

Adequacy Review Report

Project Assessment 2017-0083

**BMC Minerals Inc.
Kudz Ze Kayah Mine**



Issued May 26, 2017

Amended June 8, 2017

Prepared by

Executive Committee

Yukon Environmental and Socio-economic Assessment Board

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1.0 INTRODUCTION

The Executive Committee has reviewed the proposal for the “Kudz Ze Kayah Mine” submitted by BMC Minerals on March 27, 2017. The Executive Committee has determined that the proposal is inadequate. This Adequacy Review Report includes a request for supplementary information that is required.

A proposal is deemed adequate if the Executive Committee determines the proponent:

- has consulted with first nations and the residents of communities in accordance with subsection 50(3) of the *Yukon Environmental and Socio-economic Assessment Act* (Act);
- has taken into account the matters referred to in paragraphs 42(1)(b),(c) and (e) to (h) of the Act;
- contains sufficient information to enable the Executive Committee to prepare a statement of the scope of the Project under s. 34 of the *Executive Committee Screening Rules*;
- contains sufficient information to enable the Executive Committee to commence the screening; and
- complies with the applicable rules.

The *Screening Rules* provide the proponent up to 180 days to either submit the requested supplementary information or to advise the Executive Committee in writing, when it will be submitting the supplementary information. All supplementary information must be provided to the Executive Committee within two years from the date the proposal was submitted to the Executive Committee. The form and content of the supplementary information submission should comply with all applicable Rules and requirements of the Board, including the general filing requirements.

For questions or comments regarding this report, please contact Daniel Beaudoin, YESAB Senior Assessment Officer assigned for this Project, by telephone 867-668-6420, by email at daniel.beaudoin@yesab.ca, or in person at Suite 200 – 309 Strickland Street, Whitehorse, Yukon.

Acknowledgements

The Executive Committee invited comments on the adequacy of the Project proposal from various First Nations, Decision Bodies, and regulators including:

- Ross River Dena Council
- Liard First Nation
- Government of Yukon
- Environment and Climate Change Canada
- Indigenous and Northern Affairs Canada
- Northern Projects Management Office
- Fisheries and Oceans Canada
- Transport Canada
- Natural Resources Canada

Table 1 lists input the Executive Committee received from parties invited to participate in the adequacy review of the proposal. The Executive Committee has considered this input when preparing this Adequacy Review Report.

Table 1: Input received from external parties

Party	Document Description	YOR Document #
Health Canada	Health Canada - Adequacy Comments	2017-0083-185-1
Natural Resources Canada	Natural Resources - Canada Adequacy Comments	2017-0083-186-1
Fisheries and Oceans Canada	DFO - Adequacy Comments	2017-0083-187-1
Environment and Climate Change Canada	Environment and Climate Change Canada - Adequacy Comments	2017-0083-188-1
Government of Yukon	Government of Yukon - Adequacy Comments	2017-0083-189-1
Transport Canada	Transport Canada - Adequacy Comments	2017-0083-190-1

In addition, to support the adequacy review the Executive Committee retained four independent consultant teams to undertake a technical review of select components of the project proposal as listed in Table 2. An independent consultant was also contracted to provide additional technical support in relation to hydrology and aquatic resources. Consultants in their respective knowledge areas were requested to review relevant sections and appendices of the proposal as well as comments from First Nations, Decision Bodies and regulators. Consultants were requested to:

- review and validate specific sections of the Kudz Ze Kayah Mine proposal and related documents;
- identify key issues, concerns, information gaps, and required supplementary information;
- evaluate models used in the proposal including adequacy of field data, modeling assumptions and model analysis, uncertainty or limitations and model predictions; and
- provide professional judgment on key aspects of the project proposal.

As a result of their review, consultants provided the Executive Committee with technical memorandums focused on the adequacy of information. The Executive Committee considered the technical memorandums in preparing this Adequacy Review Report.

Table 2: Consultants retained by the Executive Committee

Knowledge Area	Independent Consultant
Hydrology and aquatic resources	EcoMetrix Inc. Artifex Engineering Hydrology Inc.
Wildlife and wildlife habitat	SLR Consulting (Canada) Ltd.
Engineering design and geotechnical considerations	SNC Lavalin Inc.
Socio-economic considerations	EEM Inc.

Summary of Adequacy Review Approach

The following report is a request by the Executive Committee to the proponent for supplementary information because the Executive Committee has determined that the proposal is inadequate. The Executive Committee developed this supplementary information request based on its review of the proposal and comments provided by Decision Bodies, regulators and its consultant teams as identified in Table 1 and 2 above. The request for supplementary information is divided in three columns: the source of the comments, a description of the issues and information requests with a rationale for each request. For clarity, the requests and associated references are presented using the same numbering and headings as the chapters in the project proposal. The source of the comments also identifies the party that commented on the particular topic, the relevant section from their comments, the question number when provided as well as the relevant sections of the proposal when provided. This request for supplementary information is supported by four technical memorandums from the Executive Committee’s consultant teams and comments from Decision Bodies and regulators, all of which have been uploaded to the YESAB Online Registry (YOR).

The Executive Committee analyzed all information provided by Decision Bodies, regulators and its consultant teams to determine whether the information requested is relevant to the adequacy review of this project, later stages of the assessment or not relevant to this screening. Where appropriate, the Executive Committee has combined similar requests from different parties into one request and also refined the questions to ensure they are relevant to the screening. All of these requests, which are required to be responded to, are in the request for supplementary information below. In analyzing the information provided or obtained, the Executive Committee also identified information that does not require a response from the proponent for the purposes of the adequacy review. This information is compiled and provided in Appendix 1 using a similar format to the request for supplementary information. Information identified in Appendix 1 is included for the proponent’s consideration as responses may be required at later stages of the assessment or regulatory process.

Note: This amended Adequacy Review Report contains 25 additional questions (R.276 – R.299) that can be found in the Additional Questions table following the Request for Supplementary Information table. There is also additional information for the proponent’s consideration highlighted in Appendix 1.

REQUEST FOR SUPPLEMENTARY INFORMATION

<i>Source</i>	<i>Issue</i>	<i>Information Request and Rationale</i>
2.0 FIRST NATIONS AND COMMUNITY CONSULTATION		
YG – Tourism and Culture	<p>Yukon Big Game Outfitters and holders of trapline concessions are listed as Tier 1 and 2 stakeholders, but it is not clear from the consultation record how they have been included.</p> <p>Other tourism operators exist in the project area, and it is not clear whether they have been contacted for their views. The Tourism Industry Association of the Yukon can be used to ensure that all tourism operators are consulted on the Project.</p>	<p>R1. Provide an updated effects assessment to understand how project activities may effect outfitters, tourism operators and trapline concession holders and possible mitigation measures and alternatives.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions and to ensure a comprehensive socio-economic effects assessment can be conducted.</p>
3.0 PROJECT LOCATION		
No information required		
4.0 PROJECT DESCRIPTION		
Permafrost and Stability		
SNC-Lavalin	<p>According to Appendix C-4, permafrost was not encountered in the test pits or observed in the thermistors within the footprint of the Class A facility. The sampling indicates that there may be permafrost at the site. However, given the reported depth to bedrock is 2.5 m to 5 m, the potential implications of future thaw settlement may be low even if permafrost is present. In the conclusions section of Appendix C-6, it is stated that the presence of permafrost within the facility footprints should be re-assessed once the installed thermistors reach equilibrium with ground temperatures and all logged data is collected.</p>	<p>R2. Provide an analysis of thermistor data. Based on this analysis, verify the conclusion that permafrost is absent under the storage facilities. If this conclusion cannot be verified from available data, describe the potential effects of permafrost being present under the storage facilities and possible mitigation.</p> <p>R3. Regarding Section 3.3 of Appendix C-3, were the thermistors installed in the winter of 2016 (i.e., February) or in the summer of 2016?</p> <p>R4. Section 4.3 of Appendix C-3 stated that none of the thermistors installed in the Class A Facility indicate freezing conditions in their data records. Why were freezing conditions not found in winter at the ground surface as would normally be expected?</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to permafrost.</p>

Source	Issue	Information Request and Rationale
SNC-Lavalin	<p>The Proponent’s discussion of the effects of permafrost on waste pile stability is generally consistent with current practice. The development of excess pore water pressures in rapidly thawing fine-grained permafrost can lead to a condition of zero effective stress within the thawing soils. For predominantly coarse-grained soils, the development of excess pore water pressures is less likely. (refer to McRoberts, E.C. 1978. Chapter 7 Slope Stability. In “Geotechnical Engineering for Cold Regions”, McGraw Hill). Creep deformation of permafrost soils is a time-stress-temperature dependent phenomenon and is independent of the excess pore water pressure issue.</p>	<p>R5. Is creep deformation potentially leading to excessive deformation or creep rupture a potential mechanism to be addressed? Provide further analysis of the risks, potential effects and proposed mitigation if creep rupture is potentially a mechanism for excessive deformation.</p> <p>R6. Were the strength properties of the overburden assumed such that it was considered to be a sensitive soil in the stability analysis? If not, provide a rationale for the assumptions used.</p> <p>R7. Does the critical failure surface occur through the overburden shell or the Class A tailings?</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to permafrost and stability analyses.</p>
SNC-Lavalin	<p>The Class A containment structure was modelled as tailings only (i.e., without SPAG rock). This assumption is valid and conservative if the shear strength of the Class A rock is higher than the tailings or if the tailings and rock are mixed in the structure. This assumption may not be conservative where there is significant co-disposal of tailings and waste rock (Class A) in a manner where it is either not compacted properly or saturated. This should be verified during the detailed design stage.</p>	<p>R8. Was co-disposal incorporated into stability design? If so, provide a rationale as to why modelling the Class A containment structure as tailings only is sufficient.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to stability analyses.</p>
SNC-Lavalin	<p>The shear strength of tailings was assumed as $\tau/\sigma = 0.55$. The slope stability is sensitive to the relationship adopted. The stability results from a sensitivity analysis performed for lower values of shear strength would be beneficial, to determine stability in lower shear strength conditions than assumed. The τ/σ shear strength relationship appears to be high for the anticipated tailings material.</p>	<p>R9. What is the basis and rationale for the τ/σ relationship that was assumed?</p> <p>R10. Was a sensitivity analysis performed on the τ/σ parameter?</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to the slope stability analysis.</p>
SNC-Lavalin	<p>Typically a textured liner is used to improve slope stability.</p>	<p>R11. Provide a rationale as to why an 80mil Smooth HDPE Geomembrane was recommended on the 2.5H:1V slopes and how this type of geomembrane will ensure sufficient slope stability?</p>

Source	Issue	Information Request and Rationale
		To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures.
SNC-Lavalin	Geomembranes are typically covered to provide protection from the elements. The conceptual drawings appear to leave the geomembrane exposed.	<p>R12. Is the 80mil HDPE geomembrane designed to remain durable upon exposure to the elements (UV exposure, etc.)? Describe the potential implications and effects of the geomembrane being exposed to the elements for their intended lifespan and proposed mitigative measures.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures.</p>
SNC-Lavalin	In Appendix C-4, Table 1 states the depth to bedrock is 2.5 m to 5 m. However, Section 4.1 states “Surficial deposits ranged in depth from 0.2 m to 10.4 m bgs.”	<p>R13. Verify the correct depth to bedrock.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to depth to bedrock.</p>
Ore Processing		
SNC-Lavalin	<p>Section 4.8.3.5 (page 4-51), the Proponent states that, “the tailings thickener overflow water will flow to the process water pond for reuse. Thickener underflow that has been dewatered to nominally 60% solids w/w.”</p> <p>In Section 4.8.3.5 (page 4-51) the Proponent states tailings “...will be fed to a splitter box which evenly distributes the flow between two agitated filtration feed tanks. Each filtration tank will feed a filter which dewateres the tailings to a produce a filter cake with a moisture content of approximately 15% with the assistance of flocculant”.</p> <p>While having a thickener before filtration is a good practice for hard rock tailings, achieving 60% w/w from thickener may be challenging and will depend on the composition of the tailings, feed consistency and the design and performance of the thickener. The tailings could be out of specification and pose challenges at the storage facilities.</p>	<p>R14. Provide details on the tailings composition and test data (pilot scale) if available and a summary of findings for evaluations on the proposed concept’s efficacy. Provide information on the gradation and mineralogy for the tailings feed and information regarding the proposed thickener and filter if available.</p> <p>R15. What type of filtration technology will be used (vacuum or pressure)?</p> <p>R16. Is there a plan to conduct a pilot test? If no pilot test is planned, what would be the basis for filter design and the tailings management plan?</p> <p>R17. Please describe if the 15% moisture content is a design basis for the filter cake and if the filtration system will be designed to achieve this target. Success of the filtration will depend on the gradation, mineralogy and technology selected.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to the tailings thickener and filtration.</p>

Source	Issue	Information Request and Rationale
Tailings Technology		
SNC-Lavalin	<p>In Chapter 4, Section 4.16.2 (page 4-147), it is stated, “BMC proposes to filter tailings to a nominal 15% moisture content for disposal in the Class A WSF or for use in producing paste backfill”. There are certain advantages and disadvantages for adopting filter technology for a given project.</p> <p>A tailings option assessment is typically completed for this type of project.</p>	<p>R18. Provide the rationale for proposing filter technology.</p> <p>R19. Was an option assessment completed and what other technology was evaluated? Otherwise, what are the specific advantages of the filtered tailings technology for this project, comparing it to other technologies and methods such as beaching?</p> <p>R20. Is there a preferred alternative (second best) tailings technology that could work as a back-up plan?</p> <p>To provide enough information for the EC to understand the proponent’s rationale for choosing the filtration technology proposed and to allow the Executive Committee to understand the considerations used by the proponent to examine options/alternatives.</p>
SNC-Lavalin	<p>Chapter 4, Section 4.16.2 (page 4-148) states, “...as this has been successfully implemented at a number of mines already, BMC does not believe that the required operational practices will be unreasonable to implement and maintain”. Filtration technology is widely used in arid environments, where water recycling is critical, and also for places with difficult foundation conditions for the tailings storage facility design. There are particular challenges to implement this technology in a northern climate; the Proponent referenced Greens Creek Mine in Alaska, often referred as a successful dry stacking facility in a northern climate; however, it took many years of operation and learning to develop feasible operational practices at Greens Creek Mine.</p>	<p>R21. Describe if and how the tailings management plan has incorporated operational learnings and best practices from similar facilities and operations such as Greens Creek Mine, Alaska.</p> <p>R22. What mitigation strategies or alternatives have been considered in the event that the operation of the KZK mine cannot consistently meet design output?</p> <p>To enable the EC to make a determination about the effectiveness of the technology as it relates to the circumstances of the Project.</p>
SNC-Lavalin	<p>A target of 15% moisture content for filter tailings appears reasonable and may have been set based on the success achieved at other metal mines.</p>	<p>R23. Demonstrate why a target of 15% moisture content for filter tailings is realistic for this project and can be maintained.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures as it relates to moisture content of the tailings.</p>
SNC-Lavalin	<p>The Proponent considers co-disposal of filtered tailings and acid generating waste rock. There are various methods of co-disposal available such as a) co-mingle, b)</p>	<p>R24. Has a feasible co-disposal method and plan been developed? If yes, provide details on this plan.</p>

Source	Issue	Information Request and Rationale
	layered, c) zonations, etc.	To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures as it relates co-disposal of tailings.
Conceptual Closure and Reclamation Plan		
Final Landform Design for Waste Storage Facilities		
SNC-Lavalin	The submission proposes progressive construction of a closure cover system over each of the storage facility landforms as areas of the stockpiles reach their final design elevation. The cover system designs vary depending on the level of net percolation reduction required which is based on the results of downstream water quality modelling; however, each cover system design includes an upper 0.3 m thick growth media layer, comprising a mixture of local topsoil and glacial till materials, to support growth of a sustainable cover of native plant species. Until the vegetation covers mature, the growth media layer will be susceptible to erosion, particularly for longer and steeper slopes and on larger terrace footprints (i.e., from slope catchments above the terrace during contributing to run-on from spring freshet and storm events).	<p>R25. What is the risk and associated effects of the reclaimed slopes being susceptible to increased gully erosion as a result of runoff waters from upper terraces discharging over the crest?</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to slope stability for the storage facilities and their cover systems.</p>
SNC-Lavalin	<p>The estimated footprint of the upper terrace for each storage facility landform at closure is not provided. As well, no information is provided on typical slope profiles for natural, glaciated landforms in the region.</p> <p>The physical and hydrologic characteristics of natural landforms with substantial topographic relief should be examined in support of designing slope profiles for final landforms relief; natural slopes have evolved over thousands of years in response to site-specific climatic, vegetation, and soil conditions.</p>	<p>R26. What is the estimated footprint of upper terraces for each storage facility landform at closure?</p> <p>R27. What is the physical and hydrologic comparison between the proposed closure landforms and similarly sloped natural regional landforms (topographic relief and slope aspects)?</p> <p>R28. Describe how the proposed final landforms for the waste storage facilities are viable with reference to the following criteria:</p> <ul style="list-style-type: none"> a. visual blending with the surrounding landscape; b. limiting the potential for unacceptable sedimentation of receiving surface water bodies due to soil loss from the reclaimed slopes; c. limiting long-term maintenance liabilities; and,

Source	Issue	Information Request and Rationale
		<p>d. overall long-term integrity and potential for increased metal leaching / acid rock drainage production?</p> <p>To provide a clear understanding of project activities and their effects from the beginning and to the end of the Project. In particular, understanding closure criteria with respect to estimated footprints and landforms of the storage facilities.</p>
Waste Storage Facility French Drains at Closure		
SNC-Lavalin	<p>In the mid-2000's, a reactive waste rock stockpile at Sullivan Mine near Kimberly, BC was partially reclaimed, which involved covering a toe drain. The arrangement led to oxygen deprivation at a monitoring station located along the buried toe drain and resulted in four fatalities at this site in May 2006. The likelihood of creating oxygen deprivation conditions along the toe of the Project's waste storage facilities post-closure is uncertain. Also, it is unclear whether monitoring stations will be established along the toe drains of the waste storage facilities and whether monitoring will occur at these stations post closure.</p>	<p>R29. Provide an evaluation on the potential for low-oxygen conditions for this project, potential effects and how they will be addressed through mitigative measures or alternatives.</p> <p>To ensure a comprehensive socio-economic effects assessment can be conducted in relation to potential low-oxygen conditions.</p>
Cover System Design for Class A and B Waste Storage Facilities		
SNC-Lavalin	<p>The designer anticipates that a substantial portion of the estimated "runoff" for both cover systems will be diverted as interflow, not surface runoff. There is no indication of the estimated volume of interflow and, more importantly, how interflow waters will be managed to prevent excessive build-up of pore-water pressures (and potential softening or ponding) near the toe of the reclaimed facilities.</p>	<p>R30. What is the basis for estimating evapotranspiration to be approximately 30% of mean annual precipitation for both the Class A and B facility cover systems?</p> <p>R31. What is the differentiation between "surface runoff" and "interflow" volumes in the mean annual water balances completed for each waste storage facility cover system?</p> <p>To enable the Executive Committee to make a determination about the effectiveness of the project design as it relates to runoff for the cover systems.</p>
SNC-Lavalin	<p>There is the potential for shallow instability of cover layers above the reduced permeability layers (liners).</p>	<p>R32. How will interflow waters be managed to prevent excessive build-up of pore-water pressures within the cover system in the lower slope regions and limit the potential for shallow instability of cover layers above the reduced permeability layers?</p> <p>To ensure a comprehensive environmental effects assessment can be conducted as it</p>

Source	Issue	Information Request and Rationale
		relates to stability of the cover systems and management of interflow waters.
SNC-Lavalin	Higher or lower evapotranspiration will affect the predicted net percolation rate, which ultimately affects seepage rates from base of the waste storage facilities.	<p>R33. How will higher or lower evapotranspiration rates from the 30 % estimate affect seepage rates from the base of the waste storage facilities and what are the implications to stability and water management?</p> <p>To ensure a comprehensive environmental effects assessment can be conducted as it relates to stability of the cover systems and estimates for evapotranspiration rates.</p>
Long-term Physical Integrity of Cover System Reduced Permeability Layers		
SNC-Lavalin	The Class A and B facilities' cover system designs incorporate a reduced permeability layer. If the underlying foundation materials or stockpiled waste undergoes differential settlement, then the potential exists for cracks and other defects to develop in the reduced permeability layers. This may lead to substantial increases in net percolation rates into the waste. As well, geosynthetic products have a finite service life due to various factors that cause geosynthetic fibres to age or deteriorate over time. The submission does not indicate the required longevity of the geosynthetic liner proposed for the Class A Storage Facility cover system.	<p>R34. How will the Class A and B Storage Facilities be constructed to prevent unacceptable differential settlement (due to the foundation materials and stockpiled waste) and how will the long-term integrity of the cover system be maintained?</p> <p>R35. What is the expected service life of the geosynthetic liner as part of the design of the proposed storage facility(ies)? Describe the risks and potential effects once the liner reaches the end of its intended lifespan. Describe potential mitigative measures and alternatives for these effects.</p> <p>R36. How will the cover system performance affect the acceptable environmental loadings to the aquatic receiving environment over the long term?</p> <p>R37. Describe how the cover system will be monitored to ensure it continues to achieve design objectives. Describe mitigative measures or alternatives that may be implemented in the event that the cover system is not performing as expected.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures as it relates to: potential differential settlement of the storage facilities; service life of the geosynthetic liner; cover system performance and how it may affect loadings to the aquatic receiving environment; and the monitoring, mitigation and alternatives that may be utilized in relation to cover system performance.</p>

Source	Issue	Information Request and Rationale
Open Pit and Underground Mining		
Open Pit		
SNC-Lavalin	In Section 4.6.2.1, a minimum 5 m wide bench at the pit crest is proposed to catch any material raveling down the pit wall slopes. The proposed bench width is very narrow. The rationale behind the selection of this bench width is not clear, and it is not clear that this will be sufficient to minimize the risk of rock fall to an adequate level.	<p>R38. Provide the rationale for selecting a 5 m wide bench and any relevant numerical analysis confirming the adequacy of the bench width.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures in relation to bench width at the pit crest.</p>
SNC-Lavalin	Golder Associates (January 26, 1996) stated in its Executive Summary that “groundwater levels are generally high and follow the topography, with some of the holes in the valley floor exhibiting artesian flow”. In the Mine Dewatering section, the report stated that additional drain holes will also be required to investigate the potential for artesian pressure in the south wall.	<p>R39. Provide additional information related to rock characteristics and the potential for artesian conditions. Provide any additional detailed plans that are available and if they are not, describe the future investigations that will occur to check rock characteristics and artesian conditions.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation rock characteristics and artesian conditions.</p>
Underground Mining		
Hydrogeology		
SNC-Lavalin	The submission outlines in Section 3.5.2 that no hydrogeological study has been conducted for underground Krakatoa and that the geomechanical assessment assumed little water inflow or a dry condition. The hydrogeological study has high importance in assessing underground excavations. Section 8 of the Rockland report states, “the review of drill holes indicated the presence of foliation, faults, structures, damage zone and micro-defect zones”. This statement is confirmed by the RMR classification and low local RQD values shown in the report.	<p>R40. Using information in response to R137, provide a comprehensive description of the hydrogeological setting of the Project, potential effects on mine operations and proposed mitigation.</p> <p>R41. Using information in response to R137, is there the potential for inflow rates into areas of underground mining to be higher than envisioned, and what mitigation is proposed to ensure the safety of workers, the stability of the mine and maintenance of environmental conditions?</p> <p>To allow the Executive Committee to understand all relevant baseline conditions as it relates to the hydrogeological setting of the Project and to ensure a comprehensive environmental</p>

Source	Issue	Information Request and Rationale
		effects assessment can be conducted in relation to inflow rates.
SNC-Lavalin	The presence of faults can create highly permeable zones that discharge the groundwater into the underground excavation at a higher rate than bulk rock mass will produce. These discretized flows can be a challenge for safety and stability of the mine workings.	<p>R42. How will high permeability zones within the rock mass and fault zones be evaluated for stability and safety and how will it be addressed?</p> <p>R43. What rock mass classification was used in the stability evaluation? If a classification other than minimal or dry was used, please provide a rationale and the potential implications on your conclusions for the effects assessment.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to: understanding how high permeability zones will be evaluated for stability and safety; and understanding the rationale for the rock mass classification that was used.</p>
<i>Rock Mass Classification</i>		
SNC-Lavalin	In Section 3.5.2. of the Rockland report, rock mass classification was performed using the Rock Mass Rating (RMR) proposed by Bieniawski in 1976. This classification was significantly updated in 1989 to incorporate the effect of joint conditions and some correction factors on the stability of underground excavations.	<p>R44. Update the rock mass classification referenced in the Rockland report using the 1989 Rock Mass Rating (RMR).</p> <p>To allow the Executive Committee to understand all relevant baseline conditions using appropriate and up-to-date methodology.</p>
SNC-Lavalin	The Geological Strength Index (GSI) classification is not addressed in the Rockland report. This can be done using the equation proposed by Hoek and Brown (1997) using RMR 1989. GSI classification is required to provide rock mass strength parameters.	<p>R45. Provide the Geological Strength Index (GSI) in order to understand the rock mass strength parameters. Use the appropriate GSI when updating the rock mass classification as per the 1989 Rock Mass Rating (RMR).</p> <p>To allow the Executive Committee to understand all relevant baseline conditions using appropriate and up-to-date methodology.</p>
<i>Structural Geology</i>		
SNC-Lavalin	The Rockland report does not provide detailed information regarding the joint system for the mine. Section 3.5.2 stated “though good orientation data was collected from holes drilled for pit wall design purpose, orientation data from these underground holes were inconsistent. Even in the good rock quality that can be	<p>R46. What is the plan for investigating and evaluating discontinuities, fault and shear zones for the detailed underground mining design? To what extent could this information inform and change your proposed underground workings?</p> <p>R47. Has the potential for significant weak discontinuities, unfavorable discontinuity</p>

