CENTER for SCIENCE in PUBLIC PARTICIPATION
224 North Church Avenue, Bozeman, MT 59715
Phone (406) 585-9854 / Fax (406) 585-2260 / web: www.csp2.org / e-mail: csp2@csp2.org
"Technical Support for Grassroots Public Interest Groups"

October 11, 2024

To: Idaho Conservation League

Re: Review of the US Forest Service Response to Comments from David Chambers (submitted December 29, 2022), originally submitted on the Stibnite Gold Project Supplemental Draft Environmental Impact Statement (2022)

From: David Chambers

During the prescribed comment period, I submitted critiques on several technical aspects of the Draft SEIS. Several of the comments/critiques received adequate responses, but the responses to several more either failed to adequately understand and/or respond to the critique, or did not attempt to answer the critique. Below, are the comments for which I believe I have not received an adequate response. I have summarized the original comment, the USFS response, and my assessment of the failings of the response.

(1) DAVID CHAMBERS, COMMENT LETTER 17634-A, COMMENT NUMBERS 2 & 9

(a) Original Comment, page 1 (abbreviated):

(Comment 2) A serious flaw with the technical analysis in the SDEIS is the failure to include an analysis of the financial surety associated with reclamation and closure. The public is ultimately liable for this cost if the company cannot pay it, and the public is liable for any difference between the amount eventually established by the Forest Service and the actual cost of reclamation and closure.

In the 2019 Prefeasibility Study, the cost estimate for the financial surety was $66.5 million. In the 2021 Feasibility Study that cost estimate increased to $100 million. These cost calculations are not included in the EIS analysis, only in the Prefeasibility analyses, but they have potential significant financial impact on taxpayers and the public. There is no technical justification for delaying the analysis of these calculations, since the mining alternative has already been determined, and the financial assurance calculations have already been done. The public deserves to be able to comment on these calculations as a part of the EIS.

(Comment 9) The response for Comment 9 was grouped with Comment 6 by the USFS. Comment 9 offers a lengthy explanation, and justifications, for including an analysis of the financial assurance amount in an EIS. It is too lengthy to include here. The USFS response to both comments was identical, and is listed below.

(b) Forest Service Response, Comment 2, page B-88; and, Comment 9, page B-89:

Reclamation cost estimates and financial assurance decisions are conducted by the Forest Service in a separate administrative process outside the NEPA scope.

(c) Chambers Remarks on USFS Response:

I believe that a financial surety that is not adequately calculated could have an impact on the human environment as described in 40 CFR Chapter V - Council on Environmental Quality, Part 1502 regulations, and therefore should have been analyzed in the EIS.

A Federal agency must prepare an EIS if it is proposing a major federal action significantly affecting the quality of the human environment.

In 40 CFR Chapter V - Council on Environmental Quality, Part 1502 - Environmental Impact Statement

§ 1502.1 Purpose.

The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the Federal Government. It shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. Agencies shall focus on significant environmental issues and alternatives and shall reduce paperwork and the accumulation of extraneous background data. Statements shall be concise, clear, and to the point, and shall be supported by evidence that the agency has made the necessary environmental analyses. An environmental impact statement is more than a disclosure document. It shall be used by Federal officials in conjunction with other relevant material to plan actions and make decisions. (emphasis added)

In 40 CFR Chapter V - Council on Environmental Quality, Part 1508, Terminology and Index, it states:

Section 1508.14 Human environment

"Human environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. (See the definition of "effects" (Sec. 1508.8).) This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment. (emphasis added)

(2) DAVID CHAMBERS, COMMENT LETTER 17634-A, COMMENT NUMBER 8

(a) Original Comment, page 4 (abbreviated):

Post Closure Water Treatment Post-closure water treatment, if required, typically doubles the amount of financial assurance required for a mine. For the Stibnite Project, the requirement for post-closure water treatment depend on two potential sources of contaminated water; (1) pit lake water in the West End Pit could exceed discharge water quality standards (SDEIS 2022, Section 2.4.7.5); and, (2) consolidation water from the tailings, and any ongoing seepage from the waste rock buttress (SDEIS 2022, Section 2.4.7.6).

