UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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REGIONAL
ADMINISTRATOR'S
DIVISION

January 10, 2023

Linda Jackson
Payette Forest Supervisor
Stibnite Gold Project
500 N. Mission Street, Building 2
McCall, Idaho 83638

Dear Linda Jackson:

The U.S. Environmental Protection Agency has reviewed the U.S. Forest Service's October 2022 Draft Supplemental Environmental Impact Statement (DSEIS) for the Stibnite Gold Project (CEQ Number 20220154, EPA R10 Project Number 17-0013-AFS). EPA has conducted its review pursuant to the National Environmental Policy Act and our review authority under Section 309 of the Clean Air Act. The CAA Section 309 role is unique to EPA and requires EPA to review and comment publicly on any proposed federal action subject to NEPA's environmental impact statement requirement.

As a Cooperating Agency, EPA is supporting the Forest Service in the EIS development including review and comment on administrative drafts of EIS documents. EPA provided Draft EIS comments to the Forest Service in November 2020. Most recently EPA has supported the preparation of the DSEIS for the revised proposal submitted by the project proponent, Perpetua Resources Ltd (formerly Midas Gold Idaho, Inc), which includes the Forest Service eliminating two of the previous DEIS action alternatives from further consideration.

The DSEIS evaluates the potential environmental impacts associated with mining operations located on the Payette and Boise National Forests in central Idaho. The proposed project will produce gold and silver doré, and antimony concentrate for commercial sale. The project includes three open pits, an ore processing facility, a lime plant and associated limestone mining, development rock storage facilities, a tailings storage facility, a water treatment facility, access and haul roads, electrical transmission lines, and other support infrastructure and facilities. The mine life will be 20 years, not including post reclamation monitoring, with active mining and ore processing occurring over approximately 15 years. The DSEIS identifies and evaluates a No Action Alternative and two Action Alternatives: 1) 2021 Modified Mine Plan (2021 MMP) Alternative, representing the Proposed Action and identified as the Agency Preferred Alternative, and 2) Johnson Creek Route Alternative.

EPA appreciates that the DSEIS addresses many concerns and recommendations raised in our earlier review of the project documents. Additionally, EPA identified environmental concerns and deficiencies in the analysis that should be addressed in the Final EIS. Our attached Detailed Comments include recommendations for protecting air quality, surface water and groundwater quality, stream temperatures, wetland and riparian resources, fish habitat, and communities with environmental justice concerns; addressing impacts from soil contaminants and reclamation cover materials, geological hazards, and greenhouse gas emissions; and additional analysis to strengthen the assessment of impacts between the different mine access routes/road alternatives and modeling for different parameters.

Key recommendations for the FEIS include:

- Clearly and sharply defining impacts from the mine access routes/road alternatives.
- Monitoring for fugitive dust and particulate matter air emissions, assessing airborne arsenic impacts, confirming consistency across proposed state and federal air quality measures, and addressing possible underestimations of mercury deposition.
- Addressing suitability of soils for reclamation and effects of soil contaminants on surface water quality.
- Implementing effective monitoring, corrective actions, and addressing uncertainty for effects to stream temperature.
- Ensuring impacts from groundwater and surface water contaminants (e.g., mercury, methylmercury, arsenic, and antimony) are not underestimated when demonstrating compliance with the Clean Water Act and determining if additional mitigation measures for potential impacts are needed.
- Including an estimated financial assurance amount and mechanism, the disclosure of which is particularly important in this project given the long-term water management needs at the site (including post-closure).
- Establishing an Independent Tailings Review Board (ITRB) for the tailings storage facility including the buttress dam and conducting regular independent reviews as a mitigation measure to ensure geotechnical stability and protection of surface resources.
- Including continuous monitoring and inspections to address uncertainty and potential underestimation of indirect impacts and functional loss to wetlands and riparian resources.
- Supplementing the environmental justice analysis with EJScreen and considering mitigation measures for impacts including but not limited to loss of access and effects to subsistence.
- For climate change:
    - Including science-based greenhouse gas emissions reduction targets.
    - Assessing the social cost of carbon.
    - Incorporating adaptation in project features, such as stream crossings, reconstruction, and riparian cover.

Thank you for the opportunity to review the DSEIS for this project. We appreciate the constructive ongoing engagement with the Forest Service during the NEPA process and look forward to working with you as you prepare the FEIS. If you have questions about this review, please contact Susan Sturges of my staff at 206-553-2117 and sturges.susan@epa.gov, or me, at (206) 553-1774 or at chu.rebecca@epa.gov.

Sincerely,

REBECCA CHU

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Date: 2023.01.10 13:51:20 -08'00'

Rebecca Chu, Chief
Policy and Environmental Review Branch

Enclosure

Alternatives Analysis – Burntlog Route and the Johnson Creek Alternative

The material summarized in the Executive Summary and in Table 2.8.1 Alternative Comparison and Impact Summary[1] indicate that the Burntlog Route may result in greater impacts on several environmental and economic indicators, than as generally presented for the 2021 MMP Alternative (which includes the Burntlog Route). Examples include more greenhouse gas (GHG) emissions, soil impacts, stream crossings, forest disturbance, wetland loss, wildlife habitat disturbances, new roads, ground disturbance, impact on historical properties, higher inconsistency with designated Recreation Opportunity Spectrum, and lower contributions to employment trends. Further, the 2021 MMP Alternative will likely: impact roadless characteristics in three inventories roadless areas; increase non-native plant species spread; and create construction noise into the Frank Church River of No Return Wilderness. As the proposed mine access routes (Burntlog Route and the Johnson Creek Route Alternative) are the primary difference between the two Action Alternatives, EPA recommends the FEIS clearly and sharply define issues related to each access route and ensure the assessments are accurately reflected across the different sections.

Potential Impacts to Air Quality

Idaho Department of Environmental Quality (IDEQ) Air Quality Permit to Construct (PTC)

The DSEIS indicates on June 17, 2022, IDEQ issued a final PTC and Statement of Basis (SOB) stating that the Stibnite Gold Project (SGP) will not require a Title V permit.[2] Further that "[a] determination was made by the State of Idaho that the SGP satisfies the requirements of the PTC program, based on demonstration of the SGP's potential emissions and controls. This was based on the complete air emissions inventory of stationary sources that was submitted by Perpetua as part of its application to the IDEQ for an air quality permit.''[3]

EPA formally commented during the public review process for IDEQ's draft air quality PTC that the draft PTC did not appear to sufficiently limit annual emissions to allow the SGP to avoid being subject to the Title V and Prevention of Significant Deterioration (PSD) programs and assure compliance with the National Ambient Air Quality Standards.[4] EPA continues to review the final PTC for compliance with the CAA. As a Cooperating Agency for this project's EIS, EPA shared our March 2022 draft PTC comments with the Forest Service. EPA recommends the FEIS include a summary of EPA's public comments. EPA is available to meet with the Forest Service and IDEQ, who is also a NEPA cooperating agency, to discuss our concerns and answer any questions.

[1] (DSEIS, p. 2-136).
[2] (DSEIS, p. 3-35).
[3] (DSEIS, p. 3-37).
[4] McFadden, Kelly. (March 16, 2022). [Letter from Kelly McFadden, US EPA Region 10 to Kelli Wetzel, Idaho Department of Environmental Quality, 2022].

Enclosure of Main Ore Processing Facility and Coarse Ore Stockpile

The DSEIS indicates the main ore processing facility building and coarse ore stockpile will be enclosed.[5] EPA notes that IDEQ's PTC does not include stipulations that the main ore processing facility building and coarse ore stockpile will be enclosed. Given the inconsistency, EPA recommends the FEIS clarify whether the main ore processing facility building and coarse ore stockpile will be enclosed, which EPA supports to reduce dust. If the main ore processing facility building and coarse ore stock will not be enclosed, correct its description throughout the FEIS. EPA also recommends adjusting the assessment analysis to account for the change.

Bag House Dust Collectors

The DSEIS indicates water sprays and/or bag house dust collectors will be installed at the ore-crushing system and at ore reclaim feeders that deliver ore to the grinding circuit.[6] EPA notes that IDEQ's PTC does not include baghouse dust collectors within the ore-crushing system and at ore reclaim feeders. EPA recommends that the FEIS clarify the measures that will be taken for the SGP, and adjust any inconsistencies in the FEIS, including the assessment analysis to account for the change.

Title V Permit

Regarding the DSEIS statement "[t]he regulation establishes mercury emissions limitations and work practice standards to control mercury emissions from gold production processes." [7] EPA recommends evaluating if this regulation would require a Title V permit for the SGP. If so, EPA recommends adding the following sentence in the same paragraph "This regulation also requires that the SGP obtain a Title V permit. See 40 CFR 63.11640(d). This requirement is separate and independent from whether a Title V permit is needed based on the project's potential air emissions."

Fugitive Dust and Particulate Matter (PM) Monitoring

Table 2.4-12 in the DSEIS indicates "[t]he Proponent will prepare a dust mitigation plan with appropriate schedule or triggers for control deemed adequate by IDEQ to achieve the level of control of 93 percent of dust (as submitted in the proponent's draft application for Permit to Construct from IDEQ). Alternatively, the proponent could employ particulate matter or opacity monitors deemed adequate by IDEQ and the Forest Service and immediately apply water or chemical dust control when PM or opacity monitors reach levels within 10 percent of the threshold determined by IDEQ."[8]

Since the final PTC has been issued by IDEQ, EPA recommends changing the reference to the draft application to a reference to the PTC for the FEIS. PTC permit condition 2.6 requires the proponent to develop and maintain a Fugitive Dust Control Plan (FDCP) and permit conditions 1.2 and 3.2 specifies 93% dust control must be met for the haul roads. The FDCP was not provided in the PTC before it was issued and has not been available for public review. EPA recommends the FEIS include a draft of the FDCP as an appendix or publicly available reference document.

