline and for Alt 1, 2, 3, & 4, during operations development rock arsenic levels in Hangar Flats DRSF are predicted to be elevated in Alts 1, 2, & 4.

Questions:

1) How much will ongoing mining activity further pollute the EFSFSR and South Fork above current baseline levels during the 12-15 years of operations?

2) Should Midas Gold be required to pay for medical expenses incurred by recreationalists and consumers of downstream fish that could be attributed to heavy metals and other toxins, including all waters from the EFSFSR and its tributaries and the S. Fork Salmon?

3) How much heavy metal-containing sediment will be deposited during operations?

4) Will Midas be required to continuously monitor heavy metal levels and other parameters of water quality during the 12-15 years of mining?

V. Mitigation: How effective will it really be "in perpetuity?"

Table 4.1-1 identifies the following

"The functionality of the MicroDrain liner/leak detection configuration proposed under Alternative 2 is relatively new technology, thus adequacy of performance over long time frames has not been fully described. Additional details on the functionality of the MicroDrain liner will be considered by Idaho Department of Environmental Quality and, if available, incorporated into the Final EIS. The project-specific copper Biotic Ligand Model threshold will be the same for all alternatives, but without the criteria it is unknown which alternatives will or will not meet the threshold."

"The Draft EIS provides a general description of SGP's water balance. A large component of the water balance includes groundwater management. No aquifer pump test results have been provided for the bedrock aquifer from which pit dewatering would occur. Rapid infiltration basin (RIB) testing results were not available for inclusion in the Draft EIS. Disposal of groundwater into RIBs also may be complicated during winter operations."

"There are uncertainties regarding the hydraulic properties of pit backfill (eg. grain size) Details of surface water management, discharge limits, and permitting is not yet available, but will be included in final EIS. The Development Rock Management Plan will provide additional clarification on handling of development rock, particularly how potentially acid generating (PAG) rock will be handled. This could change the analysis of alternatives and the predicted water quality impacts. Reclaimed stream channels in general, and stream channels created on fill in particular, would have different geomorphology and would take some time for vegetation establishment. Additional analyses of the feasibility of successful reclamation are needed."

V. A. Surface Water Quality Post-closure:

Table 2 in the Executive Summary shows the following post-closure EFSFSR surface water chemicals.:

- Arsenic - 3 of the 4 alternatives increase levels of arsenic above baseline, which is already above water quality (WQ) standard. Although Alt 2 does not raise arsenic above baseline, the level is still above standard, unless water treatment is fully effective and continued "in perpetuity."
- Antimony – Remains above WQ standard.
- Copper – Normal at baseline, but elevated above WQ standard in Alt 1, 3, 4.
- Aluminum – Remains within WQ standard in Alt 1-5.
- Mercury - Normal at baseline, elevated in Alt 1-4.

Per DEIS section 4.9.2.1.2, "Post-closure concentrations of these elements in the EFSFSR with water treatment have not been modeled for Alternative 1 and are not known at this time."

Comment: The "Good Samaritan" concept that a mining company will mitigate an already-polluted site as a byproduct of their proposed new mining operation will not apply in Midas's case, because they will leave the surface water as bad or worse than it was before, unless water treatment will be continued "in perpetuity."

Questions:

1) For how long will Midas continue managing water treatment?

2) When Midas stops paying for and managing water treatment, who will end up continuing to pay for, and provide it?

3) What are the projected cyanide levels in the TSF after mitigation?

V.B. Fish Consumption Risks Post-closure:

1. Arsenic Per IDEQ, 6/9/2015 (Hawk Stone) and IDEQ's Integrated Report (Ref 4), the data collected by USGS between September 2011 and August 2012 shows arsenic samples to be exceeding Idaho's human health criterion of 10 µg/L for consumption of fish. Therefore, secondary contact recreation is impaired for arsenic."

A 2009 study **(Ref 5)** of arsenic accumulation in an edible fish, the brown trout (*Salmo trutta*) was conducted downstream from a mine on the Bravona River, France. The investigators measured arsenic levels in fish at four stations along a contamination gradient. **Almost 70 years after the suspension of the mining activity, arsenic levels in the water and in the fish remained high, with a strong correlation between levels in water and levels in fish.** Bioaccumulation was greatest in the gills, operculum, and liver.

Question:

1) Given the 70-year long duration of elevated arsenic levels in water and fish in this 2009 study, should Midas be required to continue monitoring arsenic in water and fish downstream from all mining sites and reducing them to WQ standard for at least that long?

2. Mercury:

DEIS Chapter 4.12.2.3.3.1. p 412-49 states: "Although water column concentrations are predicted to exceed the standard for mercury, results of tissue sampling in the SGP area indicate risk to both human health and aquatic life, including fish, may be minimal, as the 0.3 milligram per kilogram MeHg threshold was not met or exceeded at sites where tissues were collected in the SGP area (MWH Americas, Inc. 2017)."…… "But this criterion does not account for exposure via bioaccumulation. Therefore, with respect to incremental bioaccumulation that may occur in fish species, potential impacts of predicted post-closure increases in water column mercury concentrations beyond baseline conditions is uncertain but would likely include some if not all the potential impacts described above." Section 4.18.2.1.4.3 states that bioaccumulation in fish, wildlife, & plants could impact fishermen, hunters & berry-gatherers.

Per EPA (Ref 6) "The main way that people are exposed to mercury is by eating fish and shellfish that have high levels of methylmercury, a highly toxic form of mercury, in their tissues. A less common way people are exposed to mercury is breathing mercury vapor. This can happen when mercury is released from a container, or from a product or device that breaks. If the mercury is not immediately contained or cleaned up, it can evaporate, becoming an invisible, odorless, toxic vapor."

"Mercury exposure at high levels can harm the brain, heart, kidneys, lungs, and immune system of people of all ages." "High levels of methylmercury in the bloodstream of babies developing in the womb and young children may harm their developing nervous systems, affecting their ability to think and learn."[6]

Methylation of Mercury: Section 3.9.3.1.1.4 Methylmercury: Background results from Stibnite revealed approximately 90 percent of the samples were below the method detection limit (<0.1 nanograms per liter [ng/L]). Higher levels were found in samples from Sugar Creek & Fiddle Creek. The average was about the same as at other locations in the US. It was lower in seeps, due to either low seep flow or to degradation of MeHg in seeps.

Although MeHg was, for the most part, undetectable at baseline studies, it is projected to be elevated in Alts 1, 3, 4 without water treatment. Alt 2 modeling is estimated to have no elevations after water treatment.

A study in the San Francisco Bay (Ref 7) states: "Mercury in the environment can easily reach toxic levels. In a process called methylation, Hg is transformed into a form that can be accumulated in the muscle and fatty tissue of fish. Accumulated levels of methylmercury become higher as the fish grow, and levels are magnified up the food web as larger fish eat smaller fish, a process called **biomagnification. As a result, mercury concentrations in fish can be millions of times higher than in surrounding waters**. Fish advisories have been set to limit consumption of certain fish higher up on the food web, especially for pregnant women and small children."[7]

Questions on mercury:

1) What are mercury levels in fish downstream in the EFSFSR and S. Fork?

2) Are there restrictions or warnings about fishing/fish consumption from the EFSFSR, S. Fork , and/or Main Salmon?

3) How will Midas prevent air emissions of mercury?

3. Cyanide:

According to a CEFAS review article (Ref 8), "…over 90 percent of all gold excavated globally is extracted using cyanide with concentrations of cyanide up to 280 µg l^{-1} recorded several kilometers downstream of a metal processing plant." (Note: the EPA standard for free cyanide in water is (200 µg l^{-1}). "Mining activities have been associated with large scale pollution events which can introduce huge `quantities of cyanide compounds into the environment over a short time period." "The persistence of cyanide in living organisms is determined by the exposure concentration and duration and the rate of detoxification (Ramzy, 2014)." Prolonged low-level exposure in fish causes goiters and other abnormalities. Fish metabolize it to thiocyanate. Ramzy reported a half-life of cyanide in Nile Tilapia (*Oreochromis niloticus*) of approximately one hour. In contrast, the half-life of thiocyanate is considerably longer" "Thiocyanate **bioaccumulation** has been linked to the occurrence of sudden death syndrome (SDS) in fish which appears to be stimulated by stress or high energy movements…" "Although thiocyanate is rapidly formed following exposure to cyanide, the rate of excretion is considerably slower and it therefore **has the potential to bioaccumulate in living organisms.**" "There are only a small number of studies which have focused on the development of methodologies for the detection of thiocyanate or other cyanide metabolites in water."[8]

Comment:
The DEIS Executive Summary states that cyanide will be recycled in the leaching process to reduce contamination of soil and TSF. However, many gold mining operations have left cyanide pollution when mining operations cease. If SGP cyanide tanks onsite released large quantities of CN into surface water, as in the examples quoted in the CEFAS reference above, it could cause fish kills downstream. If a chronic, low level leak occurred, it could cause fish contamination with CN and thiocyanate.