Source	Issue	Information Request and Rationale
	<p>pieced together for successive run, the orientations did not line up.”</p> <p>For detailed design the joint condition, frequency and orientation should be updated with enhanced mapping of the geology encountered at the site; the data collected should be significantly more detailed. The details of the local faults and associated fault zones (extend and thickness) are not defined in the report and should be addressed by further investigation and logging. Without the discontinuity analysis nothing can be concluded about the hazards for underground excavation, should there be a high discharge zone or should there be wedge failures, etc. Section 5.0 stated “the bolt length and spacing are the function of a number of parameters including rock quality, presence of shears/faults, joint spacing, state of stress, etc.” Of these parameters only rock quality was discussed in detail in this report.</p> <p>Detailed investigation and design, assessing discontinuities and shear zones, are likely suited to permitting with the Ministry of Energy, Mines and Resources.</p>	<p>orientations, and faults and shear zones been considered in the preliminary feasibility assessment of underground mining? What are the potential effects of these geological characteristics and what is your proposed mitigation in the event of significant adverse effects?</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to understanding common risk factors for underground workings.</p>
<i>In-Situ Stresses and Possible Failure Mechanism</i>		
SNC-Lavalin	<p>Section 3.4 states, “for the purpose of the underground mining at Krakatoa, the major and intermediate stresses are assumed to be 2.5 and 1.5 times the vertical stress respectively (Martin et.al. 2003).” It is correct that in Canada the horizontal stress is greater than vertical stress. However, it should be noted that Martin et al. is based on their investigation at the Underground Research Lab (URL) located in Manitoba.</p> <p>Potential failure mechanisms such as structurally controlled failure (i.e., wedge failure) and stress-induced failure (i.e., spalling and slabbing) have not been discussed in the Rockland report.</p> <p>The in-situ horizontal to vertical stress ratio will be the input for the underground mine design, support design, excavation geometry, potential failures (progressive or sudden) and other considerations. This information is normally obtainable by in-situ tests such dilatometer tests or plate load tests.</p>	<p>R48. At this stage, and considering the underground design report is at its pre-feasibility stage, a generic stress ratio can be assumed; however, the ratio should be verified as per the site condition. The ratio should be defined prior to any detailed design, so the mitigation measures can be foreseen in case of high horizontal stress magnitude. What is the proposed strategy to address in-situ stress measurement at the mine and what is the plan to verify the proposed horizontal to vertical stress ratio?</p> <p>R49. What are the expected potential failure mechanisms (both structural failure and stress-induced)?</p> <p>R50. How have the outlined mitigation measures accounted for the potential scenario where assumptions made in the preliminary design are non-conservative?</p> <p>R51. What are the gaps in information and what is the plan for addressing these gaps for the detailed design and operations?</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation</p>

Source	Issue	Information Request and Rationale
		to understanding: the plan to determine the in-situ horizontal to vertical stress ratio; expected potential failure mechanisms; how mitigation measures account for scenarios resulting from more conservative assumptions; and how gaps will be addressed.
<i>Additional Investigations</i>		
SNC-Lavalin	<p>Section 3.5.2 states, “in the next stage of assessment, a dedicated geotechnical drilling program should be carried out to obtain representative geotechnical information across the main lens and where other important infrastructures such as ramp which will be located underground”.</p> <p>The preliminary underground mining report in its current form is based on borehole logs that are not located within the underground excavation footprint. This absence of subsurface information presents uncertainty to the potential hazards associated with underground mining, such as squeezing ground, high influx of groundwater, crushed/fault zone areas, etc. The comments provided in underground report are more a ‘generic’ comments without solid background. One statement in the report revealed, “the design is based on dry condition assumption”.</p>	<p>R52. Demonstrate your awareness of the geotechnical hazards identified in previous reports through: describing the uncertainty related to the absence of subsurface information at the underground mine footprint; identifying the risks and potential effects of this uncertainty; and proposed mitigation measures or alternatives.</p> <p>R53. Provide additional information on the ground model in relation to the underground mine works that addresses, at minimum, the rock mass rating, joints, hydrogeology and related information in order to develop the mine safely and reliably. Provide information on how this will be incorporated into the design of the underground mine.</p> <p>R54. Describe your plans for conducting a more detailed investigation to facilitate a safe and reliable mine design.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to geotechnical hazards in the underground mine area.</p>
<i>Support Design</i>		
SNC-Lavalin	Section 5.0 stated, “the recommended ground support assumes a non-acid generating environment underground with generally dry condition”. It is understood at this level of analysis and with the presented information, there is insufficient information to evaluate the support design; however, there is nothing in the report or any reference made in this report that makes the case for the presence of a non-acid generating condition.	<p>R55. Provide evidence supporting the assumption that the underground will be a non-acid generating environment with generally dry conditions.</p> <p>R56. How will acid rock drainage sampling and testing be tested and assessed?</p> <p>R57. Should acid generating conditions be discovered, what is the feasibility of the recommended ground support design?</p> <p>R58. Are there alternatives considered and feasible to mitigate an acid generating underground mining environment, for this project?</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation</p>

Source	Issue	Information Request and Rationale
		to potential acid generation and metal leaching in the underground mine workings.
5.0 EFFECTS ASSESSMENT METHODS		
No information required		
6.0 AIR QUALITY		
Environment and Climate Change Canada ECCC - 001	Emissions of Criteria Air Contaminants (CACs) from off-site traffic along the highway have not been assessed either to Watson Lake or to the port in Stewart for any of the project phases.	R59. Include emissions from off-site Criteria Air Contaminants (CACs) in the air quality assessment or provide a justification as to why this is not necessary. This information would demonstrate the proponent understands the full range of effects that may impact on the valued component and ensure a comprehensive effects assessment can be conducted.
Environment and Climate Change Canada ECCC - 002	BMC identified SO ₂ , TSP, CO, PM _{2.5} and PM ₁₀ as measurable parameters for the CACs valued subcomponent. However, volatile organic compounds (VOCs), which are part of this group, are not mentioned or assessed, even though they are followed closely by Environment and Climate Change Canada (ECCC) in the long-term goal of minimizing the risks of CACs. VOCs are emitted from different sources mentioned in the project description, including combustion sources (mobile and ON and OFF road equipment) and storage tanks.	R60. Assess volatile organic compounds (VOC) emissions in chapter 6 of the proposal from all sources of emissions associated with the Project, including combustion sources and storage tanks. R61. Identify measures to mitigate VOC emissions associated with the Project. This information would demonstrate the proponent understands the full range of effects that may impact on the valued component and ensure a comprehensive effects assessment can be conducted.
Environment and Climate Change Canada ECCC - 003	The proponent has declared the use of stationary diesel engines during the construction and closure phases of this proposed project (24 hours a day for the camp and 12 hours a day for the process plant), and the use of dual fuel engines during the operational phase (24 hours a day for the process plant): <ul style="list-style-type: none"> • Unknown is the make generators being installed, whether they are Tier 1, 2, 3 or 4 compliant, (and the type of control technologies being used other than catalysts). • There does not appear to be any discussions on other components of the 	R62. Identify the power generation technology and after-treatment devices used for the site power supply. R63. Identify fuel quality and yearly fuel usage by fuel type of the site power supply. R64. Indicate the absolute emissions of Greenhouse Gas Emissions (GHG) and Criteria Air Contaminants (CACs) for the individual components of the projects (e.g. site power supply, mining operation, etc.)? To provide a clear understanding of project activities and their effects from the beginning to

Source	Issue	Information Request and Rationale
	<p>power plant. The proponent mentions using waste heat generated from the engines for heating purposes, which, would improve the energy efficiency of the Project.</p> <p>The proponent has declared the use of dual fuel generators using 99% natural gas and 1% diesel, during the operational phase of the Project:</p> <ul style="list-style-type: none"> • The proponent needs to confirm the type of natural gas and diesel fuel being consumed for power generation. • Needs to confirm the fuel ratio or substitution rate (natural gas to diesel). The proponent has declared a 1% substitution rate, which appears low. <p>GHG and CACs emissions for the project are provided using the output of an air quality model. While useful, this approach makes it difficult to estimate, on an absolute basis, the total project emissions as well as the emissions from the individual components of the projects (power plant, mine operation, etc.). Based on available information, ECCC has estimated the CO₂eq yearly emissions from the power plant to be between 31,800 and 64,600 tonnes, the TPM yearly emissions between 2.6 and 26.3 tonnes, NO_x yearly emissions between 58 and 1,354 tonnes and CO yearly emissions between 515 and 1,678 tonnes. Emission estimates of these levels are consistent with project of significant sizes. Due diligence is warranted as no absolute emissions estimates were provided and the higher limits of above estimated emission ranges are significant enough to justify an increase in estimation accuracy.</p>	<p>the end of the Project.</p>
<p>Health Canada Q 1</p>	<p>Criteria Air Contaminants (CACs) selected in the assessment are SO₂, TSP, CO, PM_{2.5}, PM₁₀, and NO₂. The Project's list of CACs is not exhaustive, mining can be expected to produce other CACs, for example: metals in dusts; NH₃; volatile organic compounds (VOCs); polycyclic aromatic hydrocarbons (PAHs); petroleum Hydrocarbons (PHCs); and diesel PM.</p>	<p>R65. Update the assessment to include relevant Criteria Air Contaminants (CACs) or provide justification for the exclusion of: metals in dusts; NH₃; volatile organic compounds (VOCs); polycyclic aromatic hydrocarbons (PAHs); petroleum Hydrocarbons (PHCs); and diesel PM.</p> <p>To understand the effects of proposed activities on air quality.</p>
<p>YG – Environment</p>	<p>(Proposal Section 6.1.2) Environment Yukon has AQ standards for SO₂, O₃, TSP, CO, PM_{2.5}, PM₁₀ and NO_x – we support Health Canada's adequacy comments</p>	

Source	Issue	Information Request and Rationale
Q 56	about other CACs that are relevant to the proposed activity. The proponent should provide justification for the exclusion of VOCs, PAHs, metals in dust, NH3, PHCs and diesel PM. Preferably, the proponent should include these additional CACs in their proposal.	
Health Canada Q 2, Q 3	<p>The assessment of PM_{2.5} refers to the Yukon Ambient Air Quality Standards (YAAQS) which are less conservative (at 28 µg/m³) than the 2020 CCME Canadian Ambient Air Quality Standards (CAAQS) guidelines of 27 µg/m³. The proposed Project will be operational when the 2020 CAAQS for PM_{2.5} come into effect (27 µg/m³ for 24 hr averaging time).</p> <p>The CAAQS for SO₂ will come into effect in 2020, with more stringent guidelines coming into effect in 2025. The new CAAQS guidelines for SO₂ are lower than the YAAQS guidelines used in the air quality assessment of 1-hour 172 ppb and an annual mean of 11 ppb. The proposed Project will be operational when the 2020 CAAQS for SO₂ come into effect with a red management level of 1-hour 70 ppb SO₂ and an annual mean of 5 ppb. The red management level will be reduced in 2025 to 1-hour 65 ppb SO₂ and an annual mean of 4 ppb.</p>	<p>R66. Update the air quality assessment of PM_{2.5} using the federal guideline.</p> <p>R67. Update the air quality assessment of SO₂ using the 2025 federal guideline.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted using relevant thresholds for air quality.</p>
YG – Environment Q 58	<p>(Table 6.2) In addition to Health Canada’s comments (Items #2 and #3, Air Quality Guidelines),</p> <p>Environment Yukon will be updating YAAQS to reflect any amendments made to the CAAQS in accordance with the federal timelines, specifically for PM_{2.5} and SO₂.</p>	
Health Canada Q 4	The air quality assessment claims there will be no significant effects on air quality from the Project and states: "The EA for air quality identified no significant effects. Furthermore, the Air Quality Management Plan (Section 18.11) will be in place and will aim to eliminate all exceedances identified through modelling as those are predicted during worst meteorological and operational conditions. Therefore, no monitoring is proposed."	<p>R68. Develop and describe a monitoring program to: understand baseline conditions for environmental media, such as air, water, soil and country foods; monitor for increases in the environmental media as a result of project-related activities; provide relevant mitigative measures and alternatives to manage future risks.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to monitoring of environmental media.</p>

Source	Issue	Information Request and Rationale
Health Canada Q 5	<p>The only specific receptor referred to in the air quality and noise assessments is the worker camp, which the assessment considered a sensitive receptor.</p> <p>However, traditional activities in the region identified in Section 15 of the proposal include hunting, trapping, gathering, and fishing. There are also cabins located near the project boundary at North Lakes, Wolverine Lakes, Money Peak, Frances Lake, Pelly Banks and Money Creek.</p>	<p>R69. Include the following as receptors in the air quality and noise assessments:</p> <ul style="list-style-type: none"> a. cabins located near the Project b. any areas where traditional activities are taking place <p>To ensure a comprehensive environmental effects assessment can be conducted that includes relevant receptors.</p>
YG – Environment Q 54	<p>A component of PM_{2.5}, BC has been shown to have significant local impacts, especially in Arctic regions- BC lands on snow and ice, accelerating warming of the atmosphere and melting of snow and ice, and off-road transportation is a significant contributor to emissions. As a powerful climate forcer, reducing BC emissions can provide significant near-term benefits including the slowing of the rate of ice, snow, and glacier melt, and reversal of adverse precipitation changes.</p>	<p>R70. Calculate and include BC emissions as a component of PM_{2.5} using Canada's Black Carbon Inventory 2016. https://ec.gc.ca/air/3F796B41-0B87-4C14-76D-899D23CD0295/Black%20Carbon%202016-ENFinal.pdf</p> <p>To ensure a comprehensive environmental effects assessment can be conducted utilizing all relevant emissions for calculating PM_{2.5}.</p>
YG – Environment Q 55	<p>The document cites the National Inventory Report as the source for Yukon's emissions in comparison to Canada-wide totals. The Yukon government has established the NIR as inaccurate for Yukon, as illustrated with the Yukon Transportation Report (attached). The NIR is approximately 75% inaccurate for Yukon.</p>	<p>R71. Utilize data from the Yukon Transportation Report instead of the National Inventory Report to more accurately represent Yukon's greenhouse gas emissions.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted that uses relevant data sources.</p>
YG – Environment Q 57	<p>The proposal indicates open burning of plastics as a disposal plan. This will not be permitted. Therefore, waste management plans will need to be updated.</p>	<p>R72. Provide plans for waste management given that open burning of plastics will not be permitted.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted that incorporates all aspects of waste management for the Project.</p>
YG – Environment Q 59	<p>(Proposal s. 8.11.3.3) This section states that “Ambient monitoring results above YAAQS will trigger contingency measures ...”, however, there is no description for the monitoring plan.</p>	<p>R73. Provide an ambient air quality monitoring plan which describes the contingency measures and how they are triggered for implementation.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness</p>

Source	Issue	Information Request and Rationale
		of the proposed mitigation measure related to the ambient air quality monitoring plan.
YG – Environment Q 60	(Proposal s.6.6.1) This section states that “no monitoring is proposed”, based on the EA identifying no significant effects. This is in conflict with #4 (above) which describes that ambient monitoring results will be used to determine contingency efforts.	R74. Revise section 6.6.1 of the proposal to reflect the proposed monitoring plan. To ensure the proposal is consistent.
YG – Environment Q 61	(Proposal s.4.10.3.2) Clarification is required about the types of air pollutant sources and mitigation efforts that will be applied.	R75. Provide a Dust Management Plan that meets the criteria set out in Yukon Government – Department of Environment’s Dust Management Guideline, including: description of all sources, and for each source a description of the primary dust control measures, thresholds/triggers for management and contingency dust control measures. To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigation measure related to dust management.
7.0 NOISE LEVELS		
Health Canada Q 6	With the exception of blasting, the effects of tonal, impulsive and highly impulsive noise were not considered in the noise assessment.	R76. Update the noise assessment to consider the impacts of tonal, impulsive, and highly impulsive noise on human health (e.g., from activities such as hammering and pile driving). Refer to Health Canada's "Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise", available here: https://www.canada.ca/en/services/health/publications/healthy-living.html#a2.5 To ensure a comprehensive socio-economic effects assessment can be conducted.
Health Canada Q 7	Health Canada's Useful Information for Environmental Assessments guidance document suggests identifying all potential noise sources during construction, operation, and decommissioning (e.g., blasting, traffic, heavy equipment, or transformer). Refer to Health Canada's "Useful Information for Environmental Assessments" guidance document available here: http://publications.gc.ca/collections/collection_2015/sc-hc/H128-1-10-599-eng.pdf	R77. Specify the noise types and levels emitted by specific equipment or processes and update Table 7-5 of the proposal accordingly. To ensure a comprehensive socio-economic effects assessment can be conducted.

Source	Issue	Information Request and Rationale
EEM S 1.1	The proposal does not contain any information about how increased noise from truck traffic may affect residents in the community of Watson Lake. While the proponent states in its <i>Consultation and Engagement Plan</i> that its open house consultations will discuss the subject of “public highway traffic including number of concentrate haul trucks and supply vehicles per day during operations,” the subject does not appear in the proponent’s consultation materials or in the consultation record except when prompted by meeting participants.	<p>R78. If trucks will be travelling at night through the communities of Watson Lake and Upper Liard, what is the anticipated frequency and volume of nighttime traffic?</p> <p>R79. Provide baseline daytime and nighttime noise measurements in the communities of Watson Lake and Upper Liard and apply appropriate modelling techniques to assess the significance of increased road traffic.</p> <p>R80. Describe steps that will be taken in future consultations with Liard First Nation and the Municipality of Watson Lake to address potential increases of highway noise.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions and to ensure a comprehensive socio-economic effects assessment can be conducted.</p>
8.0 SURFACE WATER QUALITY AND QUANTITY		
Waste Rock and Tailings Management		
EcoMetrix p. 6	<p>The most critical deficiency in this assessment of water quality was the absence of acidic drainage estimates in the water quality modelling for post closure conditions. The use of the leach test results for neutral conditions represents a deficiency for water quality predictions over the long term. This also has implications for the proposed use of passive treatment with engineered wetlands after closure.</p> <p>It was acknowledged in the geochemical assessment that the PAG waste rock and tailings, in the Class A stockpile, and the waste rock in the Class B stockpile will produce acid in the future. The depletion of the neutralization potential will result in times to onset of acid drainage that are expected to be after the proposed mine closure period. Nonetheless, the PAG materials will eventually produce acid drainage even though the drainage will be mitigated to some extent by lower infiltration covers. The significance of the acid drainage is that the low pH will be accompanied by increased loadings, and concentrations, of many metals and other constituents that can adversely affect water quality. Although mitigation of the stockpiles by limiting infiltration with covers is planned, the increased concentrations and loadings associated with acid conditions compared to those predicted for</p>	<p>R81. Provide an estimate of the loading rates for acidic conditions in the potentially acid generating (PAG) rock that is estimated to occur after closure of the operation and after the onset of acidic conditions and production of acidic drainage.</p> <p>R82. Using the above estimates, provide an assessment of the effects of the proposed mitigation of infiltration rates by engineered covers on the mine rock stockpiles and the residual loadings of constituents of potential concern (COPC) from the stockpiles and from the pit walls.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted and to allow the Executive Committee to have confidence in the effectiveness of proposed mitigation (i.e., ensure water treatment options are capable of treating water quality from the waste rock piles taking into account mitigation measures such as covers).</p>

Source	Issue	Information Request and Rationale
	<p>neutral pH in this assessment will result in increased loadings and concentrations in the residual drainage from the covered piles. This will increase the loadings and concentrations requiring mitigation post closure. The acidic drainage with higher concentrations than those in the neutral drainage may not be treatable in a passive engineered wetland system.</p>	
EcoMetrix p.7	<p>The use of adjustment factors (referred to as “scaling factors” in the reports) to address water contact and storage of soluble loads, seasonally during the year, in the waste rock/tailings stockpiles are not well-founded and unnecessarily bias the laboratory loading rates to lower values for field loading rates. Clarification is therefore required on the use of scaling factors for covers on the class A and B stockpiles.</p> <p>Adjustment factors were proposed for the use of engineered covers on class A, B and C stockpiles. These were listed in Table 3-7 of Appendix D-7 as 0.05, 0.25 and 0.90 for the class A, B and C stockpiles, respectively. If these values refer to the reduction of infiltration into the stockpiles, then these values appear to be appropriate and are likely achievable with the appropriate cover designs.</p> <p>However, there is also a discussion of reduced loads from the class A, B and C stockpiles in Section 7.2 that are not the same as those shown in Table 3-7. The load reductions presented in Section 7.2 referred to reduced loads by 98%, 75% and 10% for the class A, B and C facilities, respectively. These appear to be referring to the same adjustment factors, except that for the class A stockpile. Table 3-7 refers to a value of 0.05, referring to a reduction of 95% of the load, while the 98% reduction referred to in Section 7.2 would represent an adjustment factor of 0.02 rather than 0.05.</p>	<p>R83. Clarify whether the adjustment factors are intended to be the same or if they have been applied separately and therefore represent double accounting of the adjustment factors. Provide rationale for the chosen approach.</p> <p>To allow the Executive Committee to understand and have confidence in all relevant predictions in relation to loading rates.</p>
EcoMetrix p.10	<p>The data suggest that the predicted selenium concentrations and/or loading rates associated to drainages from the stockpiles may be substantially underestimated.</p> <p>Data provided in Appendix D-7 and Section 6.2.2.1 of the proposal show that the selenium leaching rates for waste rock are a function of the selenium content in the</p>	<p>R84. Reassess the predicted loading rates for the mine rock in stockpiles at the site in the context of the known selenium contents in the rock. The relationship between selenium content and steady-state loading rates will provide information to enable adjustment of the loading rates by rock type to account for the 8% of the rock</p>

Source	Issue	Information Request and Rationale
	<p>solids, a phenomenon that is observed at other mines, and indicates that a further assessment of selenium content in the mine rock is warranted.</p> <p>Other results from the test program also suggest that selenium will be high in drainage from the tailings. The results of the field barrel tests as shown in Section 5.2.1.3 also indicate elevated concentrations of selenium in drainage.</p> <p>Also, It was not clear whether the results from the tailings leach tests that included the humidity cell HC-3 and column test C-10 were used to estimate loading rates from the Class A storage facility that will contain the tailings along with the high sulphur waste rock.</p>	<p>samples that had selenium contents greater than 6 mg/kg.</p> <p>R85. Incorporate the leaching rates for selenium from the tailings into the predicted concentrations in drainage from the class A facility that will include the tailings.</p> <p>R86. Reconsider, and update if necessary, the predicted selenium concentrations in the context of water treatment technology that will be used and the effects on selenium removal during operations.</p> <p>To allow the Executive Committee to understand and have confidence in all relevant predictions in relation to treatment of selenium.</p>
Water Management		
<p>EcoMetrix p.13 YG – Environment Q 6</p>	<p>The current baseline hydrometric program, as reported in Section 3.1.2.2 of the report, comprised a network of ten flow monitoring installations of which seven were continuous. The information provided in the report for the current baseline hydrometric program is from the end of April 2015 to late March 2016. Data for the continuous flow monitoring installations are available from the end of April 2015 to the Fall of 2015, are within the order of five spot measurements made from the Fall of 2015 through March of 2016, and are used to infer streamflow for that period.</p> <p>Typically, the minimum period considered for collection of baseline hydrometric data to characterize streamflow response is three years. This is required to begin to understand the natural variability of hydrometric data. The hydrometric network coverage is considered good and data collected in the current hydrometric program considered reasonable, however, only eleven months of data are available. The 1995 hydrometric data are considered useful for general information purposes only, as these data are sparse, have gaps, and their quality cannot be confirmed.</p> <p>The limited hydrometric information for the local study is considered an information gap. This information gap is important as results from the hydrometric monitoring program are used to calibrate and verify developed water balance models which are used to make projections related to receiving water quantity and quality. Additional</p>	<p>R87. Provide a detailed overview of the work planned to collect additional hydrometric monitoring information through the next project phase to further verify developed water balance models and projections related to receiving water quantity and quality.</p> <p>R88. Updated hydrometric baseline information, water quality objectives, and water models (e.g., water quality model, site and watershed balance models, surface water flows, etc.) for the site are required to be submitted prior to the Executive Committee drafting the screening report. To develop a reasonable understanding of short-term variability, sampling is required to be conducted and reported on at least two sampling events, including one during low-flow conditions and one during high-flow conditions, for each year in which 5 samples are collected in 30 days.</p> <p>R89. Provide further analysis to understand whether the information collected in the current (2015/2016) hydrometric monitoring program is representative of mean, dryer, or wetter than normal conditions. This could be undertaken by comparison to pertinent regional data. It was indicated in Appendix D-2 of the project Proposal that this was not undertaken as regional data for 2015 was unavailable. However, it is anticipated this regional data for 2015 would now be available.</p> <p>To allow the Executive Committee to understand all relevant hydrometric baseline conditions. Additionally, it will allow the Executive Committee to understand what baseline</p>