The IDEQ PTC does not contain any requirements for PM monitoring as is stated above in the first paragraph. The EPA has recommended PM10 monitoring in previous cooperating agency NEPA comments and in comments to IDEQ during the draft air permit comment period.

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[5] (DSEIS, p. 4-36).
[6] (DSEIS, p.4-36).
[7] (DSEIS, p. 3-36).
[8] (DSEIS, p. 2-94).

For the FEIS, EPA continues to recommend continuous PM10 monitoring at the facility fenceline, as a mitigation measure and integral part of the FDCP, to ensure the project will not cause a violation of the primary and secondary National Ambient Air Quality Standards. Monitoring is justified based on the high range of uncertainty in the estimates of fugitive dust emissions and high potential of potential impacts to resources in the project area.

Though the DSEIS modeling indicates that PM10 impacts will be below the NAAQS, the modeling was based on numerous assumptions, including achieving a 93% control efficiency on fugitive dust emitted from haul roads. Small errors and uncertainties in the emission inventory assumptions could lead to significantly more fugitive dust emissions than estimated. In its prior comments to IDEQ, EPA raised concerns about the feasibility and enforceability of achieving the 93% control efficiency.[9] PM10 monitoring would help to verify the estimated emissions in the assessments were correct or provide a measurement tool to gauge the effectiveness of post-project mitigation to address excessive emissions.

Access Road

The DSEIS states "[t]he EPA Region X has indicated that the access road could possibly be excluded from ambient air if sufficient measures are taken to comply with the 2019 revised policy (EPA 2019a)."[10] EPA recommends disclosing that formal EPA policy review of the proposed ambient air boundary was not requested by the state and was not conducted. The EPA does not typically engage in formal review of the ambient air boundary during NEPA review and usually only conducts such a review upon request of the state during air permitting.

For the FEIS, EPA suggests the following to add to the paragraph: "Exclusion of the public access road from ambient air protections is a unique case that relies on measures assumed to meet the standards inferred in the 2019 revised ambient air policy. However, a formal EPA policy review of the ambient air boundary for the project has not been conducted nor requested. A formal review is not necessarily required. The EPA did provide formal comment on IDEQ's air quality PTC recommending a review be requested by the state and that initial measures in the PTC were too ambiguous to determine compliance with the revised ambient air policy."

Arsenic Screening Analysis

The EPA continues to have concern that the arsenic screening analysis underestimates cumulative impacts of airborne arsenic to the environment in the vicinity of the project. The results presented on page 4-46 of the DSEIS, and Table 4.3-13 are compared to an annual acceptable ambient concentration for a carcinogen (AACC), the Idaho toxics screening threshold. However, this screening threshold is not necessarily intended to be compared against a 70-year lifetime scenario where 57 years of the period assumes zero exposure. The threshold is an annual average used for screening, prescribed as a de-minimus value based on lifetime risk. Under IDEQ's hazardous air pollutant program, in practice, project impacts from the maximum year of emissions would typically be compared to the annual average AACC for arsenic.

If the impacts were determined using annual average emissions during the period of the project only, the resulting arsenic concentrations would exceed the AACC. There is significant uncertainty in the

[9] McFadden, Kelly. (March 16, 2022). [Letter from Kelly McFadden, US EPA Region 10 to Kelli Wetzel, Idaho Department of Environmental Quality, 2022].

[10] (DSEIS, p. 3-30).

emission rates of fugitive dust associated with the project such that arsenic emissions could be underpredicted.

Based on these concerns, the EPA continues to recommend the FEIS include an expanded cumulative analysis to disclose project airborne arsenic impacts to the environment.

Retort Emissions

The DSEIS states "[t]he retort emissions are based on an average of two refinery reports in 2015/2016 (NDEP 2015, 2016). The corresponding calculations are 20 percent of the retort standard of 0.8 lb/ton."[11]

The process by which these emissions are derived is unclear. The two referenced documents (NDEP 2015, 2016) contain emission values for over 25 mining operations in Nevada. Depending on the mine, the emissions can be less than 1 lb/year to greater than 500 lbs/year. For the FEIS, EPA recommends providing information on which two refinery reports were averaged and why those two were selected to best represent conditions at Stibnite.

Gaseous Elemental Mercury (Hg0) Emissions

The DSEIS indicates that gaseous elemental Hg0 emission sources at the SGP will be controlled by activated carbon absorbers.[12] If Hg0 emissions are controlled by the activated carbon absorbers, EPA recommends the FEIS clarify if this means that the 13.6 lb/year of Hg released from the SGP project will consist of particulate bound and oxidized Hg. EPA further recommends clarifying for the AERMOD assessment, if all 13.6 lbs of Hg are included in this modeling.

Underestimations of Total Hg Deposition

The DSEIS states "[t]his analysis indicates a maximum estimated increase in Hg deposition rate of 0.4 percent or less of the existing background rate. However, it should be recognized that this rate underestimates the total Hg deposition, as the mechanism of Hg0 flux is not included in the screening model."[13]

While we appreciate the inclusion of the sentence indicating a reason why this percent increase is underestimated; the reason listed is only part of the reason for the underestimation. As mentioned in a previous section, the background Hg deposition values based on data from more than 10 years ago is also biased high due to subsequent emission controls. Therefore, the 0.4% increase underestimates Hg deposition because 1) it does not include Hg0 deposition; and 2) the background deposition rates are overestimated for current conditions.

Generally, when developing an EIS on the impacts of a proposed mine, the preference is to develop conservative estimates of potential impacts and provide caveats as to why these impacts may be overpredicted. For this SEIS there are several instances where impacts are underpredicted and then caveats are added indicating that there is a low bias in the analysis. The problem with this approach is that impacts may not be identified and properly mitigated. EPA suggests adjusting the Hg deposition assessment for the FEIS to conservatively estimate the potential impacts and then provide caveats as to why these impacts are likely overpredicted.

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[11] (DSEIS, p. 4-40).
[12] (DSEIS, p. 4-50).
[13] (DSEIS, p. 4-50).

Contribution Above Estimated Hg Background

Table 4.3-18 SGP Contribution Above Estimated Hg Background indicates that SGP will result in Hg deposition of 0.056 g/km2/year. However, an earlier Table (4.3-6) indicates that the mine will release 13.6 lbs per year of Hg. The previous statement that Hg0 emissions will be controlled suggests that 13.6 lbs represents releases of oxidized and particulate bound fractions which will be deposited relatively locally.

Of the 6,200 grams of Hg released (which is mostly or entirely Hg2+ and HgP according to the previous statement in the SEIS), AERMOD predicts only 0.056 g/year is deposited with a square km. There seems to be a disconnect between the species of Hg emitted, the amount of Hg emitted, and the amount being deposited locally within this analysis. EPA recommends reevaluating these analyses, making appropriate corrections for the FEIS, and if potential significant deposition is identified, mitigating to reduce impacts.

Soils and Reclamation Cover Materials

Reclamation Cover Material

Table 2.4.-12 in the DSEIS indicates that reclamation cover material (e.g., growth media) used in places including but not limited to the TSF and tailings storage facility buttress (TSFB) would be evaluated for contaminants prior to use during reclamation. Acceptable metal/contaminant concentrations and sampling and testing would be documented in a sampling and analysis plan developed prior to reclamation. [14]

EPA recommends that the FEIS disclose the concentration limits that would be required by the Forest Service since these are directly relevant to the evaluation of environmental impacts for the project, including the analysis of the availability of and suitability of cover material (metals) and the analysis of potential reclamation and closure/post- closure impacts to wetlands, waters, wildlife, aquatic resources, and public health in subsequent EIS sections.

We have provided this same comment on previous versions of this section and the NEPA specialist report and reiterate the recommendation to disclose this information to support conclusions regarding impacts and mitigation effectiveness.

Suitable Soil Types for Reclamation

Under Suitable Soil Types for Reclamation, the DSEIS states "[t]he soils in this SMU [soil map unit typic halosparists (cTH)] also have elevated antimony, arsenic, and mercury concentrations (Tetra Tech 2021a)."[15] EPA recommends the FEIS discuss how soils with elevated concentrations of antimony, arsenic and mercury will impact predicted water quality concentrations of these contaminants. EPA also recommends specifying whether these values are elevated when compared to other background soils or in relation to soil criteria.

Soil Contamination/Chemistry

The DSEIS states "[t]he mean concentrations of antimony (14.88 ppm within a range of 0.04 to 2,580 ppm) and mercury (0.972 ppm within a range of 0.005 to 283 ppm) from the samples are high but are still within the highest screening-level phytotoxicity criteria concentrations from various literature

[14] (DSEIS, p.2-97).
[15] (DSEIS, p. 3-81).

references and federal agencies in U.S. and Canada cited in the Reclamation and Closure Plan (Tetra Tech 2021a)."[16]

While these concentrations may be below phytotoxicity criteria, EPA recommends the FEIS evaluate how elevated soil concentrations will impact surface water quality in the Environmental Consequences section of the FEIS.