Questions:

1) How much cyanide will be left onsite after leaching & recycling?

2) Will there still be cyanide in the TSF that could be released over the dam into the Hangar Flats DRSF and thence into water after heavy rain, snowmelt, dam break, earthquake, avalanche, or landslide?

4. Antimony (Ref 9)

"Arsenic and antimony, a toxic element of emerging environmental concern, are increasingly mined for a variety of industrial applications. Both elements are classified as pollutants of priority interest by the U.S. Environmental Protection Agency (EPA), which sets the maximum contaminant level (MCL) for As and Sb in drinking water at <10 and <6 mcg/ L respectively." "Both metalloids can bioaccumulate in freshwater food chains but they are not known to bio-magnify, and in some cases, they are reported to undergo bio-diminution with increasing trophic level. These metalloids co-occur at varying environmental concentrations."

In this study in Meadow Creek and surrounding wetlands, the authors aimed to study As & Sb levels in "surface water, and concentrations in sediment and stream or wetland biota including: riparian tree leaves, biofilm, algae, submergent macrophytes, benthic macroinvertebrates, frog and toad tadpoles and predatory fish (trout). The authors concluded that, "Antimony accumulates to a lesser extent than As and accumulates most readily in lower trophic levels (e.g. biofilm and plants)." [9]

Comment: The fish samples tested for antimony in the above reference were <5 cm long, and there was some question of whether they had lower levels because they swam downstream intermittently to less contaminated water. The authors did not test larger fish downstream. There is very little literature on biomagnification of antimony.

Questions:

1) Will there be any testing for antimony in larger fish in the EFSFSR & S. Fork?

References for Mitigation Section (numbering continued from above sections):

5. Ecotoxicology and Environmental Safety. Volume 72, Issue 5, July 2009,Pages 1440-1445

6. EPA: Basic Information About Mercury. https://www.epa.gov/mercury/basic-information-about-mercury

7. http://science.calwater.ca.gov/images/scinews_hg_da_lg.jpg "Seeing" Mercury Methylation in Progress. Science Highlight, Dec 2019

8. Cyanide in the aquatic environment and its metabolism by fish. Scott Davis, Joanna Murray & Ioanna Katsiadaki. **Issue date:** 15/09/2017. https://ornamentalfish.org/wp-content/uploads/Cefas-OATA-report-cyanide-metabolism-by-fish-Sept-2017.pdf

9. Bioaccumulation trends of arsenic and antimony in a freshwater ecosystem affected by mine drainage. *Meghan A. Dovick*,[A] *Thomas R. Kulp*,[A,C] *Robert S. Arkle*[B] *and David S. Pilliod Environ. Chem.* **2016**, *13*, 149–159 http://dx.doi.org/10.1071/EN15046

V.C. Reclamation Cover Materials (RCM) Human Health Risks Post-closure:

Appendix D states that: "Standards and guidelines in the Payette and Boise National Forest Land and Resource Management Plans (Forest Plans) (Forest Service 2003, 2010) that are designed to reduce or prevent undesirable impacts resulting from proposed management activities are incorporated into all action alternatives by reference. In addition, best management practices outlined in the Best Management Practices for Mining in Idaho[1] will be implemented where appropriate and applicable for operations to minimize site disturbance from mining and drilling activities and to ensure operations are in compliance with all applicable local, state and federal regulations." (Idaho Department of Lands. Best Management Practices for Mining in Idaho. 1992. Prepared by Idaho Department of Lands in conjunction with Other State and Federal Agencies through the Idaho Mining Advisory Committee. November 16. Available at: https://www.idl.idaho.gov/mining/bmp/bmp1992ttl.pdf.")

1. Soil:

Section 4.18.2.1.1.3 states that Idaho Dept of Health & Welfare (IDHW) recommended "additional characterization to adequately assess risks to public health and recommended that potential human exposure following closure and reclamation should be considered when identifying RCM to ensure protection of recreational receptors" (IDHW 2019). RBSLs were calculated based on EPA's range of acceptable excess lifetime cancer risk (ELCR) level range of 10^{-6} to 10^{-4} for carcinogenic endpoints and a target hazard quotient of 1 for noncarcinogenic endpoints. Section 4.18.2.1.1.3 states: "Reclamation activities would include removal and reprocessing of historical tailings, planting of trees in mining-impacted areas and removal of potentially contaminated soils (Tetra Tech 2019)." To bring RCM soil contaminants to human health criteria for soil ingestion, Midas uses EPA calculations for risk-based soil levels (RBSL) ingestion, based on the assumption that recreationalists will

potentially be exposed for 16 days/year (the NFS camping limit) X 26 years. **This assumption could be flawed**, especially if indigenous peoples spend considerable amounts of time in the area exercising their treaty rights for fishing, hunting, plant-gathering, and traditional ceremonies.

Questions:

1) **How will Midas assure that post-closure solid will contain sufficiently low levels of heavy metals that persons spending much more time than 16 days/year do not suffer heavy metal toxicity from soil ingestion?**
2) **How, exactly, are the caps to TSF & DRSF constructed? What materials are in them? Do they all have multi-acre tarpaulin-like covers under the soil, trees, etc., similar to the liner under the TSF?**

2. Groundwater Risks Post-closure:

Section 4.18.2.1.1.5 alleges that no persons will drink water from the site or nearby waters. The greatest water use will be for ore processing, and Midas will pump groundwater for this purpose and recycle 80% of it back to ore processing. Although there are 3 wells onsite, Midas will not use them for human consumption and will, instead, truck drinking water to employees onsite. Yellow Pine village's water comes from Boulder Creek, which has a separate source from the EFSFSR. Section 4.18.2.1.1.5 states that: "groundwater quality beneath the mine site is expected to either be the same or similar to existing groundwater chemistry during both the operational and post-closure periods, and in some areas, groundwater quality in the post-closure period would improve from existing conditions to below regulatory criteria." **It is unknown whether IDEQ will judge groundwater quality to be acceptable enough to issue a permit to Midas.**

Alt 2 plans would change water management "to improve streamflow and water quality in the SGP area, such as rerouting Hennessy Creek during mining, lining the Meadow Creek diversion channel further down the drainage, piping low flows in stream diversions to prevent water warming, and continuing to use the rapid infiltration basins during seasonal low flows."

Liner Description: Per section 4.9.1.1

a) **Tailings**: "Mine tailings would be managed through deposition in a fully-lined TSF with an engineered rock-fill dam and development rock buttress. The tailings production rate is anticipated to be approximately 20,000 to 25,000 tons per day during mining (M3 2014). Approximately 100 MT of tailings solids would be stored in the TSF at the end of mining (Midas Gold 2016). The tailings have the potential to impact geochemistry and water quality through solute loading and seepage from the base of the TSF, and uncontrolled runoff from the TSF surface. Seepage through the base of the TSF would be controlled through construction of an engineered liner. The liner system would be augmented by over-drains to collect water that drains to the base of the tailings, which would flow to a sump and be pumped to the tailings supernatant pond for reuse. Underdrains also would be installed beneath the liner to collect groundwater from springs and seeps and convey the water beneath the TSF. Detection of leaks through the liner would be performed by water quality monitoring of the underdrain collection sumps." Cyanide is to be recycled for repeated leaching of gold, thus allegedly reducing any residual cyanide left in the tailings.

b) DRSF: The DRSF would also have a similar liner.

c) Potential Problems with TSF & DRSF plans: However, per Table 4.1-1 (unknown factors), "the functionality of the MicroDrain liner/leak detection configuration proposed under Alternative 2 is relatively new technology, thus adequacy of performance over long time frames has not been fully described. Additional details on the functionality of the MicroDrain liner will be considered by Idaho Department of Environmental Quality and, if available, incorporated into the Final EIS."