Source	Issue	Information Request and Rationale
	<p>hydrometric monitoring information would be useful to verify the work completed to-date and provide additional confidence in projections. Notwithstanding, it is anticipated this information could be collected through the next project phase and used to further verify developed water balance models and projections related to receiving water quantity and quality</p>	<p>information will be available to regulators during the permitting process.</p> <p>The Executive Committee requires updated hydrometric baseline information water quality objectives, and water models (e.g., water quality model, site and watershed water balance models, surface water flows, etc.) prior to drafting the screening report. This will ensure that our assessment is conducted on more accurate information for the site.</p>
EcoMetrix p.14	<p>A water balance modeling exercise was completed for average, wet, and dry climatic scenarios: average precipitation, 1 in 50 year precipitation, and 1 in 10 year dry precipitation. While it does not seem to be specified in the Water Balance Model Report, we understand that the water balance modeling exercise is for operations at year 10.</p> <p>The water balance modelling exercise does not provide information for all phases of the mine life from construction through operations, and the active, transition, and post closure phases. This is not considered consistent with industry standards and is considered to be an information gap. Typically, through the different phases of mine life there are changes in the volumes of water generated from various sources, and how it is managed and discharged to the environment and these should be accounted for in the assessment.</p>	<p>R90. Update the detailed water balance model for the project site to include all phases of the mine life from construction through operations, and the active, transition, and post closure phases.</p> <p>R91. Provide rationale for return periods used in modeling. In addition, using the updated water balance model, evaluate the following scenarios:</p> <ul style="list-style-type: none"> a. impact of an event, such as the 24-hour design events used in sizing of water management facilities; b. impact of an event such as extreme summer and winter low flows (7Q20 and 7Q10); c. greater than normal snowfall accumulation; and d. shorter and more critical snowmelt durations.
YG – Environment Q 32	<p>Appendix D-6, s.1.2 Modelling Philosophy. The proponent refers to a Microsoft Excel spreadsheet format developed for the Finlayson Creek watershed model. The proponent should provide a functioning copy of the spreadsheet water balance.</p> <p>The proponent states “The modelling goal was to estimate surface water discharge for mean, 50 year wet and 10 year dry precipitation years”.</p>	<p>R92. Undertake a sensitivity analysis to assess variability of model predictions given variation in key model input parameters and assumptions.</p> <p>To allow the Executive Committee to understand predicted water balance through all phases of the Project as well as for additional extreme scenarios. This will allow the Executive Committee to conduct a comprehensive environmental effects assessment to have confidence in the effectiveness of proposed mitigation (e.g., water management infrastructure).</p>
EcoMetrix p.15	<p>No information is provided on the detailed water balance computations illustrating the breakdown of typical water balance components (e.g., storm water, groundwater, seepage, evaporation/evapotranspiration, water management facility</p>	<p>R93. Include summary water balance model computations to the Water Balance Model Report, including the breakdown of typical water balance components, such as but not limited to: storm water; groundwater; seepage; evaporation/evapotranspiration,</p>

Source	Issue	Information Request and Rationale
	<p>operations inclusive of projected pond water levels, and inter-basin water transfers). This information is important in understanding the Project Site water balance.</p>	<p>and; water management facility operations and inter-basin transfers. To allow the Executive Committee to understand the Project Site water balance in order to conduct a comprehensive environmental effects assessment.</p>
<p>YG – Environment Q 25, Q 33</p>	<p>Values of potential evapotranspiration (PET) in Table 2-24 are high (April 51.3; May 84.5; June 106.2) and winter months list PET which would not be expected to occur. Appendix D-6. s.3.2.4 Evapotranspiration, Sublimation and Soil-Moisture Storage. The reported annual value of 30 mm (19 percent) sublimation seems low.</p>	<p>R94. Provide an explanation of how potential evapotranspiration estimates were derived. Please address concerns with high values in April, May and June as well as values for winter months. R95. Provide an explanation of how potential sublimation estimates were derived. Please address concerns with low values. To allow the Executive Committee to understand all relevant baseline conditions in relation to water balance.</p>
<p>EcoMetrix p.16</p>	<p>An assumed Diversion Ditch Efficiency of 50% is specified in Table 2.1 of the Appendix C 7. It is unclear what is meant by Diversion Ditch Efficiency and how related assumptions impact the Project Site water balance and management. For instance, does an assumed Diversion Ditch Efficiency of 50% mean that 50% of non-contact runoff to the north and south of the project area will enter the Project Site and have to be managed accordingly?</p>	<p>R96. Clarify what is meant by Diversion Ditch Efficiency and how flow volumes associated with diversion ditches are considered in the water balance model for the Project Site. To provide a clear understanding of diversion ditches and their effectiveness in managing water in relation to the site water balance.</p>
<p>EcoMetrix p.16</p>	<p>The Surface Water Management Plan (SWMP) is based on a water balance modelling exercise that does not provide information for all phases of the mine life from construction through operations and closure. This is not considered consistent with industry standards and is considered to represent an information gap. Typically, through the different phases of mine life there are changes in the volumes of water generated from various sources, and how it is managed and discharged to the environment and the variation in volumes should be assessed.</p>	<p>R97. Update the Surface Water Management Plan as appropriate based on the updated water balance model (requested in R90 of this Report). To allow the Executive Committee to have confidence in the site water management plan and the effectiveness of proposed mitigation (e.g., water management infrastructure).</p>
<p>EcoMetrix p.17</p>	<p>Water management structures include ponds and diversions. While design criteria are provided for the proposed ponds in Table 18-6, no design criteria are provided for the proposed diversions. However, it is noted in Section 4.10.1.1 (Water Diversions and Ditches) of the Proposal that all diversion ditches will be designed to</p>	<p>R98. Provide design criteria for the diversions and provide supporting computations to demonstrate that the diversions have been sized accordingly. R99. Provide computations demonstrating that proposed ponds as specified in the</p>

Source	Issue	Information Request and Rationale
	<p>manage a 1 in 200-year flood event. For both the ponds and diversions, no information is provided to assess if the provided volumes/designs are sized sufficiently to manage the stated design criteria or how the overall SWMP functions during the stated design conditions.</p>	<p>Proposal have sufficient storage volumes necessary to meet stated design criteria and safely convey the applicable Inflow Design Flood.</p> <p>R100. Provide water balance model computations demonstrating the Site Water Management Plan and proposed water management structures can function, on an overall basis, as intended under stated design conditions for all phases of the mine life.</p> <p>To allow the Executive Committee to have confidence in water management structure and their overall function in site water management.</p>
EcoMetrix p.18	<p>Proper drainage is important to insure water is collected and managed according to the SWMP. No internal drainage network is shown or discussed for the Class A Storage Facility to manage surface water without excessive erosion from rilling and channel formation. In addition, no perimeter ditching is shown for the Class B Storage Facility, Class C Storage Facility, and Overburden Stockpile to collect and convey storm water and seepage to respective collection ponds.</p>	<p>R101. Provided information on how surface water will be managed for the Class A Storage Facility, and how perimeter storm water and seepage will be managed for the Class B Storage Facility, Class C Storage Facility, and Overburden Stockpile.</p> <p>To provide a clear understanding of surface water management for waste storage facilities.</p>
EcoMetrix p.18	<p>Several items typically considered within a Sediment and Erosion Control Plan have not been considered in the Proposal. These include the management of water from dewatering activities and construction timing restrictions (e.g., for in-water/near water work).</p>	<p>R102. Update the Sediment and Erosion Control Plan to address:</p> <ul style="list-style-type: none"> a. management of water from dewatering activities; and b. construction timing restrictions (e.g., for in-water/near water work). <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures in relation to sediment and erosion control.</p>
EcoMetrix p.19	<p>It is uncertain if the proposed sediment collection pond volumes as specified in the Proposal have sufficient storage volumes to provide the hydraulic retention time necessary to achieve the design criterion identified.</p> <p>Section 18.6.3.2 of the Proposal states that sediments ponds will be:</p> <p><i>Designed to trap sediment particles of 10 microns in size or larger with flow volumes equivalent to a 1:200 year, 24-hour rainstorm for the Class A and Class B Storage Facilities Collection ponds and 1:10 year, 24-hour rainstorm for the Class C Storage</i></p>	<p>R103. Provide computations demonstrating that collection pond volumes as specified in the Proposal have sufficient storage volumes to provide the hydraulic retention time necessary to achieve the stated design criteria.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures in relation to sediment ponds.</p>

Source	Issue	Information Request and Rationale
	<i>Facilities Collection and Overburden Stockpile ponds.</i>	
EcoMetrix p.20	Information provided in Table 16-9 of Section 16.6.1 provides a list of typical high and very high confidence findings related to climate change. However, no analyses related to the water balance analyses have been provided which consider changes in climatic input design assumptions or change in type of design events.	<p>R104. Undertake a sensitivity analysis, in support of the discussion of effects and mitigation measures associated with both extreme events and climate change, using the water balance models developed for the Project to obtain an understanding of potential effects on water management structures and discharges strategies with variation in both model input assumptions and type of events.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted and to allow the Executive Committee to have confidence in the effectiveness of proposed mitigation (i.e., water management for extreme events and climate change).</p>
EcoMetrix p.20	The issue of downstream flow changes associated with the Project, specifically those related to alteration of natural hydrologic flow regime and associated impacts on downstream erosion, stream morphology and riparian vegetation may not have been assessed.	<p>R105. Provide an assessment of impacts associated with the Project on erosion, stream morphology and riparian vegetation of all affected drainages from projected downstream flow changes during all Project phases</p> <p>This information would demonstrate the proponent understands the full range of effects that may impact on downstream flow regimes and ensure a comprehensive effects assessment can be conducted.</p>
Future Acidic Conditions at Closure and Post-closure		
EcoMetrix p.21	<p>The mitigation measures proposed for the Class A, B and C stockpiles involve some types of engineered covers to be constructed at closure. It was assumed that the loadings from each stockpile will decrease by effectively limiting the infiltration into each facility.</p> <p>The initial loadings prior to mitigation by the constructed covers were assumed to be the same as those predicted from the results of the neutral pH laboratory and field barrel tests. The use of these initial loadings is inconsistent with the understanding that the Class A rock and tailings, and Class B rock piles will eventually produce acidic drainage. Therefore, the predicted loadings after closure are biased low because they are based on the neutral pH leaching results. Once acidification occurs, the loading rates for many metals and other constituents would be expected</p>	<p>R106. Provide an assessment of the long-term loadings and water quality associated with the acidic drainage that will eventually be produced in the A and B stockpiles as well as from the pit walls above the final water level.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted and to allow the Executive Committee to have confidence in the effectiveness of proposed mitigation (i.e., ensure water treatment options are capable of treating water quality from the waste rock piles taking into account mitigation measures such as covers).</p>

Source	Issue	Information Request and Rationale
	<p>to increase substantially above those that were estimated for neutral pH conditions. And, although the loadings from the stockpiles will be mitigated to some extent by reducing infiltration rates, the much greater intrinsic loading rates within the piles will affect the residual loadings of COPCs from each of the A and B stockpiles.</p> <p>Ignoring the future acidic drainage conditions in the A and B stockpiles represents a critical deficiency in the water quality predictions and may represent a flaw in the assumption that passive treatment will be possible in an engineered wetland system after closure. Acidic drainage will be accompanied by substantial loading rates of many metals and other constituents and the final drainage from the facilities may not be treatable in a wetland system to the extent required to protect the receiving environment.</p>	
Constructed Wetland Treatment Systems		
EcoMetrix p.24	<p>The constructed wetland treatment system (CWTS) proposed for the Site has been developed to a conceptual level only at this time, reviewers require additional information to evaluate the long-term environmental effect of the site. We recognize that design and implementation of a wetland treatment system will be site-specific and an iterative process. However, it is not clear to reviewers if the Proponent has a sufficiently developed plan to ensure that this can be achieved during the life of the Project.</p>	<p>R107. Provide a schedule for completion of each phase of the constructed wetland treatment system development to be conducted over the mine operation and provide rationale to support the feasibility of the schedule. The schedule should include consideration of designing for neutral and potential future acidic conditions for site waters during post-closure.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed approach of using constructed wetland treatment systems to address post-closure water quality.</p>
EcoMetrix p.24	<p>The discussion of the transition and post closure periods for the mine as discussed in Section 7.2 of Appendix D-7 indicates that there are treatment factors for the wetlands that are proposed for passive treatment after closure. The treatment factors are constituent-specific and affected by hydraulic retention time of the system. Appendix B of Appendix H-1, states that “proxies were applied from other projects with as similar of chemistry and conditions as possible”. However, there is no indication of what the treatment factor values are and how they affect the water quality leaving the wetlands. Clarification of the treatment factors is required.</p>	<p>R108. Provide details on the assumed water quality adjustment factor. Discuss these factors in the context of the predicted effluent concentrations for an engineered wetland in Tables 4 and 5 of the Contango report (Appendix B – Conceptual Wetland Design - of Appendix H-1 Conceptual Reclamation and Closure Plan).</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed approach of using constructed wetland treatment systems to address post-closure water quality.</p>

Source	Issue	Information Request and Rationale
EcoMetrix p.25	<p>The Proposal recognized the potential for ARD to develop over time in the class A and B materials. There is a need to evaluate the potential effects of acidic drainage on wetland treatment performance. It is likely that the quality of inflow water to the wetland will change in the future as ARD develops in Class A rock and tailings, and the Class B rock. For example, as ARD develops, greater loading of metals such as aluminum, cadmium, copper, iron, manganese, nickel and zinc can be expected.</p>	<p>R109. Provide cold weather case studies for passive wetland treatment systems designed for acidic conditions as well as case studies for passive wetland treatment systems that have successfully transitioned from treating neutral drainage to effectively treating acidic drainage with increased metal loadings.</p> <p>R110. Performance results for passive wetland treatment systems are usually expressed as a percent reduction of contaminant of potential concern (COPC) loads from inflow to outflow. Wherever possible, present performance as flow volumes treated and concentrations of COPC in the inflow and outflow.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed approach of using constructed wetland treatment systems to address post-closure water quality.</p>
Surface Water Quality and Quantity		
YG – Environment Q 9	<p>In their water quality model, BMC made predictions at KZ-37 (Geona Creek) instead of at an existing water quality monitoring station. KZ-37 is depicted as a “surface water quality monitoring station with prediction” on Figure 5-1 of this report but it is not shown on Figure 1-2 of, or mentioned at all in, the 2015-2016 Surface Water Quality Baseline Report. Instead, the median monthly water quality for select modelled parameters at this location is estimated using median monthly baseline water quality and flows at KZ-9 and KZ-18. This is problematic because it results in the comparison of water quality predictions generated by the water quality model to estimated water quality at KZ-37, rather than measured water quality at this location.</p> <p>It would be beneficial to collect water quality data at the same location as the modelled water quality. However, KZ-37 and KZ-17 may be essentially equivalent if there is no additional water flowing into Geona Creek between the locations.</p>	<p>R111. Provide rationale and a discussion for using KZ-37 as a surface water quality monitoring station with predictions including:</p> <ol style="list-style-type: none"> a. how baseline information from sites KZ-9 and KZ-18 are representative of conditions at site KZ-37; b. consideration for establishing KZ-37 as a surface water quality monitoring station; and c. consideration for using an alternative existing station such as KZ-17. <p>To allow the Executive Committee to understand all relevant baseline conditions and their relevance to the water quality predictions.</p>
YG – Environment	<p>A statistician with a background in WQO derivation was recently contracted by Yukon government to prepare a statistical justification for baseline water quality</p>	<p>R112. Provide a detailed overview of the work planned to collect additional water quality monitoring information through the next Project phase to further verify developed</p>

Source	Issue	Information Request and Rationale
Q 6	<p>data requirements for quartz mining projects.</p> <p>The statistician was provided with available, relevant water quality data collected in Yukon, including data from the Wolverine mine, a mining project nearby and analogous to the proposed Kudz Ze Kayah project. The statistician concluded that three years of recent, continuous baseline water quality data is the minimum duration required to (a) generate a reasonable understanding of natural variability of water quality, and (b) detect systematic changes in water quality over time, if present.</p>	<p>water quality model and projections related to receiving water quality.</p> <p>R113. Updated water quality baseline information, water quality objectives, and water models (e.g., water quality model, site and watershed balance models, surface water flows, etc.) for the site are required to be submitted prior to the Executive Committee drafting the screening report. To develop a reasonable understanding of short-term variability, sampling is required to be conducted and reported on at least two sampling events, including one during low-flow conditions and one during high-flow conditions, for each year in which 5 samples are collected in 30 days.</p> <p>To allow the Executive Committee to understand all relevant water quality baseline conditions. Additionally, it will allow the Executive Committee to understand what baseline information will be available to regulators during the permitting process.</p> <p>The Executive Committee requires updated water quality baseline information, water quality objectives, and water models (e.g., water quality model, site and watershed water balance models, surface water flows, etc.) prior to drafting the screening report. This will ensure that our assessment is conducted on more accurate information for the site.</p>
EcoMetrix p.28	<p>The water balance modeling exercise at the watershed scale was for operations at year 10 and several closure conditions. No information was provided in this report for the construction phase or any of the projected years of operation. This is not considered consistent with industry standards and considered an information gap.</p> <p>The watershed water balance model was calibrated with data from the 2015/2016 hydrometric monitoring program. Additional hydrometric data would be useful to further calibrate the watershed water balance model, verify model development and model parameter assumptions, verify work completed to-date, and provide additional confidence in projections.</p>	<p>R114. Update the watershed model to include all phases of the mine life from construction through operations, and the active, transition, and post closure phases.</p> <p>R115. Undertake a sensitivity analysis to assess variability of model predictions given variation in key model input parameters and assumptions.</p> <p>To allow the Executive Committee to understand predicted watershed level water balance through all phases of the Project and to ensure the model is representative of site conditions. This will allow the Executive Committee to conduct a comprehensive environmental effects assessment to have confidence in the effectiveness of proposed mitigation (e.g., water management infrastructure).</p>
EcoMetrix p.30	<p>The proposed threshold criteria for surface water quantity and quality used to assess the magnitude of projected changes in the receiving environment seem arbitrary. For example, for water quality, exceedance of a pWQO is often considered to be a high effect, whereas the Proponent is proposing a threshold of</p>	<p>R116. Provide justification and rationale for the proposed threshold criteria for surface water quantity and quality used to assess the magnitude of projected changes in the receiving environment.</p>

Source	Issue	Information Request and Rationale
	10 times the pWQO or greater to represent a high level effect.	This information would demonstrate the proponent understands the full range of effects that may impact on projected changes in the receiving environment and ensure a comprehensive effects assessment can be conducted.
YG – Environment Q 4	The Preliminary Water Quality Objectives report states that “The derivation of these pWQO has been performed following the methods outlined by Canadian Council of Ministers of the Environment (CCME) (2003) and is consistent with other permitted mining projects in Yukon;” however, it is not demonstrated that this is the approach used to develop the preliminary WQO for selenium.	R117. Provide additional rationale for the derivation of Preliminary Water Quality Objectives (pWQO), including reference to recent, peer-reviewed literature, for the proposed approach to developing a water quality objective (WQO) for selenium. The discussion should include consideration of alternative approaches.
Environment and Climate Change Canada ECCC - 004	<p>The Proponent has indicated groundwater quality in the local study area (LSA) will be measured against applicable water quality guidelines as listed in the Project Proposal (9.1. Assessment Approach, pp 9-3). Further, the Proponent noted they identified natural exceedances of the water quality guidelines and would consider developing site specific water quality objectives at compliance monitoring locations.</p> <p>ECCC notes that the use of natural background concentrations at Kud Ze Kayah may not be appropriate as there have been insufficient information to support the background approach. Further, the Proponent has neither indicated the approach to the site specific water quality objectives nor appropriate background studies completed.</p>	This information would demonstrate the proponent understands the full range of effects that may impact on projected changes in the receiving environment and ensure a comprehensive effects assessment can be conducted.
EcoMetrix p.30	<p>The Proponent proposes variable pWQOs for several water quality parameters, including sulphate, nitrite, selenium, cadmium and zinc. However, the Proposal does not clarify how such variability could be applied in a practical sense to control emissions during each phase of the Project (e.g. as part of licensing).</p> <p>Variable WQOs may be justified from a toxicological perspective but can prove difficult to apply for regulatory purposes. It is common to reduce the complexity of variable objectives by applying a fixed WQO, a site specific WQO, or a seasonal WQO. In all cases, the most conservative WQO is generally applied.</p>	<p>R118. Provide details on how variable Preliminary Water Quality Objectives (pWQOs) would be applied and enforced on an operational basis from a practical perspective.</p> <p>R119. Provide evidence of other sites where this approach has been applied.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed approach of using variable pWQOs.</p>
EcoMetrix p.30	The operations water management strategy proposes a proportioned discharge rate	R120. Clarify how the 3:1 ratio at KZ-37 and 2:1 ratio at KZ-15 will be achieved and verified.