Surface Water and Groundwater Quality

Riparian Vegetation Zones

The DSEIS includes a measure to establish 18-foot-wide vegetation zones consisting of willow, spruce, and other riparian species that effectively shade stream flows in the restored and native stream channels in the mine area.[17] Studies over the years have shown that riparian vegetation located outside of an 18-foot buffer is a critical component of riparian vegetation stream shade production. [18,19] That is, restored riparian buffer widths would need to be much wider than 18 feet to produce levels of stream shade that would result in the predicted post-closure stream temperature conditions illustrated in Figure 4.9-27. The DSEIS references to the Environmental Monitoring and Management Plan (EMMP) framework, however, specific actions were not provided that described how full potential stream shading from riparian vegetation within the Riparian Conservation Area[20] will be achieved for riparian areas located outside of 18 feet from the stream.

EPA recommends the FEIS include specific management and protection that will be implemented to ensure (shade producing) riparian vegetation is promoted outside of 18 feet from the stream. Describe the specific planned efforts to eliminate anthropogenic disturbance, and promotion of riparian restoration, within the entire riparian zone, including the "outer" riparian zone associated with stream shade production (i.e., outside of 18 feet from the stream).

Stream Temperature

The DSEIS states that predicted long-term post-closure cool stream temperature conditions depend on the successful implementation of "the lined Stibnite Lake lacustrine feature above the cover of the Yellow Pine pit backfill to moderate maximum stream temperatures."[21]

"Cooling" temperature properties of this lake is dependent on lake water residence time and depth,[22] both of which are impacted by upstream sediment delivery.[23] That is, sediment transport into the lake can result in sediment deposition on the lake bottom, reducing the water depth, and subsequently decreasing the lake residence time. Specifically, it was reported that "about 90 percent of coarse-grained sediment derived from upgradient is deposited in the Yellow Pine pit" along with approximately 20 percent of the fine-grained sediment (<0.0625 millimeter in diameter), and "[t]hus, the Yellow Pine pit

[16] (DSEIS, p. 3-85).
[17] (DSEIS, p. 4-269).
[18] Groom, J. D., Madsen, L. J., Jones, J. E., & Giovanini, J. N. (2018). Informing changes to riparian forestry rules with a Bayesian hierarchical model. Forest Ecology and Management, 419, 17-30.
[19] Barnowe-Meyer, S., Bilby, R., Groom, J., Lunde, C., Richardson, J., & Stednick, J. (2021). Review of current and proposed riparian management zone prescriptions in meeting westside Washington State anti-degradation temperature criterion FINAL REPORT.
[20] (DSEIS, p. 3-250).
[21] (DSEIS, p. 4-269).
[22] (DSEIS, p.4-274).
[23] (DSEIS, p.3-191)

is an effective sediment trap for coarse-grained particles but does not have a long enough residence time to deposit the majority of the fine-grained sediment load." In addition, "most of the sediment load discharged from the Meadow Creek reach is deposited in the Yellow Pine pit lake".[24]

Unless otherwise determined through modeling analysis, it can be expected that these same sediment transport/deposition dynamics will occur with the created East Fork South Fork Salmon River (EFSFSR)/Stibnite Lake complex. In addition, this material also highlights the likely need to understand sediment loading and transport in the EFSFSR watershed to maintain the future Stibnite Lake attributes that lead to "cooling" water temperatures.

Several potential sediment reduction and management measures are introduced on DSEIS page 4-274, and it is stated that the effectiveness of these measures will be evaluated through the EMMP. However, the EMMP does not provide specific examples on how current and future sediment loading is evaluated (i.e., status monitoring), as well as evaluate the effectiveness of the proposed actions to address any future sediment "issue" (i.e., effectiveness monitoring).

EPA recommends the FEIS include implementation of detailed monitoring strategies that will: 1) monitor and quantify the sources and amount of sediment loading (including both chronic and episodic) entering the EFSFSR river system upstream of the Stibnite Lake; 2) evaluate the transport of both suspended and bedload transport in the stream network upstream of the Stibnite Lake; and 3) monitor sediment deposition and bathometry conditions in Stibnite Lake.

Information collected as part of this monitoring effort is necessary to: 1) determine if a problem exists associated with excessive sediment loading and/or deposition in Stibnite Lake, and 2) provide the necessary information to produce plans intended to adequately address any future corrective action to address excessive sediment loading and/or deposition in Stibnite Lake.

EPA also recommends the FEIS include detailed corrective action strategies that outline actions to: 1) correct/eliminate any future "elevated" sediment sources (similar to what is proposed to excessive sediment from Blowout Creek[25]); 2) correct/eliminate the transport of the bed load and "coarse" sediment load that has entered the river network; and 3) potential mitigation measures to address potential future "shallowing" of Stibnite Lake resulting from sediment deposition.

Significant Temperature Mitigation Feature

Figure 4.9-27 illustrates that the most significant temperature mitigation feature in the EFSFSR river watershed is located between the TSFB and the East Fork Meadow Creek (EFMC). Specifically, modeled stream temperatures post mine closure (i.e., end of year 27) decrease up to 7° C within this short reach, which results in lower temperature to continue downstream in the EFSFSR.[26] The DSEIS later reports that without this upstream temperature reduction "stream temperatures downstream of the Yellow Pine pit area could also be greater than existing conditions."[27] The DSEIS lists several possible reasons for this "significant" stream cooling reach: 1) resumption of "baseline" cool groundwater discharge; 2) increase stream shade; and 3) underdrain flow from the TSF.[28]

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[24] (DSEIS, p. 3-191).
[25] (DSEIS, p. 2-62).
[26] (DSEIS, p. 4-272).
[27] (DSEIS, 4-281).
[28] (DSEIS, p. 4-271).

It is unlikely that the first two factors outlined on page 4-271 are meaningful factors in the creation of the "significant" stream cooling zone between the TSFB and the EFMC. The dashed line in Figure 4.9-27 indicates that stream temperatures currently increase within this reach, indicating that "baseline" groundwater influences within this reach are likely a relatively minor factor towards the creation of the "significant" temperature reduction zone. Additionally, it is unlikely that increase shade within this reach will result in the "significant" stream cooling zone because stream shade does not "cool" a river/stream. Stream shade reduces the amount of solar heat load (i.e., sun light) from reaching the stream water, and this lower heat load can result in a gradual loss of heat energy (i.e., temperature reduction) through the relatively slow evaporation/convection processes.

It is possible that cool underdrain flow from the TSF added into this stream reach could physically "dilute" the warm stream water advecting from upstream. The amount of cooling would be dependent on the volume and temperature of these underdrain inputs.

EPA recommends the FEIS: 1) provide additional analysis describing the potential uncertainty that the "cooling" feature will function as predicted, 2) ensure proposed monitoring assesses if the "cooling" feature functions as predicted, and 3) include a description of potential mitigation/corrective actions if the "cooling" feature does not occur as expected.

An acknowledgment of potential uncertainty of predicted ground water discharge volumes and "restored" shade conditions is on page 4-281. However, as described above, these two factors are unlikely a significant source of the cool water within the TSFB and the EFMC reach of Meadow Creek. The potential uncertainty associated with the predictions of the magnitude and duration of the cool underdrain flows were not provided in the DSEIS. Material presented on Page 2-56 indicates that these underdrain flows may be unavailable for stream cooling within this reach due to 1) the potential need for it to be treated prior to discharge into the stream; and/or 2) the potential need for it to be used as makeup water for the mill process. Thus, EPA recommends the FEIS include evaluations in this assessment that describe the potential uncertainty associated with the magnitude and duration of the predicted underdrain flows.

The DSEIS does not discuss potential mitigation measures associated with a lower production and/or elevated temperatures of the expected underdrain flows discharging into the "significant" stream cooling zone between the TSFB and the EFMC. EPA recommends the FEIS include evaluations in this assessment that describe potential mitigation/corrective actions needed to address any loss or reduced effectiveness from the underdrain flows expected within this reach.

Groundwater Analyte Concentrations

The DSEIS indicates groundwater analyte concentrations beneath the mine site, particularly in the vicinity of the TSF, TSFB, Hangar Flats pit backfill, and Yellow Pine pit backfill are expected to increase in response to constituent leaching from development rock. Existing groundwater in those areas typically does not meet regulatory criteria for use as drinking water due primarily to arsenic and antimony concentrations.[29]

To adequately describe the nature and extent of additional groundwater contamination contributed by SGP, EPA recommends the FEIS include a summary that describes the magnitude of groundwater concentrations above current baseline conditions and the geographic extent (in feet) over which baseline

[29] (DSEIS, p. ES-15).

concentrations are exceeded. Figures which depict the extent and magnitude of groundwater concentration changes in relation to mine facilities would be particularly helpful to disclose groundwater impacts.

Surface Water Methylmercury (MeHg) Concentrations

The DSEIS states "MeHg concentrations in SGP site streams are not appreciably different from those reported by the USGS nationwide study, and that historical mining activity in the analysis area has not increased MeHg concentrations above those observed at similar reference locations throughout the U.S."[30]

It is accurate that the USGS nationwide study did not identify an increase in MeHg in basins containing mines; however, the FEIS will need to include a caveat that this study only included one sample location from Idaho, and that location was outside of the Stibnite study area. As such, the statement that mining activity has not increased MeHg above "similar reference locations" is inaccurate. Instead, EPA recommends the FEIS state that MeHg concentrations in the Stibnite area were similar to those observed in non-mining impacted watersheds throughout the US.

