Canadian Environmental Assessment Agency
Agence canadienne d'évaluation environnementale

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December 22, 2017

File no.: 005533

Michael McPhie
Executive Chairman
IDM Mining Ltd.
Suite 1500 - 409 Granville St.
Vancouver, BC V6C 1T2

Dear Mr. McPhie:

Re: Information Request #1 for the Red Mountain Underground Gold Project

On November 1, 2017, the Canadian Environmental Assessment Agency (the Agency) commenced the technical review of the Environmental Impact Statement (EIS) for the Red Mountain Underground Gold Project (the Project), proposed by IDM Mining Ltd. The Agency is conducting a detailed review of the following materials related to the EIS:

1. IDM's Environmental Impact Statement, submitted to the Agency on October 23, 2017;
2. IDM's response to the British Columbia's supplemental information requests issued on October 24, 2017, including additional information on the following topics:
    - Marbled murrelet and black swift surveys;
    - Calibration of the water balance model;
    - Modelling of air quality within the Project site;
    - Screening of contaminants of potential concern (COPCs) for the Human Health Risk Assessment (HHRA);
    - Acceptable risk thresholds for the HHRA;
    - Surface water as a drinking water pathway; and
    - Effectiveness of mitigation measures.
3. IDM's response to action items identified at the November 21, 2017 working group meeting, submitted to the Agency on November 24 and November 29, 2017.

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Based on our review of the materials and comments received from Health Canada, Fisheries and Oceans Canada, and Natural Resources Canada, the Agency has identified an initial Information Request (IR) outlining required information in **Annex 1** that IDM Mining Ltd. must provide. Any future IRs or additional comments received from federal departments will follow in a separate letter. The Agency requires that IDM Mining Ltd. provide its responses to this IR in a technical memorandum. With respect to the requested information related to human health, the Agency requires an updated EIS chapter and Human Health Risk Assessment appendix.

The Agency requires this information in order to assess the potential environmental effects of the Project pursuant to subsection 5(1) of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and to inform the Agency's Environmental Assessment Report under subsection 23(2) of CEAA 2012.

In accordance with subsection 27(6) of CEAA 2012, time taken by IDM Mining Ltd. to provide the requested information is not included in the legal timeframe within which the Minister of Environment and Climate Change must make her environmental assessment decision.

While you are preparing responses to the IR, the Agency and federal authorities will continue to work on the environmental assessment of the Project to improve the Agency's understanding of the environmental effects of the Project.

The issuance of this IR pauses the federal timeline for the environmental assessment at day 122 of 365. Upon receipt of a response from you to address these deficiencies, the Agency may take up to 15 days that is not counted against the federal timeline for the environmental assessment to form an opinion about whether the requested information has been provided. If the Agency has not come to a conclusion regarding the sufficiency of the IR responses during this period, the federal timeline will resume on the following day.

The Agency has also compiled raw comments received from federal departments. The Agency considered these raw comments in the development of the IR and is providing them for your consideration as part of **Annex 2.** Comments in Annex 2 are not part of the IR.

The Agency understands that IDM Mining Ltd. will also be responding to comments received from British Columbia's Environmental Assessment Office (EAO). The Agency recommends that IDM Mining Ltd. respond to both the provincial comments and the federal IR at the same time to maximize efficiencies

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in managing common issues raised by both governments and to ensure that the provincial and federal environmental assessments are coordinated to the extent possible.

Please do not hesitate to contact me with any questions at 604-666-9162 or *andrea.raska@ceaa-acee.gc.ca*.

Sincerely,

<Original signed by>

Andrea Raska
Project Manager, Pacific and Yukon Region

Attachments (2): Annex 1 – Information Request
Annex 2 – Technical Review Comments

c.c.: Max Brownhill, Falkirk Resource Consultants Ltd.
Jasmin Flores, Falkirk Resource Consultants Ltd.
Claire Backus, Catana Consulting Ltd.
Lindsay Luke, British Columbia Environmental Assessment Office
Ian Bergsma, Fisheries and Oceans Canada
Jennifer Dorr, Natural Resources Canada
Nadine Parker, Environment and Climate Change Canada
Paula Smith, Health Canada
Yota Hatziantoniou, Health Canada
Sabrina Lachance, Major Projects Management Office
Collier Azak, Nisga'a Lisims Government
Mansell Griffin, Nisga'a Lisims Government

Annex 1
Information Request #1 for the Red Mountain Underground Gold Project

IR1-01: Specificity of mitigation measures

Rationale: The EIS Guidelines state that "mitigation measures should be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation, and implementation."

The EIS identifies a mitigation hierarchy and outlines a number of mitigation measures in the effects assessment chapters and in the Summary of Mitigation Measures (section 31.3). Many mitigation measures are conceptual, non-specific, and/or vague. For example, the EIS makes reference to the implementation of certain mitigation measures "where required" or "where practicable", the use of "standard best practices", and the understanding that certain activities "will be minimized." Please note that follow-up, monitoring, and/or management plans may be useful in the context of implementing mitigation measures, but the Agency does not consider them to be mitigation in and of themselves.

The Agency has identified the following mitigation measures as examples where further details or clarification is required:

- The EIS identifies the following mitigation measure related to noise (section 8.6.3): "Impulse events, such as blasting, will be limited to certain times of day. Instantaneous charge per delay will be minimized to suit blast." Further detail is required including the time of day in which blasting would be permitted, and the blast charge.

- The EIS identifies the following mitigation measure for air quality and health (section 22.6.1.1.1): "Installing windbreaks or fences where practicable around known problem areas or stockpiles to limit the dispersion of dust emissions from equipment and stockpiles, or activities likely to generate dust." Further detail is required including the location of windbreaks and problem areas.

- The EIS identifies the following mitigation measure for air quality and health (section 22.6.1.1.1): "Water sprays and/or dust suppression measures will be used to the extent practical considering the temperature to suppress dust generation by equipment in the crushing facility" and "Water or other dust suppressant to be used on roads if needed to minimize dust from ore and waste rock haulage and grading, as needed and when ambient air temperatures permit." Further detail is required including the ambient air temperatures which would permit use of this mitigation measures.

- The EIS identifies two unnamed watercourses located where the Tailings Management Facility (TMF) would be located (section 17.5.3.1), but there do not appear to be any specific mitigation measures for diversion or isolation of the non-contact water from these watercourses other than the generic mitigation measure: “Diverting non-contact water to the natural environment so that it does not mix with contact water.” Clarify if and how the generic mitigation measure of diverting non-contact water to the natural environment would apply for the diversion of the two unnamed watercourses located where the TMF would be located.

- The EIS identifies the following mitigation measure for hydrology and fish (section 12.6.3): “Water withdrawal will follow provincial regulatory requirements and standard best practices to avoid adverse impacts to stream flows, fish and fish habitat.” Further detail is required is needed on which best practices will be used, and when, to avoid adverse impacts.

- The EIS identifies the following mitigation measure for hydrology and fish (section 12.6.3): “Discharge from the TMF will, to the extent possible, match the receiving environment hydrograph.” Further detail is required on how the discharge will be matched to the hydrograph.

- The EIS identifies the following mitigation measure for soil quality and fish (section 9.6.2.2): “The use of PAG material for construction will be minimized. For roads, pads and rock cuts, minimize cut and fill in areas with ML/ARD potential.” Further detail is required to clarify and quantify what is meant by “minimized.”

- The EIS identifies the following mitigation measure for water quality and fish (section 13.6.1.3): “Refuelling and maintenance activities will not occur within 15 m of a watercourse except where required due to equipment breakdown or approved activities near water.” Further detail is required on who is approving the activities or what the approved activities are.

- The EIS (section 17.6.1.5) says that "blasting activities will be limited to the Mine Site during operations, so there is no potential for effects on benthic invertebrates from explosive shockwaves as the blasting zone will not be near any fish-bearing watercourses." However, section 18.5.3.4.3 identifies that blasting would occur along the road right-of-way, and that Fisheries and Oceans Canada's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters document would be used for mitigation. Clarify whether blasting may occur near fish-bearing waters and identify the specific mitigation measures which would apply.

- The EIS identifies the following mitigation measure for wildlife (section 16.6.1.4): “Measures will be implemented to minimize potential Project effects in identified high-quality wildlife habitats and movement corridors,

including signage along Project roads in high-value wildlife areas or known wildlife travel corridors to warn vehicle operators of the potential to encounter wildlife." Provide a description or maps of high-quality wildlife habitats, high-value wildlife areas, and movement corridors. In addition, the Agency recommends use of a consistent term, as it is not clear how high quality wildlife habitats and high value wildlife areas might be different.

- The EIS identifies the following mitigation measures for wildlife (section 16.6.1.7): "Deterrents (e.g. fencing, noise makers, wire barricades) will be used to discourage wildlife from entering Project infrastructure for refuge, shelter, nesting, roosting opportunities and potentially becoming entrapped" and "Deterrents (e.g. fencing, noise makers will be used to prevent wildlife from becoming entrapped in on-site settling sumps, holding ponds, or the TMF." Clarify if and where these deterrent methods would be used, and provide additional information about the deterrents.