Source	Issue	Information Request and Rationale
	<p>to Geona Creek and Finlayson Creek. However, the Proposal does not clarify how release volumes will be controlled to achieve this threshold.</p> <p>A flow proportioned discharge rate is a valid approach for managing downstream water quality but it requires greater effort to measure downstream flows and to control the discharge rate. This can prove difficult, especially during ice-bound conditions.</p>	<p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed approach of using proportioned discharge rates.</p>
EcoMetrix p.31	<p>The Proponent’s assessment of potential effects on the receiving environment assumes that a high degree of treatment efficiency will be achieved. The Proponent’s conclusion of no significant adverse effects to surface water quality is substantially tied to the assumed treatment efficiencies. However, the Proposal does not provide sufficient information to defend the assumed efficiencies.</p>	<p>R121. Provide justification for the assumed treatment efficiencies.</p> <p>R122. Provide contingency options in the event that proposed water treatment options do not achieve their intended efficiencies.</p> <p>To allow the Executive Committee to determine if they have confidence in the efficiencies of proposed water treatment options and whether the treatment efficiencies can actually be achieved in the field.</p>
Health Canada Q 9	<p>There is little discussion of drinking and recreational water in this project proposal. The surface water quality and quantity assessment states "Discussions with local Kaska citizens indicated that surface water at Fault Creek is used as a drinking source...". The assessment of groundwater quality and flow states "Also, direct use of groundwater resources, such as drinking water wells, is highly dependent on groundwater quality." Table 4.1 in Appendix F-3 also highlights concerns of the Ross River Dena Council over impacted drinking water quality in Cache Creek and Ketzka River.</p>	<p>R123. Identify potential sources of water used for drinking and recreational purposes in the region of the proposed Project.</p> <p>R124. Provide an assessment of the potential for adverse human health effects from drinking and recreational waters impacted by the proposed Project.</p> <p>To ensure a comprehensive socio-economic effects assessment can be conducted.</p>
YG – Environment Q 8	<p>Comments provided by Mineral Resources Branch describe deficiencies related to waste management, options assessment, and the conceptual reclamation and closure plan. Furthermore, limited details are provided concerning the proposed in situ treatment of the ABM Lake or the conceptual constructed wetland treatment system. The removal rates and treatment factor used in the water quality model are not justified. It is not possible to assess potential significant, adverse effects to the downstream receiving environment without this information.</p>	<p>R125. Provide a report that details the proposed treatment methods, justifies site-specific treatment rate coefficients, and predicts the chemistry of the treated effluent. Based on the information in this report, provide an updated water quality model (i.e., with updated mine source loads) and, if necessary (e.g., if new contaminants of potential concern are identified), an updated water quality objectives report.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted and to allow the Executive Committee to have confidence in the effectiveness of proposed</p>

Source	Issue	Information Request and Rationale
		mitigation (i.e., water treatment and achieving proposed water quality objectives in the receiving environment).
EcoMetrix p.33	<p>A water treatment plant is proposed for the management of water quality during the operation. The necessity of a water treatment plant is based on the acknowledgement that the high sulphur PAG material will produce drainage during operations that requires management before release to the environment. The assumption of reverse osmosis technology for water treatment is reasonable. However, reverse osmosis is an expensive treatment option and the feasibility of treating large quantities of waste water should be proven.</p> <p>In addition, the byproduct of reverse osmosis is a high concentration effluent that also requires management and this was not acknowledged or considered in water management or in the water quality model during the operation. The disposal of high contaminant concentration waste generated by the use of reverse osmosis can be problematic. The current assumptions for treated water quality are summarized in Table 5-15 and Appendix D-7. Treatment technologies other than reverse osmosis will lead to different concentrations than those shown in Table 5-15 for treated water and will alter the water quality predictions during operations.</p>	<p>R126. Provide rationale and justification for the use of reverse osmosis as a feasible treatment option considering the large quantities of waste water needed to be treated.</p> <p>R127. Provide details on how the by-product of a reverse osmosis water treatment plant will be addressed. This can be done by either including the by-product in the assessment or proposing an alternate treatment process. If an alternative to reverse osmosis is considered, update Section 5.2.1.7 of Appendix D-7 (Water Quality Report) of the proposal based on the revised assumptions for the quality of treated water.</p> <p>To allow the Executive Committee to determine if they have confidence in the water treatment options and to ensure all aspects of water treatment have been considered.</p>
EcoMetrix p.34	<p>It is not clear if the capacities of the water management ponds are sufficient to accommodate both demands, and if not, how this would affect water management, specifically release volume controls and discharge to Geona Creek and Finlayson Creek.</p> <p>The operations water management strategy states that the discharge to Geona Creek and Finlayson Creek will be limited to discharge volume ratios no less than 3:1 at KZ-37 and 2:1 at KZ-15. The Proposal does not clarify how it intends to achieve this at all times.</p>	<p>R128. Provide details and justification to support sufficient capacity in the water storage ponds to accommodate the design storm during a wet year, and how the water management ponds will be managed to achieve release volume controls at all times.</p> <p>To allow the Executive Committee to determine if they have confidence in the water storage capacities and ability to manage water accordingly.</p>
EcoMetrix p.34	<p>The water quality assessment assumes that covers for the Class A, B and C storage facilities will be in place for the transition closure phase and will reduce loadings of COPCs by 98%, 75% and 10%, respectively.</p>	<p>R129. Clarify whether the reduction of infiltration was applied to achieve 2% of precipitation through the cover or applied as a 98% reduction in loadings for the water quality model as these are not the same.</p>

Source	Issue	Information Request and Rationale
	<p>The load reductions are proposed as a result of reducing infiltration through the cover systems to 2, 25 and 90% of the mean annual precipitation for the A, B and C facilities, respectively. Typically, exposed waste rock will have infiltration rates greater than 50% (as suggested in Figure 2-5 in Appendix A of Appendix H-1) but less than 100% of precipitation. If a typical value of 60% of precipitation is assumed for exposed waste rock, then a reduction of infiltration to 2% of precipitation represents a 96.7% reduction in infiltration compared to the uncovered rock. This will equate to a 96.7% reduction of load for a constant soluble load in the rock, not a 98% reduction in load as suggested in the water quality model report.</p> <p>The conceptual design for the Class A cover to achieve an infiltration rate equivalent to 2% of mean annual precipitation is presented in Appendix A of Appendix H-1 (Conceptual Reclamation and Closure Plan). The conceptual design includes the key theoretical components of a low permeability cover including a frost protection layer, a “liner” and a bedding layer to protect the liner. In theory, the infiltration may be controlled to 2% of precipitation through a cover system with this ideal conceptual design. However, it is questionable whether the technical and/or cost challenges of constructing such a cover in this northern climate can be overcome.</p>	<p>R130. Provide examples of cover systems in similar climate conditions that have demonstrated reductions in infiltration rates on waste rock and/or tailings representing 2% or less of mean annual precipitation.</p> <p>To allow the Executive Committee to determine if they have confidence in the ability of the cover systems to reduce infiltration to the extent identified by BMC.</p>
EcoMetrix p.34	<p>The equations used to predict surface water quality include an attenuation factor yet the Proposal does not specify the values used or their justification. The chemical loading discharged to the receiving environment may attenuate through various chemical, biochemical or physical process (other than dilution). The attenuation for nitrogen compounds may be high in headwater creeks, such as those which characterize the receiving environment. However, the attenuation for most metals may be low. It is common to conservatively assume no attenuation for those parameters having low potential for attenuation.</p>	<p>R131. Provide the attenuation factors used in the model for each contaminant of potential concern (COPC) and provide justification for their use.</p> <p>To allow the Executive Committee to determine if they have confidence in attenuation factors proposed by BMC.</p>
EcoMetrix p.35	<p>The attenuation of nitrogen compounds (ammonia, nitrite, nitrate) is expected to be high for headwater creeks, such as those which characterize the receiving environment. However, the Proposal does not specify the values used or their</p>	<p>R132. Provide the attenuation factors used in the model for nitrogen compounds and provide justification for their use.</p> <p>To allow the Executive Committee to determine if they have confidence in attenuation</p>

Source	Issue	Information Request and Rationale
	<p>justification.</p> <p>In such creeks, ammonia generally nitrifies to nitrite followed by rapid oxidation of nitrite to nitrate. As such, the ammonia concentration is expected to attenuate during ice-free periods at a rate greater than dilution, and nitrate is expected to be elevated above the diluted concentration. Nitrite is expected to be negligible. The results presented differ from expectations.</p>	<p>factors proposed by BMC.</p>
9.0 GROUNDWATER QUALITY		
<p>YG – Environment Q 1, Q 2</p>	<p>Groundwater conditions at the site have not been adequately described. The continuous data set on groundwater only began in May 2015 and continues until November 2016 – roughly a year and a half.</p> <p>Upon review of the baseline data presented with the proposal, which shows very high variability between years, ENV recommends at least three years of continuous monitoring to adequately describe groundwater conditions at the site. This understanding is needed to set appropriate design standards for water and wastewater facilities (i.e. water treatment plant, seepage collection ditches, etc.). This understanding will also support development of preliminary water quality objectives, site-specific discharge standards and water quality objectives.</p> <p>In addition, the most current groundwater baseline report does not mention artesian conditions in their assessment. In contrast, site investigations in 1995 and in 2015 described artesian groundwater conditions in some locations of the project footprint.</p>	<p>R133. Provide a detailed overview of the work planned to collect additional groundwater quality and quantity monitoring information through the next project phase to further verify developed groundwater quantity and quality models.</p> <p>R134. Updated groundwater quality and quantity baseline information and water models (e.g., groundwater quantity and quality models, etc.) for the site are required to be submitted prior to the Executive Committee drafting the screening report.</p> <p>To allow the Executive Committee to understand all relevant groundwater baseline conditions. Additionally, it will allow the Executive Committee to understand what baseline information will be available to regulators during the permitting process.</p> <p>The Executive Committee requires updated groundwater quality and quantity baseline information and water models (e.g., groundwater quantity and quality models, etc.) prior to drafting the screening report. This will ensure that our assessment is conducted on more accurate information for the site.</p>
<p>Environment and Climate Change Canada ECCC - 006</p>	<p>In order to determine impacts due to the Project, physical and hydraulic properties of existing permafrost should be understood.</p> <p>The Proponent has indicated that discontinuous permafrost to exist in the project area. “The Project is located in an area with discontinuous permafrost. Norecol, Dames & Moore Ltd. (1996) noted that permafrost is present on north and west</p>	<p>R135. Ensure the distribution, extent, and hydraulic properties of the permafrost areas are included in the groundwater flow and quality characterization.</p> <p>This information would demonstrate the proponent understands the full range of effects that may impact on groundwater in relation to permafrost and ensure a comprehensive effects assessment can be conducted.</p>

Source	Issue	Information Request and Rationale
	<p>facing slopes along the Geona Creek valley, especially above 1,400 masl.”</p> <p>Despite the Proponent’s conclusion, ECCC notes that groundwater permafrost interaction is an important component of project impact assessments and water license process. Potential groundwater-surface water interactions at the valley aquifer and Geona Creek can likely be influenced by the presence or absence of permafrost conditions slopes where groundwater recharge occurs. For ECCC to assess impacts to quality and quantity of groundwater and surface water, the groundwater-permafrost interactions need to be adequately characterized. As such, the potential impact of dewatering (overburden, bedrock) to quality and quantity of groundwater, Geona Creek, South Creek, Finlayson Creek and other surface water cannot be assessed based on the insufficient information with respect to nature of the permafrost. The Water license process requires the Proponent to determine whether there is a likely hydraulic connectivity between groundwater aquifers and permafrost.</p>	
<p>Environment and Climate Change Canada ECCC - 007</p>	<p>Mine dewatering creates stress on groundwater flow regimes. Assessment of potential effects of mine dewatering on the quantity and quality of groundwater and related surface water are critical aspects of the EA. For ECCC to understand the effect of mine dewatering on quality and quantity of groundwater and surface water hydrology at Kudz Ze Kayah, a thorough understanding of groundwater inflow estimates with respect to the various mine phases is required.</p> <p>The Proponent has indicated that overburden dewatering will initially be performed for a six-month period to permit access to the bedrock. Overburden dewatering will result in a reduction of the base flow to Geona Creek around the proposed open pit and immediately to the north. The Proponent has proposed flow augmentation in Geona Creek by discharging the ABM pit water into the creek, and is expecting that dewatering of the overburden will not to have any adverse effects on groundwater quality.</p> <p>Groundwater quality in the overburden will likely differ from the water quality in Geona Creek. Further, mixing of groundwater in the pit from shallow overburden</p>	<p>R136. Provide an assessment of the potential impacts of mine dewatering on quantity and quality of the head waters of Finlayson Creek, unnamed creeks south and southwest of the ABM pit, and the North Lake Systems.</p> <p>This information would demonstrate the proponent understands the full range of effects that may impact on surface water flows in relation to dewatering mine components and ensure a comprehensive effects assessment can be conducted.</p>

Source	Issue	Information Request and Rationale
	<p>aquifer and bedrock aquifers will result in water quality different from Geona Creek. The overburden and bedrock dewatering will likely have adverse effects on water quality in the receiving environment. The Proponent’s plan to discharge the ABM pit water to Geona Creek requires clarification. Further, the discharge water management plan (pp 9-20) has not clearly indicated the types of treatment that will be applied and the resulting water quality to be discharged into the receiving environment.</p> <p>ECCC notes that the mineralized zone in the pit and underground workings could likely contribute contact groundwater with elevated concentrations of contaminants of concern. In addition, elevated concentrations of contaminants could mix with shallow groundwater via structures and impact water quality of shallow groundwater and receiving environment.</p>	
<p>Environment and Climate Change Canada ECCC 008, ECCC 009</p>	<p>The hydrogeological conceptual model is unnecessarily simplified and did miss key components; the potential groundwater-surface interactions, artesian flows, permafrost, recharge and discharge locations. As indicated in (Golder, 1999b), pp 5), the potential interaction between overburden aquifer, bed rock aquifer, and the surface water have not been sufficiently described. Preferential flows via high permeability zones associated with structural features have not been sufficiently addressed.</p> <p>ECCC notes that, the unnamed tributary south and southeast of the ABM pit will likely be impacted due to mine dewatering and underground workings. The unnamed tributaries are also likely hydraulically connected to the North Lakes Systems. As such, the potential impact to quantity and quality of the North Lakes due to Mine dewatering should be incorporated in the hydrogeological conceptual models.</p> <p>ECCC notes that the conceptual hydrogeological description showed neither potential flows via structures such as fault zones (Fault zones) nor the likely interaction between the overburden aquifer, fractured bedrock, and the surface water</p>	<p>R137. Provide conceptual hydrogeological models for the project site that show groundwater flow regimes both during mine operation and completion of mining and closing of the underground workings. The conceptual hydrogeological models should incorporate key components including:</p> <ul style="list-style-type: none"> a. recharge and discharge zones; b. preferential flow pathways; c. hydraulic gradient and the likely connectivity of overburden aquifer; d. bedrock aquifer; and e. surface water. <p>This information would demonstrate the proponent understands the full range of effects in relation to groundwater flows and ensure a comprehensive effects assessment can be conducted.</p>

Source	Issue	Information Request and Rationale
<p>Environment and Climate Change Canada ECCC, 008</p>	<p>The surficial geology below the Class A waste rock facility suggests variable ground conditions, comprised of morainal tills, glaciofluvial complex and fan deposits. Further, the glaciofluvial deposits constitute the “downstream” toe of the S-PAG dump; extending in direction to downgradient of the potential capture influence of the lower-most water management pond (Figure 3).</p> <p>ECCC notes that there are no monitoring wells installed in the vicinity of Class A Storage Facility to assess the potential impact of infiltration out of the facility on the receiving environment. In addition, there has been insufficient information with respect to the potential capture of infiltration out of the Class A Storage Facility.</p> <p>Further, ECCC notes that the saturated screen lengths used to monitor groundwater quality didn’t comply with standard procedures and recommendations as provided in BC MOE 2009b. As recommended by BC MOE, maximum saturated screen lengths should be limited to 1.8 m within the target hydrostratigraphic unit. The use of longer screens for water quality monitoring would cause dilution of constituents and water quality data from such wells should not be compared directly with groundwater quality standards unless supporting rationale can be provided.</p>	<p>R138. Produce a conceptual hydrogeological model of the Class A Storage Facility. This may form part of the conceptual hydrogeological models for the project site requested above in R137.</p> <p>R139. Provide a groundwater monitoring plan in order to assess seepage, baseflow, and groundwater flow downstream of the facility.</p> <p>R140. Provide rationale for using saturated screen length longer than 1.8m in the groundwater monitoring program and discuss the effect on water quality samples.</p> <p>R141. Provide well decommissioning information for the abandoned wells that will not be used for the monitoring program.</p> <p>This information would demonstrate the proponent understands the full range of effects in relation to groundwater flows and ensure a comprehensive effects assessment can be conducted.</p>
<p>Environment and Climate Change Canada ECCC, 010</p>	<p>The Proponent has not conducted sensitivity analysis to capture those uncertainties associated with fault zone hydraulic properties. Faults may act as a barrier to groundwater flow, or as a conduit. Further analysis of the conductivity of the fault zones is required using the available site data.</p>	<p>R142. Conduct a sensitivity analyses for the predictive hydrogeological model in order to assess potential impacts on quantity and quality of groundwater inflow to the pit and its impact on surface hydrology. The analysis should address uncertainties associated with fault zone hydraulic properties.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted and to allow the Executive Committee to have confidence in the predictive hydrogeological model.</p>
<p>10.0 AQUATIC ECOSYSTEM RESOURCES</p>		
<p>Fisheries and Oceans Canada</p>	<p>The Proponent has proposed in their preliminary offsetting plan an option involving restoration of fish passage for the Robert Campbell Highway culvert crossing of Finlayson Creek.</p> <p>The Proponent has identified that this culvert crossing structure is the responsibility</p>	<p>R143. Provide additional information in relation to the Fish Offsetting Plan as presented in Appendix 4. Details should include a discussion on:</p> <p>a. the feasibility of including the culvert restoration as part of the plan given it is the</p>

Source	Issue	Information Request and Rationale
	<p>(ownership) of the Yukon Government Highways and Public Works.</p> <p>DFO's preference is for an open bottom structure (clear span or arch culvert) that mimics the natural stream channel to have confidence in the permanence of fish passage restoration.</p> <p>Baseline information is available for Genoa Creek as well as for some locations in East Creek and in Finlayson Creek upstream of the Robert Campbell Highway; however, there is limited baseline information for areas in Finlayson Creek downstream of the Robert Campbell Highway and in the surrounding areas of the Finlayson River. The baseline data is required for both upper and lower reaches in sufficient quantity as to clearly demonstrate what the gaps in fisheries productivity are. The intent of offsetting measures is to result in increased fisheries productivity. The effectiveness monitoring plan and associated performance measures, in conjunction with the baseline data, should be robust enough to demonstrate that an overall increase in fisheries productivity has resulted and not simply a redistribution of fisheries productivity</p>	<p>jurisdiction of the Government of Yukon;</p> <p>b. other potential offsetting measures that have been explored with reasons for discounting them;</p> <p>c. how the plan will take into account the most recent DFO policy, <i>Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting</i> (DFO, 2013c), including how the guidance will be incorporated into a revised offsetting plan (e.g., quantifying losses and gains, and accounting for uncertainties).</p> <p>R144. Provide baseline information for areas in Finlayson Creek downstream of the Robert Campbell Highway and in the surrounding areas of the Finlayson River. Contact Fisheries and Oceans Canada to determine what the specifics of baseline information requirements related to the Fish Offsetting Plan.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted and to allow the Executive Committee to have confidence that the Fish Offsetting Plan will achieve the intended purpose.</p>
EcoMetrix p.41	<p>The Proponent cites two recent DFO guidance documents for the proposed Fish Offsetting plan in Appendix E-4:</p> <ul style="list-style-type: none"> • Fisheries and Oceans Canada (DFO). 2013a. Implementing the New Fisheries Protection Provisions under the Fisheries Act. Discussion Paper. Fisheries and Oceans Canada, April 2013. • Fisheries and Oceans Canada (DFO). 2013b. An Applicant's Guide to Submitting an Application for Authorization under Paragraph 35(2)(b) of the Fisheries Act, November 2013. <p>However, the most recent <i>Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting</i> (DFO, 2013c) is not cited and it is not clear if this guidance was used. The proposed offsetting plan generally includes most of elements prescribed by DFO (2013c). However some suggested components are not included in the plan. Losses and gains are not particularly well quantified and uncertainty is not</p>	

Source	Issue	Information Request and Rationale
	accounted for.	
Fisheries and Oceans Canada	<p>The Proponent has characterized impacts to fish habitat in terms of alterations in water flow. Further, the proposed flow alterations involve various combinations of increase/decrease over time.</p>	<p>R145. Provide a characterization of effects in relation to related to areal extent (m²) alterations (i.e., area affected) as well as an accounting of this area by habitat type and reach. Details should include:</p> <ul style="list-style-type: none"> a. effects between each stage of these alterations should be evaluated and accounted for; b. areal extent changes as a result of groundwater changes; c. riparian clearing required for the Project; d. impacts to fish habitat from the footprints for the overburden storage facility, Storage Facilities A/B/C and the associated runoff collection ponds <p>R146. Provide a characterization of impacts to stream substrate recruitment and flushing in downstream areas of Genoa Creek.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to impacts to fish and fish habitat.</p>
YG – Environment Q 50	<p>The proponent has chosen Arctic grayling for monitoring aquatic health among fish species. To identify potential effects they state they will monitor for changes in fish distribution (presence/absence data), abundance estimates and fish condition factor. As it is currently written, the proponent has only used presence and absence electrofishing techniques to establish their baseline. They did not adequately sample for abundance, nor did we see estimates of condition factor.</p> <p>The data above will aid in standardizing the sampling effort and therefore allow for repeatability when estimating abundance. To adequately address fish abundance the proponent should include the following:</p> <ul style="list-style-type: none"> • To adequately sample for abundance the proponent must establish electrofishing stations of a defined length. • UTM's should be reported at the top and bottom of each station (So that 	<p>R147. Demonstrate how abundance estimates and fish condition factor have been considered in the sampling to date and proposed sampling moving forward.</p> <p>This information would demonstrate the proponent understands the full range of effects that may impact on aquatic health among fish species and ensure a comprehensive monitoring program can be conducted.</p>

Source	Issue	Information Request and Rationale
	<p>repeat trials can occur within each station, among years).</p> <ul style="list-style-type: none"> • Water conductivity and temperature, for each station, at the time of each sampling should be reported. • Stream stage should be reported (How deep was the section (station) of stream, where and when it was sampled). • Wetted width should also be reported within the section (station) area. • Preferably, each station should be block netted and a removal method employed to allow for a reasonable assessment of abundance. Several sweeps (passes) should occur within each station • Control stations should be established outside any potential impact area. • Estimates or indices, of species abundance should be established for each station. 	
EcoMetrix p.41	<p>Section 10.6.5 of the Proposal states that fish tissue monitoring for heavy metals and selenium will be conducted as per the existing water license, every two years, at Finlayson Creek stations, using slimy sculpins as the target species. There is no mention of how the fish tissue quality data will be interpreted, for example, by examination of trend, or by comparison to fish tissue guidelines. In the latter case, fish tissue guidelines, such as the BCMOE guidelines for selenium or others, have not been identified in the Proposal</p>	<p>R148. Identify the criteria to be used in the interpretation of fish tissue monitoring data over the course of the Project.</p> <p>R149. Provide rationale for not sampling and conduction metals testing on Arctic Grayling.</p> <p>This information would demonstrate the proponent understands the full range of effects that may impact on aquatic health among fish species and ensure a comprehensive monitoring program can be conducted.</p>
YG – Environment Q 51	<p>Metals Testing in fish was limited to Slimy Sculpin from the Geona Creek and Finlayson Creek systems. The South Creek, North Creek, and North Lakes systems have also been under represented for metals sampling. This sampling is of particular importance for the North Lake which is an important fisheries resource for First Nations in the area.</p>	
EcoMetrix p.41	<p>Section 10.6.3 of the Proposal states that sediment quality (metals, TOC, particle size) will be monitored every two years and evaluated in terms of trends over time.</p>	<p>R150. Identify the criteria to be used in the interpretation of sediment monitoring data over the course of the Project.</p>

Source	Issue	Information Request and Rationale
	<p>There is no indication that sediment quality guidelines will be considered. In the Aquatic Ecosystem and Resources Baseline Report (p.29) metal concentrations were compared to CCME sediment quality guidelines. It would be useful to know if these guidelines will be used to evaluate sediment monitoring data over the course of the Project.</p>	<p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures in relation to sediment monitoring programs.</p>
EcoMetrix p.38	<p>Predictions for phosphorus are compared to the trigger range (Table 10-8) and specifically to the upper value of that range (p.10-42) for the appropriate trophic category in the Proposal. However, the Proposal does not mention what the appropriate trophic category is for the Geona Creek control point, KZ-37. Since the average baseline phosphorus is 0.008 mg/L at KZ-37 (p.10-43) we assume the appropriate category is “oligotrophic” which has an upper value of 0.01 mg/L. Only 14.4% of predictions exceed, yet the mean phosphorus is 0.012 mg/L, suggesting a higher frequency of exceedance. It would be helpful if the selected trophic category and the phosphorus limit used for each location could be clearly stated.</p>	<p>R151. Provide the selected trophic category and the phosphorus limit used for each location in Genoa Creek and Finlayson Creek.</p> <p>To allow the Executive Committee to understand the potential effects related to phosphorus in Genoa and Finlayson Creeks in order to conduct a comprehensive environmental effects assessment.</p>
EcoMetrix p.39	<p>The preliminary WQOs specified in Appendix D-8, Table 3-1, are presented for four receiving water locations (KZ-9, KZ-13, KZ-15 and KZ-26). It is not clear if the Proponent is suggesting that both effluent limits and water quality limits for specified receiving water control points will become the basis for future license conditions.</p>	<p>R152. Identify the effluent quality parameters, the water quality parameters and control points that could be proposed to be specified for future license condition development.</p> <p>R153. Provide details of a monitoring program for flows and water quality to be conducted prior to licensing that will provide sufficient support for licensing.</p> <p>To allow the Executive Committee to understand the effectiveness and feasibility of mitigation measures and monitoring programs during operations.</p>
EcoMetrix p.40	<p>The proposed procedures for “careful control” of Project discharge water to meet WQOs in the receiving environment at all times are not clearly defined. The surface water management strategy described in Section 18.4.2 of the project proposal states that “<i>Water will be discharged to both Geona Creek and Finlayson Creek at established water quality discharge standard concentrations and at discharge volume ratios no less than 3:1 (receiving water volume: effluent volume) for Geona Creek at KZ-37 and 2:1 for Finlayson Creek at KZ-15 to meet water</i></p>	<p>R154. Provide details to demonstrate that there will be adequate storage capacity for effluent to allow holdback and controlled release of effluent.</p> <p>R155. Describe how discharge rate and flows in the receiving environment will be monitored in real time, and how the quality of the discharge and receiving waters will be monitored.</p> <p>R156. Provide clear procedures around discharging that will ensure that water quality</p>

Source	Issue	Information Request and Rationale
	<p><i>quality objectives in the receiving environment</i>’. However, in Section 8.4.2 we do not see a description of how the effluent discharge will be controlled to ensure the WQOs are met. On one hand, the Proponent has suggested that the effluent meet MMER standards for release of deleterious substances. On the other hand, many of the proposed WQOs are variable, as discussed in section 6.3.3, and are adjusted based on water hardness or other parameters in the receiving environment.</p> <p>It is important for reviewers to understand how the Proponent will manage effluent during releases to meet the WQOs. For example, is the Proponent suggesting that receiving environment conditions that affect the WQOs be considered prior to discharge to ensure no exceedance of WQOs upon discharge?</p>	<p>objectives (WQOs) are met at all times.</p> <p>To allow the Executive Committee to understand the effectiveness and feasibility of mitigation measures and monitoring programs during operations.</p>
11.0 TERRAIN AND SOILS		
Geotechnical Site Characterization and Permafrost		
SNC-Lavalin	<p>Thermistors were installed in drill holes K15-335, K16-392, and K16-395 during the 2016 site investigation program. None of the thermistors in the Mill Site area indicate the presence of frozen ground between the months of February and September 2016. It seems highly unlikely; given the location of the Project and that the thermistors were presumably read in February and other winter months, that no negative ground temperatures were recorded by the thermistors, even near the ground surface where seasonal freezing would occur. This may be just an instance of imprecise wording.</p>	<p>R157. Provide additional information on the data from the thermistors including whether they indicated unfrozen ground.</p> <p>R158. Describe whether the term “frozen ground” in the Mill Site Area Characterization Report relates to seasonally frozen ground or “permafrost”.</p> <p>R159. Provide ground temperature data that covers a sufficient timeframe, geographical area and depth to establish the presence or absence of permafrost within the project area. Use this information to update the ground temperature data including annual “trumpet curves” of the ground temperatures.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to permafrost.</p>
SNC-Lavalin	<p>In Section 11.3.4, and in Appendix C-3 (Section 3.3) it was stated that the 1995/1996 field program included 35 test pits that encountered permafrost and a further 40 test pits observed ice lenses and ice segregation, which was interpreted as an active layer rather than permafrost. Test pits that contain ice lenses and ice segregation is likely permafrost. Ice does not form in the “active layer”, as</p>	<p>R160. Confirm if the data available is sufficient to draw definitive conclusions on the distribution and character of permafrost at this site.</p> <p>R161. Given discrepancies between the various statements regarding the absence or presence of permafrost, how are these apparent contradictions regarding the</p>