It is important when comparing MeHg concentrations to other areas that these be interpreted in the context of the dissolved organic carbon (DOC) and sulfate levels present. The national USGS study referred to includes measures of these parameters. Because the amount of MeHg generated by an ecosystem is influenced by both DOC and sulfate, EPA recommends the FEIS include a comparison of not just the MeHg values, but the MeHg values in relation to existing DOC and sulfate concentrations in the Stibnite area and how those compare to other streams in the national assessment.

Major Ions, pH, and Total Dissolved Solids (TDS)

In the Surface Water - Major Ions, pH, and TDS section of the DSEIS,[31] EPA recommends the FEIS include in this discussion the levels of sulfate under existing conditions. This information is included in Table 3.9.9, but the significance and trends of this data are not described. Because the levels of sulfate may increase because of mining activity and there are important links between sulfate levels and MeHg production, EPA recommends the FEIS include a description of current sulfate levels. From the table, it appears that most sulfate levels are quite low (<10 mg/L), especially when compared to the national average from the USGS study at 45.9 mg/L.

Chemical Release Rates Temperature Correction

The DSEIS states "[t]he source terms were then scaled to field conditions to account for differences in reaction rates, temperatures, and liquid-to-solid ratios between laboratory tests and field conditions."[32]

EPA notes that the temperature correction will likely underestimate leaching rates encountered at the mine site. The Arrhenius equation is based on pyrite oxidation and is not specific to other metal/element release rates. Several metals have been shown to have higher release rates at lower temperatures.[33]

In addition to the inherent uncertainties in applying the temperature correction factor, an annual air temperature of 2.6°C should not be used for scaling. The annual average incorporates many months of sub-zero temperatures into this average when water is frozen and aqueous geochemical reactions are not occurring. A more conservative annual average would be based only on time periods when the

[30] (DSEIS, p. 3-188).
[31] (DSEIS, p. 3-176).
[32] (DSEIS, p. 4-182).
[33] SRK Consulting. 2006. Cold Temperature Effects of Geochemical Weathering.

temperature was greater than 0°C. A slightly less conservative approach would be based on an average that substituted 0's for time periods when the temperature was negative. In addition, temperatures below the surface are often higher than air temperatures, especially when they are insulated with snow cover. Furthermore, chemical reactions are exothermic and can also contribute to increases in subsurface temperatures in geochemically active areas. In addition, under future climatic conditions, the temperature is predicted to increase.

Overall, for the FEIS, EPA recommends the chemical release rates not be corrected for temperature during the water quality modeling.

Effects of Deposited Mercury to Watershed

The DSEIS indicates actual local mercury deposition rates from project emissions depend on the fractions of particulate versus gaseous mercury emissions. Particulate emissions generally deposit on the ground surface nearer to their source while gaseous emissions tend to deposit farther from the source or potentially become part of global atmospheric mercury burden.[34]

We appreciate this information being mentioned in the water quality section of the DSEIS. In the air section of the DSEIS, it suggests that most Hg0 will be captured, which suggests that most of the 13.6 lbs/year (6,200 g/year) that is released will be Hg2+ and HgP which would deposit locally. However, the results of the AERMOD predictions indicate that a much smaller amount or mercury (0.056 g/year) will be deposited within a square km around the mine site. There seems to be a disconnect between the amount and species of mercury emitted and the amount being deposited to the local watershed. EPA recommends the FEIS assess the potential for enhanced local deposition of Hg2+ and HgP of mercury to the local watershed and how this will impact water concentrations.

Ratios of Stream Mercury Loads to Atmospheric Mercury Deposition Rates

The DSEIS states "[r]atios of stream mercury loads to atmospheric mercury deposition rates have been reported in watersheds affected by gold and silver mining (Domagalski et al. 2016)... Therefore, aerial deposition would have a minor to moderate, long-term effect on particulate mercury loads in streams within the project area watershed."[35]

It is unclear what ratios are being used in the analysis that led to the conclusion of minor to moderate impacts. An earlier version of the DSEIS document stated that "[r]eported ratios of stream mercury loads to atmospheric mercury deposition rates have been reported to be approximately 50-to-1 in watersheds affected by gold and silver mining with a drainage areas less than 500 square kilometers (Domagalski et al. 2016). Application of that ratio to the total mass of mercury emission would suggest that aerial deposition could contribute up to approximately 0.3 pounds per year to streams within the watershed during the operations period, primarily in the form of particulate mercury."

At that time, the EPA commented the ratio of 50 to 1 is not applicable to this situation. Domagalski et al, 2016 is suggesting that the stream Hg loads are 50 times higher than the atmospheric deposition load due to the contribution of non-atmospheric sources in the watershed.

Applying the Domagalski ratio of 50 to 1, would indicate that deposition from the mine releases would be 0.006 pounds/ year and then multiplying value by 50 to come up with 0.3 pounds/year. But this large

[34] (DSEIS, p. 4-252).
[35] (DSEIS, p. 4-259).

multiplier is a function of untreated mine waste in the watersheds that is overwhelming the atmospheric deposition. This is not applicable to conditions presented in the DSEIS.

Our concern is that the DSEIS flips the intention of the 50 to 1 ratio to suggest that only 2% of atmospherically deposited mercury makes its ways into streams. This is inaccurate and opposite of what is presented in Domagalski for gold-silver mine impacted watersheds.

While the DSEIS does not make specific reference to the ratio used in the analysis, EPA remains concerned about the basis of the analysis that used the Domagalski ratio of 50 to 1 for these conclusions. EPA recommends the FEIS reassess the ratio used and make corrections accordingly.

Ratio to Predict Future MeHg Concentrations

The DSEIS states "a ratio method to estimate methylmercury concentrations from predicted total mercury concentrations was applied per the approach and data collection by Holloway et al. (2017) that showed methylmercury concentrations were up to two percent of total mercury concentrations in samples from Sugar Creek and the East Fork SFSR."[36]

EPA recommends the FEIS clarify if the ratio from Holloway is based on dissolved or whole water mercury concentrations and recommends utilizing dissolved concentrations since this is the form that is predicted to be released from the mine operations (i.e., "Predictive modeling indicates that mine facilities and water treatment would contribute dissolved mercury to surface waters primarily during the operating and early post-closure periods")

Also, the Holloway ratio is based on existing conditions between mercury and MeHg and will underpredict ratios that may exist if carbon and/or sulfate levels are increased.

Overall, using this ratio to predict future MeHg concentrations likely results in an underprediction of the impacts. For the FEIS, EPA recommends reassessing the use of this ratio and adjusting the assessment accordingly to avoid underpredicting impacts.

Model Sensitivity and Uncertainty

Air Temperature Correction Factors

The DSEIS states "[a]ir temperature correction factors used to scale laboratory reaction rates to field conditions by the model could underestimate actual reaction rates and chemical releases from mined materials, and hence, surface water quality impacts."[37]

We appreciate that the potential for underestimating reactions rates due to the temperature correction factor is mentioned in the DSEIS. However, for the FEIS, EPA suggests that the model be run without the temperature correction factor applied to the chemical source terms in order to provide an upper bound of leaching potential. In general, EPA suggests a preference to overpredict environmental impacts with a caveat that the predictions may be conservative rather than the other way around.

Later the DSEIS mentions "[t]he model is most sensitive to …increasing the reaction temperature" and "increasing the reaction temperature in mined materials and pit walls was shown to produce higher post-closure arsenic concentrations in the pit lakes and downstream assessment nodes."

[36] (DSEIS, p. 4-259).
[37] (DSEIS, p. 4-279).

Presumably, "increasing the reaction temperature" refers to using the humidity cell test (HCT) results that were obtained from the lab (at 25°C) without decreasing the reaction temperature to reflect the annual average measured at the mine site (2.6 °C). EPA recommends the FEIS provide details clarifying if they were still decreased from the lab, but less than had been done originally. It should also be taken into consideration that under future climate conditions, the annual average air temperature at the mine may increase, which would result in an underpredictions of chemical releases rates if the current rates are based on the average of historical temperature.

Presumably these results represent uncorrected laboratory-based source terms, as opposed to a dataset where the reaction temperature has been increased beyond what was measured in the lab. Given that the temperature correction factor was a significant variable impacting the water quality predictions (i.e. correcting the chemical release rates measured at 25 °C down to 2.6 °C), this underscores our comments for the FEIS to include the uncorrected rates in the model predictions unless specific evidence can be provided to support the use of the temperature corrections.

Atmospheric Mercury Deposition

The DSEIS states "[t]he surface water quality model predictions do not include mass loading inputs from permitted IPDES outfalls that would be required for the SGP. Additionally, mercury inputs from atmospheric deposition caused by the SGP have not been considered in the model. These additional loads were discussed qualitatively or semi-quantitatively in the analysis above but could modify future analyte concentrations compared to predicted values."[38]

As mentioned above, we appreciate disclosing this information in the DSEIS; however, for the FEIS, EPA recommends accounting for atmospheric deposition in the water quality predictions to provide a wholistic assessment of water quality impacts.

Site-wide Water Chemistry (SWWC) Model-predicted Concentrations

The DSEIS states "[m]odel-predicted concentrations generated by the SWWC Model are for the dissolved fraction only and may underpredict concentration levels for constituents such as mercury that have been shown to occur in particulate form."[39]

As mentioned previously, we appreciate disclosing this information in the DSEIS; however, for the FEIS, EPA recommends a preference to account for whole water concentrations (which is reflective of the 12 ng/L chronic criteria value for mercury).