Comment:

The Meadow Creek Valley has an alluvial floor through which contaminated water could drain to the multiple fissures underneath and thus enter groundwater. The entire area is subject to considerable seismic activity, as evidenced by multiple earthquakes over the past decades. Earthquakes have the potential to tear the liner, thus releasing large quantities of TSF chemicals into the downstream waters in a short period of time. If major avalanches or landslides down the TSF or DRSF walls occur, they could damage the dam and/or rapidly overfill the backfilled pits, thus rapidly releasing contaminated water into the EFSFSR.

Questions:

1) **1) Given that liners and caps might not be durable over many years, how much groundwater pollution will occur over time from small leaks? Say – 10, 20, 30, 50, 100 years?**
2) **Are there aquifers from which people get drinking water that could eventually be polluted from TSF & DRSF cap or liner leaks?**
3) **What data are there on efficacy and durability of such liners and caps?**
4) **Will Midas be required to perform ongoing monitoring and mitigation of groundwater? If so, for how long?**
5) **How will Midas monitor potential human health adverse effects from groundwater contamination?**
6) **How will Midas assure that no liner, under-liner drain, or cap ruptures occur, if earthquakes, avalanches, landslides, or other natural disasters occur that could cause tears or breaks?**
7) **How much cyanide will be left in the tailings after leaching?**
8) **Will mitigation plans include acceptance of leaks through the lining underlying TSF with the aim of allowing gradual release of pollutants into groundwater to allow dilution to bring levels to WQ standards? If so, what is the risk that the leak(s) will be large enough to raise toxin levels in groundwater to exceedances of WQ standards?**

3. Surface Water, TSF & DRSF Proposals

Section 4.18.2.1.1.4 states **"**All waterbodies except Sugar Creek have additional designated beneficial uses of "drinking water supply" and presumed beneficial uses of "secondary contact recreation." "Each of these inventoried waterbodies (except for West End Creek) are listed as impaired for specific uses in accordance with Clean Water Act Section 303(d). The causes for listing of these waters are associated with arsenic, for exceedances of Idaho's human health criterion for consumption of water and organisms. The EFSFSR downstream of Meadow Creek also is listed for antimony for exceedances of Idaho's human health criterion for consumption of water and organisms. Sugar Creek also is listed for mercury, unrelated to human health criteria (the impairment listing is for cold water

aquatic life and salmonid spawning, for exceedances of Idaho's aquatic life chronic criterion. Post-closure concentrations of these elements in the EFSRSR with water treatment have not been modeled for Alternative 1 and are not known at this time. The Idaho Department of Environmental Quality may identify goals towards developing a water quality improvement plan/total maximum daily loads for the EFSRSR. However, the modeled post- closure decreases of antimony and arsenic relative to baseline concentrations may help with progress toward beneficial use attainment that led to the listing of arsenic and antimony for the EFSFSR and its tributaries."

"Long-term passive water treatment as proposed by Midas Gold is predicted to improve surface water quality conditions throughout much of the watershed following closure and reclamation, and any public exposures to surface water are expected to be of limited magnitude and short duration."

Comment:

Regarding the proposed dam between Meadow Creek TSF & Hangar Flats DRSF: for Alts 1, 2, and 4, I am concerned that the proposed development rock and waste rock dam between the Meadow Creek TSF and the Hangar Flats DRSF will be potentially subject to overflow beyond the capacity of the Hangar Flats DRSF, thus releasing contaminated water into the EFSFSR, especially during periods of snow melt or heavy rain, causing the Hangar Flats backfill to also overflow. The level of chemical pollutants in the DRSF in both the dam and the backfill is unknown, thus adding further risk of downgradient contamination. Furthermore, if this dam were to break, high levels of contaminated water & sediment would be released rapidly into the EFSFSR. Humans and animals drink water from these downgradient waters. Animals, including birds, non-predator mammals, and predators, will drink water from any unfenced contaminated water bodies. Rapid release of mercury, cyanide, & arsenic can result in highly contaminated downstream water drunk by mammals and metabolized by fish, thus jeopardizing human health if hunters and anglers consume them.

Questions:

1) **How will Midas assure that no dam breaks or overflows release high levels of contaminants into downstream waters, including after heavy rains, snow melt, earthquakes, or avalanches?**
2) **How will Midas assure no seismic disasters occur that could cause dam break or `other pollutant releases?**
3) **For how long will Midas be required to monitor and mitigate release of pollutants?**

4. Water Treatment per Alternative 2

Section 4.4.2.2 states: "Alternative 2 also would include the addition of a Centralized Water Treatment Plant (WTP) near the Ore Processing Facility as part of a Water Quality Management Plan. The Centralized WTP would require approximately 40 additional annual truck trips during operations for water treatment-related chemical deliveries. Post-closure, the Centralized WTP would continue to operate "**in perpetuity"** including "approximately **34**

annual truck trips for chemical deliveries and removal of residuals. Operation of the Centralized WTP **in perpetuity** also would require continued operation of the new transmission line."

"Water mitigation would occur through changes in water management that are designed to improve streamflow and water quality in the SGP area, such as rerouting Hennessy Creek during mining, lining the Meadow Creek diversion channel further down the drainage, piping low flows in stream diversions to prevent water warming, and continuing to use the rapid infiltration basins during seasonal low flows."

Per section 4.7.2.3, Water treatment at the water treatment plant "would continue post closure and would require ongoing transport of chemicals to the site. The expected amount of chemicals needed post closure are listed on **Table 4.7-2**. In addition, an unknown number of trips would be required to transport any residual treatment sludges and wastes from the site, since these wastes would no longer be able to be disposed of in the TSF. The **"in-perpetuity" treatment would result in approximately 20 truck trips annually to deliver water treatment chemicals and an unknown number of trips to haul sludges and wastes** from the treatment plant off-site for disposal. Transport would occur during the spring through fall with chemicals stockpiled in the fall to avoid winter transport."

Under the same section, Alt 2 adds harvesting lime from rock walls, crushing it, and using it in the gold leaching process. This would reduce truck trips from off-site to haul lime, but would increase greenhouse gas emissions, thus negating the beneficial effects of trucking in lime.

Alt 2 would limit potential surface water quality impacts by constructing a centralized, active water treatment plant (Centralized WTP) to treat mine contact water and open pit dewatering water. Additional smaller-scale active and passive systems also would be implemented to treat certain contact water flows during mine construction, operation, closure and reclamation, and post closure. Active water treatment could be adapted to & considered as mitigation for Alternatives 1, 3, and 4. "**The analysis of water quality impacts post-treatment assumes that any treated water discharge would meet applicable water quality standards at the permitted outfall. It does not take into account mixing zones or higher discharge concentration limits that could be requested by Midas Gold.** Any requests from Midas Gold for higher discharge limits would be based on the site-specific surface water quality criteria regulations in the Idaho Water Quality Standards (IDAPA 58.01.02), and would be **subject to public notice and comment.** If site-specific criteria are granted by the permitting agency, future surface water concentrations would fall somewhere between the model scenario with no water treatment, and the model scenario where all treated water effluent is assumed to meet water quality standards."

"The predicted impacts from Alternative 1 included elevated antimony concentrations at YP-SR-10 and YP-SR-8 during operational years 8 through 10, and elevated arsenic concentrations at the EFSFSR assessment nodes during operational years 7 through 10. These impacts (elevated As, Sb in Alt 1) were predicted due to infiltration of untreated dewatering watering through the RIBs (SRK 2018b).

Alt 2 implements a temporary membrane treatment system during the first three years of mining, followed by active treatment at the Centralized WTP beginning in mining year 4 (operational year 7). The goal of these active systems would be to treat mine contact and dewatering water to meet applicable surface water quality standards for **arsenic (0.010**

mg/L), antimony (0.0052 mg/L), and mercury (0.000012 mg/L). At the Centralized WTP, reduction of these constituents would be achieved through iron coprecipitation, with supplemental sulfide precipitation if secondary treatment is needed to meet the mercury water quality standard. **Effluent from the Centralized WTP would either infiltrate to groundwater through the RIBs or would be discharged to the EFSFSR through an IPDES-permitted outfall near Garnet Creek.** These processes are consistent with **treatment approaches that have been proposed, installed, and demonstrated on other similar applications** for treating arsenic, antimony, and mercury". Additional treatments can be added if the above don't bring levels to SWWQ standards.

DEIS p.4.9-70:

Results for the post closure pit lakes and SWWC modeling are discussed by drainage in the following sections.