Source	Issue	Information Request and Rationale
	<p>traditionally defined. The report’s use of “active layer” is in contrast to the standard definition. The International Permafrost Association Glossary of Permafrost and Related Ground Ice Terms (2005) defines the active layer as “the thickness of the layer of the ground that is subject to annual thawing and freezing in areas underlain by permafrost”. The active layer is typically ice-free (besides winter season), although ice may often accumulate at the base of the active layer as water percolates down to the top of the permafrost table and freezes.</p> <p>According to Section 11.3.4, permafrost was not identified in any of the 2016 thermistors; however, frozen soil and ice were encountered in samples at approximately 1.5 m and 5.0 m depths from a drill hole within the Class C Storage Facility footprint. The absence of actual thermistor data in the report renders it impossible to assess the validity of this statement. There is implied contradiction in the report.</p> <p>Section 4.1 of Appendix C-3 stated that sub-zero temperatures were measured between 3 m and 14 m depth below ground surface was evident. This observation indicates permafrost at that borehole location rather than seasonal freezing.</p> <p>Section 6 of Appendix E-5 stated that the terrain analysis highlighted permafrost and periglacial processes to be widespread across the Study Area. This terrain analysis report supports the contention that permafrost is widespread through the Project. This is in contrast to other reports in the application package, particularly reports citing borehole logs and thermistor cables, which seem to indicate the absence of permafrost.</p> <p>Although quite rare, ice-rich bedrock is possible. At the Raglan Mine in northern Quebec, thick (several centimetres) ice lenses were encountered in igneous bedrock to depths of about 8 m below ground surface. Depending on the method of drilling, such ice lenses might not be identified.</p> <p>The data presented in the reports were, in some cases approximately 20 years old. In other cases, more recent thermal data was presented but it was either incomplete (not a full year) or contradictory (no freezing temperatures measured, even in the</p>	<p>evidence for permafrost at the project site being addressed?</p> <p>To provide a sound basis for an assessment of environmental effects and to allow the Executive Committee to understand all relevant baseline conditions.</p>

Source	Issue	Information Request and Rationale
	middle of winter).	
Access Road and Mine Site Terrain Analysis		
Terrain Stability, Geohazards and Risk		
SNC-Lavalin	<p>The study provided by the Proponent provides neither terrain stability mapping nor detailed definitions for the terrain stability classes presented. A preliminary hazard inventory (Terrain Analysis Map) is presented but it appears preliminary and coarse. Field assessment to confirm the extent and hazard processes has not been conducted. Appendix E-5 of the submission states that recent debris floods have impacted an active fan at Fault Creek in the proposed Open Pit footprint.</p> <p>The proponent should produce a terrain map, terrain stability and hazard map for the mine footprint and access road (including associated methodology and analysis). The terrain stability and hazard maps should follow YESAB’s geohazard guidelines for recommended scale, methodologies, and data collection. The guidelines can be found at:</p> <p>http://www.yesab.ca/wp/wp-content/uploads/2015/11/Geohazards-Guide-Nov-1-2015-2.pdf</p>	<p>R162. Provide a terrain map, terrain stability and hazard map for the mine footprint and access road (including associated methodology and analysis) that:</p> <ul style="list-style-type: none"> a. Identifies surficial geology and related geomorphologic processes; b. Identifies the type, nature, relative frequency and magnitude of hazards (baseline map); c. Evaluates how current hazard dynamic may be altered due to changes in climate; d. Identifies specific risks to the proposed infrastructure; and, e. Identifies specific risks to the environment from the proposed project (e.g.: changes to slope stability). The risk map should include consideration of climate change over the life of the Project. <p>R163. Describe how have permafrost degradation processes at the proposed Water Management Ponds footprint been addressed?</p> <p>R164. Describe how has the debris flood hazard at the proposed Open Pit been addressed?</p> <p>To allow EC to understand all relevant baseline conditions in relation to terrain stability and hazards.</p>
Permafrost and Related Hazards		
SNC-Lavalin	<p>The Proponent indicates that “<i>terrain analysis highlighted permafrost and periglacial processes to be widespread across the Study Area</i>”. However, permafrost areas have not been clearly identified nor explicitly linked to existing and potential hazards and terrain stability (e.g., solifluction and debris slides). The report in Appendix E-5</p>	<p>R165. Describe how have permafrost conditions been considered in design of mine infrastructure and the access road improvement construction and in the roads’ operation and integrity during operations?</p> <p>R166. Will the proposed conventional unfrozen road building design for the access road</p>

Source	Issue	Information Request and Rationale
	<p>states that solifluction instability are affecting the footprints of the open pit, the three waste storage facilities and the access road.</p> <p>The report does not indicate how the proposed infrastructure may impact the permafrost regime. The Proponent identifies that extensive areas of solifluction have been mapped within the project site area and the Proponent indicates that solifluction areas <i>“should be assumed to be unstable with respect to development and mitigation measures will be needed to prevent slope instability”</i>. The Proponent should address the concerns related to permafrost and solifluction concerns.</p> <p>The Proponent indicated that <i>“Although the terrain is predominantly gently inclined, the terrain analysis highlighted local geohazards including four debris slides on moderate slopes adjacent to Geona Creek. These landslides may have been caused in part by permafrost degradation”</i>. The preliminary terrain analysis also highlights that there is evidence of permafrost degradation (i.e., thaw lakes and thermal erosion features). A map of permafrost degradation potential and related analysis has not been provided.</p> <p>Section 11.3.6 describes the ground conditions at the proposed mine facilities. The conditions described highlight the presence (or potential for) permafrost and areas of known instability (e.g., solifluction and fan areas). For the Class A and B facilities, the Proponent indicates that the permafrost within the overburden soils will be removed, resulting in a low residual hazard. The Proponent indicates that the remaining facilities are exposed to different levels of hazards such as solifluction, thaw settlement, thermal erosion, etc. An analysis of risk has not been provided.</p> <p>The Appendix E-5 terrain analysis report states that permafrost is widespread through the site. However, the typical cross section for conventional cut and fill road construction (Drawing No. 1356-2-Typroad-xsections-002) reflects non-permafrost conditions. There is considerable case history literature on performance issues associated with applying non-permafrost cut and fill design methods to permafrost terrain. The Proponent is referred to:</p> <ul style="list-style-type: none"> • McHattie, R.L. and Vinson, T.S 2008. Managing ice-rich permafrost 	<p>widening and upgrades be feasible and durable in the permafrost terrain?</p> <p>To provide enough information for the EC to understand the proponent's rationale for choosing the option/location selected</p>

Source	Issue	Information Request and Rationale
	<p>exposed during construction. Proceedings, 9th International Permafrost Conference, Fairbanks, Alaska: 1167 – 1172.</p> <ul style="list-style-type: none"> Berg, R. and Smith, M. 1976. Observations along the pipeline haul road between Livengood and the Yukon River. US Army CRREL Special Report 76-11. October 1976. 	
SNC-Lavalin	<p>Only a limited permafrost discussion has been provided in the submission. The proponent should produce a more comprehensive permafrost study, including mapping and related analysis indicating permafrost distribution within the mine footprint and access road area. The investigation should include an analysis of the permafrost degradation potential. The analysis should include a baseline scenario (current condition) and potential changes during the project operation (due to climate change and impact from proposed infrastructure). Sufficient detail should be provided in areas where surface water runoff is expected to be altered (e.g., water management ponds) and where existing geohazards may be exacerbated. The investigation should include a detailed permafrost hazard map (predictive) with an associated methodology and analysis identifying permafrost related hazards in the study area, including: type, nature and magnitude. The study should identify specific risks to the Project from the permafrost hazard map. The risk map should include consideration of climate change over the life of the Project. The study should also identify specific risks to the permafrost regime from the Project (e.g. potential permafrost degradation exacerbated by water management ponds, changes to slope stability due to the construction of road, stockpiles and storage facilities). The risk map should include consideration of climate change over the life of the Project.</p>	<p>R167. Provide a comprehensive permafrost study, including mapping and related analysis indicating permafrost distribution within the mine footprint and access road area. Indicate the magnitude and extent of soil erosion potential within this area that is attributed to thermal erosion of permafrost.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to the presence or absence of permafrost within the mine footprint and effects of potential soil erosion in relation to thermal erosion of permafrost.</p>
12.0 VEGETATION COVER AND COMPOSITION		
13.0 WILDLIFE AND WILDLIFE HABITAT		
Environment and Climate Change	<p>According to the proposal, the Common Nighthawk is being represented by raptors. According to the submission, bird surveys conducted included cliff-nesting raptor</p>	R168. Conduct surveys for the Common Nighthawk using standard methodologies using appropriate timing for the area and with particular emphasis on lower elevation

Source	Issue	Information Request and Rationale
<p>Canada ECCC - 011</p>	<p>surveys, point-count surveys following a modified Breeding Bird Survey (BBS) methodology, and waterfowl surveys. Survey methodology for cliff-nesting raptors is inappropriate for the Common Nighthawk and point count surveys based on the BBS methodology are not sufficient as they are not conducted during the time of day when the Common Nighthawk is commonly or best detected.</p>	<p>habitats (e.g. along the Tote Road and the airstrip).</p> <p>R169. In accordance with SARA subsection 79(2) provide an effects assessment for the Common Nighthawk. For the habitat suitability model please include:</p> <ul style="list-style-type: none"> a. justification for the map and rank classes, b. data limitations and any modifications or enhancements made and c. methods and results of any validation analyses conducted. <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to Common Nighthawk.</p>
<p>SLR 13.1</p>	<p>The selection of some subcomponents (notably cliff-nesting raptors and olive-sided flycatchers) and the use of these subcomponents to represent the habitat of other species could lead to an inaccurate assessment of potential project effects on other bird species, including species at risk, and consequently inadequate mitigation and monitoring measures for these species.</p> <p>Raptors: Cliff-nesting raptors will not adequately represent habitat use for common nighthawk and short-eared owl.</p> <p>Passerines and red-necked phalarope: The use of olive-sided flycatcher to represent habitat use by bank swallow, barn swallow, red-necked phalarope and rusty blackbird may underestimate the potential effects of the Project on these species at risk.</p> <p>Small mammals: The assessment and mitigation measures that are identified for collared pika will likely provide protection for hoary marmot but will not likely be relevant for the other small mammal species identified as of cultural importance by the Ross River Dena Council and Liard First Nation. As such, further mitigation measures for those species not represented by collared pika should be considered.</p> <p>Wood frog. Amphibians are known to be sensitive to environmental change and are often identified as key species or subcomponents for environmental assessments. Wood frogs, although there is no baseline information, are likely to occur in the</p>	<p>R170. Comment on the risk of underestimating the potential effects of the Project on common nighthawk and short-eared owl by excluding the impacts of the Project on preferred habitats for these at-risk species.</p> <p>R171. Comment on the risk of underestimating the potential effects of the Project on bank swallow, barn swallow, red-necked phalarope and rusty blackbird by using olive-sided flycatcher to represent habitat use by these at-risk species.</p> <p>R172. Provide information as to how the Wildlife Protection Plan will be updated to include measures to protect those species not adequately represented by collared pika.</p> <p>R173. Develop and incorporate measures to protect wood frog and wood frog habitat in the Wildlife Protection Plan.</p> <p>R174. Develop and incorporate measures to protect fishers and fisher habitat in the Wildlife Protection Plan.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to bird species, including species at risk, and small mammals.</p>

Source	Issue	Information Request and Rationale
	<p>project area.</p> <p>Fisher: Fishers, which are rare in the Yukon, have been identified in the project area through baseline studies. This species should still be considered in the assessment due to its specific habitat use and conservation status in the Yukon (S2S4).</p>	
<p>Environment and Climate Change Canada</p> <p>ECCC - 011</p>	<p>An effects assessment for the Olive-sided Flycatcher is appropriate as per subsection 79(2) of SARA.</p>	<p>R175. For the habitat suitability model provide justification for the rank classes, data limitations and any modifications or enhancements made and methods and results of any validation analyses conducted.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to the Olive-side Flycatcher.</p>
<p>SLR E-8.13</p>	<p>Information on methods is missing in the proposal. As noted in Chapter 5, Section 5.1 (effects assessment approach), the existing conditions should be described in enough detail to provide the benchmark against which the project effects will be evaluated. It is, therefore, important that an adequate baseline assessment is completed, including providing detailed description of methods and results.</p>	<p>R176. Provide a complete description of the passerine survey methods, including information on number of times each station was visited, description of the point count methodology, and information on settling periods.</p> <p>R177. Clarify the inconsistencies in the sections on passerine surveys (refer to the list of examples, above). Are survey data for 2016 available?</p> <p>R178. Provide a summary of relative abundance of species by habitat type, based on the point count surveys. If there were habitat types that supported a higher proportion of detections, these habitat types could be identified as important for passerines and mitigations around protecting the habitat types could be developed.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to Passerines.</p>
<p>SLR E-8.14</p>	<p>As noted in Chapter 5, Section 5.1 (effects assessment approach), the existing conditions should be described in enough detail to provide the benchmark against which the project effects will be evaluated. Given this approach, it is important that an adequate baseline assessment is completed, including providing detailed description of methods and results. Consistency with methods and results is important to provide a reliable baseline review.</p>	<p>Provide a complete description of survey methods, including survey effort; survey frequency; protocols used; and dates, duration and linear distance of waterfowl/shorebird surveys. What is the rationale for using 5-minute point count stations?</p> <p>Provide a summary of species detected per wetland and year and ensure that Table 13-2 is complete? What are the results from the 2015 survey?</p>

Source	Issue	Information Request and Rationale
		To allow the Executive Committee to understand all relevant baseline conditions in relation to waterfowl.
SLR E-8.16	<p>Since habitat suitability mapping is utilized to define change in suitable habitat in the effects assessment, with the magnitude of the effect tied to this assessment, an accurate and validated habitat suitability model is an important component of the baseline assessment.</p> <p>The habitat suitability modelling exercise should include a clear description of model assumptions, validation, reliability, and the incorporation of zones of influence, as appropriate. If the effects assessment, as is the case here, applies a fixed buffer to suitable habitat, in lieu of zones of influence for the modelling exercise, to account for indirect habitat loss, this should be noted in the baseline assessment.</p>	<p>R179. Provide information on model assumptions, validation, reliability and zones of influence for the three habitat suitability maps for birds.</p> <p>R180. For the olive-side flycatcher map, is this for breeding habitat? Can you provide a more thorough literature review to support the assessment?</p> <p>R181. For the waterfowl map, what species (or groups of species) does the habitat suitability represent? Can you provide a more thorough literature review to support the assessment?</p> <p>R182. For the raptor map, provide a more thorough literature review to support the modelled criteria for cliff-nesting raptor habitat suitability? Which raptors is the model developed for?</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to validating habitat suitability models.</p>
Caribou		
SLR, 13.8 SLR, 13.9	The proposal does not adequately address all effects to caribou because key aspects of caribou ecology have not been discussed and included in the effects assessment and mitigation measures. Further discussion on each sub-point is available in the SLR technical memo.	<p>R183. Provide additional information on project interactions and effects with caribou in the context of each of the following parameters:</p> <ul style="list-style-type: none"> a. Migration b. Predator/prey dynamics c. Predator efficiency d. Displacement e. Calving habitat and neonatal calf mortality f. Snow patches g. Influence of fidelity to seasonally used areas

Source	Issue	Information Request and Rationale
		<p>h. Population decline and caribou distribution</p> <p>i. 'Range rotation' and increase in Finlayson Lake use during some seasons</p> <p>For topics a) through d) listed above, consider also the indirect effects of the Project. For topics e) through i) listed above, provide information that will help determine how significant this geographic area is with respect to caribou population dynamics, rather than just to habitat suitability.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to understanding the interactions between the Project and caribou, including both direct and indirect effects.</p>
<p>YG – Environment Q 34</p>	<p>The proponent developed HSI models for the Finlayson Caribou Herd for the rut and post calving periods, but not for late winter habitat. Finlayson Caribou are known to use the area during the late winter season.</p>	<p>R184. Provide a late winter habitat suitability index (HSI) model to assess direct and indirect effects on late winter caribou habitat</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to ensuring year-round effects to caribou are considered.</p>
<p>SLR 13.11; YG – Environment Q 34</p>	<p>The caribou effects assessment seems to be based largely on percentage of habitat disturbed. This overlooks aspects of caribou ecology and potential stressors which could influence the outcome of the effects assessment for caribou.</p>	<p>R185. Revise the caribou effects assessment, taking into consideration the significance of factors outlined below. Focus on caribou habitat and use related to proposed activities.</p> <ul style="list-style-type: none"> a. Rutting areas b. Traditional use of post-calving areas c. Snow patch use during post-calving d. Calving success in the project area vs. the overall range e. Stressors outside of post-calving season <p>R186. Stress effects on health: What are the "stressors" identified in section 13.4.1.1 Project Interactions of the proposal, regarding health effects that occur outside of just the post-calving season?</p> <p>R187. Traffic effects on other caribou herds: What are the potential effects of increased</p>

Source	Issue	Information Request and Rationale
		<p>hauling traffic on other Yukon caribou populations along the haul route between the mine and the boundary with B.C. (Little Rancheria and Horseranch herds)?</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to ensuring all effects to caribou are being described.</p>
SLR E-8.17	<p>Model methods have not been clearly disclosed. Information on the model methods will enable its adequacy to be evaluated and will assist in interpreting the model outputs.</p>	<p>R188. Provide further detail on the parameters used in developing the model (elevation, vegetation cover, slope, and aspect.) In addition, provide the following information regarding the caribou habitat suitability model:</p> <ul style="list-style-type: none"> a. Sex/age classes: How many data points are in each age/sex class for each of the development and evaluation phases of the caribou HSI model? b. Calving success and habitat alteration: Why has calving success not been used as part of the model for post-calving? Does the model take into account habitat alteration? c. Expert opinion: Who provided expert opinion and for what aspects of the model? d. Predictive Ecosystems Map: What is the accuracy of the PEM used? e. Model equation: What model equation was used? <p>To allow the Executive Committee to understand baseline conditions in relation to providing clarity on methods used in the model to evaluate its use and assist in interpreting model outputs.</p>
SLR E-8.18	<p>There are unclear points and inconsistencies in presentation of information which make it difficult to assess adequacy of the model.</p>	<p>R189. Provide clarity on the inconsistencies detailed below.</p> <ul style="list-style-type: none"> a. Model methods and metrics inconsistency: The methods say that "observation density" was used to evaluate the model (p. 18) but the Results section (p.19) reports relationships between suitability classes and the number of occurrences (rather than the density). Clarify what metric was used to evaluate the model. b. Aspect class clarification: Clarify what the aspect class ≤ 0 is. In what situation would an aspect be < 0 degrees? c. Measure of availability not included: It is useful to look at use, and use in

Source	Issue	Information Request and Rationale
		<p>relation to availability, when assessing value of a habitat category. What is the availability of each of the aspect and vegetation cover classes in relation to caribou use?</p> <p>To allow the Executive Committee to understand baseline conditions in relation to providing clarity on methods used in the model to evaluate its use and assist in interpreting model outputs.</p>
SLR 13.10	The Assessment Endpoint/Threshold Criterion for "Health condition" appears to be an error as it does not address health condition.	<p>R190. What is the Assessment Endpoint/Threshold Criteria for Health condition for caribou?</p> <p>To allow the Executive Committee to understand baseline conditions in relation to caribou health condition.</p>
SLR 13.15	Residual effects to caribou may not be considered fully. Although each individual effect may not be considered significant, the overall (additive) effect of all the effects combined is also important in assessing the impact to caribou.	<p>R191. Provide additional discussion on the additive effect of all residual effects of the project to caribou.</p> <p>To allow the Executive Committee to include all relevant residual project effects in relation to caribou.</p>
SLR 13.4	<p>The threshold being used for the effects assessment is based on boreal caribou ranges, not an area of northern mountain caribou.</p> <p>The implication of using a threshold based on a relationship that was not developed for the northern caribou ecotype is that the conclusions drawn about the level of significance of potential adverse effects may be inappropriate. Also, a percentage does not take into account traditional use of areas by caribou, or geographic-specific areas where calving survival may be higher.</p>	<p>R192. Provide rationale for the use of a 10% threshold, considering other information is available. Clarify how the boreal caribou habitat relationship is applicable to assessing effects on seasonal ranges/habitats for northern mountain caribou. Consider the differences in the use of range and natural disturbances.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted in relation to the use of relevant thresholds.</p>
SLR E-8.1	Some of the surveys in 2015 and 2016 (and possibly in 1996) appear to have been conducted when exploration activities were occurring. Exploration activities could have affected distribution of caribou during those surveys. The authors do not address how the explorations activities may have affected survey results, which could affect some interpretations.	<p>R193. Clarify if exploration activities were occurring during surveys and, if so, detail the extent. Discuss how exploration activities may have influenced caribou distribution during these surveys and how this impacts interpretations of survey data.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to accurate survey results.</p>

Source	Issue	Information Request and Rationale
SLR E-8.2	<p>If caribou are using the area near Finlayson Lake in deeper snow winters on the main winter range, then it suggests that the area around Finlayson Lake is important when winter conditions may be more limiting. If caribou are using the area during winters of low snow accumulation and lower snow levels are expected due to climate change, we should expect to see more use of the area.</p>	<p>R194. Discuss the implications of the use of the area around Finlayson Lake during the late winter surveys of 2007 and 2016. Particular focus should be given to the displacement effects of increased traffic on the Robert Campbell Highway and the Finlayson air strip.</p> <p>To ensure that effects of the environment are being considered in interactions between the project and caribou.</p>
SLR E-8.3	<p>Section 3.5.2 reports that fewer caribou were seen during post-calving surveys in 2015 and 2016 but does not consider how the population decline may have influenced the lower number of observations. As caribou populations decline, their ranges tend to contract, which could contribute to fewer caribou seen during surveys in 2015 and 2016.</p>	<p>R195. What are the implications of the low calf:100 cow ratios during the post-calving surveys in 2015 and 2016? Provide a more thorough discussion about calf survival, including neonatal mortality, substantiated with references.</p> <p>R196. Discuss the geographical importance of the project area to caribou considering their continued use of the area despite population decline.</p> <p>To enhance confidence in the baseline data and its interpretation.</p>
SLR E-8.4	<p>Inconsistencies in interpretations of information or inappropriate conclusions drawn from data could lead to inaccuracies in assessing effects of the Project on caribou.</p> <p>The potential questions for this set of issues all relate to resolving inconsistencies in interpretations of information or correcting inappropriate conclusions drawn from data. The points are very specific and detailed, but individually and collectively they could lead to inaccuracies in assessing effects of the Project on caribou.</p>	<p>R197. Range boundaries inconsistency: Why does the Finlayson Caribou Herd (FCH) range boundary shown in Figure 13-1 (Chapter 13) and Figure 3-1 (Appendix E-8) differ from Yukon Government's FCH herd boundary (Hegel and Russell 2013)? How does this difference in boundaries affect the effects assessment and the selection of projects identified for the cumulative effects assessment?</p> <p>R198. Rut survey interpretation: What is the density of individuals (individuals/km²), and density of groups (groups/km²) for each 5-km concentric ring? Revise the discussion of use of the area surrounding the proposed Project by caribou as a function of distance category to reflect these densities.</p> <p>R199. Spring migration timing conclusion: Are there any other data to substantiate the timing of spring migration other than those presented in Appendix E-8, Section 3.4.5? If so, please provide.</p> <p>R200. Recruitment rates vs calf:100 cow ratios: Revise the discussion: calf-cow ratios during post-calving surveys should be discussed as calf:cow ratios, not recruitment</p>