The potential for West End water treatment has been identified, so financial provision for West End Pit water treatment should be provided in the post-closure financial assurance. If water treatment is needed for the West End Pit water, neither the treatment requirement, nor the length of time the treatment will be required, has been established in the SDEIS.

Provision for water treatment in perpetuity should be assumed until it can be demonstrated by post closure monitoring that water treatment will not be required beyond Mine Year 40.

(b) Forest Service Response, page B-270:

Uncertainties regarding the long-term water quality predictions are described in SDEIS Section 4.9.2.4 with mitigation measures to address those uncertainties described in SDEIS Section 4.9.3.

The assumptions utilized for reclamation cost estimates and the establishment of closure bond amounts are determined by the Forest Service in an administrative process that recognizes potential uncertainties and the need for monitoring and updating in response to observed changes in facilities and facility closure.

(c) Chambers Remarks on USFS Response:

Post-closure water treatment costs run tens to hundreds of millions of dollars, which was mentioned in the original comments. This is a significant potential liability to the public if that money is not provided in the financial assurance for the mine. If the Forest Service or State of Idaho do not intend to require long-term water treatment as a part of the financial assurance, then the public should be made aware of the reason this potential taxpayer liability, identified as a potential for the West End. If the amount for post-closure water treatment will be included in the financial assurance, the assumptions made to estimate the amount are critical, and can change the amount by tens of millions of dollars.

As discussed in (1) above, critical calculations like this should be disclosed in the EIS, and that analysis, and the accompanying assumptions, be made available for public comment. Waiting until after the mine has been permitted to determine the amount of financial assurance in an "administrative process" will obscure, if not totally hide, the details of those calculations to the public. Something as critical as determining the potential for tens or hundreds of millions of dollars of taxpayer liability is too important to leave to an administrative process that can, and often is, conducted behind closed doors.

(3) DAVID CHAMBERS, COMMENT LETTER 17634-A, COMMENT NUMBER 8 (continued)

(a) Original Comment, page 5 (abbreviated):

The interpretation of little to no post-closure seepage is supported by the data presented in Figure 4.9-3 Tailings Storage Facility Buttress Seepage Volume (SDEIS 2022), which shows the pop-out seepage and toe seepage going to zero after the liner is installed. In Figure 4.9-6 Tailings Storage Facility Seepage Volume (SDEIS 2022), cover infiltration and consolidation water are essentially zero after Mine Year 40.

(b) Forest Service Response:

The Forest Service did not respond directly to this comment. However, in response to another comment the Forest Service did note, "*The proposed ore stockpiles are located on top of the TSF Buttress. The proposed closure of the TSF Buttress by installation of a geosynthetic liner covered with growth media and revegetated would inhibit leaching of any remaining stockpile material*." (On page B-256, Response to Comment Letter 18903, Comment 41). In addition, the Forest Service noted, "*Test work performed on materials that would be mined by the Project indicate that acid rock drainage is not anticipated. However, metal leaching is a likely effect that is addressed through the use of liners, geosynthetic covers, and water treatment.*" (On page B-257, Response to Comment Letter 19000, Comment 5).

(c) Chambers Remarks on USFS Response:

This explains the logic in the FEIS that the upper liner on the waste rock buttress will "inhibit" infiltration/metal leaching of contaminants from the waste rock into underdrains. As noted in my original comment, a top liner only on the waste rock is still likely to allow significant infiltration. The only way to minimize seepage/infiltration into the waste rock would be to add an underliner to the waste rock facility.

(4) <u>DAVID CHAMBERS, COMMENT LETTER 17634-A, COMMENT NUMBER 3</u>

(a) Chambers Original Comment, page 3 (abbreviated):

A serious flaw in the technical analysis is failure to include technical reference documents containing preliminary technical specifications and analysis of the tailings dam. The SDEIS refers to calculated factors of safety for both static and seismic considerations, provides the updated seismic risk analysis necessary to make these calculations, but is still lacking the basic engineering specifications for the dam itself. For example, there is no discussion of the fundamental type of dam construction (downstream? or centerline?), the specifications for the fill for the different sections of the dam, and how the quality

assurance for dam construction will be performed. Developing this information is standard procedure for an EIS, and since the fundamental dam design does not appear to have changed since at least 2017, there should have been more than sufficient time to develop this information.