Meadow Creek & Hangar Flats pit

Under Alternative 1 "After Hangar Flats pit has been mined and is no longer dewatered, the pit would fill with groundwater, precipitation, and surface runoff to form the Hangar Flats pit lake. The pit lake is predicted to reach hydrologic equilibrium approximately 7 years into the post closure period and would have a long-term lake stage of 6,540 feet." There would be discharge of multiple metals and other sediment during post-closure years 5-10. "A second pulse of constituent loading was simulated to occur in the pit lake during post closure years 5 through 30 due to consolidation water runoff from the TSF."

Under Alternative 2, the Hangar Flats pit lake is predicted to have an alkaline pH between about 8.2 and 8.3 for the entire post closure period. Predicted concentrations of arsenic (0.05 to … mg/L) and mercury (0.000015 to 0.00019 mg/L) **would exceed applicable surface water standards during post closure years 1 through 100.** In post closure year 1, the predicted copper concentration (0.0029 mg/L) also would exceed the Biotic Ligand Model copper criterion (Brown and Caldwell 2019c). Additionally, long-term steady state concentrations of several constituents (e.g., **aluminum, arsenic, iron, and mercury) would be higher under Alternative 2 than Alternative 1.** These changes are due to multiple aspects of Alternative 2 that have both positive and negative effects on the pit lake water quality:

- Meadow Creek would be permanently routed around Hangar Flats pit, reducing freshwater inflows that help to dilute constituent concentrations in the pit lake through continuous flushing.
- Partial pit backfill with West End development rock would introduce additional solute loading into the pit prior to the backfill being fully submerged.
- Installation of a low permeability geosynthetic cover on top of the Hangar Flats DRSF would reduce infiltration through the development rock material (but some infiltration would still occur).

To limit water quality impacts in **Meadow Creek, Midas Gold would treat the Hangar Flats pit lake discharge in perpetuity at the Centralized WTP**. The water treatment plant objective would be the same as the mine operational period, (i.e., to meet applicable surface water quality standards for arsenic [0.010 mg/L], antimony [0.0052 mg/L], and mercury

[0.000012 mg/L] in the plant effluent). Copper also would be treated to meet the 0.0024 copper criterion. Discharge from the Centralized WTP would be through an IPDES-permitted outfall to the EFSFSR below Garnet Creek."

DEIS P. 727 Section 4.12."In addition, a **Water Quality Management Plan** (Brown and Caldwell 2020b) has been developed to address potential water quality impacts associated with Alternative 2. Impacts from the **Water Quality Management Plan** and the associated Water Treatment Plant on fish resources and fish habitat, including fish passage, water quality, stream flows, and water temperature are described at the end of the Alternative 2 discussions (Section 4.12.2.4.9, Alternative 2 Water Quality Management Plan)."

The Centralized WTP also would be used to treat TSF supernatant pond water and TSF consolidation water for the first eight years of the post closure period until flow from these sources has dropped below 750 gallons per minute. After that, Midas will try to achieve SWQ standards via passive treatment and monitor runoff. If unable to achieve WQ standards, they will route this water to the Central WTP.

Without water treatment, average annual arsenic concentrations at YP-T-22 in Meadow Creek are predicted to be **at or just below the 0.010 mg/L surface water quality standard from post closure years 10 through 100.** Hg would also be above WQ standards without treatment, but Ok after treatment.

Fiddle Creek: Midas Gold would (allegedly) "**passively treat toe seepage from the Fiddle DRSF** in **perpetuity** using the BCR and aerobic vertical flow wetland discussed for Alternative 1."

West End Creek: West End Pit overflows every 20 yrs and would have high levels of As, Sb, & Hg, so they would treat it with a variety of passive measures during ops. **Near closure, Midas would negotiate permitting of water** to overflow from the pit into the creek.

Midnight Creek: Midnight pit would drain As, Sb, Cu, & Hg at low flow levels into creek as in Alt 1**. No cleanup.**

EFSFSR: As & Sb elevations would remain above WQ standards at levels about the same as at baseline; Hg would be within standards in the EFSFSR at the mine site, except at the farthest downstream sampling site below Sugar Creek confluence. These concentration changes relative to Alternative 1 are largely due to installing low-permeability geosynthetic covers on the Hangar Flats and Fiddle DRSFs, and permanently routing Meadow Creek around the Hangar Flats pit lake.

Methylmercury (MeHg)– Alternative 2

As noted elsewhere in this public comment, MeHg is the most toxic form of mercury. Mercury methylation can take place as either a result of Hg metabolism in the root rhizomes of certain underwater plants (generally ocean plants) or through industrial processes, such as mining. ."…the partial backfill of Hangar Flats pit and permanently routing Meadow Creek around the pit lake would result in higher pit lake concentrations of dissolved mercury relative to Alternative 1 **Elevated Hg would remain in Hangar Flats Pit during closure years 1 through 100** (Brown and Caldwell 2019b). The higher pit lake mercury concentrations expected under **Alternative 2 could lead to greater MeHg production in the lake** if the

mercury methylation rate is not offset by other factors such as the shallower pit lake depth. If there is evidence of MeHg in the pit lake outflow, tests would be performed prior to mine closure and reclamation to confirm whether the Centralized WTP is capable of removing MeHg or if additional treatment components would be required.

Table D-2 in Appendix D states: ""Midas Gold proposes that it or its designated contractor(s) will perform long-term maintenance as necessary, including maintaining and monitoring the Mitigation Area (including stream and wetlands) in perpetuity once the final performance standards are met or until such responsibility is relinquished to an appropriate third party (Forest Service, etc.) as approved by the USACE." (US Army Corps of Engineers)." I infer from this statement that Midas plans to foist ongoing monitoring and mitigation work to the Forest Service or other 3rd party after a few years. Thus, the promises of Midas's treating water "in perpetuity" are false. This negates the potential advantages of Alternative 2. This impression that Midas plans to duck responsibility for ongoing water treatment is further reinforced by the following statements in **App D 2.2 Compensatory Mitigation Section 5:**

"The LRMP (Land & Resource Mgmt Plan) would identify the extent of the Mitigation Area on USFS- managed land and would identify suitable and incompatible management activities within the Mitigation Area. Midas Gold proposes that it or its designated contractor(s) would perform long-term maintenance of the Mitigation Area as necessary (Section 12) **in perpetuity** once the final performance standards are met, or until such responsibility is relinquished to an appropriate third party (e.g., USFS)."

App D Purpose:

"Construction of the Project would permanently impact WOTUS, including wetlands and other waters (other waters are henceforth referred to as "streams"), subject to regulation under Section 404 of the Clean Water Act (CWA). As part of the Project development, Midas Gold will file a permit application with the United States Army Corps of Engineers (USACE) for a DA permit issued pursuant to section 404 of the CWA (33 United States Code 1344). Additionally, the USACE will request certification from the Idaho Department of Environmental Quality (IDEQ) for applicable provisions under Section 401 of the CWA and state water quality standards which would result in IDEQ's issuance of a 401 water quality certification for the Project. The permit application will address the anticipated impacts to wetlands and streams from construction and operation of the Project. This CMP describes Midas Gold's approach for mitigating Project-related impacts to wetlands and streams and is intended to satisfy the mitigation requirements of the *Final Rule, Compensatory Mitigation for Losses of Aquatic Resources* (33 Code of Federal Regulations [CFR] Parts 325 and 332 and 40 CFR Part 230)."

Subject to NEPA

"…Environmental Protection Agency (EPA) will cooperate on the preparation of the EIS and evaluate its content to ensure that the EIS can be adopted in support of the decision-making process for issuance of a National Pollutant Discharge Elimination System Permit under Section 402 of the CWA"

"…CMP considers potential impacts from the Proposed Action as described in the PRO, and includes draft mitigation designed to mitigate anticipated impacts from the Proposed Action; it does not address alternatives considered in the EIS. Once a preferred alternative/least environmentally damaging practicable alternative (LEDPA)"

"3.1 Compensatory Mitigation for Streams

. "As indicated by the appropriate and practicable provision, steps that would be unreasonably costly or would be not practicable or which would accomplish only inconsequential reductions in impact need not be taken (73 Federal Register 19594 2008)."

"The **goals of proposed stream mitigation** are to:

- Provide the required compensation for unavoidable impacts to streams resulting from the Project and to offset the Project's authorized impacts.
- Restore and increase stream functions within the Project Area."