Source	Issue	Information Request and Rationale
		<p>rates, for clarity and consistency with other studies.</p> <p>R201. Calf:cow ratio sustainability inconsistency: Statements in sections 3.5.3 and 3.5.5 describe the "sustainability" of 27 calves per 100 cows. Provide more information on the basis of this threshold.</p> <p>To provide consistency within the proposal and ensure accurate conclusions are being drawn.</p>
SLR E-8.5	<p>The baseline information needs to be adequate, and to be adequately described, to provide a solid basis upon which to build the effects assessment. Some of the points are related to lack of clarity or lack of information about methods and others are suggestions for additional information that will help in interpretation of the baseline data.</p>	<p>R202. Provide additional information on baseline surveys and maps as detailed below.</p> <ul style="list-style-type: none"> a. Use of historical post-calving surveys: Are locations from historical post-calving surveys, available? If so, provide a map that displays these for the whole range of the herd. b. Air survey methodology clarifications: How was the low number of caribou seen during the 2015 late winter survey influenced by the type of aircraft used (i.e. fixed-wing)? What type of aircraft was used for the early winter surveys described in section 3.3.1? c. Improvement in post-calving information: Display locations for 2015 and 2016 in different colours on Figure 3-8 and comment on consistency in area use between the two years. d. Methodology clarification for caribou distribution analysis: What do the categories in the "Radius from project" represent in Table 3-4? The actual radius, or radius categories? Revise interpretations if necessary. e. Further information on early winter surveys: Provide a map showing caribou locations for 2015 and 2016 early winter surveys. f. Results of 2016 rut survey missing: Provide the results of the 2016 rut survey. <p>To ensure sufficient baseline information is available for assessing and monitoring effects.</p>

Source	Issue	Information Request and Rationale
Moose		
YG – Environment Q 35	<p>There is no indication of surveys completed to assess habitat use by moose in the Local Study Area (LSA) or Regional Study Area (RSA) during calving, post-calving, and summer.</p> <p>Late winter moose surveys for this project have been conducted at the Game Management Subzone (GMS) scale. As described in the Wildlife Baseline Document, moose populations are assessed at the scale of the Moose Management Unit, not at a GMS level. Surveys conducted at the GMS scale are not a reasonable representation of a moose population.</p>	<p>R203. Complete and provide data and analysis on aerial and/or ground surveys during calving, post-calving, and summer in order to demonstrate the use of habitat. Effects on habitat use in the vicinity of the proposed activities may be characterized at the RSA scale, but data demonstrating use of these habitats would be required in additional seasons (calving, post-calving, summer). These surveys should be completed at the scale of the Moose Management Unit.</p> <p>To provide an understanding of the year round use of the LSA and RSA by moose in order to assess project effects.</p>
YG – Environment Q 35	<p>Late winter surveys were conducted to assess moose distribution patterns and abundance in the project area. Late winter surveys are only useful to describe late-winter moose distribution in deep snow years, when late-winter habitat can be a limiting factor for moose populations.</p>	<p>R204. Describe the snow conditions of the late winter surveys (i.e. depth of snow) and discuss how snow depth impacts moose distribution.</p> <p>To ensure baseline data for moose is adequate.</p>
SLR E-8.6	<p>A post-rut moose survey was completed in 2016, but the results have not been included or incorporated into the discussion.</p> <p>Information on ungulate survey methods is not sufficient to determine if methodology was sound.</p> <p>The presentation and discussion of moose survey data is not clear enough for reviewers to understand movements of moose through the seasonal range.</p>	<p>R205. Provide the results from the additional 2016 post-rut moose survey, and incorporate these results into the discussion and conclusion.</p> <p>R206. Provide details on survey methods and protocols used, including area covered or total length of survey paths.</p> <p>R207. Revise Figure 4-1 to make seasonal patterns of moose distribution clear.</p> <p>To provide a complete picture of baseline data and understand seasonal use of the Project Area by moose and to understand the completeness of surveys. To understand risks to local moose populations from the access road and increased traffic on the Robert Campbell Highway.</p>
SLR E-8.19	<p>Clear articulation of methods and assumptions is required to properly assess the suitability of the HSI model.</p> <p>Interspersion of habitat: It is unclear why the habitat suitability index (HSI) model does not account for the interspersion of available habitat (available forage with</p>	<p>R208. Articulate methods and assumptions used in the moose habitat suitability index model as indicated below.</p> <p>a. Interspersion of habitat: Consider adapting the HSI model to account for the</p>

Source	Issue	Information Request and Rationale
	<p>security and thermal cover). Moose are known to be rely on access to forage that is closely associated with security and thermal cover.</p> <p>Interspersion of habitat: It is unclear why the habitat suitability index (HSI) model does not account for the interspersion of available habitat (available forage with security and thermal cover). Moose are known to rely on access to forage that is closely associated with security and thermal cover.</p> <p>Elevation range used in model. It is unclear why Table 4-2 shows relationships with suitability and elevation for a range of 800 to 1800 masl when as per page 3 the elevation range of the entire Project area is 1300 to 1900 masl.</p>	<p>interspersion of available habitat.</p> <p>b. Interspersion of habitat: Specify why the habitat suitability index (HSI) model does not account for the interspersion of available habitat (available forage with security and thermal cover) as this will directly impact model outputs.</p> <p>c. Elevation range used in model: Clarify if adjusting the suitability and elevation range to correspond with the area modelled change the outputs.</p> <p>d. Segregation of habitat use: Clarify how suitable habitat for moose during the late season was segregated and provide the corresponding model outputs.</p> <p>e. Model equation: Clarify how models were developed for each season and provide the equation used.</p> <p>f. Model assumptions: Provide the model assumptions.</p> <p>g. Zones of influence: Are zones of influence incorporated into the model, accounting for functional habitat use? If not, please provide the rationale for this and discuss how this may affect the outcome of the effects assessment for moose habitat.</p> <p>To properly assess the suitability of the moose HSI model.</p>
SLR, E-8.19	Failure to include moderate suitability habitat in the project area during the effects assessment could lead to underestimating impacts to moose.	<p>R209. Include moderate suitability habitat for moose in the assessment.</p> <p>To ensure an accurate assessment of effects to moose as a result of lost habitat.</p>
Grizzly and Black Bears		
YG – Environment Q 36	The proponent uses thresholds about acceptable amounts of habitat loss and disturbance for grizzly bears. It is unclear how thresholds were established. The primary reference provided for Grizzly Bear thresholds in Table 13-3 is for woodland caribou (Environment Canada. 2011. Scientific assessment to inform the identification of critical habitat for woodland caribou (Rangifer tarandus caribou), boreal population, in Canada. Ottawa, ON, pp. 102.)	<p>R210. Provide a reference for the thresholds used regarding acceptable amounts of habitat loss and disturbance for grizzly bears.</p> <p>To provide confidence in the information used in the effects assessment.</p>

Source	Issue	Information Request and Rationale
YG - Environment Q 36	<p>The proponent conducted bear den surveys within a 10km radius from the open pit and found 3 dens about 5 km from the pit. Proponent indicated that surveys were conducted in 2015 (April 23, May 4 and 15) and (April 17 and 27) 2016.</p> <p>The maps are unclear as to the location of bear den locations.</p>	<p>R211. Provide an updated map that more clearly identifies the locations of grizzly bear dens.</p> <p>To provide clarity on the baseline information that has been presented.</p>
YG – Environment Q 36	<p>Surveys to assess the degree of use of the area near the mine site are limited to mid-April to mid-May. Habitat use of the area near the mine for summer and fall does not seem to be addressed in the proposal or wildlife baseline study. The baseline document identifies numerous sightings near the mine site but no discussion is provided about habitat values or impacts to these values seasonally</p>	<p>R212. Discuss grizzly bear use of the area near the mine beyond the denning season.</p> <p>To ensure that year round effects to grizzly bear are considered in the assessment.</p>
YG – Environment Q 37	<p>The proposal contains insufficient analysis of mortality rates. In the baseline report, the proponent only describes harvest history in GMA 10-07 and not surrounding GMAs or bear management unit.</p>	<p>R213. Discuss the population of grizzly bears and mortality rates in the area. This should include a discussion of mortality of female bears.</p> <p>R214. Provide information on bear conflict history in the area. This should include an examination of mortality from vehicle collisions and potential increased mortality along highways from increased traffic associated with the project.</p> <p>To ensure potential effects to grizzly bears have been considered.</p>
SLR E-8.7	<p>Aerial den surveys focused on modelled high and moderate suitable grizzly bear den habitat. If the surveys were completed based on a model that may need to be refined then the spatial focus of these surveys may have been incorrect.</p> <p><i>Lack of use of Yukon information.</i> Please make use of geographically/ecologically appropriate literature as background to the habitat suitability model.</p> <p><i>Slope thresholds and den site selection.</i> A focus on geographically and biologically appropriate information may influence model inputs and outputs. This may influence the delineation of grizzly bear denning habitat.</p> <p>The lack of information on model assumptions, model reliability and model validation make it not possible to fully assess the adequacy of the model.</p>	<p>R215. Which model was used to provide focus for the den surveys?</p> <p>R216. Why are two different sets of parameters identified? Which parameters were used to model grizzly bear denning habitat for the aerial surveys?</p> <p>R217. What survey methods standards were used for den surveys? What was the survey effort by date? Provide information on the daily flight lines. How was the Project area stratified? How many observers were there and what were their qualifications?</p> <p>R218. Provide further consideration of slope thresholds making use of readily available and geographically appropriate literature to support model development for slope thresholds, i.e., Reynolds et al. (1974), Harding (1976), McLoughlin et al. (2002), Schwartz et al. (2003) and Libal et al. (2012).</p> <p>R219. What were the model assumptions that were used to build the model? Was model</p>

Source	Issue	Information Request and Rationale
		<p>reliability determined? Was the model statistically validated?</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to the following aspects:</p> <p>As the grizzly bear den surveys are an important component of the baseline assessment, it is imperative to be able to determine if appropriate survey effort was applied and if the surveys were focused on appropriate habitat.</p> <p>If aerial den surveys were not completed to an appropriate effort and scale, the results may be skewed and not accurately reflect the actual number of dens within the Project area.</p> <p>Lack of use of Yukon information: The definition of criteria used for model inputs is dependent on utilizing appropriate information. A focus on important biological parameters may influence model inputs and outputs. This may influence the delineation of grizzly bear denning habitat.</p> <p>As slope thresholds are a primary component of the grizzly bear denning model, the identification of appropriate slope thresholds for the grizzly bear denning model is important.</p> <p>Knowing the assumptions (including the inclusion of zones of influence), reliability and validation of the habitat suitability model would help to conclude the model strength and ultimately the ability to predict changes in habitat.</p>
SLR E-8.8	The proposal does not substantiate claims that the Project area does not support a large population of black bears. Black bears are primarily crepuscular (Ayres et al. 1986; Gaines and Lyons 2003) and can be difficult to monitor without appropriate effort and application of survey standards.	<p>R220. Why were black bear surveys not conducted?</p> <p>R221. Are black bear surveys planned?</p> <p>R222. Provide information on the reliability of the predicted environmental effects on black bears.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to black bears. Conclusions about black bear abundance and distribution are based solely on incidental observations and may not accurately reflect baseline conditions.</p>
SLR 13.7	Inaccurate assumptions about survey methods will lead to unwarranted conclusions about how well wildlife is protected – in this instance black bear dens may not be	R223. How will mitigation for grizzly bears be adapted to also protect black bears, given the differences in den site use between the species?

Source	Issue	Information Request and Rationale
	identified.	To ensure that mitigation measures are adequate for the protection of black bears.
Other Wildlife Species		
YG – Environment Q 38	<p>YG anticipates that additional data is available to document wildlife baseline, including wolverine, but this data has not yet been provided for the record. Wolverine were recommended by YG Department of Environment as a VEC to the proponent in 2013, and the proponent was advised to conduct track count studies. The proponent identified wolverine as a VEC in their August 2015 “Kudz Ze Kayah Project Planned Baseline Studies.” The Department of Environment is aware that the proponent’s consultants conducted additional on-the-ground track count surveys for wildlife in late March 2017.</p>	<p>R224. Provide results of the 2017 winter track surveys in the baseline report, including:</p> <p>R225. A map of regional distribution of wolverines in the winter (ground based track counts).</p> <p>R226. A map of wolverine denning habitat including expert opinion of trappers.</p> <p>R227. A population estimate of the regional wolverine population if winter track surveys indicate that wolverines utilize habitat along the access road and around the mine site.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to wolverines.</p>
SLR E-8.9	<p>Although RISC (2001) standards were identified as being used, the methods described vary in some important aspects from these standards.</p> <p>Completing a total of fourteen 75-m transects (1,050 m total length) within an LSA that is 11,321 hectares may be inadequate to reflect actual baseline conditions.</p> <p>To determine the baseline conditions for a project it is important that:</p> <ol style="list-style-type: none"> a. Appropriate survey standards are utilized, so that results are comparable and reliable; and b. An appropriate level of effort is completed for an adequate assessment of baseline conditions. Completing a total of fourteen 75-m transects (1,050 m total length) within an LSA that is 11,321 hectares may be inadequate to reflect actual baseline conditions. 	<p>R228. Provide rationale for the methods used, including how sample sites and transect lengths were selected.</p> <p>R229. Were surveys timed with consideration for snow fall events?</p> <p>R230. Are transect lengths sufficient to provide reliable baseline information on habitat use in the area affected by the Project?</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to snow track surveys.</p>
YG – Environment Q 39	<p>The proponent states in the Baseline Report that the only sheep-focused work involved checking areas shown to be sheep WKA’s closest to the project to confirm the presence of sheep. They found that sheep were using some of these areas, but these WKA’s were not in close proximity to the proposed project infrastructure or on</p>	<p>R231. Provide results outlining the timing and extent of these surveys in the baseline report.</p> <p>R232. Provide maps showing the proposed flight path between Watson Lake and Finlayson Lake and Whitehorse and Finlayson Lake in relation to the WKA’s in the baseline</p>

Source	Issue	Information Request and Rationale
	the flightpath from the Whitehorse to Finlayson Lake Airstrip.	<p>report.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to sheep and flight paths.</p>
YG – Environment Q 40	Monitoring of collared pika is limited to the Wildlife Records Program. The proponent states that the objective of monitoring is “to check if collared pika will be disturbed more than expected from project activities”.	<p>R233. What further monitoring programs will be implemented for the Collared pika?</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigation measures related to Collared pika.</p>
SLR E-8.11 YG – Environment Q 41	<p>The little brown myotis is listed as endangered under the <i>Species at Risk Act</i> (SARA) and by the Committee on the Status of Wildlife in Canada (COSEWIC), as is the northern myotis. Under Section 37 of SARA a recovery strategy (proposed) has been developed for these two species (Environment Canada 2015). This recovery strategy details the threats and issues associated with these bats and the justification for required protections. This includes habitat loss and degradation as well as heavy mortality that have occurred in eastern Canada as a result of white nose syndrome.</p> <p><i>Bat capture program.</i> It is recognized that the calls of some bat species, in particular some <i>Myotis</i> species, can be difficult to distinguish through echolocation analysis alone. As such, it is typical that a bat capture program, under approved permit where required, co-occurs with echolocation surveys to aid in species detection confirmation.</p> <p><i>Survey period length.</i> Surveys completed in 2015 and 2016 were limited to 7 days and 18 days, respectively. Given the seasonality of habitat use, including migration, this is a very short survey period which will not fully account for the potential occurrence of bats within the Project area during their active seasons.</p> <p><i>Analysis of recordings.</i> Information on the methods used for the analysis of recordings is missing.</p> <p>The assertion that non-detection results for subalpine habitats equate to non-occurrence is not supported. Considering the limited deployment of detectors, the</p>	<p>R234. Would a bat capture survey improve baseline information on bats?</p> <p>R235. What does “several incidences” of <i>Myotis</i> spp. Mean? The results for the bat detection surveys note that “The detector established at the wetland at km 5 along the Tote Road had “several incidences” of <i>Myotis</i> spp.” and is further stated that it “It is unknown how many bats “several incidences” equates to.”</p> <p>R236. Does the life history stage model only represent roost site selection for little brown myotis? The current habitat suitability model does not appear to account for the dispersion of roosting habitat with foraging habitat.</p> <p>R237. Provide a description of model assumptions, validation, reliability and zones of influence.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to bats.</p>

Source	Issue	Information Request and Rationale
	<p>potential seasonal occurrence of use of subalpine habitats by bats is potentially missed.</p> <p>According to Government of Yukon comments, “Baseline monitoring conducted in 2016 had “several instances” of bat detections.”</p>	
<p>YG – Environment Q 42</p>	<p>No methodology is described for monitoring waterfowl use at water management facilities, water treatment ponds, and ponds built for fish habitat compensation.</p>	<p>R238. Provide methodology to monitor ponds for waterfowl use.</p> <p>To allow the Executive Committee to understand methodology used.</p>
<p>YG – Environment Q 43</p>	<p>Additional on-the-ground count surveys for wildlife conducted in late March 2017 not included.</p>	<p>R239. Provide additional 2017 wildlife survey data, any associated analyses and effects assessment.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to wildlife data.</p>
<p>YG – Environment Q 44</p>	<p>The proponent’s proposed mitigation measure for cliff-nesting raptors lacks specific details.</p>	<p>R240. Provide mitigation measures for cliff-nesting raptors including: timing windows and disturbance buffer distances (in the event that an active nest is found).</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures.</p>
<p>YG – Environment Q 45</p>	<p>Insufficient detail regarding future monitoring plans throughout the life of the project.</p> <p>The proponent states that the monitoring program will occur every three years (or more frequently if adaptive management plan deems required), and will follow baseline study protocols with focus on key species and seasons.</p>	<p>R241. For the construction, operations, decommissioning and post-closure phases of the project, provide details on the monitoring plans including:</p> <ul style="list-style-type: none"> a. methods b. timing c. duration d. frequency e. location f. personnel conducting surveys, etc. <p>To ensure enough detail is provided for monitoring plans</p>

Source	Issue	Information Request and Rationale
<p>YG – Environment Q 47</p>	<p>The proponent used wildlife cameras to monitor the use of a mineral lick south of the LSA from April to October in 2015 and 2016.</p> <p>YG recommends a full year of camera trap monitoring on all licks that are within 1km of any proposed footprint.</p>	<p>R242. Provide rationale as to why the lick monitoring limited to April to October.</p> <p>R243. Will monitoring of the lick be continued throughout the life of the project?</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to wildlife use of the lick.</p>
<p>SLR 18.1</p>	<p>The Wildlife Protection Plan (WPP) is a primary tool used to support the protection of wildlife and wildlife habitat. The use of qualifying phrases introduce a lack of clarity as to when mitigation measures would be applied minimizes the value of the mitigation measures as they are presented. The lack of specific details for many mitigation measures hinders assessment of their adequacy and makes it unclear how the effectiveness of these measures could be evaluated.</p>	<p>R244. Provide information on mitigation measures and their implementation through the Wildlife Protection Plan, including:</p> <ul style="list-style-type: none"> a. Equipment laydown areas: What distance will equipment laydown areas be from known wildlife trails or wildlife road crossings? b. Guidelines for wildlife encounters: Provide guidelines to understand how this measure will be applied and to assess how effective it will be. The guidelines should include, for example, the distance an animal is from activity for it to be to be considered "encountered" and to have "left the area", and how wildlife encounters with different species might be managed. c. Avoidance of caribou calving grounds: Where are calving grounds located and what is the seasonal period for post-calving? d. Revegetation in relation to vehicle access and predator efficiency: What measures will be taken once reclamation of the Tote Road has been completed to ensure that vegetation can re-establish to prevent motorized vehicle access and reduce predator efficiency? e. Provide details on how effectiveness monitoring will be included in the Wildlife Protection Plan and the metrics that will be used to measure effectiveness. f. Sensitive periods: The identification of sensitive periods during which mitigation measures will be applied is important information for assessing adequacy of these mitigation measures. What is the basis for the sensitive periods identified in Table 18-8? Please provide references. g. Species coverage: Provide information as to how the WPP will be updated to

Source	Issue	Information Request and Rationale
		<p>include measures to protect other species, including denning animals and breeding raptors.</p> <p>h. Traffic on the Robert Campbell Highway: Please incorporate mitigation for potential effects on wildlife of increased traffic on the Robert Campbell Highway into the relevant management plans.</p> <p>The lack of information on monitoring and assessment of effectiveness of mitigation makes it difficult to assess how adaptive management will be implemented as the Project develops.</p>
SLR 13.7	<p>Use of qualifiers. The use of terms such as “where practicable” minimizes the value of the mitigation measures as they are presented unless the criteria for applying mitigation measures are defined.</p> <p>Bird nest protection. Inadequate mitigation methodology may lead to unacceptable risk, and non-compliance, for migratory birds and species at risk protected under the <i>Migratory Birds Convention Act</i> and the <i>Species at Risk Act</i>. Information is incomplete on nest identification and use of buffer zones and mitigation plans are not consistent with the most recent guidelines from Environment Canada on reducing risk to migratory birds.</p> <p>Winter monitoring plans. There is insufficient information to assess the adequacy of these plans.</p> <p>Use of breeding bird surveys for population trends. Breeding bird counts are subject to variability due to many factors and should not be used as a measure of population abundance.</p>	<p>R245. Provide clarity as to the circumstances under which mitigation measures will be applied (in the assessment and in the WPP), especially for measures where the phrases such as “where practicable” are used to qualify the application of mitigation.</p> <p>R246. Update mitigation plans relating to bird nest protection that reflect the recommended mitigation methods. (e.g.) Incorporate nest identification and use of buffer zones.</p> <p>R247. Please re-evaluate the proposed use of breeding bird surveys to monitor population trends.</p> <p>R248. Provide more information on winter monitoring plans, including details on the location and number of transects to be used.</p> <p>a. How effective will fixed-transect snow track surveys be in identifying wolf dens?</p> <p>b. Will any additional measures be taken to identify wolf dens?</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures.</p>
SLR E-6.1	<p><i>Likelihood of occurrence.</i> The conclusions that rare plants were not expected in the LSA is not backed up in the references provided. This conclusion influences the baseline assessment of rare plant presence or absence and, subsequently, the effects assessment.</p> <p><i>Survey timing.</i></p> <p>This information is needed to alleviate the concern that the potential for rare plants</p>	<p>R249. Provide information as to whether any of the rare plants that were targeted in the survey are Beringian, or associated with hot springs, limestone, or alkaline wetlands.</p> <p>R250. What period is each of the targeted rare plants most detectable? Note: If rare plant surveys occurred when the target species were at a cryptic stage in their life cycle, then the likelihood of incorrectly concluding the plant is absent is higher.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation</p>

Source	Issue	Information Request and Rationale
	<p>to be in the Project area may have been underestimated.</p> <p>Knowing whether the surveys were timed during peak detectability of target plants helps assess the likelihood that the plants would have been found if it were there.</p>	<p>to the presence of rare plants in the project area.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to the presence of rare plants in the project area.</p>
SLR E-8.1	<p>For surveys in 2015 and 2016 that were conducted when exploration activities were occurring, exploration activities could have affected distribution of caribou during those surveys. The authors do not address how the explorations activities may have affected survey results, which could affect some interpretations.</p>	<p>R251. Were exploration activities occurring during any surveys?</p> <ul style="list-style-type: none"> a. If so, which ones, and how extensive? b. Explain how exploration activities may have influenced caribou distribution during the affected surveys and subsequent interpretations of the survey data. <p>To allow the Executive Committee to understand all relevant baseline conditions in relation to caribou distribution during surveys.</p>
SLR E-8.10	<p>The assessment is limited to defining habitat suitability within Geona Creek. The baseline assessment assumes that no other areas within the LSA will support beaver. Given that there are several other streams and small waterbodies within the LSA, this assumption is not supported.</p> <p>There are inconsistencies in the report regarding the suitability of habitat for beaver in this upper reach of Geona Creek.</p> <p>The information on modelling methods, model assumptions, reliability and validation is needed to assess the reliability of the model outputs, which form part of the effects assessment.</p>	<p>R252. What is the rationale for only including Geona Creek in the assessment?</p> <ul style="list-style-type: none"> a. How was the Allen (1982) model adapted and applied to the LSA? b. Provide information on model assumptions, an assessment of model reliability and model validation. c. Provide information on whether the model delineates habitat suitability within the LSA. d. Provide a clearer justification for the assumption that the upper 2.7 km of Geona Creek is poor beaver habitat. <p>To ensure that the Executive Committee includes all project components and activities are included in the assessment.</p>
SLR 13.3	<p>The assessment may underestimate the potential effects of the Project on caribou, moose, grizzly bear, waterfowl, collared pika, cliff-nesting raptors and passerine birds related to habitat loss through the exclusion of moderate suitability habitat.</p> <p>Threshold criteria for grizzly bear for change in wildlife movement and direct disturbance is based on a reference that does not support the threshold selected and there is an error in the reference provided for the threshold criteria for moose (it</p>	<p>R253. Provide discussion and rationale regarding the inclusion or exclusion of specific habitat suitability ratings. Include assessment of the risk of underestimating the potential effects of the Project on wildlife by excluding moderate suitability habitat.</p> <p>R254. Why is potential loss of moderate-suitability habitat excluded from the assessment for caribou, moose and grizzly bear?</p>