There are multiple aspects of the analysis in the DSEIS where the estimated impacts represent underpredictions. While each individual aspect may represent a relatively minor underpredictions, collectively they could add up to the impacts to air and water being significantly higher than what is anticipated in the DSEIS. As noted in the comments above, we recommend that underpredictions be remedied to develop conservative predictions of water quality impacts. This is important in order to disclose impacts more accurately and also to ensure that water management, control, and treatment plans will be effective at protecting water quality.

[38] (DSEIS, p. 4-279).
[39] (DSEIS, p. 4-279).

Mitigation Measures for Mercury

Mercury concentrations in West End Creek will increase from the baseline of approximately 4 ng/l to approximately 53 ng/l during mining operations (for 10 years).[40] This represents an increase in mercury loading and likely impairment to West End Creek, which is fully supporting its beneficial uses and is a high-quality water under Idaho's antidegradation policy. Additionally, it will also increase loading downstream to Sugar Creek, which is already listed as impaired under Clean Water Act Section 303(d) for mercury. The increase is due to the diversion of West End Creek, which is a result of the proposed SGP. Even though West End Creek is elevated in mercury above the proposed West End pit, by diverting the Creek and mining the pit, the SGP is resulting in an increase in the amount of mercury into lower West End Creek and Sugar Creek from current conditions. For the FEIS, EPA recommends that a mitigation measure be developed to avoid the predicted mercury water quality standard exceedances during operations or offset the additional amount of mercury being added to the system (e.g., by removing other mercury sources) to avoid further water quality degradation. Because mercury is bioaccumulative, effects to the system will likely extend beyond the lifespan of the SGP.

Financial Assurance

According to the DSEIS, calculation of the initial bond amount would be completed following the Record of Decision (ROD) when enough information is available to adequately and accurately perform the calculation.[41] EPA continues to recommend that the FEIS provide a more specific discussion of the estimated financial assurance amount and mechanism, particularly given the water management needs at the site (including post-closure). This would provide a basis for evaluating whether the planned reclamation and closure activities would be effective (funded) in the event of a bankruptcy or compliance issues. Other mining EISs have included financial assurance estimates that comport with the draft reclamation and closure plans and acknowledge that the final financial assurance would be determined after the ROD. For example, see the Donlin Gold Project EIS, the Haile Gold Project EIS, and the Northmet Project EIS. This level of disclosure is also important for the SGP. Failure to obtain sufficient financial assurance at the Stibnite Mine Site in the past has resulted in significant, unaddressed contamination at the Site. If not for the NEPA process, there would be no public disclosure of financial assurance estimates. We understand that draft estimates are currently available.

Geologic Resources and Geotechnical Hazards

Mitigation Measures for Geotechnical Stability

The SDEIS analysis does not recommend any additional geotechnical stability mitigation measures beyond those identified in Section 2.4.9. Although the TSF dam is designed to meet and exceed regulatory stability criteria, recent studies of dam failures have established that the dominant cause of failures arises from deficiencies in engineering practice associated with the spectrum of activities embraced by design, construction, quality control, and quality assurance.[42] Therefore, there is credible information highlighting that, even assuming that the dam and buttress are adequately designed, dam incidents could still happen due to human-caused errors during construction and operations. A best practice to mitigate this, is the establishment of an Independent Tailings Review Board (ITRB) and regular independent reviews during design, construction, operations, and closure. An ITRB and regular

[40] (DSEIS, p.4-251).

[41] (DSEIS, p. 2-91).

[42] Morgenstern, N.R. 2018. Geotechnical Risk, Regulation, and Public Policy. Soils and Rocks, São Paulo, 41(2): 107-129.

independent review is a best practice for new tailings dam facilities (with high or greater consequence classifications) in the Global Industry Standard on Tailings Management.[43]

The State of Idaho's dam safety regulations do not appear to require independent review. Therefore, we recommend that the FEIS include a requirement that an ITRB be established and regularly conduct independent reviews as a mitigation measure to ensure geotechnical stability, including during seismic events, and protection of surface resources. We note that the Forest Service is requiring establishment of an ITRB in RODs for the Pinto Valley Mine (AZ) and Kensington Mine (AK), based on the global standard and FEMA Federal Guidelines for Dam Safety Risk Management.

Geotechnical Stability of Mine Access Roads

When comparing geotechnical stability related to mass wasting events (i.e., landslides, rockfalls, and avalanche paths) of the 2021 MMP Alternative's Burntlog Route and the Johnson Creek Route Alternative, EPA recommends the FEIS consider the implementation of proposed environmental design features (EDFs) for the two Action Alternatives in the alternatives analysis. For example, for existing areas of landslides and rockfalls, geotechnical design considerations and improvements to existing roads with EDFs could address the issues raised as concerns for the Johnson Creek Route Alternative with geotechnical stability potentially improving as a result of the alternative. EPA also recommends that the FEIS clearly state in Section 4.2.2.3 Johnson Creek Route Alternative that the EDFs proposed for the 2021 MMP Alternative's Burntlog Route also apply to the Johnson Creek Route Alternative.

Existing Versus New Stream Crossings from Mine Access Roads

Throughout the DSEIS, the number of estimated stream crossings for mine access roads are compared between the alternatives, but the context of these stream crossings (i.e., existing versus new) is not generally included in these analyses. For example, new stream crossings where a road did not previously exist has a different impact than reconstruction of current road stream crossings to higher environmental protection standards which may result in an improvement of aquatic conditions/upstream access. Where appropriate to meaningfully distinguish impacts between alternatives, in addition to estimated number of stream crossings, EPA recommends the FEIS evaluates the potential impacts from stream crossings that considers potential different responses associated with existing stream crossings and new stream crossings.

Impact Assessment of Public Access of Burntlog Route

According to the DSEIS, Burntlog Route will be open to public use[44]and it is not apparent that the 2021 MMP Alternative will necessarily promote the separation of the general public and heavy mining equipment during operations along Burntlog Route when compared to Johnson Creek Route Alternative. Accordingly, during operations the public will potentially have access and use the same roads as large mining equipment for both Action Alternatives. Therefore, EPA recommends that potential public safety risks and potential accidents resulting from public use of these road networks are assessed similarly for both Action Alternatives. EPA also recommends that this assessment accounts for the effects of proposed improvements to the road network that are described for the Johnson Creek Route Alternative (i.e., "wider roads, more cut/fill sections, and more switchbacks") when comparing these two alternatives.

[43] International Council on Mining & Metals, UN Environment Programme, Principles for Responsible Investment, August 2020.

[44] For example, (DSEIS, pgs. 2-18, 2-20, and 4-34).

Fish Resources and Fish Habitat

Fish Exposure to Interim Conditions

The DSEIS includes a summary of measures to avoid and minimize impacts to fish habitat and describes the fishway (with trap and haul capability) and direct and indirect impacts to individual fish.[45] Measures such as removal or blockage of access will be taken to ensure fish are not exposed to mining activities that are known to be potentially harmful or lethal such as noise and vibration. The DSEIS is unclear about whether reaches that are in sub-optimal/poor condition are accessible to fish (with consideration to both anadromous and non-anadromous salmonids). Fish will have access to the active area, if the fishway provides upstream and downstream passage as planned. The DSEIS indicates fish will have access to stream reaches recently impacted and have marginal/poor condition in terms of habitat quality, stability, temperature, etc.[46] EPA recommends the FEIS clarify whether there will be fish access to recently reclaimed reaches in marginal/poor condition and discuss related control measures to ensure fish protection.

Stream Construction and Enhancements

Successful stream reclamations and enhancements are constructed to function in relative equilibrium with inputs/transport of wood, water, and sediment/bedload that vary in time and space. Therefore, design and construction are dependent on adequate modeling of these three inputs. Even with careful effort, risk of improper function can result leading to negative outcomes, such as erosion, incision, bed aggradation, channel widening, etc. This risk has been acknowledged in the DSEIS stream design report.[47] Once completed, these stream constructions/restorations require ongoing evaluation and monitoring to ensure proper function until they are established and stable.

EPA encourages that the FEIS include the best available data and modeling methods for the stream reclamation/enhancement effort. EPA further recommends following a rigorous monitoring effort, particularly following large precipitation events (e.g., rain-on-snow) to ensure that this restoration can be realized in the long-term. We recommend that these measures be identified and committed to in the FEIS.

Mitigation for Tissue-based Mercury Criteria Exceedances

The DSEIS states "[f]or mercury, while the predicted concentrations do not exceed the aquatic life criterion based on water column, it is uncertain whether incremental change in water column concentrations beyond baseline would cause fish tissue concentrations to exceed the tissue-based criterion."[48]

This uncertainty directly relates to whether the SGP would result in exceedances of Idaho's EPA-approved fish tissue-based human health criterion for mercury. The 2014 NMFS Biological Opinion for Idaho's water quality standards for toxics concluded that the aquatic life criterion is not protective of aquatic life and that it is unlikely to be protective of the human health fish tissue criterion. Therefore, EPA recommends that this uncertainty be addressed by including a mitigation measure to section 4.12.3 that would require mercury monitoring and analysis to determine whether the incremental changes could result in exceedances of the tissue-based mercury human health criterion over time and that adaptive

[45] (SDEIS, pg. 2-107, 2-119 -120, and 4-334).
[46] (SDEIS, p. 4-334).
[47] Perpetua Resources. Sept. 2021. Stibnite Gold Project– Stream Design Report. Prepared by Rio Applied Science and Engineering, Boise, Idaho.
[48] (DSEIS, p. 4-438).

management occur if exceedances are predicted. EPA also recommends the FEIS include this mitigation along with a list of potential adaptive management measures or mercury offsets.