P.4.9-70 states: "Predicted concentrations of …mercury (0.000015 to 0.00019 mg/L) **would exceed applicable surface water standards during post closure years 1 through 100."**

The above description of discharging effluent from the WTP through the RIBS into groundwater or into the EFSFSR sounds risky, at best, in terms of preventing pollution. Indeed, as stated above, these processes are consistent with those done elsewhere by mining companies. Many of these comparative companies have either continued to pollute or have foisted off the cost of water treatment "in perpetuity" onto the states where the mines are. For example, the following quotes from a Denver Post article about the **Summitville Mine in Colorado** (**Ref 10)** reveals what is likely to happen at SGP: "After 27 years of EPA control, Colorado is preparing to take over the full financial burden — a forever bill for $2 million a year — of a high-mountain cyanide gold mine that became one of the West's worst environmental disasters. The re-shaping of ravaged alpine tundra at the Summitville Mine through a $250 million federal Superfund cleanup stands out because scores of other toxic mines in Colorado still are contaminating headwaters of western rivers each day."

(Summitville report continued) "But this fix requires constant work. Colorado must pay the $2 million, a bill that the EPA has been handling, starting in 2021 for cleaning a fluctuating flow of up to 2,100 gallons a minute of toxic water that drains down a once-pristine mountainside. The Colorado Department of Public Health and Environment will use the money to run a silver-domed $18 million industrial water treatment plant built at 11,500 feet elevation in a wild and spectacular valley, surrounded by snow-splotched jagged peaks."

(Summitville report continued) "The plant houses huge stainless-steel vats of burbling brown sludge. Toxic metals are chemically coaxed and filtered out. Plant operators haul 4.1 million pounds a year of concentrated waste back up South Mountain (elevation 12,550 feet) in trucks for burial. This muck contains more than 690,000 pounds of cadmium, lead, copper, aluminum, iron, manganese and zinc. It is toxic metal that otherwise would flow down and degrade the Wightman Fork of the Alamosa River." (Ref 9) (End of Summitville report)

Comments:

1. The proposal that, near closure, Midas would negotiate permitting of contaminated water to overflow from the West End pit into downstream waters will be more likely to reflect reality, if Midas continues to apply for further mining activities or if funding is inadequate to enable "in perpetuity" centralized water treatment. Could Midas simply request permission to allow higher levels of As & Sb in downgradient effluent, even if public comment opposes this)?

2. **The above-quoted statements of purpose and goal appear to me to be Midas's admitting that their mining activities will likely continue to pollute the EFSFSR, its tributaries, and the S. Fork, that they will use loopholes in the Clean Water Act to allow**

this, and that they will transfer all responsibility for ongoing water treatment and mitigation to the USFS or other 3rd party. Does this not sound like the situation at the Summitville gold mine in Colorado described in the newspaper article above?

Even with water treatment for mercury, Alternative 2 would have no discernible effect on MeHg concentrations in mine site streams. Mercury will continue to exceed WQ standards for at least 100 years.

3. In addition, arsenic and antimony concentrations are not guaranteed to be brough within WQ standards even with water treatment, which would have to continue "in perpetuity, "or for at least the 1st 100 years post-closure in order to achieve and maintain water quality standards. Water treatment will require ongoing, continuous up to 30-40 truck trips annually to deliver chemicals and remove sludge.

<u>Questions:</u>

1) How much will it cost to continue water treatment in perpetuity?

2) For how long will Midas continue to pay for this?

3) Will Midas employees continue to perform all necessary functions for water treatment (including trucking in chemicals and trucking our sludge) in perpetuity?

4) Who will eventually take over paying for, and providing water treatment after Midas stops, as noted in the statements about a 3rd party (probably USFS) taking over?

5) Will the State of Idaho eventually be left to foot the bill for ongoing water treatment in Alt 2, as happened in Summitville, CO?

6) How will continued exploration for marketable metals affect future water treatment?

7) Will Midas apply for renewed mining permits either before or after setting up water treatment?

8) How much contaminated effluent will be released into ground and surface water after water treatment?

9) How will mining operations affect mercury methylation?

References (numbering continued from above sections)

10. Summitville Mine news article, Denver Post: https://www.denverpost.com/2018/07/10/colorado-summitville-mine-cleanup/

VI. Exploration & Further Mining Post-closure:

3.2.3.2.3.1 WEST END DEPOSIT is an example of exploratory findings to date

"Mineralized zones occur as stacked ellipsoidal bodies plunging along the intersection of favorable lithologic units and structural zones. True widths of these bodies range from 50 to over 330 feet. Midas Gold drilling intersected gold mineralization associated with the West End Fault Zone (WEFZ) well below the historical pit bottom—as deep as 1,300 feet below the original ground surface where mineralization was exposed prior to mining.

In addition to **sulfide** mineralization, open fractures along the WEFZ and subsidiary faults have allowed for **oxide** formation at depth from meteoric water infiltration (Huss et al. 2014)."

3.2.3.2.3 EXPLORATION PROSPECTS

"Besides pit expansion possibilities around the main deposits, other exploration targets may one day warrant consideration for development if they can be proved viable after additional exploration, environmental…"

Per **Section 4.1.5.1,** Midas has permits for ongoing exploration upstream & downstream from the mine site in National Forest land for the next 10 years, including 26 exploratory drill sites identified during past winter explorations and, since 2018, another 62 drill sites near the upper middle, and lower reaches of the EFSFSR; Meadow Creek, upper Meadow Creek, and West End Creek.

Comments:

It appears that the West End pit has another gold seam 1300 feet below original ground level, so Midas will most likely apply for another permit to mine at least this area. This would restart the entire permitting, evaluating by Forest Service, public commenting, etc. process all over again. Then they will apply to not mitigate the current site, because they will just want to mine in the area again. If their explorations reveal more seams of gold, silver, antimony, or other marketable metals, Midas will undoubtedly apply for additional mining permits. Thus, even if they complete the proposed mitigation, they will undoubtedly again apply to mine many of these areas, thus again releasing heavy metal-contaminated water and sediment into the EFSFSR and South Fork Salmon**. US taxpayers have already spent millions of dollars to try to clean up legacy messes from prior Stibnite mining, and the Nez Perce Tribe spends $2.7 million annually to keep alive salmon habitat and maintain fisheries. This will all go to waste, if Midas is allowed to mine now and to perpetuate mining in areas they explore.**

When (not if) they apply to continue mining in exploratory areas they find promising, they will likely again withhold mitigation for an additional 12-15 years of operations in a pattern that will continue to repeat itself again and again until the entire watershed and ecosystem are destroyed. This repetitive cycling will be the only thing Midas does "in perpetuity."

Questions:

1) **Does the FS have ongoing plans to prevent Midas from applying to mine areas they are currently exploring?**
2) **How much ongoing damage to the environment will be permitted before FS stops it?**

3) **<u>What are the chances that, instead of permitting further mining in the areas Midas has explored, the Forest Service and other regulatory institutions can again pursue getting EPA to qualify the Stibnite area as a Superfund site and fully mitigate it?</u>**

VII. Incomplete and Unavailable Information (40 CFR 1502.22):

Table 4.1-1 details many unknowns that make it difficult for either the Forest Service or the public to adequately comment on many variables that could significantly impact public and environmental safety. For example, analysis of development rock chemical effects on downgradient water is unknown, thus limiting the ability to accurately model potential impacts of mining operations and mitigation. Since there are too many unknowns, the most desirable of the CEQ regulations (40 CFR 1508.20, as listed in section 4.1.4), are the 1st 2 (a & b below):

(a) Avoiding the impact altogether by not taking a certain action or parts of an action;

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

However, simply avoiding or limiting further mining, as in Alt 5, is inadequate, because baseline contaminant levels are unacceptably high, and because fish cannot ascend the EFSFSR above the Yellowpine Pit to reach spawning areas upstream. It is critical to further mitigate all legacy mine wastes to bring the area into compliance with water and other environmental quality standards for human health by declaring the current mine site a Superfund site for further cleanup.

<u>Recommendation:</u>

Section 4.16.3, p. 1027 Alt 5 Mitigation Measures states: “Mitigation measures may be added, revised, or refined based on public comment, agency comment, or continued discussions with Midas Gold and will be finalized in the Final Environmental Impact Statement.” In accordance with CEQ regulation 40 CFR 1508.20, options a & b. I recommend this option, combined with further mitigation measures, because Alt 1-5 all fall short of the most risk-free option for human, animal, plant, & environmental health.