- The EIS indicates that direct mortality of migratory birds would be reduced through best practices related to transmission lines (section 16.7.9), and that making transmission lines more visible could further reduce mortality risk (section 16.7.12.1.1), but no additional information is provided about what these best practices are.

Requested Information: Review and revise mitigation measures throughout the EIS to remove ambiguity and ensure that proposed mitigation measures are specific (including timing, location, circumstances, and measureable outcome or threshold). Where mitigation measures remain non-specific, describe and assess the residual effects which would result should the mitigation measures not be applied.

IR1-02: Contingency measures for water treatment

Rationale: The EIS Guidelines state that "mitigation measures should be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation, and implementation."

The Agency understands that IDM Mining Ltd. has proposed water treatment for discharge from the TMF and that "IDM will consider the potential for contingency water treatment at the Portal Collection Pond, should monitoring suggest that it is necessary" (section 13.6.1.1 of the Surface Water Quality Effects Assessment). The success of water treatment affects the assessment of potential effects to fish and fish habitat.

The Agency notes that IDM Mining Ltd.'s November 20, 2017 response to the EAO "Expectations letter" indicates that a water treatment plant, if required, would take two weeks to become effective.

Requested Information: Provide a description of any interim contingency mitigation measures that would be considered in between the time that the need for additional water treatment would be required and the successful operation of any water treatment plant.

IR1-03: Identification of COPCs for the Human Health Risk Assessment

Rationale: The EIS Guidelines (section 6.3.4) state that the EIS must provide a description and analysis of how changes to the environment would affect human health of Indigenous people.

The screening levels for some Contaminants of Potential Concern (COPCs) in the Human Health Risk Assessment (Appendix 22-A), and supplemental document "2017-11-20 IDM Let to EAO re Responses to Supplemental Info Requests" appear to be incorrect. The correct screening levels would result in the identification of more COPCs and may change conclusions about effects to human health. The following issues were identified:

- An incorrect Health Canada drinking water screening level was provided for vanadium, and the guideline for uranium (0.02 mg/L) is not reported (Appendix 22-A, Table A6).

- An incorrect air quality screening level appears to have been used. The most stringent air quality screening level 1h SO_2 provided in Table 4-1 is 183 µg/m3, however this value was not used in the screening (Appendix 22-A, Table A1).

- No references for the soil screening levels identified in the updated screening in Table 2 from "2017-11-20 IDM Let to EAO re Responses to Supplemental Info Requests"

- All COPCs have not been identified in the updated soil screening presented in "2017-11-20 IDM Let to EAO re Responses to Supplemental Info Requests." For example, the screening level for gallium is not identified in Table 1, and chloride is missing from Table 2

- For soil, the United States Environmental Protection Agency Regional Screening Levels used for screening should be adjusted to provide a value equivalent to a hazard quotient of 0.2. Screening levels for aluminium, ammonia, nitrogen (missing), beryllium, chromium, cyanide (total) (missing), cyanide (WAD) (missing), iron, manganese, nickel, silver,

strontium, thallium, tin, uranium, vanadium should be adjusted in Appendix 22-A Table A6, and aluminium, barium, beryllium, boron, chromium, cobalt, iron, manganese, molybdenum, nickel, selenium, strontium, vanadium and zinc should be adjusted in Table 1 in "2017-11-20 IDM Let to EAO re Responses to Supplemental Info Requests"

- The EIS states that "as there are no sediment screening levels for direct contact with humans, the soil screening levels were used as surrogates for sediment screening levels" (section 6.3.5.3 of Appendix 22-A) and refers to Table A4 of Appendix 22-A for sediment screening levels. In accordance with Health Canada's Supplemental Guidance on Human Health Risk Assessment of Contaminated Sediments: Direct Contact Pathway (attached), only health-based guidelines (excluding inhalation) should be used for screening of COPCs. The following sources should not be used for screening of sediment: BC Background (protocol 4), BC *Contaminated Sites Regulation* Schedule 4, CCME soil quality guidelines (SQG) without a factsheet, CCME SQG_{HH} for inhalation.

- A factor of 0.2 was used the calculation of screening levels for country foods, which would assume that the particular food contributes 20% of total consumption. It is unclear why this 0.2 factor was applied.

- The source for the Toxicity Reference Value (TRV) for titanium (3 mg/kg bw/day) could not be located.

- No TRV for bismuth is provided, and therefore it is unclear why it was screened out from the COPC identification process.

Requested Information: Provide an updated Health Effects Assessment (i.e. chapter 22) and Human Health Risk Assessment (i.e. Appendix 22-A) that considers the correct COPC screening levels, including the levels identified above.

IR1-04: Toxicity assessment for the Human Health Risk Assessment

Rationale: The EIS Guidelines (section 6.3.4) state that the EIS must provide a description and analysis of how changes to the environment would affect human health of Indigenous people.

Health Canada defines Tolerable Daily Intakes (TDIs) for copper, molybdenum, and selenium on an age-group specific basis. The Human Health Risk Assessment appears to have applied adult TDIs for non-adult receptor groups. In the particular case of molybdenum, the Health Canada TDI for the toddler receptor is almost 1000 times lower than that employed by the proponent (28 mg/kg bw/day). Given the magnitude of the difference between TDIs employed

by Health Canada and used in the EIS, this has the potential to change conclusions with respect to effects to human health.

Requested Information: Provide an updated Human Health Risk Assessment that uses Health Canada TDIs for copper, molybdenum and selenium.

IR1-05: Exposure assessment for the Human Health Risk Assessment

Rationale: The exposure assessment (Appendix 22-A, section 7.2.2) appears to have averaged short term exposures for each receptor over a longer long period. This appears to be the case for the assessment for both carcinogens and non-carcinogens.

The bioconcentration factors (BCF) used to predict the concentration of COPCs in fish and plants were calculated based on the average concentrations from sampled location in the local and regional study areas, rather than co-located samples. Given that there is a large variation in the concentration of COPCs at different sampling locations (ex., arsenic concentration was 12.9 µg/g at AC-02 and 1110 µg/g at BC-03), averaging the BCF would underestimate the BCF at specific locations.

Health Canada's Supplemental Guidance on Human Health Risk Assessment for Country Foods recommends co-location of soil and plant samples, and soil and fish samples. From Figure 11, it appears as if the location of plant samples were independent of soil samples

Requested Information: Provide an updated Health Effects Assessment (i.e. chapter 22) and Human Health Risk Assessment (i.e. Appendix 22-A) that includes:

a) A description of the exposure averaging period used in the assessment, including a rationale for the averaging period.

b) Use of site-specific BCFs or the most conservative BCF for the exposure assessment. Alternatively, provide a rationale for the current approach, including a description whether the approach would underestimate the BCF in some areas, and clarify whether samples were co-located in accordance with Health Canada guidance.

IR1-06: Predicted changes to surface water quality

Rationale: The EIS Guidelines (section 6.3.4) state that the EIS must provide a description and analysis of how changes to the environment would affect human health of Indigenous people.

The EIS notes that Bitter Creek would be affected but that changes to COPCs in surface water would be minimal. It is unclear where the predicted changes to surface water would be, and whether those predicted changes are in areas potentially used as a drinking water source, recreation, or fishing. The assessment of changes to surface water quality is likely to affect the assessment of potential effects to human health of Indigenous peoples.

Requested Information: Describe the locations associated with predicted changes to COPCs in surface waters used as potential drinking water sources, recreation, and fishing.

IR1-07: Predicted changes to non-threshold contaminants

Rationale: The EIS Guidelines (section 6.3.4) state that the EIS must provide a description and analysis of how changes to the environment would affect human health of Indigenous people and that "residual effects, even if very small or deemed insignificant will be described" (section 6.5).

The total predicted NO_2 1-h (187 ug/m3) is very close to the selected air quality objective (188 µg/m^3), and exceeds the Canadian Ambient Air Quality Standard (CAAQS) (113 µg/m^3) which would come into effect in 2020 during the mine's operational period. Given the uncertainty inherent in the air quality modelling a discussion potential health impacts of NO_2 is warranted.

There is no population health threshold for human health effects for NO_2 and $PM_{2.5}$, meaning that health effects may occur at any level of exposure.

Requested Information: Discuss the residual effects from exposure to NO_2 and $PM_{2.5}$.

IR1-08: Hydrogeological model

Rationale: The EIS Guidelines (section 6.1.4) state that the EIS must provide an appropriate hydrogeologic model for the Project area, which includes sensitivity analyses to test model sensitivity to hydrogeologic parameters. A better understanding of the conceptual hydrogeological model is needed for both the mine site (Appendix 10-A) and Bromley Humps (Appendix 10-B) in order to better understand potential effects to surface water and, in turn, fish and fish habitat.