Access and Transportation

Context for Disturbance by Past Mining Activities

The DSEIS states "[t]here would be a long-term loss of access to land for exercising treaty rights within the Operations Area Boundary while the lands are occupied for mining; however, lands within the Operations Area Boundary have been highly disturbed by past mining activities."[49] EPA notes that the statement "lands within the Operations Area Boundary have been highly disturbed by past mining activities" does not serve a purpose in the context of public access and how it affects impacted Tribes without additional context. The first half of the sentence speaks to the loss of access to the land, and the underlined portion shifts to land disturbance and not access.

As written, it seems to suggest that additional land disturbance will not be as impactful to Tribes because the land has already been disturbed in the past. For the FEIS, EPA suggests either removing the identified portion of the text, or providing additional context after it, to clarify that past impacts to the land do not justify or reduce the concerns associated with future land disturbances.

Wetlands and Riparian Resources

Uncertainty and Underestimation of Indirect Effects

Regarding "[f]unctional loss due to other indirect effects, including changes in hydrology, water quality, and increase dust and/or mercury deposition has been examined through inspection of dewatering drawdown and distance to roadways, but is difficult to quantify precisely. As a result, functional units that would be lost if these indirect effects occur, may be underestimated."[50]

To address these uncertainties and underestimation of impacts, EPA recommends the FEIS include a mitigation measure to Section 4.12.2 that would require continuous monitoring and inspections to determine whether there are incremental changes that are contributing additional impacts to hydrology, water quality, increased dust/mercury deposition, etc. that are indicative of additional functional loss to wetlands or riparian resources. EPA further recommends that the monitoring and inspections be used to identify if additional best management practices, adaptive management, and/or compensatory mitigation are needed during project operations.

Conceptual Stream and Wetland Mitigation Plan

The DSEIS provides little information about the overall objectives and elements of the proposed Conceptual Stream and Wetland Mitigation Plan compared to descriptions of the other proposed mitigation plans developed for other resources. EPA recommends the FEIS provide more details about the actions proposed in this mitigation plan that demonstrates that this plan will provides adequate and appropriate compensatory mitigation. Language like what is found on page 4-322 (Section 4.11.3 - Mitigation Measures) – "Perpetua proposes to accomplish compensatory mitigation for impacts to wetlands through a combination of mitigation bank credits in the North Fork Payette subbasin and permittee-responsible on-site mitigation within the SFSR subbasin (Tetra Tech 2021b)", would be helpful to summarize earlier in the FEIS, such as in the Stibnite Gold Mitigation Plan section of the Alternatives chapter.

[49] (DSEIS, p. 4-492).
[50] (DSEIS, p. 4-308).

Environmental Justice

EJScreen

The Forest Service employs a clear methodology for identifying people of color and low-income populations in the SEIS analysis and considers the need for a state-specific threshold to identify these communities. In addition to the methodology outlined by the Forest Service, EPA continues to recommend the FEIS supplement the analysis by including an EJScreen analysis and considering its datasets with the most recent version of EJScreen, EJScreen 2.1.[51] EPA considers a project to be in an area of potential environmental justice (EJ) concern when an EJScreen for the impacted area shows one or more of the EJ Indexes at or above the 80th percentile in the nation and/or state.

Traditional Ecological Knowledge

EPA appreciates that the DSEIS includes ethnographies of the analysis area prepared by the Nez Perce Tribe, the Shoshone-Paiute Tribes, and the Shoshone-Bannock Tribes. EPA recommends the FEIS include the identification, inclusion, and integration of Traditional Ecological Knowledge (TEK) into the NEPA analysis. In addition to anticipated impacts from the project, as well as traditional hunting and land use patterns in the area, this can include the collection of local and traditional knowledge concerning the affected environment and could be used to support the understanding of how climate change has impacted local environmental resources and subsistence resources. In addition to reviewing any pertinent traditional environmental knowledge currently available, additional studies and outreach may be conducted as necessary to clearly identify potential impacts, including cumulative impacts, from the proposed project and project alternatives, and help inform avoidance, minimization, and compensation strategies across affected environmental resources. As an example, this could include potential impacts from increased noise and air emissions that may affect fish and wildlife that are of cultural and subsistence importance to communities with EJ concerns.

Mitigation

EPA notes that the DSEIS indicates that at this time, no mitigation measures have been identified for Environmental Justice and for several of the resource sections that are relevant to Environmental Justice. For the FEIS, EPA recommends including mitigation measures developed upon contribution and feedback from the communities with EJ concerns if the information can be publicly disclosed, or alternatively, note that mitigation measures have been developed or are contingent upon contribution and feedback from the communities with EJ concerns.

<u>Access Mitigation</u>

The ~14,221 acres of public lands within the Operations Area Boundary will become inaccessible to communities with EJ concerns. This restricted access has potential to result in additional adverse and disproportionate impacts by limiting subsistence or traditional use by communities with EJ concerns, including tribal members and indigenous peoples.[52] The DSEIS indicates that the action alternatives will remove access to a culturally important area for approximately 20 years.[53] The DSEIS indicates that a mitigation measure for access impact would be incorporated into any decision on the SGP due to long-term loss of access to land while the lands are occupied for mining.[54]

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[51] https://www.epa.gov/ejscreen, accessed 1/10/2023.
[52] (DSEIS, p. 4-620).
[53] (DSEIS, p. 4-623).
[54] (DSEIS, p. 4-669 and 4-672).

To the extent information can be publicly disclosed, EPA recommends including in the FEIS additional information on proposed access mitigation. EPA continues to recommend working with communities with EJ concerns to identify priority areas that will be affected by SGP, and using input from these communities to identify access opportunities, develop mitigation plans, and developing plan to restore access at the conclusion of the project. If there is interest from communities with EJ concerns in maintaining partial access to specific high-priority areas within the Operations Area Boundary, then EPA encourages Forest Service to work with these communities and the project proponent to determine specific times that may be reserved for safe access, if possible.

Replacement Cost Method for Subsistence Foods

EPA recommends that the Forest Service consider the potential use of the replacement cost method (RCM) to quantify the monetary cost of replacing subsistence foods that may be lost because of SGP activities. RCM is a standard technique for evaluating the dollar value of an ecosystem service.[55] Subsistence harvest patterns could be disrupted by harvesters' self-imposed restrictions on resources considered to be tainted, or as a result of space-use conflicts (e.g., increased number of users resulting from changes to access), or due to the temporarily avoidance of subsistence use areas due to noise impacts and habitat loss expected from construction and operation. When subsistence foods are not available, nutritionally comparable substitutes must be purchased, placing a direct financial burden on subsistence users in the form of lost harvest, as well as an indirect burden from stranded assets that users purchase for harvest activities (e.g., fishing or hunting equipment, 4x4 vehicles). EPA recommends that Forest Service work with communities with EJ concerns to consider potentially developing and adopting mitigation measures that will compensate for potential losses in harvest using the RCM.

Climate Change

NEPA Guidance on Consideration of Greenhouse Gas Emissions and Climate Change

On January 9, 2023, Council on Environmental Quality (CEQ) published interim guidance to assist federal agencies in assessing and disclosing climate change impacts during environmental reviews.[56] CEQ developed this guidance in response to EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis*. The interim guidance is effective immediately. CEQ indicated that agencies should use this interim guidance to inform the NEPA review for all new proposed actions and may use it for evaluations in process, as agencies deem appropriate, such as informing the consideration of alternatives or help address comments raised through the public comment process. EPA recommends the FEIS apply the interim guidance as appropriate, to ensure robust consideration of potential climate impacts, mitigation, and adaptation issues.

Science-based GHG Reductions Targets

The analysis in the DSEIS compares project emissions to Idaho state-level emissions as a percentage. EPA recommends the FEIS compare project emissions to science based GHG reductions targets. The United States has established a Paris-agreement target to reduce net GHG emissions economy-wide by 50-52% below 2005 levels, consistent with a pathway to net-zero by 2050. EO 14057 establishes a policy for the federal government to lead by example in order to achieve a carbon-pollution free electricity sector by 2035 and net-zero emissions economy-wide by no later than 2050. These and other policies reflect science based GHG reduction goals to avoid the worst impacts of climate change.

[55] (Brown & Burch, 1992; Hougner, Colding, & Soderqvist, 2006).

[56] https://www.federalregister.gov/documents/2023/01/09/2023-00158/national-environmental-policy-act-guidance-on-consideration-of-greenhouse-gas-emissions-and-climate, accessed 1/10/2023.

EPA recommends the FEIS discussion include whether and to what extent the estimated GHG emissions from the proposed alternatives are consistent with achieving these science based national GHG reduction targets and any relevant state or local goals.

Social Cost of Carbon

The DSEIS notes "[f]or purposes of this analysis, qualitative analysis is appropriate because quantifying the relative costs and benefits of the alternatives is not practically feasible and would be subject to high uncertainty as described below."[57] However, the DSEIS calculates estimates of direct and indirect emissions, and these estimates can be used to monetize those emissions using the Social Cost of Greenhouse Gases (SG-GHG). EPA encourages lead agencies to monetize impacts of GHG emissions using SG-GHG estimates in NEPA analyses. For transparency, EPA recommends the FEIS assess the climate impacts and disclose climate damages of the proposed project using the SC-GHG, which reflect the best available science and methodologies to monetize the value of net changes in direct and indirect GHG emissions resulting from a proposed action to society.