<u>Questions</u> (If the above recommendation is not followed):

1) **For how many years will Midas have to measure As, Sb, and Hg levels in water and fish at the mine site and downstream, including a few miles downstream from the Sugar Creek confluence in the EFSFSR and also the S. Fork??**
2) **If Midas’s explorations result in additional applications for mining farther upstream & up-valley in National Forest lands, will the Forest Service repeat this entire process of DEIS, permitting of mining and further explorations, and efforts to make Midas mitigate yet more sites?**

3) **Are the RCM of soil, trees, etc. adequate to bring soil levels of arsenic & antimony to within EPA's recommended ELCRs?**
4) **Given the potentially flawed assumption of 16-day exposure X 26 years, will the RCM be adequate to reduce levels in persons exposed for longer and more intense time intervals (eg. indigenous peoples)?**

VIII. Hazardous Materials

A. Stored Onsite:

For all alternatives, Midas will store large quantities of a variety of hazardous materials (Hazmats) onsite. Per Table 2.3-6, these include (annual totals): **ammonium nitrate 7300 tons in secured slips in open pits; sodium cyanide 3900 tons in tanks/bins in the mine process area; explosive 100 tons in secured magazines in open pits; lead nitrate 700 tons in mine process area; diesel fuel 5,800,000 gal in tanks in mine site, gasoline 500,000 gal in tanks at mine site antifreeze 40,000 gal in tanks/totes at mine site, propane 560,000 gal in tanks at mine site; sodium hydroxide 300 tons, nitric acid 115,000 gal, sulfuric acid - all 3 at mine processing area; pesticides, herbicides, and many other hazardous chemicals and petroleum products.**

Section 4.2.2.1.1.1 states that the "static factor of safety levels for the Hangar Flats DRSF and the TSF would likely result in an annual probability of failure $<10^{-7}$ in any individual year (Herza et al. 2018), assuming design, construction, maintenance, and oversite of the structure is performed at the highest levels of industry standards."

Comment: However, achieving the "highest levels of industry standards" in construction & maintenance is too idealistic in this remote location, given hard winters with deep snow, road closures, avalanches, etc. In addition, the above estimate does not take into account the multiple tanks, bins, and other hazmat storage structures noted above (from Table 2.3-6).

Per section 4.4.2.1.4.1, Under Alternative 1, various materials and chemical reagents, including fuel, explosives, and ore processing reagents, would be transported for use at the mine site. Aboveground tanks also would be used to store fuels, lubricants, coolants, hydraulic fluids, propane, explosive materials, and nitric and sulfuric acid. To minimize risk of spills, Midas Gold would comply with the EPA Toxic Release Inventory Program; develop a Spill Prevention, Control, and Countermeasure Plan; and develop a Hazardous Materials Handling and Emergency Response Plan. Although these procedures would minimize the risk and likelihood of a spill, climate change could potentially affect the severity of a spill. Climate-change related trends with respect to annual periods of frozen ground, variability in the groundwater tables, increased precipitation and flooding, and conditions affecting the ability of crews to quickly implement response measures would all factor into spill severity. These impacts would be experienced during construction, operation, and closure and reclamation, and should be considered in the development of the Spill Prevention, Control, and Countermeasure Plan and Hazardous Materials Handling and Emergency Response Plan."

4.7.2.2 **Regulatory or Permit Requirements**

Regulatory or permit requirements in relation to hazardous materials would include:

- The SGP would be required to comply with all federal and state regulations pertaining to the transport, handling, storage, use, and response to releases.
- Storage tanks would be located within a secondary containment designed to comply with federal and state SPCC regulations. Containment design would include, but not be limited to, bedding, impermeable lining, and regulatory-required containment volume for maximum volume release scenarios and local precipitation. For example, minimum secondary containment requirements mandated by federal regulations include a requirement for containment of 100 percent of the largest tank volume plus freeboard which is typically interpreted as 110 percent secondary containment capacity of the largest tank volume. Routine inspection and maintenance of storage vessels, containment, and preventative infrastructure (e.g., cathodic protection, alarms) would be conducted at prescribed intervals per planning documents.
- Used oils would be managed in accordance with the Used Oil Standards 40 Code of Federal Regulations 279 in closed containers labeled as “used oil” and sent off site for recycling, reclamation, fuel blending and or energy recovery.
- A SPCC Plan for the SGP would be maintained as required by 40 Code of Federal Regulations 112 regulations. The SPCC Plan would address site-specific spill prevention measures, fuel haul guidelines, fuel uploading procedures, inspections, secondary containment of all on-site fuel storage tanks, and staff training.
- A 90-day capacity hazardous waste storage facility and appropriate satellite storage facilities would be constructed to store any generated hazardous wastes as required by U.S. Environmental Protection Agency and State of Idaho regulations. All hazardous waste stored at the facility would be transported to an U.S. Environmental Protection Agency-approved off-site disposal facility within 90 days of collection.
- A solid waste management plan would be developed to assist with the storage, handling and disposal of solid and hazardous waste streams, including recyclables. This plan would be developed in accordance with state and federal regulations pertinent to waste. The solid waste management plan establishes procedures to identify hazardous waste and protocols to track, collect, and dispose of hazardous materials in accordance with state and federal regulations. The plan also outlines methods to minimize the generation of hazardous waste (e.g., using industrial soaps in place of solvents wherever possible). Hazardous materials would be characterized for proper off-site disposal.”

Comment:

1) All of these regulations appear very reassuring, but will not prevent contamination in the event of an earthquake or other catastrophic event.

2) 4.7.2.3 Standards of Practice Under the International Cyanide Management Code: The list of standards, if followed, would be very reassuring, but will not prevent cyanide contamination in the case of earthquake or other catastrophic event.

4.9.2.1.1.1 "Additional limited amounts of development rock would be used to construct haul roads and pad areas for site facilities. Some development rock also may be crushed and screened for use as road surfacing material or concrete aggregate. Development rock disposed on-site or used for construction or reclamation material would alter the mine site geochemistry. Generally, the extent, magnitude, and duration of geochemical impacts would depend on how the development rock is handled and placed,"

DEIS p. 2-62 *describes safety plans under "EXPLOSIVES STORAGE"*

3. **2.3.6 Seismicity:** "The analysis area is along the western boundary of the Centennial Tectonic Belt (CTB), which is centered in southcentral Idaho. Earthquakes with an approximate magnitude of 6 or greater have occurred in the CTB with epicenters east and southeast of the mine site (**Figure 3.2-4**)." "The analysis area is within the CTB and has the potential to be subjected to strong (M6 and greater) earthquake ground shaking from seismic activity related to the CTB feature (URS 2013)." Using probabilistic and deterministic Hazard analysis."

"The DSHA results can be described as a scenario: The maximum modeled event is a magnitude 6.9 earthquake 3.8 miles (6.1 kilometers) west of the TSF dam site on the Deadwood-Reeves Creek fault (URS 2013Peak ground acceleration (PGA) is traditionally used to quantify ground motion (shaking) … PSHA results indicate the PGA for 475-year and 2,475-year return period earthquake events are 0.10g and 0.14g, respectively."

3.7.2 Relevant Laws, Regulations, Policies, & Plans (relating to Hazmats): Sections 3.7.2.1 through 3.7.2.12 summarize the various federal and state laws regarding transport, use, storage of hazmats. OSHA and MSHA have regulations for labeling of hazmats and mine safety onsite. 3.7.2.4, the US Dept of Transportation Hazardous Materials Transportation permit requires specific employee training and security and contingency planning. 3.7.2.12 is the National Forest Land & Resource management Plans. are managed to "achieve a desired condition that supports a broad range of biodiversity and social and economic opportunity." The Payette and Boise National Forests have management plans regarding hazardous materials.

3.7.3 Existing Conditions:

Oil, jet fuel, and gas are stored in above-ground storage tanks (ASTs) at mine site.

"If spills occurred, they would be responded to and reported in accordance with the site **Spill Prevention, Control, and Countermeasure Plan**, as well as state and federal regulations. The **most recent reported spill was in February 2012.:**

"The ASTs meet the requirements of the Oil Prevention Pollution regulation (40 CFR 112). Midas Gold annually reports on-site diesel and Jet A fuel storage in accordance with Tier II reporting requirements under the Emergency Planning and Community Right-to-Know Act (40 CFR 370).

Midas Gold has developed a solid waste management plan to assist with the storage, handling, and disposal of solid, special, and hazardous waste streams (HDR 2017). This plan was developed in accordance with state and federal regulations pertinent to waste, although the existing exploration activities are currently considered a Very Small Quantity Generator under RCRA (40 CFR262.14)."

3.7.3.2: "The largest volume of hazardous materials currently used at the mine site is petroleum hydrocarbons (e.g., diesel, unleaded gasoline, and Jet A fuel)." Note: there have been no recent reported spills, but there is a history of wildfires onsite at least partly related to legacy fuels.