<u>Mine site (Appendix 10-A):</u>

- Hydraulic conductivity is known to vary significantly in the environment, and this variation is well demonstrated in Figures 10 and 11 (Figure 10:

Hydraulic conductivity with depth and Figure 11: Hydraulic conductivity with elevation). In the sensitivity analysis of the numerical model, only a 67% increase and decrease in hydraulic conductivity (K_H and K_V) was used. Simulations should be conducted using at least a difference of an order of magnitude.

- The EIS states (section 7 of Appendix 10-A): "The Base Case calibrated model predicted a base-flow along Goldslide Creek of 5,500 m^3/d during low-flow winter conditions, higher than the base-flow of 1,800 m^3/d inferred from a base-flow separation analysis using regional data." The value(s) of recharge imposed in the numerical model (as presented in Table 10 in Appendix 10-A) appears to be high (1467 mm/y, representing nearly 80% of total precipitation) and out of phase relative to baseflows found using river hydrographs (Figures 23 and 24 in Appendix 10-A).

- It appears that the recharge imposed/assumed in the model (for transient scenarios) is earlier in the year than field data would suggest. The EIS (Appendix 10-A, section 6.4.4) states: "The [net available recharge] estimates suggest the peak of recharge occurs between May and June as a result of freshet melt". However, Figure 14 shows that groundwater levels peak around August, and Figures 23 and 24 show that baseflows obtained from stream hydrographs peak around July. In addition, Table 1 of Appendix G shows that temperatures typically do not rise above zero until June.

- The hydraulic conductivity of the backfill material during mine closure was not provided.

- Section 6.8.2 of Appendix 10-A summarizes the sensitivity of the mine flood time at closure to parameter variations, including horizontal hydraulic conductivity (K_H). Table 18 indicates that a reduction in K_H is associated with a reduction in mine flood time, which seems counter-intuitive.

<u>Bromley Humps (Appendix 10-B):</u>

- It is unclear which precipitation scenario (base case or adjusted) was used to estimate infiltration into and leakage from the TMF at Bromley Humps. This would make a substantial difference (annually: 1457 vs 2084 mm, presented in Table 2.2-3 and Table 2.2-4 of Appendix 10-B).

- Table 2.3-1 in Appendix 10-B provides information on the active hydrometric stations in the area. The forest cover and glacier cover associated with three of the stations exceeds 100%.

Requested Information:

For the Mine Site:

a) Provide a rationale for the variation of the K value used for the sensitivity analysis and an analysis for the new values of inflow/outflow and extent of the drawdown cone using ± 1 order of magnitude.

b) Explain the threefold difference between modelled and estimated baseflow values

c) Explain the difference in recharge obtained with net available recharge (NAR) equation and stream hydrographs.

d) Provide the hydraulic conductivity (K) of the backfill material used for the hydrogeological model for the closure/post-closure period.

e) Explain how a reduction of horizontal hydraulic conductivity (K_H) corresponds to a reduction in the mine flood time.

For Bromley Humps:

a) Identify which precipitation scenario (base case or adjusted) was used to estimate infiltration into and leakage from the TMF at Bromley Humps.

b) Provide a rationale for the percentage of forest and glacier cover associated with the watershed for each of the four hydrometric stations, given that the forest and glacier cover exceeds 100%.

IR1-09: 2017 Fisheries assessment

Rationale: The proponent has indicated that further fisheries assessments were conducted during 2017. Some of this information was provided to Fisheries and Oceans Canada through a regulatory request for review process however it has not yet been included in the EIS. All of the fisheries assessment work should be included for review as part of the environmental assessment process to ensure a complete analysis of potential effects from the Project on fish and fish habitat.

Requested Information: Provide a report describing the additional fisheries baseline assessment work conducted in 2017 including methodology, results and analysis.

IR1-10: Bitter Creek and Bear River flow changes

Rationale: Section 6.3.1 of the EIS Guidelines request that the proponent identify any potential adverse effects to fish and fish habitat as defined in Subsection 2(1) of the *Fisheries Act* including consideration of the geomorphological changes and their effect on hydrodynamic conditions and fish habitats.

More information is needed to fully assess and characterize potential impacts to fish and fish habitat from flow changes that would result as part of the Project.

Increases in water supply to the receiving environment, in particular to fish bearing reaches of Bitter Creek and the Bear River, have been characterized in percentage change in water quantity or flow.

Requested Information:

a) Provide a table showing the linear length (m) and areal extent (m^2) of the maximum flow changes as a result of water supply changes (increases and decreases) in the affected streams (e.g., 0, 5, 10, 15, 20% contours).

b) Provide an analysis of what these changes would mean to available fish habitat (quality and quantity) during the seasons when relative changes would be greatest, for example overwintering.

IR1-11: Effects to fish habitat from the access road, transmission line, and tailings management facility

Rationale: Section 6.3.1 of the EIS Guidelines outlines the details that should be considered in the assessment of potential adverse effects to fish and fish habitat as defined in Subsection 2(1) of the *Fisheries Act*. This includes the geomorphological changes from Project works and their effects on hydrodynamic conditions and fish habitats, the modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities, and potential impacts on riparian areas. More information is needed to fully assess and characterize potential impacts to fish and fish habitat from the access road, transmission line, and TMF.

<u>Access road:</u>
Construction of the Access Road is the one component of mine infrastructure that could potentially result in habitat loss for fish in Bitter Creek. According to the EIS, one 150 m section of the access road would require re-alignment of Bitter Creek and involves the realignment of the Bitter Creek channel and construction of a road prism with bank armouring. The EIS states that no net loss of habitat would be anticipated; however 1.14 ha of habitat would be altered. An additional

2.7 ha of riparian habitat would be disturbed during construction of the Access Road.

Detailed maps showing the location of the habitat alterations were not provided in the EIS and no site-specific habitat and fish use data was presented in the effects assessment or baseline data to support a determination of no effects to fish or fish habitat.

Power line:
The EIS (Table 18.5-1) identifies, "Install powerline from substation tie-in to the Lower Portal laydown area" as an interaction between the Project and fish and fish habitat. No further mention of the construction of the transmission line is discussed or described in the EIS. The access road, and therefore transmission line, would cross 64 unnamed streams as well as 5 named streams, all tributaries to Bitter Creek, en route to the mine site. Transmission line construction typically requires ground disturbance for the installation of electrical pole structures as well as vegetation clearing and maintenance to ensure no interaction between vegetation and electrical wires. This type of construction can impact streams through ground disturbance and increased sediment and erosion loading as well as riparian habitat through vegetation losses or alteration.

TMF:
As identified in Section 17.5.3.1 of the EIS, approximately 520 m^2 of aquatic habitat would be lost under the TMF footprint. This appears to be the only direct loss of aquatic habitat predicted in the EIS. This area, however, is estimated and the two streams that would be lost in the construction of this mine infrastructure were not sampled during any baseline sampling events that are documented in the EIS. Although neither watercourse is fish bearing, they are both connected to Bitter Creek.

No data or mitigation measures were provided in relation to seepage or runoff from the TMF entering these streams, nor were the potential effects to Bitter Creek fish and fish habitat assessed.

Requested Information: Provide an updated assessment with impacts to fish habitat from road construction, construction of the transmission line, and construction of the TMF, including:

a) Detailed maps showing areas of road construction that overlap with Bitter Creek and Bitter Creek tributary habitat, site-specific habitat (i.e., habitat unit composition, bed substrates, depth, velocity, etc.) and fish use (i.e., species, life history stage) data for the areas proposed for alteration/loss so that potential project related effects can be fully understood.

b) A summary of the areas of fish habitat, including riparian habitats, which would be altered through the different components of road construction.

c) An assessment of the impacts to fish and fish habitat based on the construction of the transmission line, including changes to surface water quality and riparian habitat losses.

d) Mitigation measures that would be applied during the construction of the transmission line to avoid impacts to fish and fish habitat.

e) An assessment of impacts to Bitter Creek fish and fish habitat from the construction of the TMF including mitigation measures to prevent seepage and flow changes from impacting Bitter Creek.

f) A rationale for not directly sampling the two watercourses that would be lost.

IR1-12: Geochemical characterization

Rationale: Section 6.1.2 of the EIS Guidelines sets out the requirement to provide "the geochemical characterization of expected mine material such as waste rock, ore, low grade ore, tailings, overburden and potential construction material in order to predict metal leaching and acid rock drainage". This information is required to inform the assessment of predicted changes to fish and fish habitat.

Figure 3-1 in Appendix 1-B provides the location of waste rock and ore samples. It is unclear from this figure whether the ABA sampling is spatially and geologically comprehensive, and as a result, whether conclusions are substantiated.

Requested Information:

a) Provide a map showing waste rock and ore sample locations overlaid with boundaries of mine workings, rock units, and types of alteration (geologic units, pyrite-pyrrhotite and sphalerite halos).

b) Describe the potential for ML/ARD in work areas where sampling was not conducted, and the assumptions with respect to ML/ARD potential of these areas made in the effects assessment. Further detail is required on the uncertainty associated with geochemical characterization as well as measures that would be taken to address and manage the uncertainty.