(b) Forest Service Response, page B-70 (abbreviated):

The IDWR is the proper authority in Idaho to regulate design, construction and operation of dams, including tailings disposal facilities. These requirements are cited in Section 3.2.3 of the EIS. Perpetua would need to comply with the IDWR regulations and requirements for its TSF. The monitoring requirements for the TSF would be established by the IDWR permitting process and the Forest Service recognizes the primacy of the IDWR in these matters, so therefore has not specified monitoring of the TSF in the EIS. USFS monitoring of the TSF structure would be limited to reclamation.

(c) Chambers Remarks on USFS Response:

An EIS is a document that provides information to assess potential impacts from a project. In this instance I am asking for seismic risk information and analysis that is necessary to confirm that the dam proposed has met the normal standards for seismic safety. The response is that this area is not within the permitting authority of the USFS, but that it lies with the IDWR. However, if the USFS were obliged to provide only information on issues under their permitting authority, then there would be no need to discuss water quality, wetlands, road access, and a host of other issues.

I believe this response fails to meet the basic requirement of providing essential information on the project to the public.

(5) <u>DAVID CHAMBERS, COMMENT LETTER 17634-A, COMMENT NUMBER 6</u>

(a) Chambers Original Comment, page 3 (abbreviated):

The SDEIS refers to the Feasibility Study (M3 2021) for many of its technically related comments on the tailings storage facility, but the feasibility study itself does not contain technical information on the tailings dam.

The figures presented in the SDEIS, Figures 2.4-10 and 2.4-11, suggest that at least some preliminary engineering work has been performed, but there is no reference given for the source of these figures, which by themselves are wholly inadequate to permit the construction of a tailings dam. These figures also appear in the Feasibility Study (M3 2021), which contains a figure not included in the SDEIS, Figure 18-11 (M3 2021). Figure 18-11 is a cross section of the dam showing Zone B Fill and Zone C Fill, which constitute the major structural zones of the dam – but there is no explanation of how these zones will be constructed.

We do not know whether this dam would be classified as a downstream or centerline construction type. We do not know what type of stability analysis has been done on the dam, if any. Golder (2021) provides some of the information needed to perform this stability analysis, but does not discuss the stability analysis itself. This is critically important information, and should be included in the SEIS.

(b) Forest Service Response, page B-952, (abbreviated):

Updated information regarding the tailings storage facility was incorporated into SDEIS with the downstream construction of the TSF embankment depicted in Figures 2.4-10 and 2.4-11.

In the FEIS (p. 4-18) it is further explained:

All planned raises of the TSF embankment would be by downstream methods. ... The buttress would be developed in horizontal lifts, abutting the engineered tailings embankment fill (Figures 2.4-10 and 2.4-11).

(c) Chambers Remarks on USFS Response:

It is noted on Figures 2.4-10 and 2.4-11 that they were taken from the Stibnite Gold Project, Revised Proposed Action ModPRO2, Perpetua Resources Idaho, Inc. October 2021. In the same ModPRO2 document there is an additional figure (ModPRO2, Figure 3-14, below), which appears just before the two figures copied into the EIS from ModPRO2 (Figures 3-16 and 3-17), and now labeled Figures 2.4-10 and 2.4-11.