3.7.3.3 Past Releases, Remediation, & Mitigation:

"There have been multiple past releases: of hazmats onsite. The area was once designated.

- Stibnite mine was placed on the Federal Facilities Docket in 1991 Comprehensive Environmental Response, Compensation and Liability Information System No. 9122307607.
- "Removal actions for various mine wastes were conducted at the site in November 1998, 2003, August 2004, September 2005, and 2009."

" In summary, the Stibnite Mining District was proposed for listing on the National Priorities List in 2001; however, no further action was taken by EPA to designate the Stibnite Mining District as a Superfund Site." "IDEQ has monitored associated cleanup and site operation and maintenance activities."

There is an ambulance, EMS employee, and a helipad onsite. There will be about 500 employees onsite during operations, and a sizeable number during mitigation. There is limited capacity in the nearest hospitals in McCall & Cascade, limited firefighting capacity onsite and from neighboring towns, and long distances to travel for emergency response.

Table D-1 in Appendix D states many Forest Service regulations and recommendations regarding safe management of hazmats onsite. These recommendations look very good and very protective of employees and environment, but also look very hard to enforce.

B. Access Roads and Hazardous Materials Transport to and from Mine Site

4.7.2.1 ", the greatest concern would be a release of any hazardous material from a transportation accident resulting in a high potential impact to the environment"

"The impacted area would include the site of the spill and potentially downstream areas as far as the point of dilution. The East Fork South Fork Salmon River (EFSFSR) and associated tributaries, including streams within 0.5 mile of access routes, are the major surface waterbodies that could be impacted by accidental releases."

" Strict regulatory controls and SGP emergency response procedures would be expected to limit the extent of any such incidents."

4.7.2.2 Standards of Practice Under the International Cyanide management Code

4.9.2.1.2.2 Access Roads: "Of the 71 stream crossings for access roads, 14 are listed by

IDEQ as impaired. **Table 4.9-14** lists the Category 4 or 5 streams, the cause of impairment, and the beneficial use.

Road	Stream Name	IDEQ Category	Cause of Impairment (Designated Beneficial Use[1])
Burnt Log Road & Stibnite Road	EFSFSR	5	Arsenic (DWS) Arsenic (SCR)
McCall-Stibnite Road	Sugar Creek	5	Mercury (COLD) Arsenic (SCR)

The Landmark Maintenance Facility: “Additionally, the facility would include a double-contained fuel storage area with three 2,500-gallon fuel tanks for on-road diesel, off-road diesel, and unleaded gasoline. A 1,000-gallon used oil tank would be located inside the maintenance facility and a 1,000-gallon propane tank would provide for facility heating. 4.9.2.1.2.2The Landmark facility will store several fuels in tanks, along with road grading and plowing materials.

4.7.2.2 Regulatory or Permit Requirements and 4.7.2.3 Standards of Practice Under the International Cyanide Management Code apply to transport of hazmats as well as to onsite storage. Although the following statement: “A low probability fuel release of up to 10,000 gallons or large spill of concentrate could potentially occur assuming the complete failure of a bulk tanker truck or truck rollover or accident,” is likely true for many areas, there is greater risk at the SGP site, because of steep slopes, tight turns, avalanches, landslides, icy conditions, and remoteness of location. Even on Hwy 55, especially in the North Fork Payette River canyon, there is greater risk of truck accidents than in many areas of the country.

4.16.2.4.4 Alt 4 Public Health & Safety: “Alternative 4 would have greater safety and emergency impacts than Burntlog Route due to additional safety considerations required to use the Yellow Pine Route exclusively, which is in steeper terrain than the Burntlog Route and subject to avalanches and landslides”

“Yellow Pine Route in comparison with the Burntlog Route. This would require additional safety considerations for geotechnical hazards, landslides, and avalanche zones and may result in periods of road closure.”

Comment:

However, both routes are at high risk of avalanches & landslides and of trucks hauling hazmats slipping off-road, especially in winter, when all roads become icy. These post risk to both travelers and waterways, if chemicals spill, if trucks roll off-road and tankers rupture.

Per Table 2.3-6, to maintain adequate supplies of blasting materials, fossil fuels, and other hazmats noted above, Midas will have to make multiple deliveries (eg. ammonium nitrate-304 deliveries/year, diesel fuel 580 deliveries/year). Road maintenance: Midas will be responsible for blading, slough removal, culvert cleaning, & snowplowing. Valley County & private owners are responsible for other maintenance activities.

4.7.2.4.4 Both the Burntlog and Yellow Pine routes have segments with steep grades **(above 6 percent), and no emergency truck ramps are present or planned on the routes.**

4.16.4.1 P. 1029 “Supplies and deliveries for the mine site during construction, operations, and closure and reclamation would go to the Stibnite Gold Logistics Facility using SH 55 to Warm Lake Road (CR 10-579). Approximately two-thirds of all mine-related traffic would originate south of Warm Lake Road and would use SH 55 through the communities of Cascade, Banks, and Horseshoe Bend. Approximately one-third of all mine-related traffic would originate north of Warm Lake Road and would use SH 55 through the communities of Donnelly, Lake Fork, and McCall. Through McCall, mine-related traffic would use Deinhard Lane and Boydstun Street.”

Midas plans to use spent legacy mine tailings to build access roads (Section 4). “Mineral regulations specifically give the Forest Service the ability to regulate tailings: “All tailings, dumpage, deleterious materials, or substances and other waste produced by operations shall be deployed, arranged, disposed of or treated as to minimize adverse impact upon the environment and forest surface resources” (36 CFR 228.8(c)).”

Comments:

1. Onsite:

Given the mine site setting and the area’s seismicity and multiple fractures in the earth’s crust at the edge of the Centennial Tectonic Belt, the history of major nearby earthquakes and avalanches, and the plans for storing a variety of fuels and explosive materials onsite, there is significant risk for explosions that would place employees, the mining operation, and this highly sensitive environment at risk of severe damage. If such a natural catastrophe occurs, there is inadequate protection for employees, because of the difficult-to-access location, especially in winter, when transport by either ground or air is often impossible. Even if Midas complies with all of the above regulations and precautions, pollutants could still be discharged either gradually into surface& ground water and soil, if their containers leak, or discharged very rapidly, I**f containers rupture during earthquakes, avalanches, rock slides, or wildfires., Such natural disasters could cause major explosions in either pit areas or ore processing & other mine site areas. Consider the recent explosion of ammonium nitrate in Beirut, Lebanon that caused huge damages and loss of life. In the case of SGP, ammonium nitrate and explosives are to be stored in mine pits, where pit wall avalanches or landslides could trigger explosions. The location is such an environmentally sensitive area at the headwaters of the Salmon River that the discharge of multiple toxins from an explosion or leak would have devastating effects on the entire watershed and its multiple users for many decades. For example:** “In 1995, almost three million cubic meters of cyanide contaminated wastewaters were released into the Omai river when a dam breached in Guyana, and another dam breach in Romania in 2000 resulted in 100 tonnes of cyanide being released into the Danube (Hilson and Monhemius, 2006). Such pollution events are associated with large scale fish kills in rivers all over the world. They average about two spills per year (Ketcheson and Fingas, 2000).” (From Ref 6 above). In addition, Section 2 notes that the Centralized WTP in Alt 2 would be near the Ore Processing Facility, where the fuels would be stored, thus jeopardizing water treatment, if a fuel tank were to rupture. Since employee housing is also near the ore processing facility, many employees could be injured or killed, if an explosion occurs.

2. During Transport:

There is a need for plans to manage used oils sent offsite for containment and reclamation and for all hazardous waste stored at the facility to be transported to an EPA-approved off-site disposal facility within 90 days of collection, as outlined in 4.7.2.1. The addition of multiple large and small trucks hauling hazardous materials annually would increase risks of traffic accidents above the current rate, which would jeopardize public health from both traffic accidents and potential spills.