IR1-13: Effects of air entry on ML/ARD

Rationale: The EIS Guidelines (section 6.2.2) set out the requirement to provide "estimates of the potential for mined material to be sources of acid rock drainage or metal leaching." The Agency notes that, as temperatures increase, ice that occupies rock pores may melt and increase air entry into the underground. Waste rock and tailings have high sulphide concentration and, with significant air entry, only carbonate is likely to be capable of neutralizing sulphide oxidation in waste rock and tailings.

It is unclear whether the data from the field tests and monitoring of the legacy stockpiles may have accounted for the effects of increased temperatures and associated air entry to the underground.

Requested Information: Describe the potential changes to the rate of sulphide oxidation, depletion of neutralizing potential, and time to onset of net acidic weather conditions, and metal concentration in mine water drainage from increased temperatures and associated increased air entry to the underground. Alternatively, describe how the existing analysis accounted for increased temperatures and associated air entry to the underground.

IR1-14: Contingency measures for ML/ARD

Rationale: The EIS Guidelines state that "the EIS will describe safeguards that have been established to protect against [the occurrence of accidents and malfunctions] and the contingency and emergency response procedures in place if such events do occur."

In the event of an unanticipated temporary or permanent closure of the mine, or a delay in flooding the underground workings due to other circumstances, such as an extended mine life, contingency measures should be in place to ensure appropriate management of the TMF and waste rock.

Requested Information: Provide a description of contingency measures that would be considered to prevent significant sulphide oxidation due to unforeseen circumstances such as an unplanned permanent or temporary closure of the mine. These contingency measures should include explicit consideration of any time constraints that would be placed on tailings exposure.

IR1-15: TMF closure objectives

Rationale: The EIS Guidelines state that "mitigation measures should be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation, and implementation."

The TMF dramatically changes the pre-existing landform. The primary objective of closure and reclamation initiatives, as presented in Appendix 1-H, is to “return the TMF site to a self-sustaining condition with pre-mining usage and capability”.

Proposed closure mitigation measures include the use of a geomembrane to cover the tailings. Geomembrane covers are challenging to construct and eventually deteriorate.

Requested Information:

a) Conceptually, describe how the TMF design would prevent ponding on top of the geomembrane cover when the tailings consolidate;
b) Describe the source and availability of soil volumes required for the cover;
c) Provide information on the construction and life expectancy of the geomembrane cover;
d) Describe contingencies for achieving the critical function of the geomembrane should it deteriorate; and
e) Discuss the potential for air entry and oxidation of tailings during the post-closure phase, including whether monitoring of air entry is appropriate.

Annex 2

Annex 2 contains comments received from federal departments. The Agency considered these raw comments in the development of the IRs.

Comment Number: HC-01
Project Effects Link to CEAA 2012: General
EIS Reference:
5(1)(c)(i) Health and socio-economic conditions
Context:
As there are many predicted exceedances for water quality in multiple areas, a map and description of water sources used for drinking and recreation in the local and regional area would be helpful. The location of any seasonal residences, and hunting/trapping cabins should be included on this map.
Comment:
Health Canada suggests that a water sources map is included in the report.

Comment Number: HC-02
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 5; Ch 29; pg 44; Section 29.5.5.4.3
Context:
Sediment samples are being taken once every three years. Annual sediment sample campaigns will allow for a greater detail of potential effects and earlier realization should they occur.
Comment:
Health Canada recommends that the proponent explain the rationale for taking sediment samples once every 3 years rather than annually.

Comment Number: HC-03
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 5; Ch 29; pg 47; Table 29.5-3
Context:
MeHg is a metal of concern for human health. MeHg bioaccumulates in fish species and can affect humans through consumption of fish; it is of special concern to children and pregnant women.
Comment:
Health Canada suggests that when fish tissue sampling occurs MeHg be included.

Comment Number: HC-04
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 2; Ch 1; pg 174
Context:
It is noted that cyanide is expected to flow into the water system; however, no testing is taking place for cyanide in the water system.
Comment:
Health Canada recommends that the proponent describe how cyanide released from the project may impact drinking water/recreational water.

Comment Number: HC-05
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 2; Ch 5; pg. 7; Section 5.1.5.2
Context:
It is noted that water including Bitter Creek will be affected from waste rock and tailings. It is also noted that there will be minimal changes to the surface waters including waters used for fishing.
Comment:
Describe in detail the predicted changes to COPCs in surface waters used as a drinking water source, or for recreation/fishing.

Please note that this comment forms part of IR1-06.

Comment Number: HC-06
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Table A6
Context:
Health Canada noted some of the drinking water screening levels appear to be incorrect and, as a result, the most conservative screening level may not have been selected. This will impact the identification of COPCs. For example, a HC drinking water guideline has incorrectly been provided for Vanadium; however, the guideline for Uranium (0.02 mg/L) is not reported.

Comment:
Review all drinking water screening values and update as necessary. (https://www.canada.ca/en/health-canada/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html)

Please note that this comment forms part of IR1-03.

Comment Number: HC-07
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 6.3.1.1; pg 22
Context:
Text states "VOCs including diesel vapours, and process plant reagents were not carried forward from the air quality assessment because their releases were deemed to be negligible. No dispersion modelling was completed for these chemicals in the Air Quality modelling report (Volume 8, Appendix 7-A, Section 3,Table 3-2 and Table 3-3)." It is not stated in the referenced section how VOCs emissions were determined to be negligible.
Comment:
Health Canada recommends that the proponent clarify why no dispersion modelling was completed for VOCs.

Comment Number: HC-08
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Table A1
Context:
Health Canada noted some of the air quality screening levels appear to be incorrect and, as a result, the most conservative screening level may not have been selected. This will impact the identification of COPCs. For example, the most stringent AQO for 1-h SO2 provided in Table 4-1 is 183ug/m3; however, this value is not used in the screening.
Comment:
Review the air quality screening values for all media to ensure the most conservative screening levels are used. Given that this project is expected to operate beyond 2020, the new CAAQs (2020) should be used in the assessment of future air quality (e.g., http://airquality-qualitedelair.ccme.ca/en/).

Please note that this comment forms part of IR1-03.

Comment Number: HC-09
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Table A1
Context:
The total predicted NO2 1-h (187 ug/m3) is very close to the selected AQO (188 ug/m3). Given the uncertainty inherent in the air quality modelling Health Canada suggests that a discussion potential health impacts of NO2 is warranted.
The newly released Canadian Ambient Air Quality Standard (CAAQS) for NO2 recognizes that there is no population health threshold for human health effects, meaning that health effects may occur at any level of exposure (http://airquality-qualitedelair.ccme.ca/en/). As NO2 is considered to be a non-threshold substance (health risks exist below the guideline values), the guidelines should not be construed as limits to which polluting up to is allowed. Given the principles of keeping clean areas clean and continuous improvement, proposed mitigation measures should not be confined to meeting the standards, but should also be targeted towards reducing population exposure to CACs associated with the proposed project.
Comment:
As NO2 is a non-threshold substance (health effects may occur at any level of exposure), discuss the potential health impacts of NO2, and mitigation measures targeted at reducing population exposure to project-related NO2 emissions.

Please note that this comment forms part of IR1-07.

Comment Number: HC-10
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Section 6.3.1.2;pg. 22-23
Context:
EXCERPT: "For metals in particulate a weighted average of PM10 sources estimate the composition of PM10 sources (background areas, road dust, ore, and waste rock) was used to estimate the concentration of chemicals in air particulate. PM10 was used to be consistent with Health Canada Guidance (Health Canada 2011)."
Comment:
Health Canada recommends that the proponent provide the reference (Health Canada 2011) and clarify how it applies. Clarify whether the PM10 sources included contribution from wind.

Comment Number: HC-11
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Response to Supplemental Info Request, App 3, Table 1
Context:
Some of the soil screening levels appear to be incorrect and, as a result, the most conservative screening level may not have been selected. This will impact the identification of COPCs. See "Response to Supplemental Info Request, App 3, Table 2" comment.
Chloride is presented in the screening table but not in the COPC identification table.
Comment:
US EPA RSLs should be adjusted to provide a value equivalent to HQ = 0.2. Double check all screening values, in particular, those selected for aluminum, barium, beryllium, boron, chromium, cobalt, iron, manganese, molybdenum, nickel, selenium, strontium, vanadium, and zinc. Provide reference for soil pH > 7.0.
Clarify why screening values are presented for chloride but no measured or modelled values are provided for this COPC?

Please note that this comment forms part of IR1-03.