Estimated Emissions Speciated by Gas

The SDEIS presents estimates in CO_2e and not speciated by gas (CO_2, CH_4 and N_2O). To ensure transparency of the analysis, EPA recommends presenting emissions estimates individually by GHG, as well as aggregated in terms of total CO_2e in the FEIS.

Additionally, the DSEIS indicates that approximately 99.9 percent of all processing GHG emissions are CO_2. Similarly, construction, mining and commuting CO_2 emissions comprise approximately 99 percent of the total GHG emissions from those activities.[58] EPA recommends the FEIS include data to support this statement. Specifically, EPA recommends providing data showing the amount of each GHG emitted from each emission source (i.e., the activities included in Tables 4.4-2a and 4.4-2b).

Direct and Indirect GHG Emissions

EPA recommends including a data table in the FEIS to support the DSEIS statement that the direct and indirect GHG emissions are only a small increase over the current regional GHG emissions.[59] Much of the information to develop this table is already in the SEIS, but it is found in various sections and with differing units (e.g., MMT CO_2 (e) vs. tons CO_2 (e)). As an example, to produce a table to support this statement, Tables 4.4-2a and 4.4-2b could be augmented to include the estimated indirect emissions and the current Idaho GHG emissions inventory.

Access Road Alternatives

The DSEIS indicates that the magnitude of the GHG emissions difference between the access road alternatives will be small compared to total SGP construction emissions during the construction phase.[60] EPA recommends the FEIS support this statement with data demonstrating that the Johnson Creek Alternative has similar GHG emissions to the 2021 MMP Alternative. Preferably, the emissions data for this alternative would be presented the same as it is in Tables 4.4-2a and 4.4-2b so that the alternatives can be meaningfully compared.

[57] (DSEIS, p. 4-60).
[58] (DSEIS, p. 4-65).
[59] (DSEIS, p. 4-67).
[60] (DSEIS, p. 4-73).

Integration of Climate Science

Flow (quantity and timing), summer air temperatures, and snowpack are likely to be substantially different over the span of this project (i.e., the next 15 to 20 years or longer) due to climate change. Further, conditions from that point in time into the future will be even further from estimates that are based on past conditions. It does not appear that climate change related concepts/forecasting/modeling are incorporated in the relevant sections of the DSEIS beyond the acknowledgement that climate change presents uncertainty.[61] For example, the DSEIS indicates the 100-year flood recurrence interval has been the standard approach in culvert sizing,[62] but it is now important to state future projections of high flow magnitude to conservatively account for climate change; and that modeled flow future conditions are based on historic condition.[63]

For the FEIS, EPA recommends incorporating state-of-the-climate science forecasting/modeling to estimate local climate conditions for proposed work that uses estimates of flow, air temperature, and snowpack. Examples of activities that would benefit from sophisticated forecasting would be road crossings design, stream reconstruction, and growth of riparian vegetation for stream temperature attainment. If site specific models and data are not available, consider incorporating climate science literature/information to inform and adjust existing models to conservatively adjust for climate change. Consider climate science projections (knowledge from the literature, forecasting/modeling) in aspects for both ongoing and postmining operations.

Proposed Action and Alternatives

Agency Preferred Alternative

Rationale of 2021 MMP Identification

The Executive Summary highlights three reasons the Forest Service identified the 2021 MMP Alternative as the Agency Preferred Alternative, but the first two bullets (i.e., incorporates water management and closure activities to reduce the duration of long-term water treatment requirements and incorporate measures to manage stream temperatures) are also true for the Johnson Creek Alternative since the mining portion of the Action Alternatives are the same. Similarly, Section 2.7 highlights eight reasons the Forest Service identified the 2021 MMP as the Agency Preferred Alternative, but the first two are also true for Johnson Creek Alternative. For the FEIS, since the Action Alternatives differ by proposed mine access routes, EPA recommends replacing these first two reasons with other primary reasons that are exclusive for the 2021 MMP.

The Agency Preferred Alternative sections in the Executive Summary and Chapter 2, as presented, appear to imply that the Agency Preferred Alternative is environmentally superior to the Johnson Creek Alternative. For transparency, EPA recommends the FEIS provide additional context for the selection, such as if the reasons highlighted were given preference or prioritized over other potential negative impacts.

Least Environmentally Damaging Alternative (LEDPA)

Because the U.S. Army Corps of Engineers is planning to use this EIS to support its CWA Section 404 analysis, EPA recommends that the FEIS discuss whether the Agency Preferred Alternative is also the LEDPA.

[61] (DSEIS, p.4-280).
[62] (DSEIS, p.4-264).
[63] (DSEIS, p.4-326).

Environmentally Preferrable Alternative
EPA recommends the FEIS describe the criteria which will be used to ultimately determine the environmentally preferable alternative under NEPA.

Specific Comments – DSEIS

Ore Processing

- The DSEIS indicates grinding will occur within an enclosed building to reduce noise levels and facilitate maintenance of the milling equipment.[64] EPA recommends the FEIS confirm if the ore processing building will be enclosed, and if not, correct its description throughout the FEIS. EPA notes a similar statement regarding an enclosed ore processing facility building is included in the Environmental Design Features on page 2-112.

- The DSEIS indicates the limestone crusher, screens, conveyors, and feed bins would not be enclosed. Dust would be controlled in a similar manner to the ore crushing and conveying process using water sprays and/or bag house dust collectors.[65] EPA recommends FEIS confirm if the limestone processing would be controlled like the ore processing operation, and if so, correct its description throughout the FEIS.

Tailings Storage Facility

- Regarding "[t]he TSF would be designed and operated as a closed-circuit, zero-discharge facility meaning no tailings water would be discharged to the surface water or groundwater except in compliance with applicable permits and regulations"[66] and "[w]ater from the TSF and TSF Buttress underdrains may be discharged from two outfalls shown on Figure 2.4-15,…"[67]

  The first sentence implies that there will be no discharge from the TSF. Based on the other two sentences, this appears to be accurate for operational conditions, but not for closure. Therefore, for the FEIS, EPA recommends revising the first sentence as follows: "… no tailings water would be discharged during mining operations,…"

Dry Stack Tailings

- The DSEIS indicates the use of the dry stack method of tailings disposal was evaluated and determined to be technically and economically infeasible.[68] An additional consideration in the determination to not fully evaluate a dry stack option is that stability of the proposed TSF is enhanced by the waste rock buttress so the stability advantage of a dry stack over a tailings impoundment is not as prominent for the SGP as it might be for other projects. We recommend that this consideration be included in the FEIS.

Agency Preferred Alternative

- The rationale for Agency Preferred Alternative in Section 2.7 raises two travelway distances (i.e., 0.5 miles and 100ft) in comparison for potential spill contamination, sedimentation, and

[64] (DSEIS, p. 2-48).
[65] (DSEIS, p. 3-48).
[66] (DSEIS, p. 2-57).
[67] (DSEIS, p. 2-67).
[68] (DSEIS, p. 2-130).

turbidity to streams during operations.[69] As there is very likely covariance (i.e., connection) between the two travelway distance zones and that these two zones could be repeating the same information, EPA suggests the FEIS use only one distance zone in this comparison.

Table 2.8-1 Alternative Comparison and Impact Summary (for 2021 MMP)

- The DSEIS indicates low flow will be reduced at some locations during some periods of the SGP operations.[70] EPA recommends the FEIS add a sentence to the table describing how far downstream (in feet or miles) from the SGP low flow conditions would occur so that the geographic extent of low flow impacts to the EFSFSR are clearly disclosed. Note that this comment also applies to the same sentence on page ES-14.

- In the summary table 2.8-1 2021 MMP, the TSF area groundwater summary provides the estimated changes in groundwater concentrations.[71] EPA recommends the FEIS describe how far from each facility the groundwater concentrations would remain elevated above the baseline so that the geographic extent of groundwater contamination caused by the SGP is disclosed.

- The DSEIS states, "[f]or mercury, while the predicted concentrations do not exceed the aquatic life criterion based on water column, it is uncertain whether incremental change in water column concentrations beyond baseline would cause fish tissue concentrations to exceed the tissue-based criterion."[72] EPA recommends the FEIS add this sentence to the summary table 2.8-1 2021 MMP, for surface water quality since it relates to uncertainties associated with achieving Idaho's fish tissue-based mercury water quality criterion for human health.

- According to pg. 4-308, "[f]unctional loss due to other indirect effects, including changes in hydrology, water quality, and increase dust and/or mercury deposition has been examined through inspection of dewatering drawdown and distance to roadways, but is difficult to quantify precisely. As a result, functional units that would be lost if these indirect effects occur, may be underestimated." EPA recommends adding this statement or something similar to the summary table 2.8-1 2021 MMP, Wetlands for the FEIS. Otherwise, the exact acres of wetlands lost or changed provided in the table imply a level of certainty that does not exist since indirect (secondary) impacts are underestimated and not quantified. In addition, we recommend that a similar uncertainty statement be added to the Executive Summary on page ES-17.

Air Quality

- The SDEIS indicates deposition of mercury, and nitrogen and sulfur species were predicted to be less than Significant Impact Levels (SILs).[73] EPA notes that SILs are air quality screening thresholds not applicable to deposition of pollutants, so this statement is incorrect. For the FEIS, EPA recommends replacing this term with "applicable screening thresholds," or another appropriate term.