Picture the scenario of a truck hauling cyanide or other hazmat sliding off Hwy 55 between Boise and Cascade into the North Fork of the Payette River and breaking open, thus spilling cyanide or other hazmats into the Payette River watershed. Or, picture the scenario of a serious accident in the towns of New Meadows, McCall, or Cascade, spilling cyanide bricks onto the streets, where the bricks will dissolve in snow or rain and run along the streets. Imagine if a hazmat truck or tanker turned over on the Deinhard Street, bridge, McCall, spilling its contents into the Payette River, or, if one overturned at the turnoffs at either end of the Deinhard bypass around downtown McCall, spilling toxins onto Boydston Street residential district or onto the commercial area at the current stoplight near the McCall mall. Currently, huge log trucks often go through downtown McCall, choosing to make the turn at the corner of 3rd Street and Lake Street. It is conceivable that some Midas hazmat trucks could make the same choice and spill toxins in the center of downtown, in front of Hotel McCall.
Although cyanide trucks are tankers, and Midas states they will give drivers special safety training, there is still significant risk of accidents, especially on icy roads. One of my "Epi-Aid" assignments as an Epidemic Intelligence Service officer at CDC, Atlanta, was to evaluate potential adverse health effects and cancer risk from a benzene spill from a railroad tanker in Perdido, AL. Benzene had begun to appear in many families' well water 15 years after the railroad tanker overturned and ruptured, even though the land was flat, with no steep grades and no winter ice or snow. EPA had found dangerously high benzene levels in many wells in an irregularly-shaped "plume" pattern from the underground aquifer. I inspected a few wells and could readily smell the benzene, which can cause leukemia.

In addition, the oversized trucks are a road hazard. Picture driving up or down the North Fork Payette canyon behind or in front of a markedly increased number of oversized trucks hauling hazmats. Of the smaller SGP access roads, Warm Lake Rd has the highest traffic volume (8 annually, compared to 2-3 annually on other smaller roads), which will increase considerably with many trucks stopping and starting from the Logistics Transfer Facility and the Landmark Maintenance Facility.

Using development rock to surface haul roads per 4.9.2.1.1.1 will further add to onsite chemical hazards, as dust from these haul roads will impair air quality.

Questions on Storage of Hazmats Onsite:

1) **What are the safety plans for on-site storage of hazmats and regular inspection of storage tanks?**

2) **How will Midas manage an onsite explosion that ruptures a storage tank?**
3) **How will Midas protect employees, if a hazmat tank ruptures?**
4) **How will Midas prevent leakage of hazmats into waters downgradient, if a spill occurs?**
5) **How will the Forest Service enforce their regulations plus those of the MSHA, State of Idaho, OSHA, and other regulatory agencies?**
6) **How will the regulations in section 4.7.2.2 be enforced? Who will perform the inspections? If Midas is in charge of performing their own inspections or hiring their own contractors, it will be like the fox guarding the henhouse.**
7) **The standards of practice under the international cyanide management code are voluntary. Will any agency enforce these?**

Questions on Hazmat Transport:

1) **What is the specific plan for management of hazmat spills?**
    1) **2) How will the roads impaired by arsenic & mercury (Table in 4.9.2.1.2.2) be cleaned up?**
    2) **Which roads is Valley County responsible for, as noted in one of the quotes above the "comment" section above?**
    3) **Who will monitor and enforce the regulations in 4.7.2.2 and 4.7.2.3?**
    4) **Should Midas be prohibited from using development rock and spent tailings to surface roads?**

VI. Employee Health

Section 4.18.2.1.3.3 states**:** "…on- site facilities would include a **safety department** with the primary function of ensuring worker safety and training. **Emergency medical technicians** and emergency equipment and supplies would be on-site, including an **ambulance**, first aid and medical supplies." "Local communities because employees from the local community could use the mine site services".

About 500 employees will be housed onsite in either a dormitory with individual sleeping spaces or in some trailers and will eat in common dining facilities. This close living & dining arrangement could lead to spread of infectious diseases, such as COVID-19, sexually transmitted diseases (STDs), influenza, etc, and could carry them back home to their communities or to nearby towns. The DEIS states that, "However, worker safety protocols include basic measures for good hygiene and protection of infectious disease transmission; and **on-site health care** services will provide basic treatments for worker illnesses." (Midas Gold 2016). Thus, while the magnitude of possible infectious disease transmission is "medium," the possibility of occurrence is "low" due to worker health and safety protocols, on-site health services, and single-employee personal spaces/sleeping quarters.

The CDC & National Institute for Occupational Safety & Health (NIOSH) have recommendations for PPE to protect workers from hazardous chemicals to which they have risk of exposure (Ref 11, 12, 13). These include:

a) Antimony:

Exposure Limits: (“The NIOSH recommended exposure limits (**REL**s) are listed first in this section. For NIOSH RELs, “**TWA**” indicates a time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek. A short-term exposure limit (STEL) is designated by “**ST**” preceding the value; unless noted otherwise, the STEL is a 15-minute TWA exposure that should not be exceeded at any time during a workday. A ceiling REL is designated by “**C**” preceding the value; unless noted otherwise, the ceiling value should not be exceeded at any time. Any substance that NIOSH considers to be a potential occupational carcinogen is designated by the notation “**Ca**”

“NIOSH RELTWA 0.5 mg/m^3 [*Note: The REL also applies to other antimony compounds (as Sb).]

OSHA PELTWA 0.5 mg/m^3 [*Note: The PEL also applies to other antimony compounds (as Sb).]
Exposure Routes: inhalation, ingestion, skin and/or eye contact

Symptoms: irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly

Target Organs: Eyes, skin, respiratory system, cardiovascular system

Personal Protection/Sanitation:

Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily

First Aid

Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA:

Up to 5 mg/m^3: (APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. See Ref 12 for information on selection of N, R, or P filters. (APF = 10) Any supplied-air respirator

Up to 12.5 mg/m^3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode (APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.

Up to 25 mg/m^3: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. (APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m^3: (APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape: (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.

b) Arsenic:

Exposure Limits: NIOSH RELCa C 0.002 mg/m^3 [15-minute] OSHA PEL [1910.1018] TWA 0.010 mg/m^3

Exposure Routes: inhalation, skin absorption, skin and/or eye contact, ingestion

Symptoms: Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]

Target Organs: Liver, kidneys, skin, lungs, lymphatic system

Cancer Site: [lung & lymphatic cancer]

Personal Protection/Sanitation

Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid: See Ref 13

Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH: At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Similar NIOSH guidance is available at the same website for a large number of hazardous industrial and min-related chemicals. The chemicals pertinent to SGP are cyanide and mercury.

Table D-1 in Appendix D states the following regarding employee health & safety:

FS-26	A site-wide health and safety plan will be developed and provided to the Forest Service. As part of the Health and Safety Plan, medical, fire, and weather emergency response procedures will be developed, and all employees and contractors will be familiar with these procedures.

COMMENTS:

1) I did not find in the DEIS a description of an onsite clinic facility or health care provider, other than an EMS employee. The DEIS refers to complying with NIOSH and MSHA regulations and recommendations and has FS 26 in FS requirements noted above, but Midas's protocols (eg. the NIOSH protocols outlined above) for these are not included.

2) Air Quality: Alt 2 is designed to reduce water quality risks, but the lime kiln onsite will increase air emissions of toxins. Air Quality will not meet NAAQS standards, but would have minimal effect on non-employees driving through the mine site because they would have short exposure times. However, there is **no mention of effects on employees.**

3) Noise levels with blasting, crushing, grinding will likely be in decibel ranges high enough to damage hearing in employees.

4) Blasting, hauling, moving rock, etc. are dangerous jobs.

Questions:

1) **Will Midas be required to hire an onsite nurse or PA to provide routine and emergency health care and have a clinic with adequate routine care capability and first aid and emergency equipment, supplies and medications? Will the FS fully enforce FS-26 (noted above) requirement for employee health & safety?**

2) **What types of personal protective equipment will be given to, and required of, employees? N95 or higher masks? Hearing protection?**

3) **What protections will Midas have against traumatic injuries in the various dangerous jobs associated with blasting, removing, and processing ore?**

4) **Will Midas be required to move employee housing as far away as possible from the ore processing area for safety in case an explosion occurs and to allow better air quality?**

5) **Will Midas be prohibited from using development rock or spent tailings to surface haul roads?**

6) **What protocols for infectious disease prevention will Midas be required to follow (eg. flu shots, TB testing, COVID-19 testing, face masks, social distancing, STD testing & treatment, contact tracing, reporting to Central Idaho Health Dept)?**

References:

11) (numbering continued from above) NIOSH Pocket Guide to Chemical Hazards https://search.cdc.gov/search/?query=arsenic&Submit=Search&affiliate=cdc-main&sitelimit=niosh+npg

12) Selection of N-, R-, or P- Series Particulate Respirators https://www.cdc.gov/niosh/npg/pgintrod.html#nrp

13) NIOSH First Aid Procedures https://www.cdc.gov/niosh/npg/firstaid.html