Comment Number: HC-12
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Response to Supplemental Info Request, App 3, Table 2
Context:
Some of the soil screening levels appear to be incorrect and, as a result, parameters may not have been identified as COPCs that should be carried forward in the HHRA.
Screening levels are not available for all COPCs and alternate, defensible, referenced rationale should be provided for these compounds. This applies to all media.
Comment:
Update. Please provide references for explanations provided in the Table 2 footnotes on pages 5 and 6, and double check that all relevant COPCs are accounted for (e.g. gallium).
Please note that this comment forms part of IR1-03.

Comment Number: HC-13
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A, Table A6

Context:
Some of the drinking water screening levels appear to be incorrect and, as a result, the most conservative screening level may not have been selected. This will impact the identification of COPCs.
Comment:
US EPA RSLs should be adjusted to provide a value equivalent to HQ = 0.2. Please double check all screening values, in particular, those selected for aluminum, ammonia nitrogen (missing), beryllium, chromium, cyanide (total) (missing), cyanide (WAD) (missing), iron, manganese, nickel, silver, strontium, thallium, tin, uranium and vanadium.

Please note that this comment forms part of IR1-03.

Comment Number: HC-14
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 6.3.5.3; pg 31
Context:
Not all soil screening levels are relevant and appropriate for screening sediment. Only the human health-based guidelines (excluding inhalation) should be considered (HC, 2017). Health Canada suggests that the following sources not be considered in the development of the sediment screening levels. BC background (protocol 4), BC CSR schedule 4, any CCME SQG without a factsheet, and CCME SQGHH for inhalation. This will result in more COPCs being identified for this media.
Health Canada. Supplemental Guidance on Human Health Risk Assessment of Contaminated Sediments: Direct Contact Pathway. Federal Contaminated Site Risk Assessment in Canada. March 2017.
Comment:
Provide an independent Table for "sediment screening levels evaluated in the identification of HH COPCs" instead of referring to Table 4 which is not entirely applicable and does not contain all of the sediment parameters.

Please note that this comment forms part of IR1-03.

Comment Number: HC-15
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 6.3.6.3
Context:
A rationale was not provided in the HHRA for why a factor of 0.2 was applied in the calculation of country foods screening levels. Applying this factor assumes that the screening level is a concentration

in a single food associated with an exposure that alone accounts for 20% of the term [TRV x BW/FC], or perhaps one of the components of that term (e.g. the oral TRV).

The consumption rates employed by the proponent could not be located by Health Canada in the cited FNFNES report and no explanation is provided by the proponent on how the consumption rates were derived based on information from the FNFNES.
In the case of titanium, Health Canada cannot locate the source of the TRV reported by the proponent of 3 mg/kg bw/day.
For bismuth, no TRV is provided and therefore we are uncertain how the element was screened out as a COPC.

Comment:

Provide a rationale to support the application of a factor of 0.2 in the calculation of country foods screening levels.
Provide the source of the titanium TRV, and a rationale for excluding bismuth as a COPC in fish and plant foods.
Please note that this comment forms part of IR1-03.

Comment Number: HC-16

Project Effects Link to CEAA 2012:

5(1)(c)(i) Health and socio-economic conditions

EIS Reference:

Vol 8; App 22-A; Table A19

Context:

Only one TDI is presented for copper, molybdenum and selenium. Health Canada defines TDIs for these COPCs on an age-group specific basis. In cases where the non-adult TDIs are less than the adult TDIs, the health risk may be underestimated.
In the case of molybdenum, the Health Canada TDI is almost 1000 times lower than the TRV employed by the proponent (i.e. 28 mg/kg bw/day). Considering that molybdenum was not determined to be a COPC for further assessment in food, we recommend the proponent reconsider molybdenum as a potential COPC using the updated TDIs.

Comment:

Health Canada suggests using age-group specific TDIs when available.
Please note that this comment forms part of IR1-04.

Comment Number: HC-17

Project Effects Link to CEAA 2012:

5(1)(c)(i) Health and socio-economic conditions

EIS Reference:

Vol 3; Ch 22; pg 81

Context:
Health Canada currently considers NO2 and fine particulate matter (PM2.5) to be non-threshold substances, meaning that health effects may occur at any level of exposure. It should be acknowledged that health risks exist below the guidelines, particularly given the recently released NO2 CAAQS which will be in effect during the life of the project. http://airquality-qualitedelair.ccme.ca/en/
Comment:
Include a discussion of NO2 and PM2.5 in the Residual Effects Characterization.
Please note that this comment forms part of IR1-07.

Comment Number: HC-18
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 7.1.4; pg 43
Context:
Clarification is needed to facilitate the technical review of the fish BCF. It is unclear if water samples were collected in the same locations with fish samples. It is suggested that fish and water data be paired for each location for the calculation of the BCFFish,location (see discussion below) and that this information be provided in a table.
The report states that mean concentrations were used to calculate the fish BCF (Table A16). Based on information provided (Table A4-2, Appendix 18-A, Appendix 4), there may be a large variation in the data based on location (for example mean arsenic at: AC 02 = 12.9 (SD 0.42) µg/g, and BC04 = 1,110 (SD 56) µg/g). HC requests that the proponent: identify whether the use of the mean of all locations would underestimate the BCF in some areas, provide calculations of BCFFish for specific areas (i.e. BCFFish,location), and identify whether the higher BCFFish,location value should be used in the calculation of future predicted fish tissue concentrations in order to obtain a value that would be representative of the most impacted areas.
Comment:
Clarify if water and fish samples were co-located.
Identify whether the use of the mean of all locations would underestimate the BCF in some areas.
Provide calculation of BCFFish for specific areas (i.e. BCFFish,location).
Identify whether the higher BCFFish,location value should be used in the calculation of future predicted fish tissue concentrations.
Please note that this comment forms part of IR1-05.

Comment Number: HC-19
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 7.1.5; pg 44

Context:
Clarification is needed to facilitate the technical review of the BCFPlant. HC guidance recommends obtaining co-located soil samples with plant tissue samples (Supplemental Guidance on Human Health Risk Assessment for Country Foods, Health Canada 2010). The individual plant concentration data are provided in Table A17; however, it appears that soil samples were sampled at locations independent of plant samples (Figure 11).
Comment:
Identify whether co-located plant and soil samples can be used to calculate area-specific plant BCF (e.g. BCFPlant,wwi,location).
Provide the data for soil concentration and location used in the calculation of the plant BCF.
Please note that this comment forms part of IR1-05.

Comment Number: HC-20
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 7.2.2
Memorandum: Provide a detailed dose sample calculation for carcinogenic and non-carcinogenic calculations – Action Item 11, November 29 2017
Context:
It appears that exposure averaging and amortization has been done; however, more information is required to ensure that potential exposure and human health risks have not been underestimated. For example, it appears that short term exposure was averaged over a different time period non-carcinogens and carcinogens.
Comment:
Provide durations that the exposures were averaged on (e.g. 12 weeks for the hunter/trapper/fisher receptor for non-carcinogenic compounds), include rationale, and discuss whether the calculations provided may underestimate exposure and estimated risk while at the site.
Please note that this comment forms part of IR1-05.

Comment Number: HC-21
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 3; Ch 22; pg. 67
Context:
Health Canada suggests that the inhalation of fugitive dust should be considered a potential exposure pathway given that the project is anticipated to increase concentrations of COPCs in soil, and the large uncertainty in the air quality modelling.

Comment:
Since the proponent carried this pathway forward for COPCs that were identified, it should not affect the assessment.

Comment Number: HC-22
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 3; Ch 22; Section 22.6.2 and 22.9
Context:
As Management and Monitoring Plan and Follow-up programs are being revised in detail, the proponent should include specific, relevant, measurable goals to assess impacts to human health. Continued consultation with the author of the HHRA may be useful in this regard.
Comment:
No action required at this time.

Comment Number: HC-23
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 3; Ch 22; pg. 67
Context:
Health Canada suggests that the inhalation of fugitive dust should be considered a potential exposure pathway given that the project is anticipated to increase concentrations of COPCs in soil, and the large uncertainty in the air quality modelling.
Comment:
Since the proponent carried this pathway forward for COPCs that were identified, it should not affect the assessment.

Comment Number: HC-24
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 3; Ch 22; Section 22.6.2 and 22.9
Context:
As Management and Monitoring Plan and Follow-up programs are being revised in detail, the proponent should include specific, relevant, measurable goals to assess impacts to human health. Continued consultation with the author of the HHRA may be useful in this regard.

Comment:
No action required at this time.

Comment Number: HC-25
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
General - Tables
Context:
Health Canada noted that Tables require more notes for clarification. Readers should be able to understand the Tables from the information provided in the notes. For example, in App 22-A:
Table 1 - Which region was the AAQO adopted from? What do the acronyms mean?
Table A9 - Why are there no predicted future concentrations for so many of the COPCs?
Table A10 - Why is there no future predicted value for lithium?
Table B1 - Yttrium is missing, why is boron listed as 20 mg/kg across the board?
Comment:
Review all tables and figures to ensure the information presented can be interpreted from the notes provided.
Please elaborate on why the selected values are more appropriate for screening than the maximum concentration.
Units of measurement should be provided.