- The DSEIS states "SILs are defined concentrations of criteria pollutants in the ambient air that are considered inconsequential in comparison to the NAAQS. A project impact shown to be

[69] (DSEIS, p. 2-133).
[70] (DSEIS, p. 2-141).
[71] (DSEIS, p. 2-143).
[72] (DSEIS, p. 4-438).
[73] (DSEIS, p. ES-9).

below a SIL can be presumed to not cause or contribute to the violation of a NAAQS."[74] The first sentence in this paragraph is misleading. For the FEIS, EPA suggests the following language replace the first sentence: "SILs are screening thresholds of criteria air pollutant concentrations considered by the EPA as a level of de minimis impact to air quality. SILs are primarily used in air quality modeling assessments, where a project impact shown to be below a SIL can be presumed to not cause or contribute to the violation of a NAAQS."

- EPA recommends the FEIS clarify or note in Section 3.3.2 why the much larger "far-field" region's scope is of importance to the Tribes,[75] given the potential impacts of poor ambient air quality to wilderness areas of Tribal and cultural significance.

- The DSEIS states "[t]he New Source Review process requires facilities to undergo an EPA pre-construction review if they propose building new facilities or modifying existing facilities that would result in a "significant increase" of criteria pollutants per 40 CFR § 52.2376."[76] For the FEIS, EPA recommends changing the regulatory cite from "52.2376" to "52.21" and "criteria pollutants" to "regulated NSR pollutants."

- The DSEIS states "[a]pplicability of the PSD program to the SGP depends on the magnitude of annual emissions for criteria pollutants."[77] We recommend the FEIS revise this sentence to be more precise: "Applicability of the PSD program to the SGP depends on the project's potential to emit regulated NSR pollutants. Applicability is determined using maximum potential annual potential emissions of the project for each NSR pollutant."

- The DSEIS states "… the 2021 MMP analysis did include an assessment of the significance of SGP air quality impacts by comparison to the Class II PSD increments."[78] EPA suggests the FEIS add an additional sentence to disclose why the PSD increment is selected as a threshold to assess the significance of air quality impacts. For example, additional language could state: "The PSD increments may provide a reasonable significance threshold for NEPA assessment because, under the Clean Air Act, significant air quality deterioration is recognized to occur when the amount of new air pollution from a new or modified source would exceed the applicable PSD increment."

- The DSEIS includes a statement "…consistent with best available control technology for new surface mining and processing operations"[79] which is incorrect. The project did not go through BACT review under the IDEQ PTC process because it did not go through major-source PSD permitting. EPA recommends removing the reference to BACT in the FEIS. A similar statement is included at the top of page 4-59 which EPA recommends revising to remove the reference to BACT.

[74] (DSEIS, p. 4-27).
[75] (DSEIS, p. 3-30).
[76] (DSEIS, p. 3-34).
[77] (DSEIS, p.3-35).
[78] (DSEIS, p. 4-28).
[79] (DSEIS, p. 4-35).

- EPA suggests the FEIS revise the second sentence on page 4-38 to read "As shown in Table 4.3-4, *IDEQ determined that* these emissions are less than the annual threshold of 100 tpy that would trigger Title V or 250 tpy for PSD permitting status."

- Regarding DSEIS statement on page 4-43 "…it also is unlikely the SGP would cause or contribute to a violation of a PSD increment" and Table 4.3-9 column heading "PSD Increment Compliance", it is important to disclose that comparison to the PSD increment threshold in the EIS is not to determine compliance to the standard (this is not a full regulatory assessment of increment consumption) but as a measure of the significance of project impacts to air quality for purposes of NEPA review. Therefore, we recommend the FEIS add a sentence to state the results instead indicate the project does not cause a significant deterioration of air quality. Also, EPA suggests changing the column header for Table 4.3-9 from "PSD increment compliance" to more appropriate wording such as "Results below threshold" or something similar to show the comparison is used to judge significance of project impacts rather than compliance with a regulatory threshold.

- For the DSEIS statement "[t]he most recent measurements were between 2007 and 2010 and are provided in Table 3.3-10 to serve as an estimate of historical Hg deposition in the region surrounding the SGP area,"[80] EPA recommends the FEIS add the word "wet" before deposition to specify that these data do not include dry deposition.

- For Table 3.3-10 Historical Annual Average Concentration and Mercury Deposition Rates – Three Idaho MDN Sites,[81] EPA recommends the FEIS add "in precipitation" to this Table title.

- The DSEIS indicates the nearest geographic site to the SGP area is no longer active but was active from December 2008 to August 14, 2017.[82] For the FEIS, EPA recommends specifying that the nearest site is over 500 km away.

- EPA notes that the Table (3.3-11) Annual Average Mercury Concentration – Salt Lake City AMNet Site[83] contains an important error. The Table reports that the overall mean gaseous elemental mercury (GEM) concentrations is 12.91 ng/m3. This value is not accurate. All yearly averages shown above in the Table are less than 2.5 ng/m3; and if taking an overall mean of the annual means the value would be 1.88 ng/m3 which is much lower than the 12.91 ng/m3 value currently included in the Table. It appears that the values for particle bound mercury (PBM)2.5 and GEM were switched, because the PBM2.5 value listed is lower than all of the annual reported concentrations. EPA recommends the FEIS correct the error accordingly.

- Regarding the DSEIS statement "[e]stimates of these emissions were based on regulatory compliance emission test results available for several gold mines in Nevada that use the same type of extraction process (Nevada Division of Environmental Protection 2006, 2015, 2016),"[84] for the FEIS, EPA recommends the FEIS add whether the mercury content of the ore was significantly different in the comparison between Stibnite and the Nevada mines.

[80] (DSEIS, p. 3-47).
[81] (DSEIS, p. 3-56).
[82] (DSEIS, p. 3-56).
[83] (DSEIS, p. 3-57).
[84] (DSEIS, p. 4-25).

- The DSEIS states "[f]urther speciation of the particulate forms of Hg is possible such as fine [particle-borne Hg (HgP)], which is analogous to filterable and condensable PM10. Essentially, the PM10 associated with HgP is the mercury bound within the particles of the particulate smaller than 10 microns. Appropriate particle distribution of mercury can be established using proper test methods and techniques, but the overall percentage of HgP compared to total Hg is small, with HgP PM10 being even less (~14.1 percent vs 2.4 percent from a coal boiler as an example) (Peng 2021). However, as discussed below, and in further detail in Section 4.3.4.2, the approach applied for this analysis did not speciate HgP."[85] EPA notes that this statement appears superfluous, given that particulate bound Hg was not further speciated in the analysis. EPA suggests the FEIS include some context for why this information is included or consider removing it.

Surface Water and Groundwater Water Quality

- The SDEIS states that for copper and mercury, impacts may be minimal but uncertainties in predicting future conditions exist.[86] EPA recommends the FEIS describe the mitigation and monitoring that will occur to reduce the uncertainties and actions that would be taken if impacts are more than minimal and result in exceedances of Idaho's CWA aquatic life criteria for copper and mercury.

- For the FEIS, EPA recommends noting in a footnote of the Table 3.9-6a Average MWMP Results – Development Rock and Ore and in the text that refers to the Table[87] that the detection limit used for this test for mercury (100-200 ng/L) is significantly above the CWA aquatic life criterion of 12 ng/L. Therefore, while some concentrations were above 200 ng/L, when values were less than this it does not indicate that the leachate would meet criteria. The same comment also applies to cadmium, copper, selenium, silver, thallium and lead. If similar issues also exist in other Tables in the text, EPA recommends adding a similar note indicating where the detection limit of the analysis is above the regulatory criteria level.

- The DSEIS indicates, under existing conditions, streams in the SGP area (except for West End Creek) are listed as impaired in accordance with CWA Section 303(d). The causes for listing of these waters are associated with arsenic (plus antimony and mercury at some locations) for exceedances of Idaho's water quality standards (WQS). Operational and post-closure concentrations of these elements in the East Fork SFSR are predicted to be comparable to or less than the existing conditions.[88] EPA recommends the FEIS add a sentence to this statement in the Executive Summary that identifies that under the proposed action West End Creek is predicted to exceed Idaho's CWA mercury aquatic life criterion for approximately 10 years during operation. The predicted mercury Idaho CWA WQS exceedances are described in the main text of the SDEIS, but we recommend that they also be identified in the Executive Summary.

- For Table 3.9-10b, [89] EPA recommends the FEIS add Idaho's CWA mercury criteria to the table header row as is done for the other constituents.

[85] (DSEIS, p. 4-30).
[86] (DSEIS, p. ES-16).
[87] (DSEIS, p. 3-160).
[88] (DSEIS, p. ES-15).
[89] (DSEIS, p. 3-183).

- Since cyanide is predicted to be elevated in the tailings pond,[90] EPA recommends the FEIS include cyanide in Table 4.9.6. Predicted TSF Surface Water Chemistry so that predicted cyanide concentrations are disclosed.

- EPA recommends the FEIS add cyanide to Table 4.9-8 Predicted Groundwater Chemistry Underlying the TSF for the same reason as above.

Fish Resources and Fish Habitat

- The DSEIS states "[t]he SGP area could experience natural climate change impacts to fish resources…"[91] EPA recommends the FEIS clarify and/or rephrase this sentence to either remove "natural" from the sentence or clearly identify what is meant by "natural climate change."

[90] (DSEIS, p. 4-207).
[91] (DSEIS, p. 4-70).