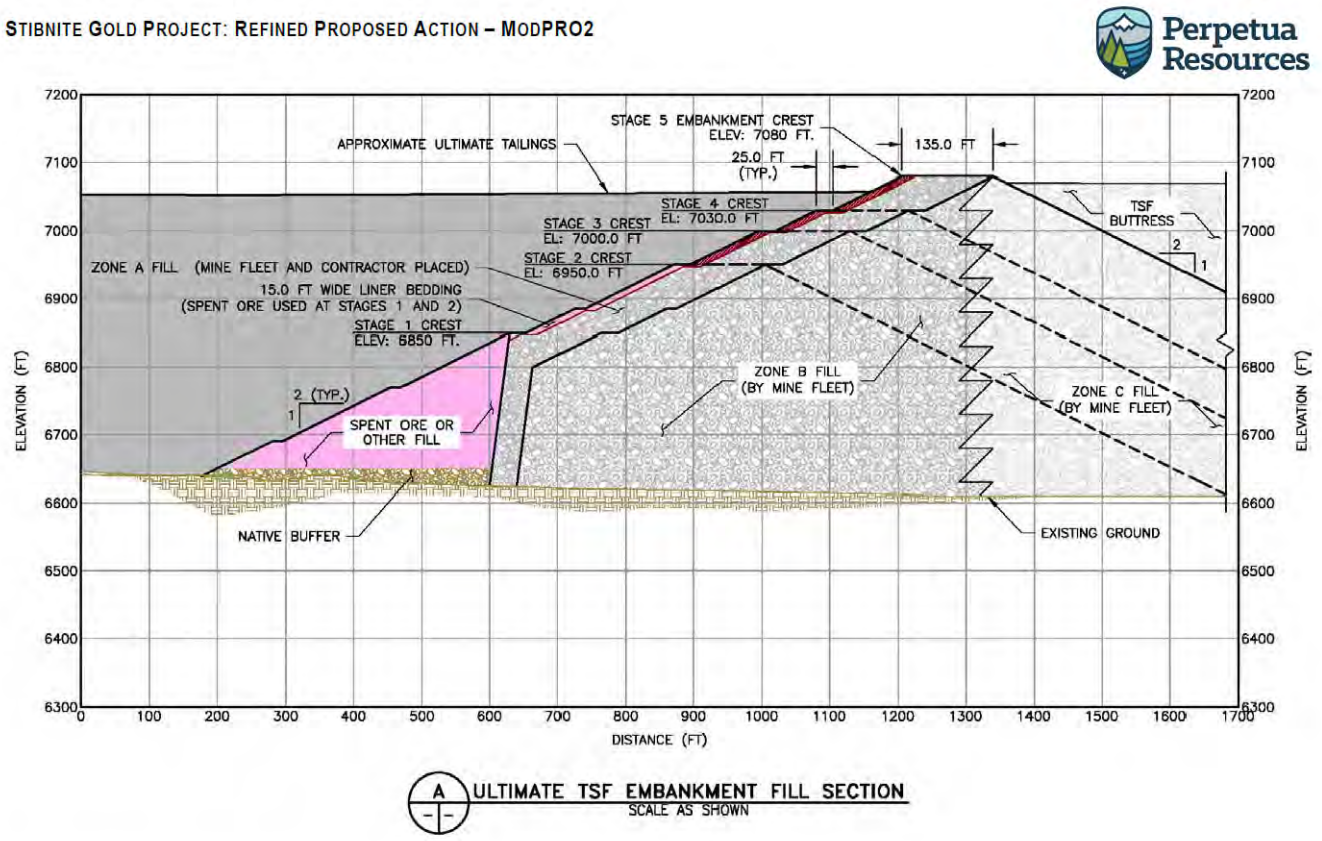

Figure 3-14. Design Cross Section through TSF Embankment and TSF Buttress

Figure 3-14 clearly shows centerline-type construction, not a downstream-type as stated in the FEIS.

Utilizing cross sections from ModPRO2 in the EIS merely confounds the confusion, which is what I pointed out in my comments on the SDEIS. The dam cross sections in ModPRO2 and the D/FEIS were developed by Perpetua. The dam cross sections are not taken from a technical consultant's report, so it is not clear what, if any, actual engineering was used to develop these figures. Perpetua does not have the internal technical ability to design the tailings dam, or to certify its safety. That expertise comes from outside technical consultants, and there is no reference to a report from outside consultants.

While it is now clearly stated in the FEIS that the dam construction will be downstream-type, there is no technical information to confirm those statements. The existence of competent technical analysis is important because this analysis is needed to determine how the factors of safety were determined, and how the earthquake stability analyses was conducted.