Comment Number: HC-26
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
General - Referencing
Context:
Health Canada noted that the incorrect tables are often cited within the text. For Example:
App 22-A; Ch6.3.1.3 First paragraph refers to Table 22.2-1 but likely meant to say Tables A1 and A2.
App 22-A; Ch 6.3.2.3 Last paragraph. Soil screening levels are found in Table A4 not Table A6.
App 22-A; Ch 6.3.2.4 baseline and predicted soil concentrations are compared to screening levels and regional background levels in Table A5 not A7.
App 22-A; Ch 6.3.5.1 First sentence should refer to Figure 12.
App 22-A; Ch 6.3.3.1 First paragraph, Figure 8 should be Figure 12 (which shows sample locations)
Comment:
Review all table citations and update.

Comment Number: HC-27
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 6.3.3.1
Context:
Paragraph 2 is unclear. Possibly track changes that were left in place.
Comment:
Review paragraph 2 and update for clarity.

Comment Number: HC-28
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 6.3.2.1
Context:
At end of paragraph, update "… Appendix Attachment B, Table B1" to say "...Appendix B, Attachment B, Table. B1."
Comment:
Review and update sentence.

Comment Number: HC-29
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 7.1.4
Context:
Sentence in first paragraph should read "As noted in Section 6.3.6, Dolly Varden served as a surrogate for salmon in the LSA."
Comment:
Review section reference and update sentence.

Comment Number: HC-30
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 7.1.4

Context:
Please provide section and page number where the baseline fish tissue data can be found in Appendix 18-A.
Comment:
Provide section and page number for baseline fish date in Ch. 7.1.4.

Comment Number: HC-31
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Ch 7.1.6
Context:
Double check the Sections referenced in the first paragraph, possibly remove 7.1.1 and add 7.1.5.
Comment:
Review section references and update sentence.

Comment Number: HC-32
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A; Table A19
Context:
The Health Canada Carcinogenic TRV (oral slope factor) for arsenic is 1.8 (mg/kg bw/d)-1.
Comment:
Review TRV and update sentence.

Comment Number: HC-33
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Response to Supplemental Info Request, App 3, pg. 2
Context:
Information in the Identification of COPCs paragraph (pg. 1), and two sets of bullet points (pg. 2) is repetitive.
Comment:
Consolidate the information in the Identification of COPCs paragraph to improve clarity.

Comment Number: HC-34
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 3; Ch 22; pg 71
Context:
First paragraph, incomplete sentence "The hazard and risk to the country food consumer".
Comment:
Review and update sentence.

Comment Number: HC-35
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 3; Ch 22; pg 73
Context:
COPCs are no longer identified using a percent difference to background.
Comment:
Remove references to estimated increases in concentrations being less than/more than 1%.

Comment Number: HC-36
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 3; Ch 22
Context:
Acronyms and abbreviations list is absent.
Comment:
Provide acronyms and abbreviations list

Comment Number: HC-37
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8; App 22-A
Context:
Acronyms and abbreviations list is incomplete
Comment:
Review document for acronyms and abbreviations and update list.

Comment Number: HC-38
Project Effects Link to CEAA 2012:
5(1)(c)(i) Health and socio-economic conditions
EIS Reference:
Vol 8: App 22-A; pg 70-71
Context:
Reference for "Zaung 2007" is not provided in Reference Section
Comment:
Add reference to reference section.

Comment Number: DFO-01
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Vol 3; Ch. 18; Appendix 18-A
Context:
The Proponent has indicated that further fisheries assessments were conducted during 2017. Some of this information was provided to DFO through a regulatory request for review process however it has not yet been included in the EA. All of the fisheries assessment work should be included for review as part of the EA process to ensure a complete analysis of potential effects from the project.
Comment:
Provide a report describing the additional fisheries baseline assessment work conducted in 2017 including methodology, results and analysis.
Please note that this comment forms part of IR1-09.

Comment Number: DFO-02
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Vol 3; Ch. 18; Appendix 18-A
Context:
More information is needed to fully assess and characterize potential impacts to fish and fish habitat from flow changes that will result as part of the project.
Comment:
Increases in water supply to the receiving environment, in particular to fish bearing reaches of Bitter Creek and the Bear River, have been characterized in percentage change in water quantity or flow. Provide a table showing the linear length (m) and areal extent (m2) of the maximum flow changes as a result of water supply changes (increases and decreases) in the affected streams (e.g. 0, 5, 10, 15, 20% contours etc). Provide an analysis of what these changes will mean to available fish habitat (quality and quantity) during the seasons when relative changes will be greatest. E.g. overwintering.
Please note that this comment forms part of IR1-10.

Comment Number: NRCan-01
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Volume 1 - Executive Summary
Volume 2, Chapter 1;
Volume 3, Chapters 10, 11, Volume 5, Chapter 29, 30;
Volume 7, Appendices 1D, 1H, 10A, 10B,Table of Concordance.
Context:
The hydrogeological information is well presented for this project. The methodology and the results are also well presented and described, and NRCan would like to note that it is all too rare that the conceptual models are illustrated with schematic cross-sections. This is much appreciated.

For the mine site technical study area (TSA):
In the sensitivity analysis of the numerical model, NRCan is seeking clarification on why a 67% increase or decrease was used for both hydraulic conductivities (KH and KV), when this parameter is known to vary significantly. This high degree of variation is well demonstrated in both figures showing values from the 1996 and 2016 field campaigns (Figures 10 and 11). As K is the parameter that affects most the model response, NRCan believes that simulations should have been done with at least an order of magnitude difference.
Comment:
1. Please provide reasoning for the variation of the K value used for the sensitivity analysis.
What would be the new values of inflow/outflow and extent of the drawdown cone using ± 1 order of magnitude?
Please note that this comment forms part of IR1-08.

Comment Number: NRCan-02
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Volume 1 - Executive Summary
Volume 2, Chapter 1;
Volume 3, Chapters 10, 11, Volume 5, Chapter 29, 30;
Volume 7, Appendices 1D, 1H, 10A, 10B,Table of Concordance.
Context:
For the mine site TSA:
The Conclusion of Appendix 10-A states that: “The Base Case calibrated model predicted a base-flow along Goldslide Creek of 5,500 m^3/d during low-flow winter conditions, higher than the base-flow of 1,800 m3/d inferred from a base-flow separation analysis using regional data.”
The value(s) of recharge imposed in the numerical model (found using a water budget and called NAR for “net available recharge”, presented in Table 10) appear to be very high (1467 mm/y, representing

nearly 80% of total precipitation) and out of phase (or delayed) relative to baseflows found using river hydrographs (shown in Figures 23 and 24). How do the annual and monthly values of NAR compare with those found using hydrograph separation?

There is probably a lot of uncertainty associated to the glacier melting and thus to recharge estimates obtained using a water budget. Therefore, hydrograph separation represents another recharge assessment method that can likely provide a maximum threshold when using the filters (such as the Nathan and MacMahon 1990 filter) and a minimum threshold when using solely stream winter values (i.e. low-flow period, corresponding to nearly 100% of groundwater contribution). How do they compare with those found using the water budget (NAR)? If they are significantly different, could they be used in the model for alternative scenarios? There are likely potential measurement errors s during winter time, but these low-flow values would still probably provide an estimate of the lower limit for recharge.

Hydraulic head comparison is usually the first step in model calibration, but it is not very robust. A good correspondence between measured and modeled stream flows is also important and will strengthen the conceptual model of the hydrogeological system.

Comment:
Please explain the threefold difference between modeled and estimated baseflow values.

Please note that this comment forms part of IR1-08.

Comment Number: NRCan-03
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Volume 1 - Executive Summary
Volume 2, Chapter 1;
Volume 3, Chapters 10, 11, Volume 5, Chapter 29, 30;
Volume 7, Appendices 1D, 1H, 10A, 10B,Table of Concordance.
Context:
For the mine site TSA:
Appendix 10-A (p. 26 and Table 10: Estimation of Net Available Recharge (NAR)) states that: “The estimates suggest the peak of recharge occurs between May and June as a result of freshet melt“ However, Figure 14 shows that groundwater levels peak later in the year, around August. In addition, Figures 23 and 24 show that baseflows obtained from stream hydrographs peak around July. Also, Table 1 of Appendix G (Comparison of Climate Data for the period of 1981 to 2016) at the end of Appendix 10-A shows that temperatures typically start being above zero only in June. Therefore, it appears that the recharge imposed in the model (for transient scenarios) is likely shifted forward.

Comment:
Please provide an explanation for the shift in recharge estimates obtained with NAR and stream hydrographs .

Please note that this comment forms part of IR1-08.