Source	Issue	Information Request and Rationale
	<p>is a caribou reference).</p> <p>The absence of a detailed assessment of the Project's effects on wolverine and wolf at the RSA scale may lead to inadequate mitigation measures and monitoring.</p>	<p>R255. Why is only high-suitability habitat included for waterfowl, collared pika, cliff-nesting raptors and passerine birds?</p> <p>R256. Provide additional information for the threshold criteria selected for moose and grizzly bear.</p> <p>R257. What is the rationale for limiting the scale of the assessment to the LSA for wolverine and wolf, given the large home ranges of individuals of these species?</p> <p>The information is necessary to ensure that the Executive Committee understands the potential effects of the project on wildlife habitat.</p>
14.0 HERITAGE RESOURCES		
YG – Tourism and culture	The project proposal summarizes heritage assessment work conducted for the proposed project in 2015 but does not include a copy of the relevant report (Permit 15-10ASR) in the supporting documents and may not fully detail the extent of baseline data gathering studies.	<p>R258. Provide the report for work completed under permit 15-10ASR in the supporting documents.</p> <p>To ensure all relevant information is included.</p>
YG – Tourism and culture	Proposed improvements to the Finlayson Lake Airstrip (Section 4.12.2) and the mine access tote road (Section 4.12.1) have not been assessed for heritage resources and related effects to heritage resources cannot yet be determined.	<p>R259. Provide a heritage overview assessment for the Finlayson Lake Airstrip and mine access tote road.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions for heritage resources as per the scope of the project.</p>
15.0 SOCIO-ECONOMIC EFFECTS ASSESSMENT		
EEM, 3.1 EEM, 4.5 EEM, 7.2	The <i>Socio-economic Baseline Report</i> is intended to provide a baseline against which future project effects can be predicted, assessed and monitored. However, based on the information provided in the <i>Kaska Ethnographic Overview</i> it appears as though the proponent has not fully integrated information relating to Traditional Knowledge within the study area into the <i>Socio-economic Baseline Report</i> .	<p>R260. Incorporate all relevant Traditional Knowledge from the Kaska Ethnographic Overview into the Socio-economic Baseline Report.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions for First Nation land use in relation to the project and to ensure a comprehensive socio-economic effects assessment can be conducted.</p>
EEM, 3.3	The <i>Socio-economic Baseline Report</i> does not provide any analysis about	R261. Provide historical top-line municipal tax revenue and inflation-indexed municipal tax

Source	Issue	Information Request and Rationale
	<p>economic stability within the communities of the study area. Information provided in Tables 3 and 4 of the <i>Socio-economic Baseline Report</i> is not further analyzed. An understanding of financial resiliency at the community level is needed to assess the effects of the boom and bust cycle.</p> <p>Further, the proposal does not provide details about the ‘conservative assumptions’ made in the prefeasibility study as they relate to operation of the mine and temporary or unplanned closures.</p>	<p>rate trends for Faro and Watson Lake and provide accompanying analysis about the stability of the tax base in these communities over time within the Socio-economic Baseline Report.</p> <p>R262. Identify situations or scenarios where the project might operate on a reduced scale (including temporary or unplanned closure). This should include detail about assumptions made in the financial assessment of the prefeasibility study (referred to in Section 17.4 of the proposal). Characterize the potential effects of these scenario’s and proposed mitigation.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions and to ensure a comprehensive socio-economic effects assessment can be conducted.</p>
EEM, 3.7	<p>The proponent has identified a desire to source goods and services locally. Additional information about the timing of the need for these goods and services will allow the local community to anticipate these needs and be more likely to fill them.</p>	<p>R263. In order to assess how the proponent has considered competing demands for goods and services within communities, provide tables with anticipated procurement needs by project phase.</p> <p>To allow the Executive Committee to understand all relevant baseline conditions and to ensure a comprehensive socio-economic effects assessment can be conducted.</p>
EEM, 4.1	<p>The <i>Socio-economic Effects Assessment</i> notes that higher incomes and education levels tend to be correlated with better individual health outcomes. However, this section should also make broader reference to drug and alcohol abuse, mental health, and occupational health and safety risks that also have an impact on individuals employed in the mining industry.</p>	<p>R264. Provide an effects assessment of individuals employed for this project in relation to the drug and alcohol abuse, mental health and occupational health and safety risks often associated with the mining industry.</p> <p>To ensure a comprehensive socio-economic effects assessment can be conducted. In particular to understand the potential socio-economic effects of this mining project on the individuals employed.</p>
EEM, 4.2	<p>Aside from statistical data about divorces and separations, the <i>Socio-economic Baseline Report</i> does not contain any information or analysis relating to family structure in the project communities. Families in small communities with little-no access to childcare may experience additional stress based on the fly-in, fly-out shift structure.</p>	<p>R265. Provide additional statistical data about family structure in the project communities, with a particular focus on single parent households and couples with children.</p> <p>To ensure a comprehensive socio-economic effects assessment can be conducted.</p>

Source	Issue	Information Request and Rationale
EEM	<p>The proposal recognizes that substance abuse may be an issue in local communities and could be exacerbated by higher incomes. Mitigation measures are proposed, but with no baseline information it is unclear how the proponent plans to monitor the success of these measures and refine them as needed.</p>	<p>R266. BMC has proposed mitigation measures on how to manage alcohol and drug abuse in local communities. Provide additional information on how you will be monitoring the effectiveness of proposed mitigation measures.</p> <p>To allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures.</p>
Health Canada Q 8	<p>The proposed Project is located in close proximity to areas where traditional activities are taking place (e.g. hunting, trapping, fishing, gathering plants, etc.). There are also registered traplines and First Nations' cabins in the areas of North Lakes, Wolverine Lakes, Money Peak, all of which are adjacent to the local study area.</p> <p>This project proposal did not include an assessment of human health, with the justification that there are no permanent or semi-permanent residents nearby.</p> <p>However, people using the cabins at the project boundary were not considered in the assessment.</p>	<p>R267. Provide a preliminary quantitative Human Health Risk Assessment for each stage of the project. This assessment should be informed by Health Canada's Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA) Version 2.0 (2012). At minimum this assessment will address the following:</p> <ul style="list-style-type: none"> a. risks associated with human use of the area (e.g. the cabins at the project boundary or for traditional activities such as hunting, trapping, harvesting) potentially impacted by the project; b. risks associated with consumption of country foods (e.g., fish, caribou, migratory birds, and other animals exposed to environmental contaminants from the project in the air, water, or soil) harvested through traditional hunting, fishing, and gathering activities; and c. risks associated with consumption of surface and ground well water used for drinking potentially impacted by the project. <p>To ensure a comprehensive socio-economic effects assessment can be conducted. In particular, in relation to the health and traditional activities of people using areas potentially impacted by the project through its various stages.</p>
Health Canada Q 8, Q 9 EEM, 4.5	<p>There was no assessment of the Project's effects on country foods and the potential for human health impacts.</p> <p>However, the project proposal notes that culturally significant species are hunted (caribou, moose, sheep) and fished (grayling, trout, jackfish, whitefish, sucker fish) in the Ross River Dena Council and Liard First Nation traditional territory which overlaps with the Project footprint.</p>	<p>To ensure a comprehensive socio-economic effects assessment can be conducted. In particular, in relation to the health and traditional activities of people using areas potentially impacted by the project through its various stages.</p>
EEM, 4.5 EEM, 8.2	<p>Traffic safety around the project footprint is described in detail but there is very little description of the proponent's plans to mitigate traffic risks in Watson Lake or along the truck route to port facilities.</p>	<p>R268. Provide additional information on the identification of risks, effects of increased traffic along the entire route, and mitigations. Include communities, other road users, and wildlife in addition to the following:</p> <ul style="list-style-type: none"> a. strategies for avoidance of school children at the beginning and end of the school day,

Source	Issue	Information Request and Rationale
		<p>b. logistics to reduce risks of driver fatigue in long haul truckers, and</p> <p>c. risks to other users based on the transportation of fuel, supplies, and ore concentrate.</p> <p>To ensure a comprehensive socio-economic effects assessment can be conducted and to allow the Executive Committee to determine if they have confidence in the effectiveness of the proposed mitigative measures.</p>
EEM, 6.1	A shortage of rental housing capacity in Whitehorse was brought up at one of the meetings in the consultation record. However, the proponent states in its proposal that Whitehorse is understood to have the capacity to absorb an in-migration of workers, which is likely to happen during the construction phase of the project.	<p>R269. Provide additional information to support the assumption that there is sufficient rental housing capacity in Whitehorse. Provide an understanding of the current rental housing capacity in Whitehorse and projections that consider likely demands and in particular demand from other proposed mining developments such as the Coffee Gold mine (Goldcorp Inc.) and the Casino mine (CMC Inc.).</p> <p>R270. Describe mitigative measures and alternatives that may be utilized in the event that the rental housing capacity in Whitehorse is unable to serve the needs of this project.</p> <p>To ensure a comprehensive socio-economic effects assessment can be conducted and to allow the Executive Committee to understand all relevant baseline conditions.</p>
EEM, 6.3	In order to assess effects from project waste, YESAB requires further information on where the following types of waste will be disposed of: beverage containers and other recyclables, steel/copper/rubber, tires, batteries, antifreeze (and used containers), solvents (and used containers), and all other forms of hazardous waste.	<p>R271. Identify the final destination for each type of waste that will be disposed of off-site, including licensed recycling or disposal facilities.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted.</p>
16.0 EFFECTS OF THE ENVIRONMENT ON THE PROJECT		
Environment and Climate Change Canada ECCC - 013	<p>Most, if not all of the extreme weather event discussion involves impacts to operations of the Project (e.g., reduction of activities, minimize traffic, damage to infrastructure). There is no information with respect to potential impacts on the environment (e.g., to water quality in nearby streams).</p> <p>Return periods associated with design 24-hour precipitation events (Table 16-5) and likelihood of flooding from infrastructure (Table 16-6) appear to be calculated with</p>	<p>R272. Incorporate climate change information to re-assess the return periods associated with design 24-hour precipitation events and likelihood of flooding from infrastructure.</p> <p>R273. Given this information, re-assess whether there will be significant future changes to hydrological flow regimes in watercourses around the Project area affecting water conveyance and storage systems or surrounding infrastructure.</p> <p>To ensure a comprehensive environmental effects assessment can be conducted which</p>

Source	Issue	Information Request and Rationale
	<p>respect to historical and not projected future climate.</p> <p>Although some general information on climate change is provided (including associated temperature and precipitation maps over the region associated with various emission scenarios and future time periods), there is no information or analyses regarding how these projections will be reflected in changes to extreme 24-hour precipitation and associated flooding events. It is therefore difficult to discern if there will be significant future changes to hydrological flow regimes in watercourses around the Project area affecting water conveyance and storage systems or surrounding infrastructure.</p>	<p>incorporates climate change considerations.</p>
17.0 MALFUNCTIONS, ACCIDENTS, AND UNPLANNED CLOSURE		
<p>Fisheries and Oceans Canada</p>	<p>In Accidents and Malfunctions a discussion of the impacts on fish and fish habitat and the associated affects to Commercial, Recreational or Aboriginal (CRA) Fisheries that would result from a catastrophic failure of the water management ponds on Genoa Creek should be provided. The expectations for this analysis would be a robust assessment of potential impacts and risks to CRA Fisheries that would include modelling of wave inundation and erosional forces associated with an event that occurred during a dry or wet year in combination with a dry (piping) or wet (precipitation) event. This assessment would include discussion of how far the inundation wave would travel, how far erosional forces would extend, the range of potential effects.</p>	<p>R274. Provide a discussion of the impacts on fish and fish habitat and the associated affects to Commercial, Recreational or Aboriginal (CRA) Fisheries that would result from a catastrophic failure of the water management ponds on Genoa Creek.</p> <p>To provide the Executive Committee with information as to how the proponent will ensure that effects are being managed in all known and unforeseen circumstances (i.e., accidents and malfunctions).</p>
	<p>Section 17.4 references the additional cycle of boom and bust that would occur in the event of unplanned closure and recognizes the negative effect this may have on employees. Several mitigation measures have been provided for this effect. However, the proposal does not mention the risk of this event to local contractors and businesses. There is also no detail on how BMC will ensure that the mitigation measures proposed for employees will be carried out.</p>	<p>R275. Provide additional information on the risks of temporary or permanent unscheduled closure of the Project focusing on socio-economic effects to employees, contractors, and businesses, and others who have been impacted economically. Include details and description on how adverse socio-economic effects will be mitigated and financed, particularly if an unscheduled closure occurs (i.e., how will BMC be able to finance the costs associated with mitigation measures).</p> <p>To ensure a comprehensive socio-economic effects assessment can be conducted and to give the Executive Committee confidence in the effectiveness of proposed mitigation</p>

Source	Issue	Information Request and Rationale
		measures.
18.0 CONCEPTUAL MANAGEMENT PLANS		
See additional questions in table below		
19.0 SUMMARY AND CONCLUSIONS		
No information required		

ADDITIONAL QUESTIONS – AMENDED JUNE 8, 2017

Source	Issue	Information Request and Rationale
4.0 PROJECT DESCRIPTION		
Tailings Technology		
YG – EMR- Minerals	<p>A thorough options assessment is a critical component of project planning and MRB (Mineral Resources Branch) would have expected the proponent to have conducted an assessment not only on the waste disposal locations but also on management methods and facility risks for all stages of the project. This options assessment needs to rigorously assess all feasible options and must describe the rationale for the selected option in a transparent manner.</p> <p>In light of the long-term liability of the waste management facilities, particularly the Class A Facility, after closure to Yukon, it is imperative that all reasonable options for waste management are examined. These options need to be examined, not just in the light of the operational and near post closure period, but in the light of the benefits and costs over the long term. MRB strongly suggests that the proponent conduct a thorough options analysis coupled with a multiple accounts analysis, and a comprehensive risk assessment, which considers different mechanisms for disposal of mine waste.</p>	<p>R276. Additional information on how the options assessment was conducted, the parties involved, and the criteria and ranking systems used; and</p> <p>R277. Provide the reports referenced in Section 4.15.4 in support of the Options Assessment.</p> <p>R278. Provide a risk assessment for mine waste management facilities including a failure modes effects analysis.</p> <p>To enable the EC to determine whether options for mine waste were sufficiently considered and to give the EC confidence in the chosen design for waste rock storage.</p>
Long-term Physical Integrity of Cover System Reduced Permeability Layers		
YG – EMR- Minerals	<p>Section 9 of the CRCP includes a preliminary closure liability estimate, MRB would like to note that the estimate provided is not consistent with the 2013 guidance document prepared by Yukon government (YG) and the Yukon Water Board entitled “Reclamation and Closure Planning for Quartz Mining Projects.” Specifically the estimate does not provide for indirect costs such as reclamation research, engineering design, interim care and maintenance and other costs associated with the development of closure plans. Given the uncertainty surrounding the waste disposal methods and treatment of impacted water, it is important for the proponent to give full consideration to the costs associated</p>	<p>R279. Provide an updated Conceptual Reclamation and Closure Plan demonstrating that the mine site will remain chemically and physically stable in the long-term using proven technologies demonstrated to work in northern climates.</p> <p>R280. Provide an updated closure liability estimate consistent with the 2013 Reclamation and Closure Planning for Quartz Mining Projects guide by Yukon Government and the Yukon Water Board.</p>

Source	Issue	Information Request and Rationale
	closure plan development and implementation.	
Underground Mining		
<i>Support Design</i>		
YG – EMR – Land Management	In the Project Description (pages 4-106 and 4-107), borrow sources information is lacking. The current land lease does not speak to borrow sources and no other authorization from LMB has been granted for Borrow Sources. LMB considers Borrow Sources to be a quarry; as a result, a quarry lease and permits would need to be applied for.	<p>R281. Provide information on borrow sources for the mine site, access road and airstrip upgrade including:</p> <ul style="list-style-type: none"> a. the locations of borrow sources; b. description of dimensions of borrow source excavations including area and depth of excavations; c. the estimated quantities of suitable borrow material available; d. the quantity of borrow material required for engineered mine components; e. length of time individual sources will be used for; and f. proposed mitigation measures to minimize potential adverse effects associated with the development and use of the proposed borrow sites. <p>To enable the EC to complete a comprehensive effects assessment including the borrow sources that will be used by the proponent. Also to ensure that borrow material needed for construction is available.</p>
YG – EMR – Land Management	The Project Proposal (Section 4.12.1.3; page 4-105) talks about the 30m wide RoW for the access road upgrade. It states that “in areas where cut and fill slopes extend outside of the 30 m cleared corridor, the clearing width will be increased to 3m beyond the extent of the cut slope and/or 10m beyond the extent of the fill slope”	<p>R282. Clarify the maximum width of disturbed area along the access road.</p> <p>To ensure that information used in the effects assessment is consistent with the project.</p>
YG – Oil and Gas	The project proposal does not contain sufficient information on the LNG power	R283. Provide a map of the power plant showing the equipment layout and LNG storage

Source	Issue	Information Request and Rationale
	<p>plant and storage area to evaluate risks and potential effects.</p>	<p>area.</p> <p>R284. Provide the proposed positioning of the LNG storage tanks and LNG containment in relation to the buildings, diesel tanks and other activities which may impact the overall site layout.</p> <p>R285. Provide an analysis of potential risks and their implications of LNG operations onsite and during transportation.</p> <p>To allow an analysis of the effects and risks associated with the LNG power plant.</p>
<p>YG – HPW</p>	<p>Transportation Aviation Branch reviewed the section on the proposed upgrades to the Finlayson Lake Airstrip and have provided the following comments. The proponent has not indicated whether or not the proposed improvements for the airstrip will be done in compliance with Transport Canada’s document TP312 Aerodrome Standards and Recommended Practices, 5th Edition.</p>	<p>R286. Describe how proposed upgrades to the Finlayson Lake Airstrip will be done in compliance with Transport Canada’s TP312 Aerodrome Standards and Recommended Practices, 5th Edition.</p>
<p>YG – HPW</p>	<p>Transportation Engineering Branch also reviewed the information provided on the proposed upgrades to the airstrip and has identified that further, more detailed information on the proposed design, and how it relates to the surrounding terrain, is required. As indicated in the project proposal, HPW previously considered options for upgrading this airstrip. From this exercise HPW is aware that the surrounding terrain (e.g. close proximity to the lake), the location of the road, and the availability of materials for upgrading present challenges to the design, cost and feasibility of potential upgrades.</p>	<p>R287. Provide more detailed design information and discussion in relation to the upgrades of the Finlayson Lake airstrip. Specifically:</p> <ul style="list-style-type: none"> a. consider how the proposed design will address/service multiple users, vehicle parking, plane parking and equipment and materials storage to support servicing of the airstrip; b. given the surrounding terrain challenges, the detailed design information needs to demonstrate how the upgrades can be completed in the proposed location; and c. identify any necessary mitigations or changes that may be required to the surrounding environment. <p>To ensure an effects assessment can be completed regarding other users at the airstrip and the environmental challenges presented by the terrain.</p>

Source	Issue	Information Request and Rationale
8.0 SURFACE WATER QUALITY AND QUANTITY		
Waste Rock and Tailings Management		
YG – EMR- Minerals	Mineral Resources Branch is of the opinion that the method of co-mingling waste should be determined in the early stages of facility design, as this will have an impact on both the geochemical and physical stability of the facility. Without knowledge of how the facility is being constructed, the proponent cannot be certain that the kinetic tests being performed will be reflective of site conditions in the operational period as well as facility performance in post-closure.	R288. Confirm the disposal methodology for the Class A facility. This could be done by: initiating a representative kinetic test to predict acid generation and metal leaching from the facility; or conducting a sensitivity analysis on cell C-10 to determine the scaling factors that should be used based upon ultimate disposal determinations. To provide confidence that the proposed design will perform as expected during closure.
Water Management		
YG – EMR- Minerals	The Class A facility is predicted to be net acid generating within the mine life, while the Class B facility is expected to be net acid generating during the closure period. As such, seepage collection from these facilities is required to ensure protection of both surface and ground water resources. It is unclear however how the proponent has tested the proposed liner system to ensure that all seepage from the facility will be collected.	R289. Provide additional information to demonstrate that the proposed liner system will be sufficient to direct seepage from the Class A and Class B facilities to the seepage collection ponds for treatment. This should be demonstrated for both the operational and closure facilities. To provide confidence to the EC that the liner systems proposed will be sufficient to protect ground and surface water.
12.0 VEGETATION COVER AND COMPOSITION		
YG – FMB	Section 12 and Appendix E of the project proposal both discuss timber values that will be impacted by this project but do not provide specific detail on how much timber volume will be removed incidentally to project activities or discuss the management of incidentally harvested timber. Timber is a valuable resource to Yukon communities and the Forest Management Branch prefers timber to be salvaged whenever practical and economically feasible.	R290. Provide details on how incidentally harvested timber will be managed. Specifically address the following: <ul style="list-style-type: none"> a. details on the total amount of incidental timber volume to be harvested; b. whether timber will be utilized by the proponent during project activities, made available for public salvage, or disposed of with a rationale for this decision; and c. if timber is proposed to be made available for public use, identify the proposed storage location, salvage volume, and method of harvesting.

Source	Issue	Information Request and Rationale
		To ensure that timber values are incorporated into the effects assessment.
15.0 SOCIO-ECONOMIC EFFECTS ASSESSMENT		
YG – HPW	<p>While the proposal provides an effects characterization on Transportation Infrastructure – Roads and Airports (Section 15.8.2), it only considers traffic volumes; it does not provide information on or discuss the current condition of the Robert Campbell Highway. No details are provided about the configuration and types of project related vehicles that will be using the highway, and there is limited discussion as to how or whether or not the current conditions and state of the highway, and how it can vary seasonally, could affect or alter the project schedule and use of the highway. Additionally, there is limited discussion about potential mitigations or adjustments that the proponent could implement or propose to accommodate highway conditions and other highway users. The discussion provided is focused on limits to legal axle loads that could be imposed during spring thaw and break up. And while the project proposal does have a Traffic and Access Management Plan component (Section 18.12), it appears only to apply to the proposed tote road and site/haul roads in the project area and not to the proposed use of the Robert Campbell Highway.</p>	<p>R291. Provide information on the following in relation to the Robert Campbell Highway:</p> <ul style="list-style-type: none"> a. current conditions with respect to expected road standards; b. configuration and types of project related vehicles that will be using the highway; c. discussion on how or whether the current conditions and state of the highway, and expected seasonal variances and effects of the environments, may affect or alter the project schedule and proposed use of the highway; d. traffic management plan for proposed use of the Robert Campbell Highway including consideration for the varying physical state and condition of the road and with respect to other users; and e. mitigations and alternatives that could be implemented <p>To ensure that the impacts to other road users are included in the effects assessment, including the effects of the Project on road quality.</p>
18.0 CONCEPTUAL MANAGEMENT PLANS		
YG – Community Services	<p>The proponent's Conceptual Waste Management Plan (Section 18.2) has limited details regarding destination for certain waste streams. For example, Table 18 -2 in the Waste Management Plan notes that tires will be taken for "off site disposal" and Special Waste such as batteries, antifreeze and solvents will be "Shipped to licensed recycle or disposal facility on regular basis."</p> <p>Small community and unincorporated waste management facilities and transfer stations are not appropriate destinations for waste produced at industrial/mining operations.</p>	<p>R292. Provide additional information related to the destination for all potential waste types.</p> <p>To ensure that waste disposal is considered in the effects assessment.</p>

Source	Issue	Information Request and Rationale
<p>YG -Health and Social Services</p>	<p>Appendix A-6 – Occupational Health and Safety Policy (links to Health, Safety and Emergency Response Plan (HSERP)) These comments are related to HSS values of Health and Safety of Individuals.</p> <p>The BMC Health and Safety Management System is noted as a component of the Occupational Health and Safety Policy, but primarily the process for developing this system is described in the proposal here (with suggestions for planned components but many details ‘to be determined’).</p>	<p>R293. Provide additional information on the Health and Safety Management System and the risks it is designed to address. Specifically describe the potential risks and the responses.</p> <p>To assess effects and the effectiveness of mitigations related to worker safety.</p>
<p>YG -Health and Social Services</p>	<p>More information on the ‘levels’ of emergency is required in order to assess impacts/ effectiveness of mitigations (given potential connection to public health and safety, health and safety of individuals and quality health care service delivery).</p> <p>While the type of ‘control measures’ to be defined have been listed, many of the details are left for later in the planning stage. In order to assess the potential impacts and mitigations on health and safety risks to employees, the public and service providers, more information is needed at this stage on these control measures.</p> <p>The medical evacuation flowchart is provided as an example but lacks details.</p>	<p>R294. Provide the following information related to levels of emergency:</p> <ul style="list-style-type: none"> a. type of incidents that will be manageable with onsite personnel; b. type of health professionals and health services that will be available on-site; c. type of incidents that will require Government of Yukon services; d. plans for each ‘level’ developed with Government of Yukon; and e. defined roles and responsibilities related to emergency response. <p>R295. Provide the following in relation to control measures:</p> <ul style="list-style-type: none"> a. details on the personnel training plan & emergency response/rescue team; b. how many personnel will be trained and to what level; and c. the level of emergency medical care that will be available on site and in what quantity. <p>R296. Confirm that the medical evacuation flowchart is the anticipated flow of evacuation and whether it was informed by emergency response providers.</p> <p>To ensure that impacts to local emergency services are considered in the effects assessment and to evaluate emergency plans for worker safety.</p>

Source	Issue	Information Request and Rationale
YG -Health and Social Services	In Section 18.11.2, the proponent describes a number of dust suppression measures that will be used (e.g. watering unpaved roads, exposed surfaces and stockpiles) during all phases of the project. However, it is not clear when these measures will be implemented.	R297. Describe how you will determine when dust suppression (e.g. watering unpaved roads, exposed surfaces and stockpiles) is needed. R298. Describe the thresholds or triggers for the application of dust control measures. To provide EC with confidence that proposed mitigations will be practicable.
YG -Health and Social Services	In Section 18.11.3.3 ambient monitoring results above Yukon Ambient Air Quality Standards (YAAQS) are noted as triggers for the application of contingency measures in the case of specific weather conditions. However, in Section 6.6.1 (Air Quality Monitoring) of the proposal, the proponent suggests that no air quality monitoring is proposed.	R299. Describe the source for the monitoring results that would trigger dust suppression and other mitigations. To provide EC with confidence that proposed mitigations will be practicable.