As pointed out in my DSEIS comments, there is still a significant gap in the technical background information available for the EIS. The response in the FEIS has not addressed that gap. There is a promise of downstream-type dam construction, but at this point it is unsubstantiated by the information available.

(6) DAVID CHAMBERS, COMMENT LETTER 17634-A, COMMENT NUMBER 11

(a) Original Comment pages 8-10 (abbreviated):

The stability analysis of the tailings dam is discussed in Section 4.2.2.2 2021 MMP – Tailings Storage Facility and TSF Buttress. The analysis is summarized in Table 4.2-1 Calculated Factors of Safety for the TSF Embankment and TSF Buttress. The analysis is based on a study performed for the original project as proposed by Midas Gold (Tierra Group 2017). The Tierra Group study uses the Site-Specific Seismic Hazard Analysis performed by URS (2013) as the basis for its seismic stability calculations. That study has been superseded by the Site Specific Seismic Hazard Assessment (Golder 2021). Even though the Golder study reduces the calculated peak ground acceleration that it predicts could be experienced at the site, it is not clear that the spectral accelerations associated with the lower peak ground acceleration are less than those associated with the 2017 Tierra Group peak ground acceleration. The issue of spectral acceleration differences from the Tierra Group is not addressed by Golder. In addition, Golder notes that the only bedrock conditions were used for the ground motion conditions in the pseudostatic modeling (Golder 2021, p. 7). The center portion of the dam will be constructed on alluvial/glacio-fluvial valley sediments, with the left and right abutments bedrock (Golder 2021). It is not clear from the Golder-Tierra discussions why pseudostatic modeling is appropriate for a dam with several different foundation conditions, and whether two-dimensional modeling might better reflect the different dam foundation conditions.

In addition, the Tierra 2017 analysis, where the current static and seismic factors of safety were developed, did not cite an actual tailings dam design report as the basis for developing the model it used to conduct the pseudostatic analysis. As with the information provided for tailings dam design in the SDEIS, we do not know where the engineering specifications for the dam design come from. It appears that some actual engineering design work has been done, but there is no reference to it. We do not know what specifications have been required, for example the type of fill, and the quality assurance requirements that will be enforced. We do not know what assumptions were assumed in the factor of safety calculations. The level of design information presented for the tailings dam is insufficient to adequately review the dam design information used to calculate the factors of safety.

(b) Forest Service Response, page B-135:

Additional slope stability analyses have been performed for static, or normal loading conditions, and for pseudo static conditions, representing earthquake loading conditions (Tierra Group 2021). The TSF embankment and TSF Buttress were analyzed to determine factors of safety for two potential failure surfaces: 1) full height failure of the downstream slope of the TSF Buttress such that the failure surface intersects the TSF dam crest and thereby causes a potential loss of tailings or water containment; and 2) TSF dam failure, similarly, intersecting the crest, but assuming the buttress was not present. Analyses were developed for a variety of events up to and including the design event (the MCE). Results for static conditions, the 2,475-year event, and the MCE are reported in the Final EIS as a revised Table 4.2-1.

(c) Chambers Remarks on USFS Response:

The response to the technical questions that were asked are not answered. The response only repeats what is presented in the EIS, which is exactly the lack of detail that generated the questions. The response cites Tierra Group (2021), which was not a reference (or made available) in the DSEIS. Tierra Group (2017) was the reference cited in the DSEIS. The DSEIS used the Tierra Group (2017) study to develop results and tables in the DSEIS. However, the Tierra Group (2017) and DSEIS tables are exactly the sources that failed to provide answers to my questions.

I can only assume Tierra Group (2021) was either not made available to reviewers of the DSEIS, or that the citation to Tierra Group (2021) is mistaken. It is possible that instead of Tierra Group (2021), the response meant Golder (2021), which does reference seismic sources of risk for the dam. However, Golder (2021) does not contain a discussion of the dam stability analysis, it is only a seismic-source risk analysis.