Comment Number: NRCan-04
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Volume 1 - Executive Summary
Volume 2, Chapter 1;
Volume 3, Chapters 10, 11, Volume 5, Chapter 29, 30;
Volume 7, Appendices 1D, 1H, 10A, 10B,Table of Concordance.
Context:
For the mine site TSA:
What was the hydraulic conductivity (K) of the backfill material used in the numerical model for the mine closure?
Comment:
Please provide the K values for the backfill material.

Please note that this comment forms part of IR1-08

Comment Number: NRCan-05
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Volume 1 - Executive Summary
Volume 2, Chapter 1;
Volume 3, Chapters 10, 11, Volume 5, Chapter 29, 30;
Volume 7, Appendices 1D, 1H, 10A, 10B,Table of Concordance.
Context:
For the mine site TSA:
How can a reduction of KH provide a reduction of the duration of the mine flooding period? See results presented in Table 18 (Sensitivity of Closure to Post-Closure Model Outputs) of Appendix 10-A.
Comment:
Please provide an explanation for how the reduction of KH will provide a reduction of the duration of the mine flooding period.

Please note that this comment forms part of IR1-08.

Comment Number: NRCan-06
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Volume 1 - Executive Summary
Volume 2, Chapter 1;
Volume 3, Chapters 10, 11, Volume 5, Chapter 29, 30;
Volume 7, Appendices 1D, 1H, 10A, 10B,Table of Concordance.
Context:
For the Bromley Humps site:
It is unclear which precipitation scenario (base case or adjusted) was used to estimate infiltration into and leakage from the TMF at Bromley Humps. This would make a substantial difference (annually: 1457 vs 2084 mm, presented in Table 2.2-3 and Table 2.2-4 of Appendix 10-B).
Comment:
Please clarify which precipitation scenario (base case or adjusted) was used to estimate infiltration into and leakage from the TMF at Bromley Humps.
Please note that this comment forms part of IR1-08.

Comment Number: NRCan-07
Project Effects Link to CEAA 2012:
5(1)(a)(i) Fish and fish habitat
EIS Reference:
Volume 1 - Executive Summary
Volume 2, Chapter 1;
Volume 3, Chapters 10, 11, Volume 5, Chapter 29, 30;
Volume 7, Appendices 1D, 1H, 10A, 10B,Table of Concordance.
Context:
For the Bromley Humps site:
In Appendix 10-B, Table 2.3-1 “Active Site Hydrometric Stations”, how can there be more than 50% of each cover (forest and glacier) in a given watershed?
Comment:
Please provide a rationale for how percentage of forest and glacier covers was assigned to the watersheds.
Please note that this comment forms part of IR1-08.

Comment Number: NRCan-08
Project Effects Link to CEAA 2012:
EIS Reference:
Vol 1: Executive Summary
Vol 2: Ch. 1 – Project Overview,

1.2.2.2 Local Geology,
1.2.2.3 Property Geology,
1.2.2.3.3 Bedrock Geology and Structures
1.2.4.1 Geotechnical Assessments, 1.6.4.14.4 Design Basis and Operating Criteria,
1.6.4.14.6 Seismicity,
1.7.3.2.5 Ground Control and Surface Subsidence,
Chapter 4 – Alternative Means of Undertaking the Project
Chapter 5 – Closure and Reclamation (41 p)
Volume 3:
Chapter 9 – Landforms and Natural Landscapes (146 p)
9.4.1 Overview of Existing Conditions - Regional Setting Overview
9.4.1.2 Local Setting Overview, Chapter 24 – Effects of the Environment on the Project,
24.2 Scope
24.9.3 Seismic Activity,
Volume 7, Appendix 1-A Geotechnical Site Report,
Volume 8, Appendix 1-A Geotechnical Site Report,
Appendix 9-B - Red Mountain Geophysical Baseline, Section 2.5 – Seismic History,
Appendix 23-A Tailing Dam Breach Analysis

Context:

NRCan would like to acknowledge that the proponent has done a good job of describing the seismic hazards, potential effects, and mitigation methods for the project area.

Comment:

In Volume 7, Appendix 1-A, the Proponent discusses faults at the project site. As a clarification, please confirm that there is no evidence for recent faulting (or surface faulting) on the faults observed at the TMF (e.g., Fig. 3.8, p. 20).

Comment Number: NRCan-09

Project Effects Link to CEAA 2012:

Effects of the environment on the project

EIS Reference:

Vol. 3; Ch. 24

Context:

Volume 3, Chapter 24 includes a discussion on “the potential effects of the environment,” but there is no mention of potential of volcanic hazards.

Comment:

Although the probability of a volcanic eruption is low, NRCan recommends that the proponent include an overview of volcanic hazards in the project region, including the frequency and possible impacts.

Comment Number: NRCan-10
Project Effects Link to CEAA 2012:
Effects of the environment on the project
EIS Reference:
Vol. 1
Vol. 2, Ch. 1;
Vol. 3, Ch. 9, 23, 24;
App. 9A, 9B, 9C, 23A.
Table of Concordance.
Context:
NRCan has completed a review of the EIS within the scope of its expertise in terrain hazards. The EIS includes an exhaustive review of the surficial geology conditions, geomorphology, soils, landslides, and avalanche potential in the regional study area per the requirement of the federal EIS. The proponents have covered the region of the mine site, tailing management facility (TMF) and access road. Descriptions, maps, cross-sections, methodology and data interpretation are provided with a sufficient level of details. Good information is provided on the quantity and details of the information in the EIS. NRCan is pleased to read that the proponent has completed a detailed study of the ground (bedrock and sediments) physical conditions of the TMF. Such analysis is required to avoid any ground disturbance and potential dam breach once the tailing facilities reach capacity.
Comment:
While NRCan found minimal information on soil depth, there is enough information on sediment thickness, sediment type and soil types. NRCan does not believe that additional soil depth information would make a substantial difference to the EIS.

Comment Number: NRCan-11
Project Effects Link to CEAA 2012:
EIS Reference:
Vol.1
Vol 5, Ch. 29; Section 29.10
Context:
The Explosives Management Plan presented in Volume 5, Chapter 5, indicates that the mine infrastructure, access road and haul road construction will involve explosives manufacturing and storage. This will include the use of magazines, an ammonium nitrate storage silo and a bulk ANFO truck (or mobile process unit).
Comment:
NRCan notes that the proponent's explosives supplier will require a magazine license and either a temporary factory license or satellite site certificate issued under the Explosives Act for the supply of explosives during the construction phase.

Comment Number: NRCan-12
Project Effects Link to CEAA 2012:
EIS Reference:
Vol. 5, Ch. 29; Section 29.10
Context:
The Ammonium Nitrate Storage Facility Regulations referenced in Volume 5, Chapter 29, Section 29.10.3 are no longer in force.
Comment:
These regulations are now part of the Explosives Regulations (2013) which are also listed in Section 29.10.3.

Comment Number: NRCan-13
Project Effects Link to CEAA 2012:
EIS Reference:
Vol. 8, Appendix 10-A
Context:
In Appendix 10-A, Figure 22, the different figures of the conceptual model for the mine TSA site in page-wide format in the report would be easier to review, instead of having four small ones. These figures present and provide important information. Also, the addition of the available boreholes on these cross-sections, showing their depth, orientation and water levels would have been appreciated.
Comment:
NRCan requests page-wide figures for the conceptual model for the mine TSA site, currently presented in Appendix 10-A, Figure 22.

Comment Number: NRCan-14
Project Effects Link to CEAA 2012:
EIS Reference:
Vol. 8, Appendix 10-A
Context:
Appendix 10-A, page 28, makes reference to a "…a transfer distance of 2,500 m."
Comment:
Please provide clarification as to what "transfer distance" is alluded to.

Comment Number: NRCan-15
Project Effects Link to CEAA 2012:
EIS Reference:
Vol. 8, Appendix 10-B

Context:
Appendix 10-B (p. 10) states that: “Using a base-flow separation analysis, the lowest base-flow values were estimated to occur in January as 1.6 l/s/km² for Bitter and Otter creeks, and 1.9 l/s/km² for Goldslide Creek (SRK, 2017b).” Likewise for Table 7: Unit Base-Flow for Bitter, Otter and Goldslide Creeks of Appendix A.
Comment:
NRCan requests these values be converted to mm/y.

Comment Number: NRCan-16
Project Effects Link to CEAA 2012:
EIS Reference:
Appendix 1-B Geochemical characterization of waste rock, ore and talus
Context:
In Appendix 1-B “Geochemical characterization of waste rock, ore and talus”, Figure 3-1: “Location Map of P14 location map for waste rock and ore samples” is inadequate to show if ABA sampling is spatially and geologically comprehensive and representative, creating uncertainty in whether the conclusions drawn by the proponent in characterizing the mine material are substantiated.
Comment:
NRCan requests the proponent provide a map that is larger scale and shows sample locations along with boundaries of mine working and rock units and types of alteration (geologic units, pyrite-pyrrhotite and sphalerite halos) in order to fully assess the adequacy of sampling.
In addition, NRCan requests the proponent provide justification for the areas of the proposed mine workings that were not sampled, including a description the potential Acid Rock Drainage and Metal leaching characteristics of the rock in those areas, and how they will be handled.
Please note that this comment forms part of IR1-12.