APPENDIX 1 – INFORMATION FOR THE PROPONENT’S CONSIDERATION

The following table presents information that the Executive Committee has determined does not require a response from the proponent for the purposes of the adequacy review. This information was compiled from comments provided by Decision Bodies and regulators and technical memorandums produced by the Executive Committee’s consultant teams. This information is provided for the proponent’s consideration and responses may be required at later stages of the assessment or regulatory process. Additional information for consideration highlighted below is part of the June 8, 2017 amendment to the Adequacy Review Report.

<i>Source</i>	<i>Issue</i>	<i>Information for Consideration</i>
2.0 FIRST NATIONS AND COMMUNITY CONSULTATION		
YG – Tourism and Culture	This appendix [B] has a large variety of reports and presentations and is difficult to navigate.	Provide a table of contents for Appendix B Consultation and Engagement.
4.0 PROJECT DESCRIPTION		
YG – EMR – Land Management	Section 1.2 on page 5 of Appendix C mentioned that Table 1-2 is a “preliminary list of the anticipated equipment requirements for the construction phase”. Then it states that “additional equipment will be required for the airstrip upgrade and the upgrade to the Tote Road”.	A list of the additional equipment needed to upgrade these infrastructure, would be helpful.
YG – EMR – Land Management	Throughout the documents, the terms license and lease are used interchangeably, it would appear to refer to the current tote road lease.	Land Management Branch would like to clarify that the current tote road is under a lease and that this lease can be amended to accommodate the new RoW width of the upgraded access road.
8.0 SURFACE WATER QUALITY AND QUANTITY		
YG – Environment (Q.29)	Section 3.1.2.3 states an electromagnetic flow meter was used for discharge measurements. Details were not provided on instrumentation or quality assurance quality control to ensure measurements were accurate.	Provide the make and model of the electromagnetic flow meter.
Health Canada Q 10	The qualitative discussion of baseline contaminant data in water sources is not easy to follow or understand.	Present baseline contaminant data for water sources in a table format together with applicable thresholds and guidelines.
Health Canada	Table 8-36 shows preliminary water quality objectives (pWQO) exceedances of	Discuss the potential risk to human health from the consumption of arsenic in drinking water

Source	Issue	Information for Consideration
Q 11	<p>arsenic both before and after treatment of ABM lake.</p> <p>The Canadian Council of Ministers of the Environment's (CCME) water quality guideline for arsenic is 0.005 mg/L and Health Canada's drinking water guideline for arsenic is 0.01 mg/L.</p>	<p>with reference to the CCME water quality guidelines and Health Canada's drinking water quality guidelines, as traditional land users in the area may drink untreated surface water.</p>
Water Management		
EcoMetrix p.18	<p>Several items typically considered within a Sediment and Erosion Control Plan have not been considered in the Proposal. These include the management of water from dewatering activities and construction timing restrictions (e.g., for in-water/near water work).</p>	<p>Update the Sediment and Erosion Control Plan to address:</p> <ul style="list-style-type: none"> a. management of water from dewatering activities; b. and construction timing restrictions (e.g., for in-water/near water work).
EcoMetrix p.19	<p>It is uncertain if the proposed sediment collection pond volumes as specified in the Proposal have sufficient storage volumes to provide the hydraulic retention time necessary to achieve the design criterion identified.</p> <p>Section 18.6.3.2 of the Proposal states that sediments ponds will be:</p> <p><i>Designed to trap sediment particles of 10 microns in size or larger with flow volumes equivalent to a 1:200 year, 24-hour rainstorm for the Class A and Class B Storage Facilities Collection ponds and 1:10 year, 24-hour rainstorm for the Class C Storage Facilities Collection and Overburden Stockpile ponds.</i></p>	<p>Provide computations demonstrating that collection pond volumes as specified in the Proposal have sufficient storage volumes to provide the hydraulic retention time necessary to achieve the stated design criteria.</p>
Surface Water Quality and Quantity		
EcoMetrix p.29	<p>Additional hydrometric information would be useful to verify the work completed to-date and provide additional confidence in projections. Notwithstanding, it is anticipated this information could be collected through the next project phase and used to further verify developed water balance models and projections related to receiving water quantity and quality.</p>	<p>Continue to collect hydrometric information to be utilized in the water balance and water quality models.</p>

Source	Issue	Information for Consideration
9.0 GROUNDWATER QUALITY		
YG – Environment Q 5	The groundwater quality data is compared to the Federal Contaminated Sites Action Plan Federal Interim Groundwater Guidelines. These guidelines were developed for federal contaminated sites in jurisdictions that did not have current groundwater guidelines.	Reference the Contaminated Sites Regulation (Yukon) for groundwater quality data standards.
YG – Environment Q 13, Q 30	It is possible for the groundwater quality at the site to be degraded through seepage from the waste management facilities at the site and the eventual evolution of water quality of the pit lake. The groundwater modelling exercise presents the majority of groundwater at the site entering Geona Creek at some point of the reach. Without full groundwater capture, impacted groundwater could bypass the proposed wetland treatment and degrade the quality of Geona Creek.	Provide additional information to demonstrate that the proposed compacted till liner systems will be sufficient to allow full seepage collection to the collection ponds and what percentage of seepage bypass could occur to groundwater. Collection of groundwater should be included in the conceptual closure plan.
Environment and Climate Change Canada ECCC - 008	<p>The surficial geology below the Class A waste rock facility suggests variable ground conditions, comprised of morainal tills, glaciofluvial complex and fan deposits. Further, the glaciofluvial deposits constitute the “downstream” toe of the S-PAG dump; extending in direction to downgradient of the potential capture influence of the lower-most water management pond (Figure 3).</p> <p>ECCC notes that there are no monitoring wells installed in the vicinity of Class A Storage Facility to assess the potential impact of infiltration out of the facility on the receiving environment. In addition, there has been insufficient information with respect to the potential capture of infiltration out of the Class A Storage Facility.</p> <p>Further, ECCC notes that the saturated screen lengths used to monitor groundwater quality didn’t comply with standard procedures and recommendations as provided in BC MOE 2009b. As recommended by BC MOE, maximum saturated screen lengths should be limited to 1.8 m within the target hydrostratigraphic unit. The use of longer screens for water quality monitoring would cause dilution of constituents and water quality data from such wells should not be compared directly with groundwater quality standards unless supporting rationale can be provided.</p>	<p>Produce a conceptual site model of the Class A Storage Facility and groundwater monitoring plan in order to assess seepage, baseflow, and groundwater flow downstream of the facility.</p> <p>Provide rationale for using saturated screen length longer than 1.8m in the groundwater monitoring program and discuss the effect on water quality samples.</p> <p>Provide well decommissioning information for the abandoned wells that will not be used for the monitoring program.</p>

Source	Issue	Information for Consideration
Environment and Climate Change Canada ECCC - 010	The Proponent has not conducted sensitivity analysis to capture those uncertainties associated with fault zone hydraulic properties. Faults may act as a barrier to groundwater flow, or as a conduit. Further analysis of the conductivity of the fault zones is required using the available site data.	Conduct a sensitivity analyses for the predictive hydrogeological model in order to assess potential impacts on quantity and quality of groundwater inflow to the pit and its impact on surface hydrology. The analysis should address uncertainties associated with fault zone hydraulic properties.
10.0 AQUATIC ECOSYSTEM RESOURCES		
YG – Environment Q 50	<p>The proponent has chosen Arctic grayling for monitoring aquatic health among fish species. To identify potential effects they state they will monitor for changes in fish distribution (presence/absence data), abundance estimates and fish condition factor. As it is currently written, the proponent has only used presence and absence electrofishing techniques to establish their baseline. They did not adequately sample for abundance, nor did we see estimates of condition factor.</p> <p>The data above will aid in standardizing the sampling effort and therefore allow for repeatability when estimating abundance.</p>	<p>To adequately address fish abundance, establish electrofishing stations of a defined length with reported UTM's at the top and bottom of each station (So that repeat trials can occur within each station, among years). Additionally, sampling at each station should include:</p> <ol style="list-style-type: none"> a. records of water conductivity and temperature, at the time of each sampling; b. records of stream stage (How deep was the section (station) of stream, where and when it was sampled). c. records of wetted width within the section (station) area. d. Preferably, each station should be block netted and a removal method employed to allow for a reasonable assessment of abundance. Several sweeps (passes) should occur within each station; e. establishment of control stations outside any potential impact area; and, f. estimates or indices, of species abundance.
YG – Environment Q 52	Metal concentrations data in benthic invertebrates was collected at only three sampling stations, two of which were located on Finlayson Creek on either side of the Geona Creek confluence and a third again from Finlayson Creek where the creek crosses the Robert Campbell Highway.	Include the South Creek and North Lakes watershed, and additional sampling sites within the Geona Creek and Finlayson Creek watershed in the sampling protocol.
YG – Environment Q 53	The proponent did not report average water temperatures from locations where minnow pots were set.	Report average water temperatures from locations where the pots were set in future sampling.

Source	Issue	Information for Consideration
11.0 TERRAIN AND SOILS		
Soil Baseline and Soil Erosion		
SNC-Lavalin	There is no soil erosion map presented in the submission.	Provide a baseline soil erosion map at an adequate scale to support the soil erosion potential evaluation and a soil erosion potential for the study area which includes the component attributed to thermal erosion (where permafrost is identified as being present).
13.0 WILDLIFE AND WILDLIFE HABITAT		
SLR 13.10	The assessment endpoint/threshold criteria for the "Change in wildlife movement/Change in population distribution" measurable parameter was based on expert opinion. The expert or experts relied on for this decision should be cited (i.e., named in the text or referenced as a personal communication. This will assist reviewers in understanding the basis for the criteria.	Provide a citation for the expert/experts whose professional opinion formed the "Change in wildlife movement/Change in population distribution" parameter.
SLR 13.12	The only specific monitoring for caribou is the rut survey but the text identifies a number of issues relevant to caribou. "The purpose of the monitoring program will be to track habitat use and population trends to assess whether the predicted rut habitat avoidance occurs and whether the lost habitat or indirect effects on predation are affecting the overall population or recruitment" (p. 13-124). It is unclear how one rut survey each year can assess indirect effects on predation. Residual effects were also identified for post-calving habitat, but the monitoring program does not include post-calving habitat.	Provide additional information on the monitoring program and how it will achieve stated objectives of tracking habitat use and population trends (including predation and recruitment). Include post-calving habitat use in the monitoring program and identify how it will be tracked.
SLR 13.13	Table 13-9 Provides a list of potential effects to be carried forward for mitigation but does not include several effects to caribou that are mentioned in the discussion. This table should be complete to ensure that detailed mitigation measures are put in place for these effects.	Complete Table 13-9 by including the following effects to caribou: a. displacement (caused by the road and the mine); b. health effects due to stress/displacement; c. direct calving habitat loss;

Source	Issue	Information for Consideration
		<ul style="list-style-type: none"> d. effects of potential increased predator efficiency along the road; e. disturbance on winter range from increased traffic on the Robert Campbell Highway; and f. changes in the predator/prey system.
SLR 13.14	Methods used to determine the Predicted Effectiveness of Mitigation and identification of residual effects in Table 13-20 are not clearly defined.	<p>Indicate the methods used to determine the predicted effectiveness of mitigations and identification of residual effects in relation to the Finlayson caribou herd. The following information on methods is needed to assess the adequacy of proposed mitigation measures for the Finlayson caribou herd (Table 13-20):</p> <ul style="list-style-type: none"> a. How was Predicted Effectiveness of Mitigation (High, Medium, Low) determined? b. How was a Residual Effect identified?
YG – Environment Q 36	Loss of grizzly bear habitat is based on a denning habitat suitability map for the GMA. The proponent only included the project footprint and local study area in the calculation of loss of feeding habitat. This should be completed at a regional scale.	Provide maps and information on loss of grizzly bear habitat on a regional scale. Incorporate information from Yukon Government about grizzly bears at a regional scale into the effects assessment.
YG – Environment Q 36	The proponent uses thresholds about acceptable amounts of habitat loss and disturbance for grizzly bears. It is unclear how thresholds were established. The primary reference provided for Grizzly Bear thresholds in Table 13-3 is for woodland caribou (Environment Canada. 2011. Scientific assessment to inform the identification of critical habitat for woodland caribou (Rangifer tarandus caribou), boreal population, in Canada. Ottawa, ON, pp. 102.)	Provide a reference for the thresholds used regarding acceptable amounts of habitat loss and disturbance for grizzly bears.
YG – Environment Q 36	Proposal does not seem to consider maintenance of security habitat or buffers around human-related disturbances. Cumulative effects discussion focused on direct mortality, no discussion on cumulative effects to grizzly bear habitat. In general the cumulative effects analysis and discussion is incoherent and inadequate.	Incorporate discussion of the loss of grizzly bear habitat and indirect mortality into the discussion of cumulative effects to grizzly bear.

Source	Issue	Information for Consideration
	<p>Cumulative effects encompass more than direct mortality.</p> <p>GMS 10-07 is an inappropriate scale to be examining cumulative effects on Grizzly Bears.</p>	
<p>YG – Environment Q 36</p>	<p>The proponent conducted bear den surveys within a 10km radius from the open pit and found 3 dens about 5 km from the pit. Proponent indicated that surveys were conducted in 2015 (April 23, May 4 and 15) and (April 17 and 27) 2016.</p> <p>The use of only 2 surveys in 2016, combined with the use of a 10 km radius only surrounding pit operations, does not provide confidence that grizzly bear denning has been adequately surveyed.</p>	<p>Complete an additional year of bear den surveys (with at least 3 surveys), using a 10 km radius on all mine operations.</p>
<p>SLR 13.2</p>	<p>The omission of thinhorn sheep as a subcomponent weakens the assessment of effects on this economically and ecologically important species.</p>	<p>Consider including thinhorn sheep as a subcomponent if the proposed flight paths demonstrate potential interactions with thinhorn sheep. Provide an assessment of potential effects on thinhorn sheep populations near the project area and on a regional basis. Thinhorn sheep effects assessment should include a more detailed explanation of air traffic routes and how real time information on sheep locations in proximity to proposed flight paths would be used as a basis for applying mitigation measures.</p>
<p>YG – Environment Q 49</p>	<p>Access management is a critical aspect of this project to prevent increase hunting pressure from easy and available access via the Tote Road.</p>	<p>Provide details on the security station and gate at the access point of the Tote Road from the Robert Campbell highway. This should include:</p> <p>Will the gate be managed for the life of the project (i.e., through the postclosure phase)?</p> <p>How will snowmobiles/ATV's be prevented from accessing the Tote Road when the mine is closed or the gate is unmanned (i.e. holidays, etc)?</p>
<p>SLR 18.2</p>	<p>The Traffic and Access Management Plan needs more detail for some mitigation measures and more clarity as to when measures will be applied. This information is needed to assess the adequacy of the plans. In addition, there is information presented for which the origin is unclear (wildlife crossings and wildlife areas).</p>	<p>Provide the following information to assess the effectiveness of traffic control as a mitigation measure:</p> <p>What are the "minimum traffic levels" proposed for this mitigation measure?</p> <p>When would they be applied or not applied (i.e. what would constitute a time when these measures would not be practical or practicable.)?</p>

Source	Issue	Information for Consideration
		<p>What are the speed restrictions for the mitigation measure "Setting and enforcing speed restrictions during the migration periods"?</p> <p>How will access be managed after the road is decommissioned? (Note: The access road alignment may provide a travel route via all-terrain vehicles for the public into the former mine site and as such presents a long-term risk to local populations of wildlife due to increased hunter access).</p> <p>What are the sources of information for the potential wildlife crossings shown in Figure 18-6?</p> <p>What additional information sources can be used to maintain up-to-date information on flight routes and air traffic volume in relation to ungulate distribution and movements?</p> <p>How were key areas for caribou determined for Figure 18-8?</p> <p>Include the map and a discussion of it in Appendix E-8 and/or Chapter 13.</p>
SLR 13.5	Section 13.5 of the technical memo from SLR refers to several clarification and consistency points within the proposal. It is important to provide as accurate information as possible within the limitations of publicly available data as well as baseline data to support the environmental effects assessment and the overall risks associated with this project proposal.	In regards to the SLR technical memo, s 13.5, explain how you have addressed each issue raised, how any resulting corrections or additions to the assessment might affect the conclusions drawn about the potential for adverse effects on wildlife and wildlife habitat, and how these corrections and additions might alter any proposed mitigation measures.
14.0 HERITAGE RESOURCES		
EEM	The <i>Socio-economic Baseline Report</i> is missing heritage resources baseline data about ice patch wood fragments that are discussed in the <i>Heritage Resources Impact Assessment Report</i> .	Include baseline data about ice patch wood fragments in Section 6.3 of the Socio-economic Baseline Report.
15.0 SOCIO-ECONOMIC EFFECTS ASSESSMENT		
EEM, 3.2	The use of average individual aggregate income as a proxy for economic growth in Figures 3 and 4 of the <i>Socio-economic Baseline Report</i> is questionable as it ignores demographic variables and population trends within each community. To be useful	Provide the sum of individual aggregate incomes by community for each tax year in the Socio-economic Baseline Report to improve the economic growth indicator. The temporal trend for each community should be shown on a graph to provide additional context for this

Source	Issue	Information for Consideration
	as an indicator of GDP (and by proxy economic growth at the community level), the <i>sum</i> of all individual aggregate incomes by community for each tax year would need to be provided in the baseline study. It will be difficult to assess and monitor the project affect to economic growth without a baseline that shows temporal trends	indicator. Describe how this project may influence the ‘sum of all individual aggregate incomes by community’ through operations, temporary closure and closure stages.
EEM, 3.4	The proposal details anticipated positions and labour requirements for pre-production and operational stages of the project and project preferences for First Nations and local hiring. However, skill and capacity gaps within the community may lead to First Nations and local community members/businesses being unable to benefit from these opportunities.	In relation to all phases and requirements of the project, provide additional information about a) worker skills inventory in the study communities, and b) contractor capacity in local communities in order to demonstrate gaps or barriers to implementing the strategies that have been outlined.
EEM, 3.5	The Socio-economic Baseline Report mentions courses and training provided by the Centre for Northern Innovation in Mining program at Yukon College. The scholarship program for Kaska students is a good initiative, but without knowledge of how many students are enrolled (and their target completion dates), it is impossible to assess the effectiveness of the program.	Describe how the Centre for Northern Innovation in Mining relates realistically to local employment opportunities at the mine, considering the timelines for graduation in relation to all stages of the mine plan.
EEM, 3.6	The <i>Socio-economic Baseline Report</i> does not provide any explanation of the role that traditional economic activities play in First Nation households when presenting labour force participation rate statistics.	Provide additional context for lower labour force participation rates by First Nation peoples in the Socio-economic Baseline Report.
EEM, 3.8	The assumptions underlying the calculations of revenue from royalties, corporate income taxes, and individual income taxes are not explained. There is a huge discrepancy between what the proponent says it expects to pay in royalties and corporate income taxes and what the model suggests that these government revenues will be.	Provide the parameters used to model different scenarios for government royalties, corporate income tax, and individual income tax revenues.
EEM, 4.6	While a conceptual management plan and approach to occupational health and safety risk identification and mitigation is provided, the proposal lacks details about	Identify project-specific occupational health and safety risks and explain how they will be mitigated to ensure the safety of project employees. Specifically, detail plans to manage risks related to: noise-induced hearing loss, exposure to diesel particulate matter, and

Source	Issue	Information for Consideration
	specific health and safety risks.	fugitive dust emissions of lead concentrate during the loading of shipping containers.
EEM	The discussion of population of the <i>Socio-economic Baseline Report</i> and <i>Socio-economic Effects Assessment</i> does not include discussion of the indirect effects to the local workforce when local hiring occurs.	Describe the impacts to affected communities and First Nations of local hire initiatives to the available workforce within that community.
EEM, 5.3	The proposal does not assess the increased likelihood of disorderly conduct associated with drug and alcohol abuse or the increased possibility of prostitution in Whitehorse and along the transportation corridor associated with company employees or contractors.	Describe measures proposed to ensure that off-duty incidents involving company employees in project communities are dealt with in a way that encourages good company-community relations?
EEM, 6.2	The proponent states that the residual effect of increased traffic on the Campbell Highway will be a net positive through additional highway improvements without mentioning the current state of the road or additional wear and tear due to project traffic.	Provide additional information or records of communication with Yukon Government – Highways relating to additional traffic and/or planned highway improvements.
EEM, 8.1	There is no reference in project documentation to a stakeholder grievance mechanism for the project. It is generally regarded as best practice in the mining industry to put a process in place that allows project stakeholders to file project-related complaints and provides the company with a means to systematically address such complaints in a transparent manner. This would typically be detailed in the proponent's conceptual management plans.	Detail any plans to address stakeholder grievances throughout the life of the mine.
YG – Economic Development	Section 15.5.2 of the project proposal describes the impacts to economic growth as well as estimated project gross revenues over the 10-year mine life. However, the proponent does not supply any information related to the assumptions used in their economic forecasting.	The information that would be necessary to determine adequacy would include assumptions made on Canadian interest rates, Canadian and US dollar exchange rates, and commodity prices over the mine life.
YG – Economic	The proponent also states that total capital costs are estimated at \$426 million, and	What percentage of total contract dollars does the proponent anticipate awarding to Yukon

Source	Issue	Information for Consideration
Development	goes on to describes the breakdown of direct and indirect impacts on the Yukon GDP. However, the proponent does not supply estimates of how much of the capital costs will be spent locally.	businesses?
YG – Economic Development	In the same section, the proponent states that they will “encourage the participation of local communities, local Indigenous Peoples and associated businesses in its projects wherever practicable”. This statement is vague and does not fully give context to what “practicable” means in this project proposal.	<p>Further information is necessary to understand what impact the project will have on local communities. What mechanisms will the proponent use to encourage the participation of local businesses and communities?</p> <p>What is the proponent’s target for contracts to be awarded to Yukon businesses during all phases and what mechanisms do they plan to use to achieve those targets?</p> <p>What is the proponent’s approach to unbundling contracts to facilitate maximum participation by Yukon businesses?</p>
YG – Economic Development	In Section 15.5.7, the proponent states “the project is expected to provide a beneficial effect through an increase in the number of contracts available for Kaska, local and Yukon firms”, including as pursuant to the SEPA agreement, Kaska companies will be offered the right to submit a “first proposal” on certain contracts. However “submitting a first proposal” does not mean anything substantive in terms of being able to assess the likely effect of the project on the community.	Further information on mechanisms by which the proponent will seek to maximize participation by other Yukon contractors is necessary
YG – Economic Development	The proposal is missing information related to understanding local hire targets during all phases.	In table 15-9, the proponent supplies community employment assumption ranges, however specific local hire targets (percentage of local hire) for the project during all phases would be appreciated for an overall context
YG -Health and Social Services	The proponent has indicated that a Health Human Risk Assessment has not been included as “there are no permanent or semi-permanent residents in the immediate vicinity of the Project...”	<p>A summary of the potential interaction of contaminants with human health, and what mitigations would be applied would be helpful.</p> <p>Many of the components for this information may be present in the report (such as in Section 12.4.1.6), but pulling all relevant contaminant risk/mitigation information relevant to human health would offer a more complete picture and help support the assessment.</p> <p>As noted in the Appendix on Traditional knowledge, the perception of contamination may also have an impact on the dietary practices of those who would otherwise consume country</p>

<i>Source</i>	<i>Issue</i>	<i>Information for Consideration</i>
		foods. HSS suggests that the proponent consider the possibility of this impact (describing the likelihood of this risk and any proposed mitigations).
OTHER REQUIRED INFORMATION		
Fisheries and Oceans Canada	The 1996 Cominco Ltd. Initial Environmental Evaluation report has not been provided; recommend that all available reports from this time frame be provided.	Provide the 1996 Cominco Ltd. Initial Environmental Evaluation report and all available reports from this time frame