Additionally, in the FEIS (2024) there is a reference: Tierra Group International, Ltd. (Tierra Group). 2021. Stibnite Gold Project Tailings Consolidation Addendum. December 2021. As noted, this reference was not listed in the DSEIS. The Tierra Group (2021) reference addresses tailings consolidation, and does not address tailings dam issues.

None of these references supply the information I was looking for in reviewing the DSEIS.

I realize my questions are highly technical. The point is that the technical support documents referenced in the EIS do not provide this information, and they should have. I understand, and can appreciate, that the people that drafted the EIS may not have the background to understand these comments. However, the consultants that developed the technical reports do, and if they are not able to provide these answers in response to the questions asked in the EIS comments, then I can only conclude that the work necessary to address these comments was not done. Therefore, the background information provided in the EIS is insufficient.

(7) DAVID CHAMBERS, COMMENT LETTER 17634-A, COMMENT NUMBER 5

(a) Original Comment, page 2 (abbreviated):

The autoclave is a major component of the ore processing system, yet doesn't rate even a subtitled paragraph in the SDEIS, just a line here and there under other headings. An autoclave is very expensive to operate, requires pure oxygen from an oxygen plant, and because of the high operating temperature at which it operates, can be a major source of mercury in the exhaust. There is no discussion in the SDEIS about where the oxygen for the autoclave will be sourced. It must either be produced onsite in a local oxygen plant, which has potential hazards of its own, or it must be trucked in from an outside plant, with potential transportation liabilities. More information on the source and risks with oxygen must be provided.

(b) Forest Service Response, page B-161:

The text has been revised to indicate that the autoclave system would be the equipment used for the oxidation step. Information regarding oxygen supply has been added to the Final EIS. The summary of predicted air pollutions presented in Section 4.3.2.2 includes autoclave system emissions.

(c) Chambers Remarks on USFS Response:

The discussion of the autoclave added to the FEIS, although brief, is appreciated.

I searched the FEIS documents available on the project website,[1] which included: FEIS - Abstract to Chapter 2 Alternatives; FEIS - Chapter 3 Affected Environment; FEIS - Chapter 4 Environmental Consequences; and, FEIS - Chapter 5 to Appendix A.

I was not able to locate the information regarding the oxygen supply for the autoclave in any of these documents.

Section 4.3.2.2 Ozone and Secondary PM2.5 Analyses, referenced in the Forest Service response, contains no mention of mercury. In the FEIS, the description of the autoclave mercury removal system consists of one sentence, "*Control of the autoclaves include the uses of a venture scrubber, vent gas cleaning tower, vent gas stream condensing tower and at least one sulfur-impregnated activated carbon filter.*" (FEIS, p. 4-42) Likewise, in the FEIS Air Quality Specialist Report (2023), while there is extensive discussion of the modeling that produced the estimate of annual mercury emissions, including from the autoclave, there is no discussion of how efficient the mercury removal system for the autoclave will be at the Stibnite Project, or how often mercury emissions will be monitored for any of the mercury emission sites at Stibnite. Measuring mercury emissions is difficult, and consequently expensive. We need to know what mercury removal efficiency is being assumed for the Project, to assess whether the assumption used for the air quality modeling is reasonable. And, we need to know how often mercury emissions will be measured at each mercury emission source, in order to check on whether the assumptions used in the air quality modeling are being achieved. This information is not disclosed in the FEIS.

Reviewer's Background

I have 45 years of experience in mineral exploration and development – 15 years of technical and management experience in the mineral exploration industry, and for the past 30+ years I have served as an advisor on the environmental effects of mining projects both nationally and internationally. I have a Professional Engineering Degree in physics from the Colorado School of Mines, a Master of Science Degree in geophysics from the University of California at Berkeley, and am a registered professional geophysicist in California (# GP 972). I received my Ph.D. in Environmental Planning from Berkeley. My recent research focuses on tailings dam failures, and the intersection of science and technology with public policy and natural resource management.

Sincerely;

David M. Chambers, Ph.D., P. Geop

[1] https://www.fs.usda.gov/project/payette/?project=50516