Comment Number: NRCan-17
Project Effects Link to CEAA 2012:
EIS Reference:
Appendix 1-B Geochemical characterization of waste rock, ore and talus
Context:
As temperatures increase, ice that currently occupies rock pores may melt and increase air entry underground. Much of the waste rock and tailings samples have high sulphide concentration and with significant air entry only carbonate is likely to be capable of neutralizing high rates of sulphide oxidation in the waste rock and tailings.
Comment:
NRCan recommends NP(TIC) rather than bulk NP measurements for calculation of time to onset of NP depletion and onset of acid weathering conditions in the waste rock and tailings.
In addition, NRCan requests that the Proponent clarify how the project proposal accounted for the increased temperature and potentially increased air entry underground compared to the legacy dump

and field test pads in the calculation of the rates of sulphide oxidation, NP depletion and the time to onset of net acidic weathering conditions and metal concentrations in the drainage.
Please note that this comment forms part of IR1-13.

Comment Number: NRCan-18
Project Effects Link to CEAA 2012:
EIS Reference:
Appendix 1-K Geochemical Characterization of Metallurgical Tailings
Context:
In the event of an unanticipated temporary or permanent closure, or a delay in flooding due to other circumstances such as an extended mine life, contingency measures should be in place to ensure appropriate management of the TMF and waste rock.
Comment:
NRCan requests the Proponent provide details on any contingency measures that would be considered to prevent significant sulphide oxidation during an unplanned permanent or temporary closure.
Please note that this comment forms part of IR1-14.

Comment Number: NRCan-19
Project Effects Link to CEAA 2012:
EIS Reference:
Appendix 1-H Tailings and Water Management
Context:
The TMF dramatically changes the pre-existing landform. Maintenance of physical containment and geochemical mitigation will be required forever. Closure and reclamation initiatives will not return the TMF site to a self-sustaining condition with pre-mining usage and capability as indicated in Appendix 1-H (p.48).

Proposed closure mitigation measures include the use of a geomembrane to cover the tailings. Geomembrane covers are challenging to construct and eventually deteriorate. Therefore, the costs of replacing the geomembrane cover if necessary should be accounted for in the Closure and Reclamation Costs outlined in Appendix.

In addition, the proposed Post Closure Monitoring should include monitoring of air entry, weathering, geochemistry, and discharge from the TMF to ensure closure and reclamation objectives at the site are met.
Comment:
NRCan requests that the Proponent provide details on the proposed cover construction and replacement cost. What is the source and are there sufficient volumes of suitable soil?
Please note that this comment forms part of IR1-15.

Comment Number: NRCan-20
Project Effects Link to CEAA 2012:
EIS Reference:
Appendix 1-H Tailings and Water Management
Context:
The proposed reclamation methods and objectives are site specific with the design informed by site specific studies, however p. 48 of Appendix 1-H makes reference to “international closure standards” and p. 49 refers to “Industry standard reclamation methods will be employed”.
Comment:
NRCan requests the Proponent clarify which international standards for closure and reclamation are being referenced in these statements.

Comment Number: NRCan-21
Project Effects Link to CEAA 2012:
EIS Reference:
Appendix 1-L Geochemical Characterization of Construction Materials
Context:
The two major rock groupings that will be encountered at the TMF and Plant Site, are Bromley Humps area intrusive and the Hazelton Group sediments. Approximately 20% of the construction material will be sourced from rock from the Plant Site, mainly comprising Hazelton Group sediments.
The results presented in Section 4.1.2 of Appendix 1-L indicate that, overall, approximately one-third of the Hazelton Group sediment samples are PAG or have an uncertain potential for ARD, including three samples in the immediate vicinity of the Plant Site.
Comment:
Unless demonstrated otherwise by operational characterization, NRCan recommends that the Hazelton Group rock should be assumed to be PAG material and use in the construction of the TMF dams should only be permissible in locations above the potential depth of groundwater flow.

Comment Number: CEAA-01
Project Effects Link to CEAA 2012:
EIS Reference:
Vol 4; Ch. 28; Section 28.5.1
Context:
The EIS summary table of issues raised during public consultation does not contain summary or individual comments on the project by members of the public at large. Chapter 28 discusses the various measures that the proponent took to inform the public the project.
Comment:
Conceptually, how will the impoundment design prevent ponding on top of the geomembrane cover when the tailings consolidate?

Comment Number: CEAA-02
Project Effects Link to CEAA 2012:
EIS Reference:
Vol 4; Ch. 27; Section 27.4.3.4
Context:
This section of the EIS notes that the unique nature of Treaty Rights renders it inappropriate for IDM to make a significance determination on residual adverse effects to Treaty Rights. However, an analysis of effects to Treaty Rights is conducted in section 27.4.8 of the EIS.
Comment:

Comment Number: CEAA-03
Project Effects Link to CEAA 2012:
EIS Reference:
Vol 4; Ch. 27; Section 27.5.2.4
Context:
This section of the EIS describes different spatial boundaries compared to the other chapters.
Comment:
The Proponent should also consider whether the diversion of incident precipitation will result in air entry and oxidation of the tailings, producing chemical instability. This should include an assessment of the oxidation and resulting discharge, as well as consideration of any potential change that may result when the geomembrane under the liner deteriorates. Will the critical functions of the liner need be replaced, and how will this be achieved?

Comment Number: CEAA-04
Project Effects Link to CEAA 2012:
EIS Reference:
Vol 4; Ch.r 27; Section 27.5.3.1.1
Context:
This section of the EIS describes estimates on Nisga'a Citizens' employment and income. These estimates are derived from previous studies relating to Brucejack and KSM. Those projects were approved and are now operational.
Comment:
Is there any information from Brucejack and KSM relating to actual Nisga'a citizen employment figures that may provide further support in the employment estimates?

Comment Number: CEAA-05
Project Effects Link to CEAA 2012:
EIS Reference:
Vol 4; Ch. 27; Section 27.5.4.3.1

Context:
This section of the EIS states that Nisga'a workers would be able to live in their home communities and work in Stewart during mine operations.
Comment:
Is this assumption based on previous surveys or focus groups on commuting/migration patterns on other development projects?

Comment Number: CEAA-06
Project Effects Link to CEAA 2012:
EIS Reference:
Almost all wildlife VC except hoary marmot and western screech-owl
Context:
The numbers for the area of altered habitat and area of sensory disturbance reported in the habitat availability section for most wildlife species are not the same as in the cumulative effects section. Some are off only by a few digits, others have greater ranges.
Comment:
Clarify which the reported areas of altered habitat and sensory disturbance are correct, or provide an explanation for the different numbers.

Comment Number: CEAA-07
Project Effects Link to CEAA 2012:
5(1)(a)(iii) Migratory birds
EIS Reference:
16.7.9.1.1, 16.8.4.7.1
Context:
In tables 16.7-10 and 16.8-11, the numbers of RSA total effective habitat (ha) for birds guilds as a riparian area and shrub/early successional area habitat types have been inversed. Which number is the correct one for shrub/early successional area, 12,146 or 49,889 ha?
This information is necessary since if the number is the same as in Table 16.7-10 (12,146ha), then the cumulative impact of the project on shrub/early successional habitat availability is 12% - a moderate magnitude which may change the effects assessment and potentially require additional mitigation measures.
Comment:
Provide clarification of the numbers of RSA total effective habitat for shrub/early successional area.

Comment Number: CEAA-08
Project Effects Link to CEAA 2012:
Species at risk

EIS Reference:

16.7

Context:

The criteria for the characterization for wildlife (Table 16.7-1) have not changed between the residual effects assessment and the cumulative effects assessment. For the Northern goshawk VC, the criteria of magnitude also has not changed by combining the habitat change in the RSA (%) on both nesting and foraging habitat. According to the assessment, the magnitude of residual effects is around 6% therefore moderate (6-15%); yet in the cumulative assessment, the magnitude of the cumulative effects is also moderate even though the effect of projects on effective habitat is 15% for nesting and 8% for foraging - respectively high and moderate and combined together (23%) should be high.

Comment:

Clarify the magnitude.

Comment Number: CEAA-09

Project Effects Link to CEAA 2012:

5(1)(a)(iii) Migratory birds

EIS Reference:

16.7.9.1.1

16.8.4.7.1

Context:

In tables 16.7-10 and 16.8-11, the numbers of area of altered habitat and area of sensory disturbance reported in the section of effects on habitat availability for bird guilds are not the same as in the section of cumulative effects on habitat availability for bird guilds. This would impact the percentage of habitat change in the RSA, LSA and the magnitude criteria. The numbers also slightly differ for all other VCs, however they do not change the percentage of habitat change for the other VCs.

Comment:

Provide clarification of the numbers of area of altered habitat and area of sensory disturbance for bird guilds.